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The Development and Validation of the Spatial Anxiety Scale for Secondary School Students

Özlem Özçakır Sumen
Ondokuz Mayıs University

Abstract

This study aims to develop a scale for determining the anxiety levels of secondary school students in situations that require them to use their spatial skills. The scale was developed in three stages. In the first stage, after expert assessments, a pilot study was conducted. In the second stage, the scale was applied to all students (N=348) studying in a secondary school selected by random sampling for exploratory factor analysis, and results supported a structure with two sub-dimensions consisting of 14 items. For confirmatory factor analysis, the scale was applied to a different group of students (N=206), and analysis results confirmed the two-factor structure of the scale. The first factor, including spatial relations and orientation items, was named Anxiety of Spatial Relations and Orientation, and the second was named Anxiety of Spatial Visualization. In the third stage, Cronbach’s alpha reliability of the scale was found to be .82 for the whole scale and .81 and .72 for sub-dimensions. The McDonald’s omega was also calculated as .97 for the whole scale and .96 and .91 for sub-dimensions of it. The results revealed that the scale measures the spatial anxiety level of students validly and reliably.

Keywords: Secondary School Students, Spatial Anxiety, Spatial Orientation, Spatial Relations, Spatial Skills, Spatial Visualization.

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INTRODUCTION

Spatial skills are defined as the ability to form and control mental images (Lord, 1985), but the nature of spatial skills is still not fully understood (Linn & Petersen, 1985; Tam et al., 2019). There are positive correlations between spatial skills and mathematics achievement (Battista, 1994). Spatial skill is also known as a predictor of STEM achievement (Ramirez et al., 2012; Wai et al., 2009). Regarding spatial skills, spatial anxiety refers to students’ anxiety about performing spatial tasks (Ramirez et al., 2012) and affects student performance negatively (Dursun, 2010). Besides, it has been reported that spatial anxiety reduces the ability to focus on the cues required to maintain geographical orientation (Lawton, 1994). Because of the important and multi-dimensional effects of spatial anxiety, there is a need for more research investigating it. This study, aimed to develop a scale for measuring the spatial anxiety levels of secondary school students. Since spatial anxiety scales are limited in the literature (Lawton, 1994; Lyons et al., 2018), this study will contribute to the field.

Theoretical Framework

Spatial skills are defined in different ways by researchers. Tartre (1990) defined it as “mental skills concerned with understanding, manipulating, reorganizing, or interpreting relationships visually” (p. 216). Linn and Petersen (1985) emphasized the symbolic (nonlinguistic) information in spatial skills and expressed it as the “skill in representing, transforming, generating, and recalling symbolic information” (p. 1482). According to Lohman (1993), spatial skills are “to generate, retain, retrieve, and transform well-structured visual images” (p. 3). On the other hand, Casey et al. (2001) emphasized spatial skills as reasoning skills by transforming of mental pictures.

Spatial skill is an important component of intellectual skills (Linn & Petersen, 1985). Besides, it is positively associated with mathematical skills (Tam et al., 2019) and is a significant predictor of students’ mathematics success and reasoning skills (Casey et al., 2015; Battista et al., 1982; Hannafin et al., 2008). Moreover, spatial skills play an important role in students' success and participation in the STEM disciplines (Casey et al., 2001; Gunderson et al., 2013; Lauer et al., 2018; Wai et al., 2009). It is also possible to increase the students' success in engineering courses with spatial skills (Sorby, 2009).

Components of Spatial Skills

The only known about spatial skill is that it includes multiple processes (Linn & Petersen, 1985). So there are different classifications related to the components of spatial skills. McGee (1979) and Clements (1998) classified spatial abilities in two components: spatial visualization and spatial orientation. According to Lohman (1979) and Contero et al. (2005), spatial skills involve three types: visualization, relations, and orientation. Linn and Petersen (1985) also explained three components of spatial skills according to the results of a meta-analysis study: spatial visualization, spatial perception, mental rotation. Different researches express two components of spatial skills, but the components are different. Burnett and Lane (1980) defined two types of spatial factors: the first one is spatial relations and orientation as a whole, and the second is spatial visualization. The researchers explaining two factors of spatial skills, including spatial visualization and spatial relations also exist in the literature (e.g., Elliot & Smith, 1983; Pellegrino et al., 1984; Olkun, 2003).

Spatial visualization, which is an essential component of spatial skills, described as the ability to imagine the spinning of objects in three-dimensional space and folding or unfolding of flat patterns (Burnet & Lane, 1980; McGee, 1979). Visualization is the revival of the new state of the object due to moving and rotating (Ekstrom et al., 1976). However, it is a complicated ability involving multistep manipulations of spatial information like mental rotation and spatial perception (Linn & Petersen, 1985). The other component of spatial skills is spatial orientation, defined as “understanding and operating on the relationships between the positions of objects in space with respect to one’s own position” (Clements & Battista, 1992, p. 69). It includes “the arrangement of elements within a visual
stimulus pattern” (McGee, 1979, p. 892). The next one is spatial perception, and it consists of determining spatial relationships with respect to the orientation of individuals’ own bodies (Linn & Petersen, 1985). Another type of spatial skill is mental rotation, and it can be defined as “the ability to rotate a two or three-dimensional figure rapidly and accurately” (Linn & Petersen, 1985, p. 1483). The last one is spatial relations. It was described as “comprehension of the arrangement of elements within a visual stimulus pattern” (McGee, 1979, p. 892) and includes recognizing “the identity of an object when it is seen from different angles” with spatial orientations (Burnet & Lane, 1980, p. 233). As seen in the different definitions, it is very complicated to distinguish the components of spatial skills with strict limits.

Spatial Anxiety and Its Relationships with Spatial Skills

According to Lawton (1994), spatial anxiety is the anxiety about environmental navigation. Schmitz (1997) defined spatial anxiety as concerns about becoming lost. Spatial anxiety, which negatively correlates with spatial skills, negatively affects student academic success (Dursun, 2010). Reducing spatial anxiety and understanding its relationship with spatial skills will contribute to spatial skills development and increase success in STEM disciplines (Ramirez et al., 2012; Wai et al., 2009).

Regarding the studies on spatial anxiety, the results showed that both men (Erkek & Işıksal Bostan, 2015) and women show higher spatial anxiety levels (Ferguson et al., 2015; Lauer et al., 2018; Lawton, 1994; Lyons et al., 2018). It has also been found that adults with high spatial anxiety use lower navigation strategies (Lawton, 1994) and show lower mental rotation performance in their spatial reasoning skills (Ferguson et al., 2015; Lawton, 1994; Lyons et al., 2018). Regarding spatial skills in childhood, Ramirez et al. (2012) examined the relationship between the spatial anxiety and mental rotation performance of first and second-grade students. They found that higher spatial anxiety of children with higher working memory is related to poorer mental rotation performance. The results also revealed that girls showed higher spatial anxiety than boys as in adults (Ferguson et al., 2015; Lawton, 1994). In a different study with third and fourth-grade children, Cardillo et al. (2017) reported similar findings: Spatial anxiety is negatively associated with mental rotation performance, and girls have higher spatial anxiety than boys. More studies investigating spatial anxiety and its relationships with spatial skills from different perspectives will contribute to the field.

The Importance of the Study

The absence of a scale that measures the level of spatial anxiety of secondary school students constitutes the study’s point. There are two spatial anxiety scales previously developed. The first is the spatial anxiety scale developed by Lawton (1994) for measuring college undergraduates’ navigational skills, consisting of a dimension and eight items. The other is the spatial anxiety scale developed for adults by Lyons et al. (2018). Therefore, this study aimed to develop a "Spatial Anxiety Scale" for secondary school students.

METHOD

This study is a scale development study and aimed to develop the Spatial Anxiety Scale to measure the anxiety levels in situations that require secondary school students to use their spatial skills.

Participants

The data was collected from three groups of participants. The first group consisted of 5th-grade students (N=12) used for the pilot study. In the second stage, the scale was applied to all students (N=348) studying in a public secondary school selected by random sampling. This group includes 177 girls (50.9%) and 171 boys (49.1%); 85 fifth grade (24.4%), 74 sixth grade (21.3%), 97 seventh grade (27.9%), 92 eighth grade (26.4%) students. The scale was reapplied randomly to 206
students studying in a different secondary school for confirmatory factor analysis. There were 93 girls (45.1%) and 113 boys (54.9%) in this group. In terms of grade levels, there were 67 students (32.6%) in the fifth grade, 73 students (35.4%) in the sixth grade, 53 students (25.7%) in the seventh grade, and 13 students (6.3%) in the eighth grade.

Developing the Scale

The scale was developed in three stages. In the first stage, for the content validity, the items were evaluated by experts, and a pilot study was conducted with 5th-grade students for the clarity of the scale. In the second stage, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted. After obtaining a meaningful factor structure, in the third stage, the scale’s reliability was analyzed.

In the first stage, the studies about spatial skills were investigated, and different classifications about the components of spatial skills were reviewed. The scale was developed based on the classification made by Lohman (1979) and Contero et al. (2005). Lohman (1979) and Contero et al. (2005) classified spatial skills in three components: spatial orientation, relations, and visualization. In this context, the items of the scale were determined. Contero et al. (2005) summarized the features of the literature’s most commonly cited paper-and-pencil spatial ability tests, and the items of the scale were constructed considering this summarization. Table 1 presents the types of spatial skills determined by Contero et al. (2005).

Table 1. The types of spatial skills (adapted from Contero et al., 2005)

<table>
<thead>
<tr>
<th>Spatial Skills</th>
<th>The Types of Abilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Spatial Relations</td>
<td>Performing a mental rotation of 2D objects</td>
</tr>
<tr>
<td></td>
<td>Matching a given image with an image that is identical, but rotated</td>
</tr>
<tr>
<td></td>
<td>Determining whether images of hands rotated in different positions, correspond to the left or right hand (Left or Right Hand Identification)</td>
</tr>
<tr>
<td></td>
<td>Mentally rotating 2D objects (Cards Rotation)</td>
</tr>
<tr>
<td>2 Visualization</td>
<td>Viewing two-dimensional parts of a paper and selecting the figure that indicates the appearance of the final unit of paper when the parts are assembled (Paper form)</td>
</tr>
<tr>
<td></td>
<td>Indicating what an unfolded shape would look like when folded (Differential Aptitude)</td>
</tr>
<tr>
<td></td>
<td>Folding a paper mentally a certain number of times, making a hole through the folds, then visualizing the unfolded paper (Paper Folding)</td>
</tr>
<tr>
<td></td>
<td>Visualizing how a piece of paper can be folded to form a given 3D object (Surface Development)</td>
</tr>
<tr>
<td></td>
<td>Identifying rotated versions of 3D objects composed of cubes</td>
</tr>
<tr>
<td>3 Spatial Orientation</td>
<td>Identifying in which direction the object has moved when shown pictures of an object in different spatial orientations.</td>
</tr>
<tr>
<td></td>
<td>Imagining an egocentric perspective transformation (Perspective-Taking)</td>
</tr>
</tbody>
</table>

The abilities in Table 1 and transformation questions from 2D to 3D and 3D to 2D, including visualization in mind, were also included in spatial visualization ability following expert opinions. A scale form was developed, including 30 items that measure anxiety of spatial relations, visualization, and orientation.

Content Validity

Two experts in the Mathematics Education Department, one expert from the Turkish Language Education Department, and two mathematics teachers evaluated the scale. Three items were removed from the scale (items 19, 24, 28), and some adjustments were made on items, resulting in a form with 27 items. Then, for the clarity of the scale, it was applied to fifth-grade students (N = 12), and the statements of the items were revised with the students' feedbacks.
Construct Validity

To determine the scale’s construct validity, after excluding the extreme values (N=7), EFA was performed on the data (N=341). As a result of EFA, the anti-image table, which shows the adequacy of items in the scale, was examined. It is stated that this value should be >0.50 or more for each item (Özdamar, 2017; Şencan, 2005). Then, Kaiser-Meyer Olkin (KMO) coefficient and Barlett Sphericity Test results were evaluated. The KMO coefficient above 0.60 and the Bartlett test being significant (p <0.05) show that the data is suitable for factor analysis and the sample size is sufficient (Büyüköztürk, 2012; Özdamar, 2017). Principal axis factoring with oblique rotation was used for the factor analysis. Principal axis factoring was conducted to determine the hidden structures behind the variables, and Oblique rotation (direct oblimin) was performed considering that the variables are related to each other (Şencan, 2005). All items with a factor loading above 0.40 were included in the scale (DeVellis, 2003; Şencan, 2005). As a result of EFA, overlapping items (the difference between factor loadings is lower than 0.10) were excluded from the scale (Karagöz, 2019). Since the common variance is affected by the sample size and it is not possible to obtain high common variance values in social sciences, it is suggested that this value should be taken as 0.20 (Çokluk et al., 2012; Şencan, 2005). After EFA, the model was also tested with CFA. The fit indexes of χ²/df, RMSEA, SRMR, GFI, CFI, NNFI, AGFI, and IFI were used in the study for the model tested in CFA. The model fits were evaluated based on the following criteria: χ² / df < 5; GFI > .90, CFI > .90, NNFI > .90, IFI > .90; and RMSEA < .06 and SRMR < .08 (Hu & Bentler, 1999; Jöreskog & Sörbom, 1993; Kline, 2016; Özdamar, 2017; Schumacker & Lomax, 2004; Tabachnick & Fidell, 2007).

Convergent Validity

For the convergent validity of the scale, the Pearson correlation between the students’ scores from the Spatial Anxiety Scale (Lawton, 1994) and the scores in this study were analyzed. The Spatial Anxiety Scale (Lawton, 1994) consists of 8 items and one factor. In this study, CFA analysis was also conducted to validate the Spatial Anxiety Scale of Lawton, (1994). The scale was first translated into Turkish and corrected following the expert opinion (a lecturer working in language). It was applied to the participants (N =206), and CFA was conducted. As a result of CFA, the fit indexes were found as χ² /sd=1,783 GFI=.956 AGFI=.921 CFI=.944 NNFI=.922 IFI=.946 RMSEA=.063 SRMR=.0506. The scale showed a perfect and acceptable fit (Hu & Bentler, 1999; Jöreskog & Sörbom, 1993; Özdamar, 2017; Thompson, 2004), and it was seen that the scale could be used on secondary school students. Cronbach’s alpha of the scale in this study was found to be 0.77.

Item Analysis

To determine the reliability of the items in the scale, the item-total test correlations were analyzed. The t-values of the bottom and top 27% groups of the scale related to differences were also examined. Excel, SPSS, and AMOS programs were used for data analysis.

Reliability

The coefficients of Cronbach’s alpha and McDonald’s omega were calculated for the reliability of the scale. The Cronbach’s alpha coefficient assumes that factor loadings and error variances of the items are equal, and McDonald’s omega assumes factor loadings and error variances to be different. Therefore, it is suggested that, especially in multi-dimensional scales, the McDonald’s omega has higher values than the Cronbach’s alpha coefficient (Şencan, 2005, p. 120; Yurdugül, 2006, p. 29).
RESULTS

Findings Related to the Construct Validity of the Scale

Exploratory Factor Analysis

As a result of EFA, KMO was found to be .909. Barlett’s test of sphericity was significant (χ²(2704, 192) = 351, p<.05) The diagonal of the anti-image correlation matrix was examined, and it was decided to exclude four items (items 3, 6, 10, 17) with an anti-image value less than .50. As a result of EFA, a five-factor structure that explains 38.793% of the total variance was obtained. The factors, eigenvalues, and total variances explained were presented in Table 2.

Table 2. Factors as a result of EFA

<table>
<thead>
<tr>
<th>Factors</th>
<th>Eigenvalues</th>
<th>Total variances explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7.203</td>
<td>24.447</td>
</tr>
<tr>
<td>2</td>
<td>2.827</td>
<td>8.256</td>
</tr>
<tr>
<td>3</td>
<td>1.310</td>
<td>2.595</td>
</tr>
<tr>
<td>4</td>
<td>1.134</td>
<td>1.935</td>
</tr>
<tr>
<td>5</td>
<td>1.002</td>
<td>1.561</td>
</tr>
<tr>
<td>Total variance</td>
<td></td>
<td>38.793</td>
</tr>
</tbody>
</table>

In Table 2, it is seen that five factors with eigenvalues greater than one emerged as a result of EFA. However, when the variance rate explained by the eigenvalues falls below 10% (in some features, this ratio can be taken as 5%), it can be judged that the factor determined for that eigenvalue cannot adequately explain the latent structure of the phenomenon and that factor can be neglected (Özdamar, 2017). Therefore, the percentage of variance explained by factors 3, 4, and 5 has fallen below 5%. The scree plot of EFA was presented in Figure 1.

Figure 1. Scree plot as a result of EFA

According to Figure 1, the slope flattens after the third point. However, considering the theoretical background of the scale, three components of spatial skills according to Lohman (1979) and Contero et al. (2005), the rotated EFA solution was limited to 3 factors. EFA was conducted again, and as a result of the second EFA, it was observed that all of the items loaded on two factors,
and there was no item in the third factor. Therefore, it was decided to neglect the third factor. So EFA was conducted by limiting the oblimin rotation to 2 factors. As a result, five items (items 1, 2, 11, 12, 27) whose factor loadings were below ,40 and 4 overlapping items (items 5, 8, 9, 25) were excluded from the scale. Analysis results showed that nine items of spatial relations and spatial orientation abilities loaded on the first factor, so the first factor was named “Anxiety of Spatial Relations and Orientation (ASRO)”. The second factor consists of 5 items that measure spatial visualization ability, and it was named “Anxiety of Spatial Visualization (ASV)”. Factor loadings of items were presented in Table 3.

Table 3. Factor Loadings of Items

<table>
<thead>
<tr>
<th>Items</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASRO</td>
</tr>
<tr>
<td>14</td>
<td>It makes me uneasy to think about how the shapes on the surfaces of a cube look from different angles.</td>
</tr>
<tr>
<td>15</td>
<td>I am afraid to confuse right and left when I need to transform a two-dimensional shape in my mind.</td>
</tr>
<tr>
<td>18</td>
<td>I hesitate to imagine the look of an object on the different parts of a table.</td>
</tr>
<tr>
<td>7</td>
<td>I am anxious when I am asked to draw a top view of a figure viewed from the side.</td>
</tr>
<tr>
<td>21</td>
<td>When I need to change my location, it confuses me to imagine how the objects look according to the new location I am in.</td>
</tr>
<tr>
<td>23</td>
<td>When asked about a new shape that will be created by rotating a geometric shape around an axis, I panic.</td>
</tr>
<tr>
<td>26</td>
<td>It makes me anxious to visualize a two-dimensional shape drawn on paper by rotating it in the desired direction.</td>
</tr>
<tr>
<td>4</td>
<td>I panic when I need to determine what the appearance of objects will be relative to any point.</td>
</tr>
<tr>
<td>30</td>
<td>I feel bad when I am asked to draw the image from the desired direction by rotating a shape made of cubes in my mind.</td>
</tr>
<tr>
<td>20</td>
<td>A question that asks the closed state of an opened cube and shapes on its surfaces does not bother me.</td>
</tr>
<tr>
<td>22</td>
<td>Drawing symmetry of an object relative to a line does not worry me.</td>
</tr>
<tr>
<td>29</td>
<td>I am not concerned about determining which edges will overlap if I am asked to combine an open prism in my mind.</td>
</tr>
<tr>
<td>13</td>
<td>It does not bother me to draw a three-dimensional image of an object photographed from different angles.</td>
</tr>
<tr>
<td>16</td>
<td>It does not scare me to determine the appearance of the water when a glass with water is tilted at different angles.</td>
</tr>
<tr>
<td>Eigenvalues:</td>
<td>4.111</td>
</tr>
<tr>
<td>Variance explained:</td>
<td>24.710</td>
</tr>
<tr>
<td>Total variances explained:</td>
<td>34.048</td>
</tr>
</tbody>
</table>

As seen in Table 3, a scale consisting of two sub-dimensions explaining 34,048% total variance was obtained. The first factor explains 24,710% of the total variance, and the second factor explains 9,338% of it. The factor loadings of the items in the first factor ranged from ,678 to ,472 and in the second factor ranged from ,699 to ,519. The inter-factor correlation values of the scale were presented in Table 4.

Table 4. Inter-factor correlation values of the scale

<table>
<thead>
<tr>
<th>Factors</th>
<th>ASRO</th>
<th>ASV</th>
<th>SAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASR</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ASV</td>
<td>.323**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>SAS</td>
<td>.879**</td>
<td>.735**</td>
<td>1</td>
</tr>
</tbody>
</table>

** p < .01

ASRO: Anxiety of Spatial Relations and Orientation, ASV: Anxiety of Spatial Visualization, SAS: Spatial Anxiety Scale
The inter-factor correlation values in Table 4 showed a low positive correlation between ASRO and ASV \( r = 0.323, p < 0.01 \), and high levels of positive correlations between ASRO, ASV factors, and total scores of SAS. Şencan (2005) states that if the scale obtained from factor analysis consists of two or more sub-factors and the relationship between these factors is 0.60 and above, the sub-dimensions are dependent, and they all measure one conceptual structure together. In this case, factors are not evaluated as a sub-scale, and it is assumed that the expressions of sub-dimensions measure a single conceptual structure. The correlation values between ASRO and ASV factors are less than 0.60 so it can be said that they are independent of each other and measure two different conceptual structures. Therefore, the correlation results also confirm the two-factor structure of the scale.

**Confirmatory Factor Analysis**

The construct validity of the scale consisting of 14 items and two factors was tested with CFA. Table 5 presents the fit indexes of the scale as a result of CFA.

### Table 5. The fit indexes of the scale

<table>
<thead>
<tr>
<th>Fit indexes</th>
<th>( \chi^2 )</th>
<th>sd</th>
<th>( \chi^2 /sd )</th>
<th>RMSEA</th>
<th>SRMR</th>
<th>GFI</th>
<th>CFI</th>
<th>NNFI</th>
<th>AGFI</th>
<th>IFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAS</td>
<td>81,385</td>
<td>76</td>
<td>1.071</td>
<td>0.019</td>
<td>0.0446</td>
<td>0.925</td>
<td>0.990</td>
<td>0.989</td>
<td>0.925</td>
<td>0.991</td>
</tr>
</tbody>
</table>

The fit indexes in Table 5 suggested that the model fit the data well, \( \chi^2 (81,385) = 1,071, p = 0.315 \), RMSEA=0.019, SRMR=0.0446, GFI=0.925, CFI=0.990, NNFI=0.989, IFI=0.991 (Hu & Bentler, 1999; Jöreskog & Sörbom, 1993; Özdamar, 2017; Thompson, 2004). Figure 2 shows the factor loadings of the two-dimensional scale model. The factor loadings in ASRO are between 0.49 and 0.66; the factor loadings in ASV vary between 0.46 and 0.64.

![Figure 2. Measurement Model for Spatial Anxiety Scale](image-url)
Findings Related to Convergent Validity of the Scale

For the convergent validity of the scale, the correlation between the "Spatial Anxiety Scale", which measures anxiety for navigational skills developed by Lawton (1994), and the anxiety scale developed in this study, was analyzed. Correlation analysis results revealed that; spatial anxiety involving navigational skills has a moderately positive correlation with the anxiety of spatial relations and orientation \[ r = .446, p < .01 \]. The results also showed that spatial anxiety (Lawton, 1994) was in a low positive \[ r = .175, p < .05 \] with spatial visualization anxiety and in a low positive \[ r = .397, p < .01 \] relationship with total spatial anxiety scores (Şencan, 2005). Significant positive correlations between all these spatial anxiety types reveal that the developed scale provides convergent validity.

Findings Related to Item Analysis

For the item analysis of the scale, item-total score correlations were analyzed with the Pearson Correlation coefficient. Table 6 shows the comparisons of t-values of the bottom and top 27% groups of the scale, “corrected item-total correlations” and “Cronbach’s alpha if item deleted” values.

Table 6. Item Analysis Results

<table>
<thead>
<tr>
<th>Items</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>Corrected item-total correlation</th>
<th>Cronbach’s alpha if item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASRO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i14</td>
<td>Top</td>
<td>2.92</td>
<td>1.60</td>
<td>13.037**</td>
<td>.495</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.20</td>
<td>0.52</td>
<td></td>
<td>.800</td>
</tr>
<tr>
<td>i15</td>
<td>Top</td>
<td>3.35</td>
<td>1.20</td>
<td>15.761**</td>
<td>.558</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.20</td>
<td>0.54</td>
<td></td>
<td>.794</td>
</tr>
<tr>
<td>i18</td>
<td>Top</td>
<td>2.75</td>
<td>1.38</td>
<td>10.969**</td>
<td>.491</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.12</td>
<td>0.36</td>
<td></td>
<td>.800</td>
</tr>
<tr>
<td>i7</td>
<td>Top</td>
<td>3.19</td>
<td>1.22</td>
<td>11.213**</td>
<td>.418</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.48</td>
<td>0.82</td>
<td></td>
<td>.805</td>
</tr>
<tr>
<td>i21</td>
<td>Top</td>
<td>2.90</td>
<td>1.17</td>
<td>9.252**</td>
<td>.416</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.43</td>
<td>0.96</td>
<td></td>
<td>.805</td>
</tr>
<tr>
<td>i23</td>
<td>Top</td>
<td>3.17</td>
<td>1.22</td>
<td>10.063**</td>
<td>.463</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.49</td>
<td>1.03</td>
<td></td>
<td>.801</td>
</tr>
<tr>
<td>i26</td>
<td>Top</td>
<td>2.95</td>
<td>1.24</td>
<td>10.298**</td>
<td>.482</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.35</td>
<td>0.82</td>
<td></td>
<td>.800</td>
</tr>
<tr>
<td>i4</td>
<td>Top</td>
<td>2.84</td>
<td>1.24</td>
<td>10.324**</td>
<td>.394</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.29</td>
<td>0.72</td>
<td></td>
<td>.806</td>
</tr>
<tr>
<td>i30</td>
<td>Top</td>
<td>3.12</td>
<td>1.41</td>
<td>10.729**</td>
<td>.464</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.32</td>
<td>0.77</td>
<td></td>
<td>.801</td>
</tr>
<tr>
<td>ASV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i20</td>
<td>Top</td>
<td>3.42</td>
<td>1.50</td>
<td>12.179**</td>
<td>.449</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.54</td>
<td>0.94</td>
<td></td>
<td>.802</td>
</tr>
<tr>
<td>i22</td>
<td>Top</td>
<td>3.17</td>
<td>1.19</td>
<td>11.536**</td>
<td>.413</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.44</td>
<td>0.82</td>
<td></td>
<td>.805</td>
</tr>
<tr>
<td>i29</td>
<td>Top</td>
<td>3.35</td>
<td>1.21</td>
<td>9.612**</td>
<td>.380</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.67</td>
<td>1.16</td>
<td></td>
<td>.808</td>
</tr>
<tr>
<td>i13</td>
<td>Top</td>
<td>3.38</td>
<td>1.29</td>
<td>9.439**</td>
<td>.362</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.70</td>
<td>1.12</td>
<td></td>
<td>.810</td>
</tr>
<tr>
<td>i16</td>
<td>Top</td>
<td>3.26</td>
<td>1.28</td>
<td>12.135**</td>
<td>.389</td>
</tr>
<tr>
<td></td>
<td>Bottom</td>
<td>1.32</td>
<td>0.84</td>
<td></td>
<td>.807</td>
</tr>
</tbody>
</table>

**p<0.001
In Table 6, it is seen that there is a significant difference between the bottom and top 27% groups of the scale (p < .001) and the corrected item-total correlations are above .30 (Büyüköztürk, 2012; Şencan, 2005). Considering the Cronbach’s alpha value of the whole scale (α = .83), the values of “Cronbach alpha if item deleted” show that all items contribute to the reliability of the scale.

**Findings Related to the Reliability of the Scale**

The coefficients of Cronbach’s alpha and McDonald’s omega of the scale are presented in Table 7.

**Table 7. Cronbach’s alpha and McDonald’s omega coefficients**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Cronbach’s alfa</th>
<th>McDonald’s omega</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASRO</td>
<td>.81</td>
<td>.96</td>
</tr>
<tr>
<td>ASV</td>
<td>.72</td>
<td>.91</td>
</tr>
<tr>
<td>SAS</td>
<td>.83</td>
<td>.97</td>
</tr>
</tbody>
</table>

In Table 7, it is seen that all reliability coefficients of the scale were .70 and above. These results are accepted to be reliable (Büyüköztürk, 2012; Şencan, 2005; Özdamar, 2017). Therefore, Cronbach’s alpha and McDonald’s omega coefficients showed that the scale and sub-dimensions are quite and highly reliable.

**Evaluation of Spatial Anxiety Scale**

The spatial anxiety scale consists of 14 items and two sub-dimensions. The first sub-dimension is ASRO including 9 items (items 14, 15, 18, 7, 21, 23, 26, 4, 30) and the second is ASV including 5 items (items 20, 22, 29, 13, 16). It has 5 negative items (items 13, 16, 20, 22, 29). The scale was developed in the five-Likert type scored as "strongly disagree" (1), "disagree" (2), "neither agree nor disagree" (3), "agree" (4), and "strongly agree" (5). The minimum-maximum score range of the scale is between 14-70 points. The high score obtained from the scale indicates a high anxiety level, a low score indicates a low anxiety level.

**DISCUSSION AND CONCLUSION**

In this study, the validity and reliability of the spatial anxiety scale developed to measure secondary school students’ spatial anxiety levels were examined. It was aimed to develop the spatial anxiety scale based on the components of spatial skills by Lohman (1979) and Contero et al. (2005), including spatial visualization, spatial relations, and spatial orientation skills. However, the analysis results showed that the scale has a two-factor structure. The first factor consists of spatial relations and spatial orientation items, and the second factor consists of spatial visualization items. Therefore, it was observed that this scale structure was not parallel for the classification of Lohman (1979) and Contero et al. (2005). Loading the items of spatial relations and spatial orientation skills in the same sub-dimension revealed a similar result to the study by Burnett and Lane (1980). Burnett and Lane (1980) defined two types of spatial factors: spatial relations, and orientation as one factor, and the second is spatial visualization. So the first factor, consisting of spatial relations and spatial orientation items, was named Anxiety of Spatial Relationships and Spatial Orientation, and the second factor consisting of spatial visualization items was Anxiety of Spatial Visualization. Based on the results, it can be asserted that, rather than three sub-dimensions, spatial skills consist of two sub-dimensions, spatial relations and spatial orientation as one factor and the other is spatial visualization.

Cronbach’s alpha and McDonald’s omega coefficients of the scale showed that the scale was quite reliable to be used in researches. These results revealed that the scale is a valid and reliable measurement tool that can measure the spatial anxiety levels of secondary school students. Investigating students’ spatial anxiety level and its relationships with other variables is important for
the future mathematics and STEM success of students (Ramirez et al., 2012). However, different findings of the researches require further investigation on spatial anxiety. For instance, spatial anxiety does not predict geometry success (Erkek & Işıksal Bostan, 2015), or teachers’ spatial anxiety significantly predicts students’ spatial skills (Gunderson et al., 2013) are quite important results in terms of mathematics education.

Spatial sense must receive greater attention in instruction and researches (Clements, 1998). Investigating the variables that affect spatial anxiety or designing experimental studies to decrease the students’ spatial anxiety levels will both contribute to the field and guide the researchers. Adaptation of this scale to different education levels or developing new ones can be suggested for future studies.

REFERENCES


Özdamar, K. (2017). Ölçek ve test geliştirme yapışal eşitlik modellemesi IBM SPSS, IBM SPSS AMOS ve MINTAB uygulamalı. [Scale and test development Structural equation modeling IBM SPSS, IBM SPSS AMOS and MINTAB applied]. Nisan Kitabevi.


Digital Simulation Experiences of Pre-service Science Teachers: An Example of Circuits

Gülşah Uluay
Ordu University

Abstract

The purpose of this study is to investigate the self-efficacy levels of pre-service science teachers who participated in a workshop about physical laboratory implementations supported by digital simulations and also to determine their views on digital simulations. For this purpose, a 6-week workshop was designed based on a digital simulation program called Crocodile Physics. The participants in the research were 16 university students who were studying in the science education department of a public university. This study includes quantitative and qualitative data. The Science Learning Self-Efficacy (SLSE) scale was used to collect quantitative data. Qualitative data was collected with a structured interview form. According to analysis results for quantitative data, self-efficacy levels towards physics of pre-service teachers were significantly developed. Analysis results of qualitative data showed that pre-service science teachers mostly have a positive tendency to integrate digital simulations into educational environments.

Keywords: Digital Simulation, Physics, Self-Efficacy, Laboratory, Pre-Service Teacher.

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INTRODUCTION

The field of instructional technologies bears witness to developments in interactive multimedia learning environments such as computer-assisted instruction over many years (Jonassen, 1992; Yoder, 1994) and research in this field emphasizes contributions to learning processes offered by technology. According to Roschelle, Abrahamson and Penuel (2004), technology supports student learning in four basic dimensions of active participation, cooperative learning, real world cases, and ordinary and immediate feedback. Traditional methods transform into constructivist methods with technology use in the learning process (Matzen & Edmunds, 2007) since technology provides limitless opportunities to develop instructional experiences, increase academic chances, and improve skills in critical studies (Wilson, 2002). In this context, technology-rich classrooms train critical thinkers and leaders (Bingimlas, 2009) and also technology can promote learners in developing higher order thinking skills and metacognitive skills (Wang et al., 2004).

Although technology is described as a catalyst required for constructivism (Collins, 1990), several barriers were determined in integrating technology into education (Bingimlas, 2009). Fullan and Stiegelbauer (1991) determined these barriers as beliefs, attitudes, and pedagogical ideologies; content knowledge; pedagogical knowledge; and changed instructional resources, technology, and materials. According to Ertmer and Ottenbreit-Leftwich (2010), four factors termed knowledge and skills, self-efficacy, pedagogical beliefs, and culture are key variables for technology integration. All around the world, teacher training institutions attempted to overcome these barriers and began to integrate technology into their curriculums to make pre-service teachers understand pedagogic reasons for technology use by experiencing how technology can support learning and teaching in different subjects (Tondeur et al., 2012). This is important since it is expected that institutions train pre-service teachers who can sufficiently use technology for their own educational implementations (Brun & Hinostroza, 2014). One of the approaches that can be used to meet this expectation is digital simulations.

Digital simulations are defined as computational models of real or hypothesized situations or phenomena that enable users to discover the effects resulting from manipulating or changing parameters within the models (Clark, Nelson, Sengupta & D’Angelo, 2009). In another definition according to Miller (1984), digital simulations can be explained as being representations of reality. Indeed, digital simulations offer their users an opportunity to discover scientific phenomena which they experience in daily life (Clark, Nelson, Sengupta & D’Angelo, 2009). Digital simulation programs can be described as a virtual laboratory with all virtual components (Le Thang, 2014).

Several advantages of digital simulations in educational environments were emphasized in the related literature as follows: Digital simulations:

• support self-efficacy (Bautista & Boone, 2015; Gegenfurtner, Quesada-Pallarès & Knogler, 2014; Kozlowski, Gully, Brown, Salas, Smith & Nason, 2001);
• support learning (Squire, Barnett, Grant & Higginbotham, 2004);
• support active learning (Miller, 1984; Woodward, Carnine & Gersten, 1988);
• support motivation (Clark, Nelson, Sengupta & D’Angelo, 2009; Dekkers & Donatti, 1981);
• direct exploring (De Jong, 1991);
• ensure multiple representations (Lindgren & Schwartz, 2009);
• build accurate intuitive understandings of concepts (Clark, Nelson, Sengupta & D’Angelo, 2009);
• are more practical instead of performing an activity which has several characteristics such as being expensive, time-consuming and dangerous (De Jong, 1991), and is inaccessible in daily life (Clark, Nelson, Sengupta & D’Angelo, 2009);

• provide
an interactive learning environment (Lindgren & Schwartz, 2009).

Self-Efficacy

Self-efficacy is defined as a personal judgment about the individual's own ability with regard to actualizing certain behaviors and actions to achieve specific goals and expected results (Bandura, 1997). Self-efficacy is also described as self-confidence of the individual that they can perform the duties assigned to them (Kinzie et al., 1994). Based on these definitions, the individual's thoughts about themselves about issues such as achieving a task which they have undertaken or reaching a determined goal are explained with self-efficacy. Indeed, Bandura (1995) emphasized that self-efficacy is separate from whether a task can be achieved or not, and underlines that self-efficacy is the belief that the task can be achieved. The self-efficacy judgment indicates how much effort individuals will make and how long they will persist when faced with obstacles or deterrent experiences (Bandura, 1982).

Bandura (1997) explains the sources of self-efficacy with 4 factors of mastery experiences, vicarious experiences, social persuasion experiences and emotional arousal. Mastery experiences are experiences gained through a successfully completed task which have a positive impact on an individual's confidence in their ability to achieve a similar task. On the contrary, failure of the task, which is the opposite of this situation, will have a negative effect on the individual's confidence for future tasks. Vicarious experiences are formed through the individual's observations about the performance of others who are performing a task. The successes and failures of others performing a task influence the individual's self-efficacy beliefs. This effect is especially constituted when the individual has no experience with the task. Social persuasion experiences stem from others' verbal suggestions about the abilities of the individual. These suggestions can encourage and discourage individual beliefs about abilities. Emotional arousal can be explained by physiological states such as cheerfulness, sadness, anxiety or stress. These states affect individuals’ self-efficacy beliefs. For example, an individual’s mood being one of the positive feelings or attitudes such as cheerfulness influences the self-efficacy belief of the individual positively (Bandura, 1997).

The reason for examining self-efficacy towards physics in this study is the common belief that physics is seen as a challenging subject (Lindstrøm & Sharma, 2011). Similarly, it can be stated that students have low self-efficacy beliefs towards physics. For example, Sawtelle et al. (2010) reported that traditional lecture classrooms negatively influence physics self-efficacy levels of students. In the same study, modeling instruction can positively affect self-efficacy. In addition to this, Fencel and Scheel (2004) determined that a traditional lecture environment negatively impacts physics self-efficacy beliefs of students. In this context, new methods such as digital simulations may be integrated into physics lectures. In addition, the value of physics is also mentioned from the perspective of STEM education, which was emphasized in educational research especially in recent years (Li, Wang, Xiao & Froyd, 2020). As a matter of fact, basic physics subjects are required for all STEM fields except mathematics (Sawtelle, Brewe & Kramer, 2012). In addition, when studies investigating the relationship between self-efficacy and gender in the field of physics are examined, there are research results emphasizing that females have lower levels of self-efficacy than males (Lindstrøm & Sharma, 2011; Nissen & Shenwell, 2016; Yerdelen-Damar & Pșman, 2013). One of the factors that cause fewer females to enter STEM fields is self-efficacy (Marshman, Kalender, Nokes-Malach, Schunn & Singh, 2018). Considering the global importance given to STEM education, together with the instrumental role that STEM fields have assumed for economic growth and productivity (Takeuchi, Sengupta, Shanahan, Adams & Hachem, 2020), the importance of self-efficacy towards physics is
remarkable. In this context, it is recommended to create active learning environments to ensure self-
efficacy development (Dou, Brewe, Zwolak, Potvin, Williams & Kramer, 2016).

In the relevant literature, there are studies emphasizing the positive effects of digital
simulations on self-efficacy development. For example, a study which examined the effect of digital
simulation-based learning on self-efficacy by Kozlowski, Gully, Brown, Salas, Smith and Nason
(2001) was conducted with 60 participants, and the research results stated that the self-efficacy levels
of the participants improved with a computer simulation over 2 days. Similarly, in another study
conducted by Bautista and Boone (2015) with 62 pre-service early childhood teachers, a teaching
simulation called TeachME™ Lab was used. The researchers reported that the self-efficacy levels of
the participants in science teaching increased at the end of the application process. In addition to this,
when the relevant literature is examined, there is a deficiency in the field of educational research
examining the possible effects of simulations on self-efficacy (Gundel, Piro, Straub & Smith, 2019). In
this context, this study can contribute to the literature.

METHOD

Research Model

In this study, a mixed method research design was used. Mixed method research designs are
procedures to collect and analyze data by using a combination of both qualitative and quantitative
methods in a single study or in a multiphase series of studies (Creswell & Plano Clark, 2011). In
contrast with any single method, using both qualitative and quantitative methods offer the opportunity
to develop a better understanding with respect to research problems and questions (Creswell, 2012).
According to Creswell (2012), six types of mixed method research are generally used for educational
surveys and embedded design was used in this study. The purpose of this research design is to collect
qualitative and quantitative data simultaneously or sequentially, with one form of data used for
promoting the other form of data (Creswell, 2012). In the present study, qualitative data was used to
support quantitative data and develop detailed understanding of the results.

Purpose

The main purpose of this study is to investigate the self-efficacy levels of pre-service science
teachers who participated in a workshop with physical laboratory implementations supported by
digital simulations and determine their views on digital simulations.

Participants

This study was carried out with 16 university students studying in the science education
department of a public university in the spring term. All pre-service teachers voluntarily participated in
this research. The average age of the participants was determined to be 19.12 years, with range
between the ages of 18 and 20.

Table 1 Demographics of participants

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>10</td>
</tr>
<tr>
<td>Male</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
</tr>
</tbody>
</table>

Data Collection Tools

This study includes quantitative and qualitative data. The Science Learning Self-Efficacy (SLSE)
scale which was developed by Lin and Tsai (2013) and was adapted into Turkish and for
physics lesson by Alpaslan and Işık (2016) was used to collect quantitative data. Alpaslan and Işık
(2016) stated that the scale, with 5-point Likert type and 5 factors in 27 items, was valid and reliable as a result of their scale adaptation study which they conducted with 193 participants. The factors of the scale were called conceptual understanding (CU), higher-order cognitive skills (HCS), practical work (PW), everyday application (EA), and science communication (SC).

In this study, a structured interview form (Table 2) was also used as a data collection tool. The structured interview process is defined as asking the same questions to participants with the same statements and in the same order (Corbetta, 2003). Three questions which comprised the interview form in the study were asked to all participants respectively.

### Table 2 Interview guide

<table>
<thead>
<tr>
<th>Phase</th>
<th>Instructions</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning</td>
<td>Clarifying the aim of the interview</td>
<td>5-6 min.</td>
</tr>
<tr>
<td></td>
<td>Informing about confidentiality of the study</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Asking permission for recording</td>
<td></td>
</tr>
<tr>
<td>Questions</td>
<td>1. What do you think about whether the digital simulations you experienced with Crocodile Physics are integrated into educational environments?</td>
<td>20-25 min.</td>
</tr>
<tr>
<td></td>
<td>2. What do you think about the effects of digital simulations you experienced with Crocodile Physics on educational environments?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Can you compare free-hand experimenting and experimenting with Crocodile Physics, please?</td>
<td></td>
</tr>
</tbody>
</table>

**Data Collection Process**

The data collection process was carried out within the scope of the workshop which continued for 6 weeks in 2-hour sessions per week. In this process, a digital simulation program called Crocodile Physics, which was developed by Crocodile Company, was used. Crocodile Physics was updated and transferred to Yenka, which is a new software platform (www.yenka.com).

Crocodile Physics is a computer program which is used to design virtual experiments. One of the reasons for choosing this program in this study is that it offers easy use. Indeed, Le Thang (2014) stated that users can easily use virtual laboratory equipment with symbols and looks similar to their appearance in a real laboratory through Crocodile Physics and similar programs. Crocodile Physics provides both symbols and real appearance of laboratory equipment to its users.

![Figure 1. Screenshot from Crocodile Physics](image)
Figure 2. Screenshot from Crocodile Physics

At the beginning of the workshop, participants were informed about the process. Then the Crocodile Physics program and its tabs are introduced. Throughout the process, the experiments regarding the topics that are presented in Table 3 were followed, respectively. Worksheets that included various information about the experiment were presented at the beginning of each session to participants. Subheadings in the worksheets were as follows: (1) name of experiment, (2) purpose of experiment, (3) equipment, (4) procedure for experiment, (5) data, and (6) results of experiment.

Table 3 Workshop content

<table>
<thead>
<tr>
<th>Week</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-test implementation</td>
</tr>
<tr>
<td></td>
<td>Explanation about the content of the workshop</td>
</tr>
<tr>
<td></td>
<td>Introduction to Crocodile Physics</td>
</tr>
<tr>
<td>2</td>
<td>Circuit components and basic circuits</td>
</tr>
<tr>
<td>3</td>
<td>Ohm’s Law</td>
</tr>
<tr>
<td>4</td>
<td>Series Circuits</td>
</tr>
<tr>
<td>5</td>
<td>Parallel Circuits</td>
</tr>
<tr>
<td>6</td>
<td>General review</td>
</tr>
<tr>
<td></td>
<td>Post-test implementation</td>
</tr>
</tbody>
</table>

The participants performed experiments with Crocodile Physics in accordance with the instructions in the worksheets. During this process, they recorded their experimental data in the data section of the worksheets. Then, they generated the experimental results section with calculations and the results they obtained with the data. Examples of digital simulations which were designed with Crocodile Physics by pre-service science teachers are presented as follows:
Data Analysis

This study consists of quantitative and qualitative data. Quantitative data in the research was analyzed with SPSS package software. At this point, normal distribution was firstly examined. Since the sample size is less than 50, the Shapiro-Wilk test was used to examine whether the pre-test and post-test averages show normal distribution. It was determined that the data set did not display normal distribution. For this reason, the relationship between the pre-test and post-test averages was analyzed with the Mann-Whitney U test.

In the analysis process for qualitative data, the constant comparative method was used. This analysis method begins with open coding (Boeije, 2002; Mills et al., 2006; Strauss, 1987) by comparing the data with other data throughout the coding analysis (Fram, 2013). Open coding is an interpretation process based on the analytical disjunction of the data obtained. In this coding process, events, actions or interactions are compared with others in accordance with their similarities or
differences. At this point, the compared events, actions or interactions are labeled. Thus, events, actions or interactions which are conceptually similar are grouped together to generate categories and subcategories (Corbin & Strauss, 1990). After this phase, the axial coding process was started (Boeije, 2002). Axial coding is the process of evaluating the relationships between categories, their features and dimensions (Corbin & Strauss, 2008). In order to protect the privacy of the participants, each interview record was coded as PST1, ..., PST16. Interview transcriptions were made with these codes and they were also used for examples of participant responses.

**FINDINGS**

In the data analysis process, firstly normal distribution of the quantitative data set was examined. At this stage, since the number of participants is less than 50, the Shapiro-Wilk test (Büyüköztürk, 2012) was used. As a result of the analysis, it was concluded that the data set didn’t show normal distribution ($p < .05$) (Büyüköztürk, 2012). Therefore, the analysis procedure for the data was continued with the Mann-Whitney U test, which is one of the non-parametric hypothesis tests. The analysis results obtained are presented in Table 4.

**Table 4 Analysis results of pre-test and post-test scores**

<table>
<thead>
<tr>
<th></th>
<th>$n$</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>16</td>
<td>12.06</td>
<td>193.00</td>
<td>57.00</td>
<td>.007*</td>
</tr>
<tr>
<td>Post-test</td>
<td>16</td>
<td>20.94</td>
<td>335.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$p < .05$

According to analysis results from the Mann-Whitney U test, there was a significant difference between self-efficacy levels of pre-service teachers at the beginning of the process and their self-efficacy levels at the end of the workshop ($U = 57.00$, $p < .05$). Considering the mean rank, the post-test average is higher than pre-test average. This finding shows that the workshop process supported by digital simulations is effective in increasing the self-efficacy levels of the participants.

After this stage, differences for each scale factor were examined one by one. The results of the analysis for factors termed conceptual understanding (CU), higher-order cognitive skills (HCS), practical work (PW), everyday application (EA), and science communication (SC) are presented in Table 5.

**Table 5 Analysis results of pre-test and post-test scores for factors**

<table>
<thead>
<tr>
<th>Factor</th>
<th>$n$</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>$U$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test of CU</td>
<td>16</td>
<td>12.56</td>
<td>201.00</td>
<td>65.00</td>
<td>.016*</td>
</tr>
<tr>
<td>Post-test of CU</td>
<td>16</td>
<td>20.44</td>
<td>327.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test of HCS</td>
<td>16</td>
<td>13.78</td>
<td>220.50</td>
<td>84.50</td>
<td>.095</td>
</tr>
<tr>
<td>Post-test of HCS</td>
<td>16</td>
<td>19.22</td>
<td>307.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test of PW</td>
<td>16</td>
<td>12.53</td>
<td>200.50</td>
<td>64.50</td>
<td>.015*</td>
</tr>
<tr>
<td>Post-test of PW</td>
<td>16</td>
<td>20.47</td>
<td>327.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test of EA</td>
<td>16</td>
<td>12.13</td>
<td>194.00</td>
<td>58.00</td>
<td>.007*</td>
</tr>
<tr>
<td>Post-test of EA</td>
<td>16</td>
<td>20.88</td>
<td>334.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-test of SC</td>
<td>16</td>
<td>13.75</td>
<td>220.00</td>
<td>84.00</td>
<td>.087</td>
</tr>
<tr>
<td>Post-test of SC</td>
<td>16</td>
<td>19.25</td>
<td>308.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*$p < .05$

When Table 5 is investigated, post-test mean ranks of factors termed HCS and SC are higher than mean ranks for the pre-test. However, these differences are not statistically significant ($p > .05$). In addition to this, post-test mean ranks for CU, PW and EA are higher than their pre-test mean ranks with a statistically significant difference. In light of these findings, the 6-week workshop had a positive effect on developing CU, PW and EA, but the workshop was not effective for the other two factors (HCS and SC).
Findings related to the interview questions used in obtaining qualitative data are presented in the following section.

Question 1: What do you think about whether the digital simulations you experienced with Crocodile Physics are integrated into educational environments?

Most of the pre-service teachers (n = 15) who participated in this study reported positive views regarding the use of digital simulations in educational environments. However, PST16 stated that computer programs such as Crocodile Physics should only be used for enhancement purposes, not on teaching course subject matter or laboratory practices. Some participants who expressed positive opinions about supporting educational processes with digital simulations explained their thoughts in accordance with various conditions. For example, most of the participants expressed their views that digital simulations alone should not be used in classroom environments and underlined that laboratory activities should be carried out both with digital simulation programs and free-hand experiments. In addition, some participants (n = 2) stated that these programs should be used when needed, not always. Examples of participant responses are presented as follows:

PST3: “I enjoyed the Crocodile Physics program. Thanks to the experiments carried out with this program, the course subject was reinforced. I think the subject matter became more understandable. I think this program and the like should be used in courses such as physics and chemistry...”

PST7: “When a course is supported with visuals, the course becomes more permanent in the student's mind. Theoretical knowledge is forgotten after a certain time, as it is very memorized. For this reason, I think programs like Crocodile Physics should be used in science courses.”

PST8: “In my opinion, it is not enough to perform experiments only manually or only with a program in laboratory activities. So I think they should always be used together. I mean we should always do an experiment with both our hands and computer programs. After my experience in this lesson, I think it is better for us to use both together.”

PST10: “Crocodile Physics is a very good program. But this situation doesn't mean that we always use the program. Of course, programs make the courses more understandable and fun. However, manual experiments and virtual experiments will not be the same. So just using one of them would be against logic. The computer programs should be used on a needs basis. Such programs are useful if they are used when there is a need...”

When participant responses for this question are examined, it was noteworthy that in an educational process carried out with digital simulations and free-hand experiments, the opinions regarding the priority order of these activities were expressed. At this point, 9 participants evaluated working with digital simulations first and then performing free-hand experiments as more useful. Four participants, on the other hand, stated that an opposite method of implementation would be more effective. Examples of participant responses for these views are presented below:

PST1: “It is more efficient to conduct the laboratory course with the program. It is more efficient for us to do the experiment manually first and then apply it with the program.”

PST14: “Laboratory experiments should be shown first with the program. After working with the program, we must establish our own setup using our laboratory materials and make our experience. In this way it will be more beneficial to us.”

PST15: “It would be more useful if we use the program before the experiments. We will make fewer errors in experiments and set up the assemblies more easily...”
Question 2: What do you think about the effects of digital simulations you experienced with Crocodile Physics on educational environments?

While participants were answering this question, they especially focused on the effects of digital simulations on two processes of experiment and course. In this context, the answers given to this question are classified under two categories termed as “effect on experiments” and “effect on course”. While there are five codes under the category of effect on experiment, the effect on course category consists of six codes. Through axial coding, the relationship between these two categories and the codes which they contain was examined and "learning process" category was obtained with this combination. These categories and codes are presented in the following table.

Table 6 Participant opinions about digital simulations used in learning processes

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect on Experiment</td>
<td>Learning installation of circuits easily</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Compensation for damaged/missing laboratory equipment</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Investigating experimental data in detail</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Decreasing experimental errors</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>More trial-and-error opportunities</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Saving time</td>
<td>3</td>
</tr>
<tr>
<td>Effect on Course</td>
<td>Efficient</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Increasing clarity</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Learning with fun</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Learning by discovery</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Permanent learning</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Enhancement of subject matter</td>
<td>4</td>
</tr>
</tbody>
</table>

While the majority of the participants (n = 13) expressed their opinions about the use of digital simulations in learning processes, they stated that the Crocodile Physics program is easy to use. When the participant responses about the effects of digital simulations on experimental design were examined, pre-service teachers (n = 12) determined that they learned to install electrical circuits more easily through digital simulations. However, another highlighted point (n = 11) is that digital simulations are ways to compensate for missing or damaged equipment in the laboratory. In addition, the opinions that different experimental data can be easily examined with digital simulations and that the error margins of the experiments can be reduced with reliable measurement results were emphasized by 9 participants. Also, 8 participants reported that the trial-and-error method can be used quickly with digital simulations and this situation makes it easier to achieve the right results or compare data. Three participants also identified that this process, which speeds up the examination of the experimental data, will save time. The category called effect on the course which includes participant responses about the impacts of digital simulations on laboratory courses focuses on the advantages of a course where simulations are integrated. At this point, Table 2 shows that the most emphasized participant response (n = 13) is efficient lessons. Similarly, participants (n = 12) underlined that a clearer presentation of the subject matter was provided through digital simulations. It was stated that these computer programs provide learning by having fun (n = 10) and discovery (n = 8). Some participants (n = 7) explained the effect of digital simulations on learning with permanent learning. In addition, 4 participants reported that simulations played an important role in reinforcing the subject matter of the course. Examples of participant responses for these opinions are presented as follows:

PST1: “... We investigated the values of the experiment with the program in the most efficient way ... I understand the physics laboratory course with the program. I do the experiments by trial and error. In short, I think the course became more efficient with this program.”
PST2: “I think Crocodile Physics is good. Thanks to the program, I learned to install the circuits more easily. Actually, I wasn't a person who was able to install circuits, but thanks to the program, I learned to install circuits more quickly.”

PST5: “This program should definitely be used by students for physics experiments. Because there may be problems with the equipment which we use in our experiments and therefore there may be errors in the data of the experiments we measure. There are no errors in our experiment data with this program. So, our margin of error falls. The program can be learned easily, although it may seem a little complicated and time consuming.”

PST6: “… Experimental equipment can sometimes be damaged in the physics laboratory. Sometimes the materials are missing. Therefore, we have problems doing the experiments. The best advantage of this program is that it eliminates such problems.”

PST9: “First of all, I want to state that I have not done any experiments about physics subject matter until my graduate education. I also do not see myself as successful in physics course... But in this course Crocodile Physics was a very good program for me. I believe that these things are always more beneficial to us students. I believed in the accuracy of this a little more with this application…”

PST11: “Crocodile Physics is visually very productive. For this reason, after installing the circuit with this program, while installing the circuit manually with the experimental equipment, the visual in my head comes to life and the circuit installation becomes easier and more practical. Thanks to this program, we get more understandable experiment results. However, it is fun to use the program.”

PST12: “This program which we used has benefited me a lot in the physics course. Seeing the experiments in the program before doing them is very useful when we started to do the experiment ourselves. Since we see the experiment in the program, we can install circuits much easier and faster. We also save time with this program while making new operations by increasing or decreasing the values. Parallel and serial circuits can be installed more clearly, and the circuits are more memorable. I am a person who gets bored in class in general, I am not bored in this course due to this program.”

PST13: “I like Crocodile Physics. The use of the program with laboratory activities was very effective. Both the experiment which we worked on the computer and the experiment which we did with our equipment helped me to interpret the subject matter better.”

PST14: “… Crocodile Physics contributed a lot to me. It simplified the lesson. I was having trouble installing serial and parallel circuits before. I did not know what and where to connect when I installed the circuit. I learned circuit elements with the program.”

Question 3: Can you compare free-hand experimenting and experimenting with Crocodile Physics, please?

When the responses of the participants related to this question were investigated, pre-service teachers maintained their positive tendencies regarding digital simulations. However, they stated that free-hand experiments should be carried out together with computer programs. In this context, they especially determined that free-hand experiments are important in recognizing laboratory equipment and learning the use of this equipment (n = 12). In addition, they stated that individuals who learned to establish real mechanisms by identifying laboratory equipment can be successful in solving the related problems which they encounter in their daily life (n = 5). Examples of opinions expressed, apart from these opinions, are presented below:

PST1: “By doing the experiment with our own hands, we learn how the circuits in the experiment will be installed. And then, we observe the data clearly with the program.”
PST4: “I think it would be better to use both laboratory materials and computer programs in physics courses while doing experiments. While doing experiments manually, the equipment can be broken, or the bulb can explode. We can overcome these deficiencies with the computer. While doing manual experiments, we can find out what each equipment does and how they work by touching the equipment as if we were playing with them which we did not see in our previous science courses.

DISCUSSION AND CONCLUSION

The aim of this study is to investigate the self-efficacy levels of pre-service science teachers who participated in a workshop with physical laboratory implementations supported by digital simulations and determine their opinions about digital simulations. In accordance with this purpose, a 6-week workshop based on digital simulations was designed. In this process, Crocodile Physics was used to design digital simulations for circuits.

This study consists of quantitative and qualitative data. The Science Learning Self-Efficacy (SLSE) scale was used to collect quantitative data. According to analysis results for SLSE, self-efficacy levels towards physics of pre-service science teachers were significantly developed. Considering that self-efficacy beliefs are most affected by mastery experiences (Bandura, 1994), the workshop supported by digital simulations, which provided pre-service teachers with the opportunity to experience experiments first-hand, may be the source of this increase in self-efficacy levels.

When the difference between each scale factor is analyzed in itself, it is concluded that the change in the factors named CU, PW and EA was statistically significant. In this context, it may be determined that digital simulations support conceptual understanding, practical work and everyday application. Conceptual understanding represents individual confidence in understanding physics laws, theories and concepts. Practical work, on the other hand, is explained as the confidence to perform physics laboratory activities at the cognitive and psychomotor level. However, everyday application refers to the understanding of physics and for integrating skills into daily life (Alpaslan & Işık, 2016; Lin & Tsai, 2013). The significant increases in the self-efficacy levels of pre-service teachers related to these three factors are attributed to the process they actively carried out in the laboratory.

According to analysis results for HCS and SC, there was no statistically significant difference. Based on these findings, the workshop supported by digital simulations was not effective for supporting higher-order cognitive skills and science communication. Higher-order thinking skills consist of more complex subjects and these subjects require higher-order thinking skills such as critical thinking and scientific inquiry (Alpaslan & Işık, 2016; Lin & Tsai, 2013). There is no activity related to the development of higher-order thinking skills within the scope of the workshop organized in this study. Therefore, it is thought that the participants could not improve the HCS factor. In addition, there was no development regarding the SC factor, which represents the ability of the individual to talk and discuss physics-related issues with others. It is believed that the short duration of the workshop and the process not being supported by discussion and communication-based activities, such as arguments, is effective on obtaining this result.

According to the analysis results obtained from qualitative data, pre-service science teachers mostly have a positive tendency to integrate digital simulations into educational environments. The participants' responses to the effects of digital simulations on educational environments were shaped within the framework of categories calle effect on experiment and effect on course. The participants mostly focused on the features of digital simulations that provide savings in terms of time and trial attempts, and ease of learning the process of installing circuits and conducting experiments. In the category of effect on course, pre-service teachers highlighted the efficiency of the lesson process and underlined advantages such as learning by discovery and permanent learning. Additionally, creating a fun learning environment through digital simulations was emphasized. In light of these findings, it can be stated that the participants are disposed to support the activities of the physics lab with digital simulations. It is thought that the possibilities offered by digital simulations designed with Crocodile.
Physics in terms of both visual aspects and ease of use may be effective on this situation. Indeed, Le Thang (2014) explained that the course process will be much more vivid with Crocodile Physics, and thus high efficiency will be achieved.

Participants also stated that it would be beneficial to perform digital simulation implementations and free-hand experiments sequentially in laboratory processes by comparing free-hand experiments and experiments designed with digital simulations. At this point, they determined that they want to have the opportunity to identify the laboratory materials by touching and experiencing them firsthand.

In the findings obtained from qualitative data, codes termed “more trial-and-error opportunities” and “compensation for damaged/missing laboratory equipment” were formed. According to these findings, pre-service teachers thought that the implementation process, which allows the participants to practice more, contributes to their own development. In this context, the significant increase in the PW factor is due to the positive perspectives of the participants towards the practices they experienced in this process. As a matter of fact, Espinosa, Miller, Araujo and Mazur (2019) reported that active teaching strategies can be effective on self-efficacy development. From this point of view, it can be concluded that this process, which participants actively experience, is reflected in the PW factor.

The codes termed “learning installation of circuits easily”, “efficient”, “learning with fun”, “learning by discovery”, “increasing clarity”, “permanent learning”, and “enhancement of subject matter” were also derived from analysis of qualitative data. At this point, pre-service teachers thought that the practices in the research process they participated in had a positive effect on their conceptual understanding. Indeed, when the related literature is investigated, there are studies which underline contributions of simulations to learning. For example, Squire, Barnett, Grant and Higginbotham (2004) conducted an experimental study which focused on teaching of electromagnetism. The researchers reported that simulations have a positive effect on student understanding. Similarly, as an example from this study, pre-service teachers indicated that they could learn the subject matter of circuits easily with digital simulations. In this context, these perceptions of participants cause development of the CU factor. Indeed, learners can develop positive efficacy beliefs with a simulation-based educational environment towards learning (Gegenfurtner, Quesada‐Pallarès & Knogler, 2014).

The significant increase in the EA factor can be evaluated as enabling pre-service teachers to conduct more detailed data research during the implementation process. Limitations caused by situations such as material or time constraints may be encountered in the laboratory are irrelevant in the digital simulation environment. In this way, the participants have the chance to try their own designs. In fact, in this study, the code termed “investigating experimental data in detail” was created with qualitative analysis. According to the results of the study, it is suggested that digital simulations that enable active learning (Miller, 1984; Woodward, Carnine & Gersten, 1988) can be used to develop self-efficacy levels of learners.

REFERENCES


Metaphorical Perceptions of Other Branch Teachers Towards Physical Education Teachers and Lessons

Mehmet Ulaş
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Abstract
This study aimed to explore the perceptions of other branch teachers towards physical education teachers and lessons through metaphors. A basic qualitative research model was used in this study. Two hundred twenty-one teachers working in various types of schools and branches in the 2018/2019 education year in Burdur, Turkey, constituted the study group. For data collection, the teachers were asked to fill in the blanks in the metaphor form, including the sentences "physical education lesson is like…, because …" and "physical education teacher is like…, because…" The data were analyzed using the content analysis method. As a result of the analysis, the teachers produced 118 metaphors for the perception of physical education lessons and 120 different metaphors for the perception of physical education teachers. Metaphors for physical education lessons were gathered under the themes of "expected and beloved lesson," "unifying factor," "disciplinary tool" "entertaining, relaxing and health-improving lesson," "gathering, discovering and directing different talents," "mobility," "free environment," and "basic lesson." The teacher produces metaphors for physical education teachers under the themes of "hard-working and versatile," "physical strength element," "exploring and guiding," "providing control and discipline," "savior," "student-friendly," "comfortable and active personality," and "health-giving." Consequently, the metaphors that the branch teachers produced both for the physical education lessons and physical education teachers were similar, and it was seen that the branch teachers had positive perceptions about both the lesson and teacher.

Keywords: Physical Education Lesson, Physical Education Teacher, Metaphorical Perception

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INTRODUCTION

Recently, qualitative researchers have been using metaphors to explain different situations or concepts, such as attitude, perception, and awareness. "The use of metaphor generally means a way of thinking and seeing that helps our understanding of the world" (Çelikten, 2006). Metaphors involve using a familiar object or event as a conceptual tool to explain the characteristics of a complex subject or situation (Oxford et al., 1998). "A metaphor is formed by explicitly or implicitly stating that the X phenomenon is like the Y phenomenon. Since it allows educators to compare 2 things, draw attention to similarities between them, or explain something by replacing it with something else" (Saban, 2004; Saban, 2009), metaphors have attracted the attention of many researchers and have been used for different purposes in different fields.

There are various perception studies in the literature that have been examined through metaphors. While Çenberi, Sezgin, and İnce (2020) examined the perceptions of middle school students about the pattern concept in mathematics, Karateke (2019) determined the perceptions of high school students about religious vocational high school, professional course teachers, and administrators. While Uslu (2019) included the perceptions of preschool teachers and school principals towards academics, Ding, and Chew (2019) evaluated the perceptions of online feedback by Chinese students. While Girgin (2019) examined the perceptions of music teachers about instrument education, Özarslan (2019) determined the perceptions of gifted and non-gifted students regarding biology. Sağdıç and İlhan (2018) reported the perceptions of social studies teacher candidates towards the concept of the homeland, whereas Şahin and Sabancı (2018) determined the perceptions of students about the concept of education. While Gültekin (2017) examined the perceptions of elementary school teachers towards the concept of education programs and Aslan (2015) examined the perceptions of pre-service teachers about gender, Anılan (2017) determined the perceptions of science teacher candidates towards the concept of chemistry.

These studies used metaphors in determining perceptions about different concepts in fields, such as education, social, and science. This method, which is used in many disciplines, has been used in sports sciences to discover perceptions of different concepts. The scientists examined perceptions towards traditional game and digital game (Hazar, Tekkurşun, & Dalkıran, 2017), sports clubs (Kurtipek, 2019), complaisance (Tatlısu & Bayraktar, 2020), physical activity concept (Türkeli, 2019), Fair play (İnan, Dervent & Karadağ, 2019), and popular sport branches (Karakaya & Salıcı, 2016) through metaphors. In sport sciences, perceptions of middle school students between 10 and 14 years old towards physical education teacher were examined through metaphors (Cirit, 2020; Sözên & Korur, 2019; Yılmaz et al., 2017), in addition to studies examining the perception of middle school (Namlı, Temel and Güllü, 2017; Koksal and Gorucu, 2015) and gifted middle school (Yılmaz et al., 2017) students for physical education lessons. There are limited studies that include metaphorical perceptions in sport sciences with different sample groups. In particular, studies examining the perceptions of individuals who teach in different branches towards physical education lessons and teachers are quite limited in the literature.

The positive or negative perception of branch teachers towards physical education lessons and teachers can directly influence the participation of the students in this lesson. For this reason, the necessity of examining the perceptions of branch teachers towards physical education lessons and teachers has emerged. Research has revealed that the negative attitude of the school administration towards the course, the lack of support of the sports activities by the other course teachers, and the negative perceptions of these teachers towards the class and sports activities affect the participation of the students in the course and the performance of the physical education teacher (Hakyemez, 2010; Özşaker, 2001; Demirhan et al., 2014; Kul, 2008; Uğur, 2006; Yaşar, 2008; Çelik, 2008; Oğul, 2010). Mohr and Townsend (2001) emphasized that due to the structure of the physical education lesson, the neglect of the lesson and the different perceptions towards the lesson caused the teacher to feel marginalized, and this negatively affected their performance.
This study aimed to explore the perceptions of other branch teachers about physical education teachers and lessons through metaphors. It was sought to find answers to the following questions:

1- What are the metaphors that branch teachers produce for physical education lessons, and under which themes are they classified?

2- What are the metaphors that branch teachers create for physical education teachers, and under which themes are they classified?

METHOD

Research Model

The basic qualitative research model was used in this study. In basic qualitative research, researchers are concerned with what meaning participants ascribe to their experiences, and the whole goal is to understand how people comprehend their lives and experiences (Merriam, 2013). This research model was the right choice for the current study because it was aimed to examine the metaphorical perceptions of the teachers.

Study Group

The study group for this research was determined using the criterion sampling method, which is one of the purposeful sampling methods. In this sampling method, some criteria were determined by the researcher for the research. The individuals who meet these criteria were included in the study, and a working group was formed (Yıldırım & Şimşek, 2013). Within the scope of the research, the criteria of working in branches other than physical education teaching were determined, and a total of 221 teachers, comprising 117 women and 104 men, who worked at different levels and types of school in the 2018/2019 academic year, were included in the study. Teachers in the branches of Information Technologies (n = 6), Biology (n = 8), Geography (n = 13), Religious Culture and Moral Knowledge (n = 11), Philosophy (n = 7), Science (n = 8), Visual Arts (n = 5), Foreign Languages (n = 30), Chemistry (n = 4), Mathematics (n = 28), Special Education (n = 3), Guidance (n = 6), Class Teacher (n = 5), Social Studies (n = 8), History (n = 9), Turkish Language and Literature/Turkish (n = 41), and other vocational courses (n = 14) were recruited.

Data Collection

"In the metaphor form, after determining which person, comprehension, value, skill or object is desired to be revealed, a metaphor sentence pattern should be created" (Kılıcan, 2019). Teachers were asked to fill in the blanks in the metaphor form, including the sentences "physical education lesson is like…, because …" and "physical education teacher is like…, because…" The phrase "like" used here is used to create an analogy and the phrase "because" to write the rationale for this analogy. In the first part of the metaphor form, statements explaining the purpose of the research in detail were included and the socio-demographic characteristics of the participants were asked about. In the second part, the descriptions of the metaphor and sample metaphor sentences were given before the sentences.

Data Analysis, Validity, and Reliability

The data were analyzed using the content analysis method. Content analysis is expressed as an effort to reduce and make sense of any qualitative data to determine fundamental consistencies and meanings by taking the voluminous qualitative material (Patton, 2018). In other words, the necessary process in content analysis is to gather similar data within the framework of specific concepts and themes (Yıldırım & Şimşek, 2013). In this framework, the metaphor expressions that were produced by the participants were classified and interpreted under the themes that covered them. Hence, an inductive content analysis approach was chosen, which aimed to explore patterns and themes from
within the data (Patton, 2018). The following steps were followed in the analysis and classification of the metaphors: 1) the sorting phase, 2) the compiling phase of the sample metaphor, 3) the category (theme) development phase, and 4) the stages of validity and reliability (Saban, 2009).

1. Sorting Phase

At this stage, first, the metaphor forms were numbered, starting from 1, and processed into an Excel file. The number here was used to classify the participants. Each number represented 1 participant (For example, Participant Teacher 1 – PT 1, Participant Teacher 2 – PT 2). This coding was also used to refer to the participant, while the opinions of the participants were directly quoted in the findings section. On forms in which the metaphor was included, but the reason was not, only the metaphor reason was included, and the blank forms were not included in the evaluation (Saban, 2009; Kılcan, 2019). In this context, 161 forms were included in the evaluation of metaphors for the physical education lessons (60 forms were excluded from the evaluation), and 141 forms were included in the evaluation of metaphors for the physical education teachers (80 forms were excluded from the evaluation).

2. Compiling phase of the sample metaphor

The reasons for the 161 metaphors obtained for physical education lessons and 141 for physical education teachers were read and analyzed. The aim was to categorize the metaphors under the themes or categories according to the reasons for the metaphors (Saban, 2009; Kılcan, 2019). As a result of this process, 118 different metaphors from 161 participants for the physical education lessons and 120 different metaphors from 140 participants for the physical education teachers were obtained.

3. Category (theme) development phase

At this stage, it was aimed to combine the metaphors under categories according to the reasons. Steps of the 1) similar, 2) simulated, and 3) the relationship between similar and simulated (Kılcan, 2019) were taken into consideration. Here, 8 themes were specified for the metaphors related to both the teachers and lessons.

4. Stages of validity and reliability

For ensuring validity in the qualitative research, the collected data should be reported in detail, how the results were achieved should be explained in particular, and the opinions of the participants should be frequently included through direct quotations (Yıldırım & Şimşek, 2013). The details of the data analyses were explained, the themes were presented in detail, and direct quotes were given in the results section. Creswell (2013) mentioned reliability in qualitative research as the consistency in the answers of multiple encoders of the data sets obtained. Experts who had qualitative studies were asked to match the metaphors for the teachers and lessons with the themes. According to the original matching list, the matching results were evaluated using the consensus and disagreement reliability formula (reliability = consensus/consensus + disagreement) proposed by Miles and Huberman (2016). It is recommended that this confidence interval should be over 90%. Accordingly, the average reliability rate among the coders for the physical education lesson was 0.96. The average reliability rate among the coders for the physical education teacher was 0.91. Excluded were 4 metaphors for the physical education lessons (1 of the 4 wheels of the car, factory, water, and life) and 10 metaphors for the physical education teacher (balance, scales, health coach, parallel lines, water, master splinter, a hormone of happiness, green mask, fruit, stress ball, idol).

RESULTS

In this section, the metaphors and themes were presented in tables. Sample metaphors and the rationale of these metaphors were also reported.
Metaphors and themes for physical education lessons

Extracted were 8 themes for metaphors for the physical education lessons. Table 1 shows the themes, sample metaphors, and rationale. Metaphors for the physical education lessons were gathered under the themes of "expected and beloved lesson," "unifying factor," "disciplinary tool" "entertaining, relaxing and health-improving lesson," "gathering, discovering and directing different talents," "mobility," "free environment," and "basic lesson."

| Themes | Metaphor | Frequency | Rationale of the metaphor
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected and beloved lesson</td>
<td>Golden (1) Balloon (1) Feast (1) Children’s house (1) Peanut (1) Imagination (1) Creamy kadayıf (1) Amusement park (1) Cotton candy (1) Pollyanna (1) Water (1) Candy (1) Holiday (1) Dessert (1) July (1) Inhalation (1) Food (2)</td>
<td>18</td>
<td>…like a break because students look forward to the arrival of this course (PT 76). … like a children’s home because it is a popular lesson (PT 48). … like water because it is a competitive and desired course… (PT 33). … like a holiday because the students look forward to the arrival of this course (PT 77).</td>
</tr>
<tr>
<td>Unifying factor</td>
<td>Solidarity (1) Factory (1)</td>
<td>2</td>
<td>… like a factory because the students go to the conclusion by acting in unity in this course […] (PT 154).</td>
</tr>
<tr>
<td>Disciplinary tool</td>
<td>Machine (1) Anthill (1) Lion (1) Army (1) Life lesson (1) Fishing (1) Five star hotel (1) Lungs (1) Antibiotic (1) Antidepressant (1) Brain (1) Brain implanted (1) Boxing sack (1) Tea break (1) Chocolate (1) Discharge (1) Doctor (1) Doping (1) Entertainment (3) Entertainment place (1) Favorite food (1) Energy drink (1) Wonderland (1) Air (1) Life (1) Ibn Sina (1) Medicine (6) Human body (1) Human veins (1) Generator (1) Coffee break (2) Blood (1) Carnival (1) Lemon water (1) Amusement park (3) Meditation (1) Happiness (1) Eucalyptus (1) Game (3) Lightning rod (1) Picnic (1) Battery (1) Protein (1) Psychological relaxation (1) Puzzle (1) Relaxation session (1) Comfort (1) Spirit (1) Health (2) Free activity (1) Hot air balloon (1) Cinema activity (1) stress beat (8) water (5) water bed (1) leech (1) Superman (2) Charge (1) Nature (1) Inhalation (2) Therapy (4) Vitamin pill (2) Cold water on the summer day (1) Summer vacation (1) Splash (1)</td>
<td>6</td>
<td>… like an army because it requires strict discipline. Like getting in line or being in a certain order (PT 179).</td>
</tr>
<tr>
<td>Entertaining, relaxing, and health-improving lesson</td>
<td>Tree (1) Arena (1) Forest without ax (1) Tool bag (1) Chameleon (3) Exploring the sea (1) Fortress (1) Fairy tale hero (1) Ocean (2) Forest (1) Magic Cube (1)</td>
<td>89</td>
<td>… like a game because it allows the child to have fun and learn while playing. It allows both physical and social development (PT 48). … like a battery because it gives energy to students (PT 113).</td>
</tr>
<tr>
<td>Gathering, discovering, and directing different talents</td>
<td></td>
<td>14</td>
<td>… like the ocean because there are many different types in it (PT 86). … like a chameleon because it varies. There is a sports branch where each individual is suitable (PT 64).</td>
</tr>
</tbody>
</table>
Table 1. (Continued) Metaphoric perceptions and themes of the branch teachers towards physical education lessons.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Metaphor</th>
<th>Frequency</th>
<th>Rationale of the metaphor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td>Beehive (1) Cheetah (1) Kangaroo (1) Ant (1) Tiger (1) Bird (1) Playground (1) Overflowing (5) foal (1) Springboard (1)</td>
<td>14</td>
<td>…like a rabbit because there is a constant rush, movement (PT 184). ... a bee hive because it requires constant movement and work (PT 61).</td>
</tr>
<tr>
<td></td>
<td>Free environment</td>
<td>8</td>
<td>…like an epic of liberation because students feel free in this course, and each creates their stories (PT 167). ... like freedom because students are more active than other lessons taught in the classroom […] (PT 17).</td>
</tr>
<tr>
<td>Basic lesson</td>
<td>The root of the tree (1) Mother (1) One of the four wheels of the car (1) Dynamo (1) Heart (2) Breath (2) Water (1)</td>
<td>9</td>
<td>…like water because water is the basic need. Physical education lesson is one of the basic needs (PT 115). ... like a heart because we cannot live without heart, physical education lesson is also a must (PT 125).</td>
</tr>
</tbody>
</table>

Number of metaphors = 118
Total number of metaphors = 161

The largest numbers of metaphors were produced under the theme "entertaining, relaxing, and health-improving lesson," wherein 89 teachers created 59 metaphors under this theme. The reasons for the metaphors under this theme revealed that the teachers perceived physical education lessons as entertaining, relaxing, and health-improving lessons.

While naming this theme, it was thought that the concepts of "entertaining, relaxing" and "health-improving course" could be divided into 2 themes, but when the reasons for the metaphors were examined, it was seen that these 3 concepts were under the same reason. "Physical education lesson is like a leech because it takes unnecessary energy and tension on the students and ensures that they become a healthy individual" (PT 16). "The physical education lesson is like a fun place because while most of the students are bored with lessons, they never get bored with the physical education lesson. Physical education lesson is both a therapy activity and entertainment activity for them" (PT 66). "Physical education lesson is like a stress spring because it gives students flexibility and health, it takes their negative aspects. It also allows them to have fun" (PT 109). The metaphors and their rationale for this theme were as follows:

The physical education lesson is like an amusement park because we get rid of the stress and fatigue of the day by having fun in physical education lessons. Various sports activities provide our soul to rest. It motivates us to other lessons. We have fun in lesson games like a child having fun in an amusement park (PT 5)

Physical education lesson is like cold water on a summer day because it provides the opportunity to relax children who are overwhelmed by lessons […] (PT 7).

Physical education lesson is like a medicine because in this lesson, the students get rid of the mental fatigue that other lessons give to them by making physical movements […] (PT 18).

The physical education lesson is like a waterbed because it relaxes people, it is a salvation from other heavy lessons (PT 24).
Physical education lesson is like a generator because it motivates students and makes them energetic; it takes the negative energy from other classes and gives positive energy (PT 35).

Physical education lesson is like discharge because it enables people to save themselves from thoughts and problems in their minds (PT 43).

Physical education lesson is like vitamins because the person who has physical education is vigorous and sportive in terms of health (PT 57).

Physical education lesson is like an antibiotic because it can solve even the problems that have been helpless, and no solution has been produced (PT 73).

Physical education lesson is like therapy because it is the course that helps students to relieve their stress, spend their energy in the correct ways through various exercises, and to remain fit, happy, and resilient thanks to sports (PT 75).

Physical education lesson is like a free activity because, as desired, stress is relieved through activities such as playing games and playing ball (PT 116).

Physical education lesson is like eucalyptus because in physical education lessons, all the bad energy and synergies are thrown out, and there is a spiritual relief (PT 191).

Physical education lesson is like charging because it motivates the student who has depleted again (PT 194).

Physical education lesson is like meditation because you will get rid of all unnecessary thoughts that fill your mind in the lesson (PT 185).

Physical education lesson is like an antidepressant because it relaxes people (PT 178).

The second theme in which the teachers produced the most metaphors was the "expected and beloved lesson" theme. In this theme, 18 teachers created 17 different metaphors. The rationale showed that the teachers perceived physical education lessons as expected and loved by students. Examples of the metaphors and rationale classified under this theme were as follows:

The physical education lesson is like July, because when people get bored with the long winter months, they miss the coming of the summer months and wearing swimsuits and opening the seas. Like him, physical education lessons wish to wear tracksuits and go out after tiring lessons […] (PT 15).

The physical education lesson is like an amusement park because it behaves and enjoys as it comes from within (PT 45).

Physical education lesson is like eating because the physical education lesson is much more enjoyable than other lessons. […] Physical education lesson is like a delicious meal that is eaten once a week or once […] (PT 52).

The physical education lesson is sweet because it is a course that students enter with pleasure (PT 63).

The physical education lesson is like creamy kadayif because it is one day a week, wait, wait, it does not come, it quickly ends when it comes (PT 65).
Physical education lesson is like a feast because students eagerly await this lesson (PT 80).

Moreover, 14 teachers produced 12 different metaphors under the "gathering, discovering and directing different talents" theme. Examples of the metaphors and rationale classified under this theme were as follows:

Physical education lesson is like an arena because all abilities are revealed in the arena (PT 188).

Physical education lesson is like a toolbox because, regardless of the interests, abilities, skills, academic success, socioeconomic status, psychological status, there may be appropriate activities (tools) that will appeal to each individual (PT 177).

The physical education lesson is like a magic cube because every individual expects to be discovered […] Everyone's talents are different. In physical education lessons, one can discover and develop his/her ability […] (PT 160).

The physical education lesson is like a forest because each of the creatures in the forest has different characteristics and separate worlds. Students who take physical education lessons have different skills and features. Each student's wishes and dreams are different (PT 136).

Physical education lesson is like a fortress because it converts the wood into lumber by chip (PT 91).

The physical education lesson is like a chameleon because each student's ability can change according to his/her interest. There is an activity that will appeal to every student. It will be beneficial if the teacher discovers the student's interests and abilities and directs them to an area where he/she will feel strong (PT 83).

Under the theme of "mobility", 14 teachers produced 10 different metaphors. The following metaphors and justification examples were included under this theme:

Physical education lesson is like a foal because it is energetic […] (PT 34).

The physical education lesson is like a playground because different games are played continuously in the playgrounds; there are various activities in physical education lessons (PT 59).

The physical education lesson is like a bird because birds are always alive. There is mobility in a physical education class. With the activities performed, students become more active (PT 67).

Physical education lesson is like an ant because it is a course that requires continuous work, training, and movement… (PT 68)

The physical education lesson is like a rabbit because children do not stay in their places like rabbits, they run and jump from there (PT 78).

Under the theme of "basic lesson," 9 teachers produced 7 different metaphors. Under this theme, there were metaphors and rationale, such as "Physical education lesson is like a mother because it is a field course that addresses and responds to all areas of development of students. Mental, spiritual, and motor development is a field course that fully saturates a person (PT 2)" and "Physical
education lesson is like a dynamo because it activates the student both physically and mentally (PT 139)."

In the "free environment" theme, 8 teachers produced 6 different metaphors. Under this theme, there were metaphors and rationale, such as "Physical education lesson is like a bird because it is a free environment where children come out of the 4 walls and find themselves (PT 9).", "Physical education lesson is like a cloud because it allows you to fly and be free (PT 74).," "Physical education lesson is like a door to freedom because students are overwhelmed in the classroom (PT 110)."

The themes in which the teachers participating in the research produced the least metaphors were "Disciplinary tool" and "unifying factor" themes, respectively. Under the theme of discipline, 6 teachers created 6 different metaphors. In the unifying factor theme, 2 teachers produced 2 metaphors.

"Physical education lesson is like an anthill because the order and education of the students firstly go through physical education lessons and teachers. It is through physical education that students gain responsibility without being aware of it and that they are proper people [...] That's why I care about physical education (PT 119)" and "Physical education lesson is like a lion because the discipline of the students in the school is ensured thanks to the physical education lesson. Physical education lesson is important for school discipline [...] (PT 145)" were the examples for this disciplinary tool theme. Under the "unifying factor" theme, "Physical education lesson is like solidarity because students spend time with more activities as a whole. In teamwork and team sports, solidarity is strong as they act in unity (PT 107)" is an example of a metaphor and rationale.

### Metaphors and themes for physical education teachers

Metaphors produced by different branch teachers for the physical education teachers were classified under 8 themes. In Table 2, these themes and sample metaphor rationale are presented.

**Table 2. Metaphoric perceptions and themes of the branch teachers towards physical education teachers.**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Metaphor</th>
<th>Frequency</th>
<th>Rationale of the metaphor</th>
</tr>
</thead>
</table>
| Hard-working and versatile  | Octopus (2), Tool Bag (1), Bee (1), Lion (1), Aspirin (1), Horse (1), Atomic Ant (2), Mirror (1), Acrobat (1), Cartoon hero (1), Polygon (1), Electric switch (1), The Joker (2), Ant (1), Mule (1), Bird (1), Tire (1), Leader (1), Major (1), Machine (1), Picklock (1), Spider-Man (1), Pink Panther (1), Color table (1), Right arm (1), Treble Clef (1), Popeye (2), Theater (1), Tractor (1) | 33        | … like the right arm because he/she takes part in every job, everywhere (PT 161).  
  … like a picklock because he/she does everything (PT 144).  
  … like a tool bag because he/she is equipped to do many works of that school (PT 134).  
  … like a bee because the bee is a hard-working animal (…) (PT 57)  
  … like a wild card because he/she can be used in every aspect (PT 117). |
| Physical strength element   | Hercules (2), Popeye (1), Eagle (1), Superman (3), | 7         | … like Popeye because he/she is strong and agile (PT 26).                                |
| Exploring and guiding       | Chef (2), Atomic Ant (1), Fish Hunter (1), Light (1), Magician (1), Detective (1), Lantern (1), Explorer (1), Queen Bee (1), Locomotive (1), Miner (1), Carpenter (1), Inventor (1), Army Commander (1), Orchestra Conductor (1), Playmaker (1), Gepetto (1), Fairy Mother (1), Guide (2), Artist (1), Magic Wand (1), Circus Instructor (1), Master Splinter (1), Life Coach (1), Scout (1), Director (1) | 28        | … like an inventor because he/she reveals the abilities of the student, and develops them (PT 8).  
  … like a detective because he/she discovers every student the hidden potential (PT 64).  
  … like a locomotive because he/she directs students wherever they want (PT 110).  
  … like a lantern because he/she shows the way (PT 102).  
  … like an explorer because he/she discovers the student (…) (PT 70). |
The teachers produced metaphors for the physical education teachers under the themes of "hard-working and versatile," "physical strength element," "exploring and guiding," "providing control and discipline," "savior," "student-friendly," "comfortable and active personality," and "health-giving." Moreover, 33 teachers produced 29 different metaphors under the theme of "hard-working and versatile." Teachers perceived the physical education teachers as a hard-working and versatile teacher. The following are the sample metaphors and rationale:

<table>
<thead>
<tr>
<th>Providing control and discipline</th>
<th>Savior</th>
<th>Student-friendly</th>
<th>Comfortable and active personality</th>
<th>Health-giving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother Ant (1), Soldier (1), Lion (4), Shepherd (1), Ship Captain (1), Gladiator (1), Gotama Buddha (1), Shadow (1), Referee (1), Law (1), Ant (1), Commander (5), Dog (1), Queen Bee (1), Mussolini (1), Sentry Teacher (1), Organizer (1), Orchestra Conductor (1), Chairman of the parliament (1), Director (1)</td>
<td>Balance (Libra) (1), Fairy Tale Hero (1), Savior (1), Stress Ball (1), Superman (1)</td>
<td>Friend (1), Mirror (1), Father (1), Trouble Cube (1), Doctor (1), Fatih Sultan Mehmed (1), Idol (1), Medicine (1), Hero (1), Cat (1), Nasrettin Hodja (1), Student Coach (1), Clown (1), Cotton (1), Cotton Candy (1), Parallel lines (1), Rubik's cube (1), Health Coach (1), Water (1), Theater Artist (1), Flying Balloon (1), Master Splinter (1), Close friend (1)</td>
<td>Cicada (1), Cheetah (1), Pinwheel (1), Garfield (1), Ant (1), Happiness Hormone (1), Squirrel (1), Superman (1), Rabbit (2), Green Mask (1)</td>
<td>Gardener (1), Fruit (1), Health Coach (1)</td>
</tr>
</tbody>
</table>

| | | | | | Number of metaphors= 120 |
| | | | | | Total number of metaphors = 140 |

The physical education teacher is like a leader because sometimes the teacher teaches lessons, sometimes he/she is the commander of the ceremony, and he/she gives discipline. Sometimes he/she is a companion in misfortune. Sometimes he/she plays, he/she is a player, and sometimes he/she makes first aid like a doctor […] (PT 162).

The physical education teacher is like an atom ant because our physical education teachers at school run to everything and take part in organizing all activities and organizations (PT 145).
The physical education teacher is like a cartoon hero because he/she is versatile and should be able to meet the needs of children; he/she must be able to keep up with the movements and energies of children. He/she should be active, not standing where it stands (PT 142).

The physical education teacher is like a horse because he/she can be a leader, joins society, keeps up with their order, and directs them to a division of labor and cooperation. He/she also does not know what getting tired means. He/she works continuously (PT 118).

The physical education teacher is like a tractor because he/she comes to do all jobs (PT 111).

The physical education teacher is like an octopus because he/she can work in many branches (PT 87).

The physical education teacher is like aspirin because he/she participates in every activity of the school, he/she is the face of the administration... He/she takes students' stress and troubles. He/she is a panacea (PT 35).

The physical education teacher is like Spiderman because it is a branch that reaches everywhere and prepares all activities and shows (PT 23).

The physical education teacher is like an ant because he/she is known for its hard-working and productive identity on school, student, and society in all aspects (PT 2).

Under the theme of "providing control and discipline," 30 teachers produced 20 different metaphors. The teachers perceived the physical education teacher as the person providing control and discipline at school. The following are the sample metaphors and rationale:

The physical education teacher is like an orchestra conductor because he/she enables students to act together (PT 198).

A physical education teacher is like Mussolini because while students are not afraid of other branch teachers, they are afraid of physical education teachers, and they bow down (PT 179).

The physical education teacher is like the lion of the forests because all students enter into order when a physical education teacher arrives, they are afraid of it. They regulate schools. They are the people whose word is heard (PT 141).

The physical education teacher is like an ant because physical education teachers can make children disciplined without being boring […] (PT 119).

The physical education teacher is like a lion because he is the manager, leader, and king (PT 74).

The physical education teacher is like a shepherd because they have to keep the students who have escaped like goats in all directions in order (PT 39).

"Exploring and guiding" was the third theme under which 28 teachers produced 25 different metaphors. The teachers perceived the physical education teacher as the person who identified talents, and explored the potential of students, and guided them in the right direction. The following are the sample metaphors and rationale:
The physical education teacher is like a director because he/she is the person who directs them while entertaining people (PT 199).

The physical education teacher is like a scout because he/she must discover the potential that exists in the students. He/she should direct the student to sports activities [...] (PT 160).

The physical education teacher is like an army commander because of how the army commander drives the soldiers to the front according to their different features; the physical education teacher guides the students using various features and skills (PT 139).

The physical education teacher is like an orchestra conductor because it is a personality that can enable individuals with different characteristics and spirits to do sports together and see which branch is suitable for which child, he/she can create a harmonious union from the differences (PT 106).

The physical education teacher is like an artist because an artist can shape the raw material in front of him with very different aspects (PT 88).

The physical education teacher is like a magic wand because he/she reveals the hidden abilities of the student and helps the students to realize themselves. Students who seem to fail in academics or other subjects gain self-confidence in these ways (PT 83).

The physical education teacher is like a guide because he/she both contributes to the development of talents and discovers talents (PT 53).

The physical education teacher is like a carpenter because he/she shapes the wood and timber, which are not sculpted (PT 36).

Under the theme of "student-friendly," 23 teachers produced 23 different metaphors. The teachers perceived the physical education teacher as a teacher who cares about every problem that the students have, treats them sincerely, and is loved by the students. The following are the sample metaphors and rationale:

The physical education teacher is like water because he/she cleans, nurtures, and gives life to students spiritually and physically, like water (PT 163).

The physical education teacher is like a flying balloonist because he/she is a very colorful and entertaining person (PT 146), who is the center of attention for children, and is expected to come immediately upon request.

The physical education teacher is like cotton because he/she gives people peace, comfort, and joy (PT 115).

The physical education teacher is like a father because he/she is a role model. Students love him/her and take him/her as an example (PT 1).

The physical education teacher is like Fatih Sultan Mehmet because he/she conquers the hearts of all students (PT 84).

The physical education teacher is like a close friend because the physical education teacher does not act officially. You can have fun by doing sports activities with the physical education teacher (PT 52).
The physical education teacher is like a companion in misfortune because students tell him/her their problems with other lessons or their private lives. For students to cope with these problems or forget about them, he/she has various sports activities and advises them (PT 18).

The physical education teacher is like a student coach because students share their problems and concerns about their future lives in the most comfortable way with their physical education teachers (PT 37).

Under the theme of "comfortable and active personality," 11 teachers produced 10 different metaphors. The teachers perceived the physical education teachers as having a more cheerful personality than other teachers and as an active figure due to their work. The following are the sample metaphors and rationale:

The physical education teacher is like a rabbit because he/she is active in its branch. Being comfortable makes him/her cute like a rabbit (PT 33).

The physical education teacher is like cotton because he/she gives people peace, comfort, and joy (PT 115).

The physical education teacher is like a squirrel because he/she is continuously mobile and agile (PT 38).

The physical education teacher is like Superman because he/she is always in motion (PT 124).

The teachers produced metaphors under the themes of "physical strength element," "savior," and "health-giving." The physical education teacher is like Hercules because body strength is at the forefront (PT 128) is an example of "physical strength element." The physical education teacher is like a fairy tale hero because it frees students from the impact of a heavy curriculum and directs them to activity (PT 16) is an example of "savior." The physical education teacher is like a gardener because he/she does the necessary to grow numerous, a different type of flowers in his/her garden healthily (PT 6) is an example of "health-giving."

**DISCUSSION AND CONCLUSION**

This study aimed to examine the perceptions of other branch teachers about physical education teachers and lessons through metaphors. The teachers produced 118 metaphors for the physical education lessons and 121 metaphors for the physical education teachers. These metaphors were classified under 8 themes for both the lessons and the teachers. The teachers perceived the physical education lessons as "expected and beloved lesson," "unifying factor," "disciplinary tool" "entertaining, relaxing and health-improving lesson," "gathering, discovering and directing different talents," "mobility," "free environment," and "basic lesson." The variety of metaphors and themes that were used for the perception of physical education lesson coincided with the variety of the definition and general objectives of the course. Especially when defining the concept of physical education, this versatility emerged. Kirk (2009, p.11) mentioned that physical education has many definitions in many openness, features, and scopes today, and these are generally associated with the human body, physical and social skills, health, spiritual and mental activities. The objectives of the physical education lesson revealed this versatility. Tamer and Pulur (2001, p. 51-52) stated that the general objectives of physical education are to provide the organic, psychomotor, mental, spiritual, and social development of people, namely children. The solidarity, anthill, antibiotics, discharge, health, the door to freedom, the root of the tree, etc., metaphors overlapped with the definitions and objectives of the course.
The theme in which the branch teachers produced most metaphors was “entertaining, relaxing, and health-improving”. It can be said that different branch teachers perceived the physical education lesson as a lesson that entertains and relaxes students, and improves health. The second theme in which the branch teachers produced the most metaphors was the “expected and beloved lesson” theme. When the reasons for the metaphors presented were examined, the teachers perceived the physical education lesson as a lesson that students were looking forward to and expected. Research has shown that students perceive physical education lesson as a joyful, relaxed, developer, entertainment environment, beautiful and enjoyable lesson (Namli, Temel, & Güllü, 2017; Köksel & Görücü, 2015; Yılmaz et al., 2017).

Additionally, in their study of the perceptions of Norwegian students about physical education lessons, Roset Green & Thurston (2019) concluded that the physical education lesson was perceived as relaxing by getting rid of the routine and school intensity, strengthening social ties, and improving social interaction, entertaining students. Coulter and Ni Chroinin (2013) emphasized that the physical education lesson was perceived as an essential part of the school, and a factor that relieves children from other academic intensity, and thus contributes to their health positively. In their study, Morgan and Hansen (2008), who examined the perceptions of classroom teachers towards physical education lesson, concluded that the classroom teachers perceived the physical education lesson as one that gives children vitality, protects them from obesity and increased sedentary life, and has a positive effect on the learning behaviors of the children. The teachers perceived the physical education lesson as a disciplinary tool, a free environment, and a basic lesson. These findings were similar to the results of Yılmaz et al. (2017), which included disciplinary tool, source of life, freedom, and Köksal and Görücü (2015), including freedom and necessity. The findings (theme) of unifying factor, gathering, discovering, and directing different talents, mobility were not found in literature; hence, with these metaphorical perceptions of the teachers, this study contributed to the qualitative literature on physical education and sports.

The teachers perceived the physical education teachers as "hard-working and versatile," "physical strength element," "exploring and guiding," "providing control and discipline," "savior," "student-friendly," "comfortable and active personality," and "health-giving." In current studies where the perceptions by students about the physical education teacher were examined through metaphors, it can be said that physical education teacher was perceived in similar ways (Korur ve Sözen, 2019; Cirit, 2020). Gifted students perceived the physical education teacher as a mentor and leader, a problem solver and a master, and a wise person (Aynur et al., 2017). Karaşahinoglu and Ilhan (2019) examined the perceptions of secondary school students towards physical education teachers through drawings. Physical education teachers were perceived as disciplined and hard-working, entertaining, physical strength elements, a good person, hero, motivating, guiding, being an element of love, shaping the student, and a helpful teacher. Yilmaz and Guven (2015) examined the perceptions of gifted students towards the physical education teacher by drawing and writing. The physical education teacher was perceived as unifying and integrative, guiding and leading, an element of love and exemplary person.

The perceptions of branch teachers about physical education lessons and teachers are essential in terms of directing students to physical education lessons and their activities (such as extracurricular sports activities). It was revealed in the research results that the branch teachers did not have any negative perceptions of either the lessons or the teachers. These results reflected a positive attitude towards directing and encouraging students to the lessons and the activities (such as extracurricular sports activities).

**Study Limitations and Future Research**

The fact that the branch teachers had negative perceptions about the course and the teacher may affect participation by the students in the lesson and its activities. For this, branch teachers who have a negative perception towards physical education lessons and the teachers can be identified, and
research can be conducted to identify the causes of the negative perceptions and eliminate them. Moreover, the perceptions of different study groups towards physical education lessons and teachers can be examined through metaphors. One of the limitations of this research was that the branch teachers participating in the study were not distributed homogeneously.

REFERENCES


Tathsu, B., & Bayraktar, G. (2020). Concept of tolerance in sport according to undergraduate students at the department of physical education and sport (Bayburt University example). *Journal of


Yaşar, G. (2008). *An evaluation from the aspect of some parameters of how the teachers of physical education cope with the problems related with the school works; and how they control over their stress.* Unpublished master's thesis, Çukurova University, Adana, Turkey.


Activity-Based Teaching with Social Studies Pre-Service Teachers for Developing the Thinking Skills of Learners

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Abstract

In this study, by helping social studies pre-service teachers develop activities for thinking skills, it was aimed to explore the effects of such activities in the context of professional competencies. The research was designed as action research. The action research group included 31 pre-service teachers (16 women and 15 men). Semi-structured interviews were conducted in final meeting with 12 volunteering participants after the application was completed. The following findings were explored in detail as; in the context of professional development, skills, values, and professional competence dimensions; in the context of lesson planning and teaching processes, lesson planning, teaching processes, material use, and contributions to activity production; and, at the end of the implementation process, evaluations of the implementation process and personal development. As a result of the research it was determined that creative thinking, critical thinking, thinking from different perspectives, original thinking, reflective thinking, high-level thinking, problem solving, scientific thinking, analytical thinking, thoughtful thinking, empathetic thinking, objective thinking, aesthetic thinking, developing broad perspective, collaborative thinking, and questioning skills were developed in the skills dimension. In the dimension of value, values such as justice, empathy, patriotism, austerity, respect, trust, self-confidence, solidarity, diligence and responsibility were developed. When the general results are evaluated, it was revealed that the pre-services improved their professional competencies in terms of lesson planning, implementation, activity development, material use, and pedagogical aspects. In order to ensure that the professional needs and competencies of pre-service teachers are met and supported, institutional educational programs that train teachers should undergo curriculum updates with the addition of the necessary theoretical and practical information to implement activity-based teaching in it successfully.

Keywords: Thinking Skills, Activity-Based Teaching, Social Studies, Pre-Service Teachers

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INTRODUCTION

Experienced teachers are valuable human sources that can provide solutions for the most difficult teaching challenges. Even if all resources are sufficient in education and training, it is still very difficult to achieve high quality of success without experience. Main focus of many education teams is the teacher, who coordinates and manages the educational situation. The situations such as exposure of the ideas, the creation of the inspirational teaching environments, the conditions that push students to think, and the complex situations related to learning are always influenced by the teacher’s experience.

It is a common belief that the teachers in charge of realizing current educational outcomes should be qualified teachers by enjoying the support of country authorities at the point reached today. For this reason, the pressure has been developed to provide quality in teacher training. It is foreseen that it will be possible to contribute to student success through more effective education in teacher education, especially with the increase in professional development quality (Sonmark, Révai, Gottschalk, Deligiannidi, & Burns, 2017). According to Singer, Murphy, Hines and The Hofstra New Teachers Network (2003), the stereotype, that philosophers were conceived of as wise people, comes from the view that philosophers have disconnected from their surroundings and plunged into their own world of thought. In a sense, everyone is a philosopher and everyone has a philosophy that guides their beliefs and actions. From the perspective of the teacher, it can be stated that each teacher has an educational philosophy that shapes the way of teaching and that this philosophy is based on a belief in life, learning and an understanding how to achieve it.

Qualified teacher education includes the 21st century skills (creativity, critical thinking, problem solving, cooperation, communication etc.) at different levels in many OECD countries. Contemporary new demands require teachers to switch from traditional to innovative methods. Therefore, updating teachers’ skills through teacher training institutions is one of the main problems. (Sonmark et al., 2017).

Especially, teachers are expected to become experts in the ability to “translate” the topics they teach, into appropriate learning methods and using to different topics. In this sense, it is important to carry out the necessary curriculum and application studies so that teachers have the ability to combine approaches, a rich repertoire of teaching strategies and how and when to use them (Schleicher, 2012 Cited in Kennedy, Latham, & Jacinto, 2016: 14).

All skills can be developed in educational settings. The important thing is that the teacher use the appropriate strategy, method, and technique. It is the teaching facilitating the students to mobilize, to enable them to think, analyze, discuss and execute ideas, to work in collaboration with a planned and sharing manner. In addition to this, the skills in the curriculum should be handled with precision in a way related to the acquisitions, should be supported with daily life and subjects that will attract the attention of the students (Başsal, Çarıkçı, & Yaşar, 2016). After all, the teacher is only responsible for a learning process that does not just focus on delivering material to the student. The students should discover and construct the information, process complex information and be responsible for learning outcomes actively involved in learning (Triswahyono, Sukartiningsih, & Harmanto, 2019). It is a requirement that textbooks should be prepared with logic supporting these mechanisms and they should be designed to contribute to the development of research, inquiry and critical thinking skills (Aladağ & Karaman, 2018).

Social studies teachers who want to teach their thinking skills need to organize discussions in a small or large group, add many types of writing activities to their daily classroom routines, and add their teaching activities to their routines, from simple recallment questions to the memory and high-level questions (Karabulut, 2012). For example, creatively solving any problem, providing a unique perspective for potential solutions requires the ability to think critically; teachers should take responsibility for this process (Changwong, Sukkamart, & Sisan, 2018). It is necessary to spend time
and effort on critical thinking in order to prepare students who will act in the public interest and to raise the citizens who will be able to make decisions and solve problems using reflective thinking (Wilen & Phillips, 1995).

Education and training are inherently connected. This process is aimed at acquiring the various competencies and skills necessary for any citizen to seize good employment opportunities and have a positive impact on society. Activity-supported practices are defined as a system in which students actively participate in the learning experience instead of sitting in line as passive listeners (Anwer, 2019). In learning sessions in classrooms where traditional teaching is based, the main physical task performed by students is to take notes or sit down to answer any queries of the teacher. It is very difficult for students to express themselves actively in this way and they become passive learners. This makes the learning procedure dull and dry. It does not provide educators and students a space for any movement. Another disadvantage of this technique is that students with learning problems cannot adjust the way courses are delivered (Noreen & Rana, 2019). By overcoming these kinds of problems to make contemporary teaching, The Activity-Based Teaching (ABT) has been developed as a learning approach that supports active participation of students in learning theories or concepts through applied experiences in educational campuses and in many learning environments (Priyono, Wena, & Rahardjo, 2017).

Social studies lesson is full of activities that actively involve student thinking. For example, to identify and compare geographic regions by using maps, to apply constitutional rights concepts in certain situations, or to guess the changes in prices using the principles of supply and economic demand. Many of these or other similar topics include outcomes that are very suitable for thinking activities within the learning area. In order for students to be productive in responding to the intellectual tasks they face, they need competence in both general problem solving and thinking about specific types of intellectual tasks (Solomon, 1987). Including the concept of thinking within the skills in the social studies curriculum; critical thinking and innovative thinking are emphasized. In the special objectives of the programme, items such as “having critical thinking skills as individuals who know the ways of reaching correct and reliable information”, “having access to information based on scientific thinking, observing scientific ethics in using and producing information” are included (MEB, 2018). Among the issues that should be considered in the practice of the curriculum of the social studies lesson, the understanding of “social studies as social sciences” and “social studies as reflective thinking” should be given importance by making use of the events inside and outside the school and comparing the students should be compared real-life problems and contradictory situations, they should think reflectively for the problems they have. In addition, in the 9th article, the expression is that “current and controversial issues about acquisitions can be carried to the class by using different discussion techniques, by associating them with problem solving, critical thinking, using evidence, decision making and research skills”. Among the competencies; the highlighted concepts of mathematical competence and basic competencies in science/technology (logical and spatial thinking) are included as the third key competence. As for individual development and teaching; abstract thinking ability is included.

**Purpose and Importance**

Thinking is a complex process that takes place consciously in the mind, undergoes a series of processes for a purpose and progresses successively. Therefore, the teacher should have a good education (Baysal et al., 2016). Teacher education has a very important value in this context. The adequacy of teachers’ thinking skills is a very important requirement in their professional lives. Likewise being qualified with pre-vocational training on this subject and designing activities that develop these skills for students and leading all students to the practice affect the quality of education (Tok & Sevinç, 2010). In this process, teacher education institutions should increase their professional development opportunities, and they should ensure that their pre-service teachers graduate by fully taking the qualifications required by the profession (Seferoğlu, 2004).
The reforms, that have taken place due to some changes in today’s world, point out that teachers should adapt to the changing their features and should not be left behind. This constantly and remarkably emphasizes personal and professional development culture as well as pedagogical issues. In order to make these demands workable, teachers are needed who are aware of and able to adapt to changing situations in the world (Buldu, 2014).

It is the teacher’s responsibility to develop thinking skills thematically. Teachers need to identify some basic skills of learning and teaching, to adapt their teaching accordingly (Kusuma, Gunarhadi, & Riyadi, 2018). Social Studies offers a quite appropriate content and opportunity to close this gap. Based on these requirements, in this research, with social studies pre-service teachers were provided to develop activities for their thinking skills; it is aimed to investigate the effects of these activities in the context of professional competencies. In this context, the organization of social studies education with ABT, experiencing it with the production of activities, and the importance of appearing situations will be discussed in this work. At the same time it will be researched whether pedagogical studies on teaching students to gain thinking skills in social studies teaching provide comprehensive experience in pre-service teachers. In this context, the aim of the study will be evaluated primarily as the purpose, knowledge, skills, values, time, related outcomes, processes, and activity planning and practice stages; secondarily as the reflection of these features among pre-services in terms of student status; and finally as the overall contribution of the study from the dimension of vocational education.

In literature, there are some studies related to skills such as critical thinking (Akpınar & Kranda, 2018; Karaboga, 2019; Aldan Karademir, 2013; Bilgin & Eldeleklioglu, 2007; Kusuma, Gunarhadi, & Riyadi, 2018; Puspita & Aloysius, 2019; B), high level thinking (Çakır, 2013; Karakaya, 2012; Söylemez, 2018), creative thinking (Tok & Sevinç, 2010; Dikmen & Tuncer, 2018; Işık, 2012; Birgili, 2015), reflective thinking (Baş, 2013), questioning (Aldan Karademir, 2013; Aldan Karademir, Çaylı, & Deveci, 2019; İnel Ekici, 2017), analytical thinking (Çelik, Gürpinar, Başer, & Erdoğan, 2015), aesthetic thinking (Dolapçıoğlu, Gürkan, & Karakuş, 2019; Özbal & Aydoğan, 2017), empathetic thinking (Çubukçu & Girmen, 2009). In ABT based literature, it is stated that reflective thinking skills have a positive relation with high level thinking skills and that reflective thinking way develops these skills (Ersözli, 2008). Such activities provide a meaningful development in critical, reflective and attentive thinking skills (Biçer, 2019), creative thinking skills develop the students’ successes of developing projects (Karataş & Özcan, 2010), there is a positive correlation between the teachers’ activeness in their classroom activities and their self confidence in teaching thinking skills (Koç, 2020), activities motivate the critical thinking (Valdez, Lomoljo, Dumrang, & Didatar, 2015). Unlike these studies, there is no study about the thinking skills and teaching of the activities in social studies on pre-service teachers’ vocational development in literature.

Accordingly, the following question is the main one for the research of current work: Can the professional competencies of pre-service teachers be strengthened with ABT to improve their thinking skills? In this framework, answers to the following additional questions were sought:

1. Which skill, value, and professional competence to make pre-service teachers gain thinking skills can be provided with ABT?

2. Which competences from the dimensions of preparing lesson plan, making teaching process workable, using material, and producing activities can be provided in means of making pre-service teachers gain thinking skills with ABT?

**METHOD**

This research is planned as action research, which is one of the qualitative research methods. Think-do-think process of action research, in other words “action cycle” according to MacNaughton and Hughes (2009), proceeds according to the stages of choosing changes, planning for changes, creating change, and sharing change lessons. In this cycle; the processes of asking questions, meeting
with the action research family, conducting a literature review, ethical responsibilities, reflection and critical reflection, determining usefulness, planning difficulty and validity, creating a movement research group, and gathering basic data take place. This study is based on the action research model of MacNaughton and Hughes (2009), following steps represent the explanation and ABT practice process in this model.

**In choosing change stage:** Opportunities and topics that will transform into experience for change were analyzed. Conditions to create change were determined.

The subject of this project is to develop the professional competencies of the pre-service teachers of social studies to help them gain thinking skills.

Research question is that: Can the professional competencies of the pre-service teachers for developing their thinking skills be strengthened with ABT?

**In planning the change stage,** The research has advanced with a collaborative approach among researchers and action research members. The related literature has been scanned. As the cycle progresses, there occurs a return to the literature periodically. The consent of the participants was obtained for the practice and the project. At various points; the project evaluation is done and the subject is re-examined. The working group and its scope have been held on to.

**In creating change stage:** Data were collected and analyzed. Data were collected three times, at the beginning, in the middle and at the end of the process. Data; The activities prepared together with the pre-service teachers; were gathered through recording, reporting, observation, and final meeting. From the social studies curriculum; achievements, skills, and values were determined and groups of 4 people were formed from the class lists and random lots were used to determine the weeks in which groups would apply to the activities. In the group where the research was conducted; There were 31 pre service teachers, 16 girls and 15 boys. The study was applied to the whole class. Semi-structured interviews as final meeting took place with 12 volunteer candidates selected from the groups after the implementation was completed. Examples of the distributed outcomes that will be reflected to the numbered groups from the social studies curriculum (MEB, 2018) on the ABT activities are given in table 1. Action working plan is given in table 2.

### Table 1. Examples of thinking skills in the social studies education programme outcomes

<table>
<thead>
<tr>
<th>Thinking skill</th>
<th>Sample outcome</th>
</tr>
</thead>
</table>
| Analysis       | SS.6.5.5. Students will be able to analyse the place and the importance of qualified manpower on Turkey’s economy.  
SS.6.6.3. Students will be able to analyse the elements that affect the decision processes of the government. |
| Evaluation     | SS.5.2.5. Students will be able to evaluate the historical development of cultural elements in daily life.  
SS.7.4.4. Students will be able to evaluate the contribution of free thought to scientific developments. |
| Association    | SS.6.5.1. Students will be able to associate our country’s sources with their economic practices.  
SS.7.6.3. Students will be able to associate the republic of Turkey’s basic qualifications with the practices in social life. |
| Questioning    | SS.6.1.3. Students will be able to question prejudices about differences to live in harmony with the society.  
SS.5.3.4. Students will be able to question the creation reasons of disasters and environmental problems in their environment. |
| Making Inference | SS.6.3.4. Students will be able to make inference about climate conditions by thinking about the lives of people from different natural environments in the world. |
| Comparison     | SS.4.2.3. Students will be able to compare current plays with traditional ones in means of change and continuity.  
SS.6.6.1. Students will be able to compare different regimes in means of basic principles of democracy. |
| Developing idea | SS.4.4.4. Students will be able to develop some ideas about designing typical products by following the needs of their own surroundings.  
SS.7.7.4. Students will be able to develop ideas about the solutions for global problems with their friends. |
Table 2. Action working plan

<table>
<thead>
<tr>
<th>Process</th>
<th>Type of work</th>
<th>Data collection tools</th>
<th>Time period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before implementation</strong></td>
<td>Pre-interview</td>
<td>Observation</td>
<td>A week: 08-12 October, 2019</td>
</tr>
<tr>
<td></td>
<td>Seminar</td>
<td>Interview</td>
<td>2 weeks: 15-26 October, 2019</td>
</tr>
<tr>
<td></td>
<td>Determining the groups</td>
<td></td>
<td>2 weeks: 15-26 October, 2019</td>
</tr>
<tr>
<td></td>
<td>Determining outcomes, skills and values/</td>
<td></td>
<td>A day: 31 October, 2019</td>
</tr>
<tr>
<td></td>
<td>distributing them to the groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preparing lesson plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preparing activities</td>
<td>Observation, report, video recording, assistant interviews</td>
<td>7 weeks: 05 November-21 December, 2019</td>
</tr>
<tr>
<td></td>
<td>Implementation of prepared activities</td>
<td>Group reports</td>
<td>7 weeks: 05 November-21 December, 2019</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Weekly coordinator reports</td>
<td></td>
</tr>
<tr>
<td><strong>Implementation process</strong></td>
<td>Preparing lesson plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Preparing activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implementation of prepared activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>After implementation</strong></td>
<td>Final interview</td>
<td>Semi structured interview</td>
<td>A week: 24-28 December, 2019</td>
</tr>
</tbody>
</table>

Data Collection Tools

The data related to the research consist of interviews, observation, in-process evaluation, and final interview.

Examples of outcomes distributed to groups to be reflected in the ABT implementations are given in Table 3.

Table 3. Outcome examples related to teaching program

<table>
<thead>
<tr>
<th>Class level</th>
<th>Learning domain</th>
<th>Outcome</th>
<th>Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Individual and Society</td>
<td>Students will be able to make new inferences about their personal identities by analyzing formal identity card.</td>
<td>Empathy</td>
</tr>
<tr>
<td>4</td>
<td>Science, Technology, and Society</td>
<td>Students will be able to develop some ideas about designing typical products by following the needs of their surroundings.</td>
<td>Innovativeness</td>
</tr>
<tr>
<td>5</td>
<td>Production, Distribution, and Consumption</td>
<td>Students will be able to develop new ideas related to production, distribution, and consumption by working in collaboration.</td>
<td>Innovativeness</td>
</tr>
<tr>
<td>6</td>
<td>Active citizenship</td>
<td>Students will be able to realize the value given to the women in social life by analyzing Turkish history and current examples.</td>
<td>Critical thinking</td>
</tr>
<tr>
<td>6</td>
<td>Global relations</td>
<td>Students will be able to analyze the economic relations between our country and the others.</td>
<td>Critical thinking</td>
</tr>
<tr>
<td>7</td>
<td>People, places and environments</td>
<td>Students will be able to give examples for the negative situations that can occur with the restriction of freedom of accommodation and travel which are among basic rights.</td>
<td>Problem solving</td>
</tr>
<tr>
<td>7</td>
<td>Global relations</td>
<td>Students will be able to develop ideas about the solutions for global problems with their friends.</td>
<td>Problem solving</td>
</tr>
</tbody>
</table>

The sub-problems of the research are consisted of the main categories of the interview questions. Interview questions and the main categories including these questions (sub-problems) are given in table 4.

Table 4. Interview questions and main categories

<table>
<thead>
<tr>
<th>Main categories</th>
<th>Sub categories</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vocational development</td>
<td>Skill dimension</td>
<td>1- In which subjects did your practice improve from the skill dimension related to teaching thinking?</td>
</tr>
<tr>
<td></td>
<td>Value dimension</td>
<td>2- In which subjects did your implementation make progress in terms of values related to teaching thinking?</td>
</tr>
<tr>
<td></td>
<td>Vocational competence dimension</td>
<td>3- In which subjects did your implementation’s professional competence dimension related to teaching thinking make progress?</td>
</tr>
</tbody>
</table>
In this section, the following findings take place in detail; in the context of professional development; skill, value, and professional competence dimensions; in the context of lesson planning and teaching process, lesson planning, teaching process, material use, contribution to activity production; at the end of the implementation process; Findings on the dimensions of evaluating the implementation process and personal development are included. Interviewed participants are identified with consecutive numbers to maintain anonymity (P1, P2, … P12).

Findings related to the evaluation of pre-service teachers’ vocational development

In this section, findings related to the opinions of pre-service teachers regarding the professional development results of the ABT implementation are presented. The development in skill dimension is given in table 5.

Table 5. Development in skill dimension

<table>
<thead>
<tr>
<th>Theme</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical thinking</td>
<td>6</td>
</tr>
<tr>
<td>Reflective thinking</td>
<td>2</td>
</tr>
<tr>
<td>Scientific thinking</td>
<td>1</td>
</tr>
<tr>
<td>Creative thinking</td>
<td>7</td>
</tr>
<tr>
<td>Thinking with a wide perspective</td>
<td>1</td>
</tr>
<tr>
<td>Authentic thinking</td>
<td>2</td>
</tr>
<tr>
<td>Thinking with different aspects</td>
<td>5</td>
</tr>
<tr>
<td>Analytical thinking</td>
<td>2</td>
</tr>
<tr>
<td>Attentive thinking</td>
<td>1</td>
</tr>
<tr>
<td>Empathetic thinking</td>
<td>1</td>
</tr>
<tr>
<td>Aesthetic thinking</td>
<td>1</td>
</tr>
<tr>
<td>Objective thinking</td>
<td>1</td>
</tr>
<tr>
<td>High level thinking</td>
<td>1</td>
</tr>
<tr>
<td>Problem solving</td>
<td>2</td>
</tr>
<tr>
<td>Collaborative thinking</td>
<td>1</td>
</tr>
<tr>
<td>Questioning</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35</td>
</tr>
</tbody>
</table>

As it is seen in Table 5, contributions of the study to develop the thinking skills were identified in the areas of creative thinking (P1, P3, P4, P6, P9, P10, P12), Critical thinking (P1, P4, P6, P7, P8, P10), Thinking with different aspects (P1, P4, P6, P10, P11), Authentic thinking (P3, P4), Reflective thinking (P1, P8), High level thinking (P9, P2), Problem solving (P6, P7), Scientific thinking (P1), Analytical thinking (P4), Attentive thinking (P4), Empathetic thinking (P4), Objective thinking or Rational thinking (P8), Collaborative thinking (P7), Questioning (P7), Aesthetic thinking (P4) and thinking with a wide perspective (P6).
P1: Yes, we believe…that our work affects our critical thinking, creative thinking, reflective thinking, and scientific thinking. We understood better that we should approach a subject from a different perspective.

P3: I strongly believe that our work improves our thinking skills. Because in this event, we kept our minds busy for days to derive something new and tried to add something to the event. We thought a lot on how to make the event creative and original, which improved my creative and authentic thinking skills.

P4: Since our study is authentic, different, original, we think that it has developed our creative thinking, critical thinking, analytical thinking, attentive thinking, empathetic thinking skills.

P9: Yes, we believe we did a cognitive process while doing our work. In this process, creative ideas were developed in order to make the learning-teaching process effective, clear, understandable, enjoyable and appropriate for the student level. This was an important step towards the development of our high level thinking skills.

On the context of the contribution to the development from value dimension; pre-services expressed that this study has an effect on some important values such as justice (P1, P5, P6), empathy, patriotism, austerity (P1), respect (P1, P3, P6), trust, self-confidence (P3), solidarity (P5, P11), diligence (P5), responsibility (P5, P6, P8), friendship, honesty, self control, patience (P6), helpfulness (P1, P6, P11), love (P1, P6), also cherishment to the art (P12), and realizing consciousness of human rights (P4).

P1: In our activity, there were values that support justice, empathy, patriotism, love, respect, austerity and solidarity. It also contributed to our value education.

P3: Considering the activity we do in terms of values education; When looking at national education programs, there are many values that are desired to be opened to children. We can also say universal notes of education. The student who comes to the board in the activity, imposes some values to himself. These values are such as trust, self confidence, respect. Lets take one of them. The student who comes to the board has to wait for his turn while doing the activity. The student does this even it is consciously or not in front of the society and respects people.

P5: In the activity; solidarity, diligence, responsibility, and justice values were prioritized within the scope of the social studies lesson. Values, which have an important place in the establishment and maintenance of a regular social structure, are vital for the education of individuals. Individuals who know, perceive, think, and internalize their values play an active role in society.

P6: Our study will add lots of value to students in terms of values education. In our activity, justice, friendship, honesty, self-control, patience, respect, love, responsibility and helpfulness are the values that our children should definitely have.

P8: The child will learn that his own freedom ends where the freedom of others begins. By reaching the awareness of rights and responsibilities, he will learn his right in legal ways.

On the context of the contributions of the vocational competence dimension; With this study, it has provided pre-service teachers with knowledge and experience of self expression in professional life. (P1, P2) P1 stated: “We cannot deny that our work and activities have improved us in terms of the teaching profession. That is to say, we were able to express ourselves more comfortably in our professional life than before and especially we have realized our self-confidence and how we
should communicate with students. Of course, this also contributed to education. We were able to see how we had comprehensive knowledge of field.”

ABT practice has opened the horizon for what contemporary principles and methods are how they are used, how to present with different activities (drama...), how to combine theory and practice, enrich the course through activities, how to reduce knowledge to student level, how to make the lesson fun, how a student can be active and how effective teaching can be (P3, P4, P8, P9). P3 stated: “We have gained knowledge and skills that match with our teaching profession and which we can add lots of good things in the future to our students in accordance with the information we have received during the four years, such as the teaching principles and methods course and the program included in the curriculum. As our activity was put into practice, we also provided active learning. It led us to shed light on our future career.”

The activities have made the pre-services gain experience in how they can interact, direct, control the classroom and provide a multi-dimensional and in-depth look at topics and internalize them (P6). P6: “Within the framework of our activities, we have examined and analyzed the events in depth, not in a narrow way but multi dimensionally, to internalize the interaction between teacher and student and how classroom control should be.”

It enabled to use and practice time efficiently (P11). P11: “We have learned to do activity theoretically. We have learned to involve the student in the process and use the time efficiently.”

They have learned to be able to produce original activities regardless of the textbook (P12). P12: “We will have the ability to create unique activities with our own imagination without being tied to a book while teaching the subject to our students.”

Findings related to the evaluation of pre-service teachers’ lesson planning and teaching processes

In this section, the findings related to the opinions of the pre-service teachers regarding the results of Lesson Planning and Teaching Process the ABT implementation are presented. Contribution from the teaching process dimension is given in Table 5.

On the context of lesson planning and preparation dimension. According to the results obtained from the states of the pre-service teachers, it has made them gain experience regarding the issues to be followed in lesson planning and a preparation process, the details of teaching and planning, how to develop an existing plan/program, how it is possible to produce something new, how to make creativity workable and to implement plan, how to make lesson effective, efficient and permanent (P1, P2, P3, P4, P6, P7, P8, P10, P11, P12). P1: “We have gained experience on how to make a lesson plan, what to consider when preparing a lesson plan, or how to develop a ready lesson’s plan and how to transfer these plans to lessons.” P11: “We have gained experience on how to handle a subject in the teaching-learning process, and how we will do the activities in the classroom by thinking about the ways of how to do.”

P9: “It has given us the opportunity to experience how to prepare the lesson plan with activities and how to achieve it in the most suitable and efficient way.”

According to the results obtained from the statements of the pre-service teachers, it has provided a chance to predict the meaning and the importance of preparing a lesson plan carefully in contrast to the results of plans which were designed with a frivolous perspective or in a sloppy and random way (P2, P3). P2: “It allowed us to take the lesson and plan more carefully and seriously, and to take into account the good or bad results of this and the benefits it brings to us and the children.” P3: “.....We thought how we can use the time in a lesson, how we can make it more efficient. This was definitely a great experience that it led us out of theory and made us gain as feedback.”
According to the results obtained from the states of the pre-service, it has made us gain a perspective of being more effective and efficient in considering and realizing the needs of the individual and society in preparing lesson planning (P5). P5: “It has had a positive effect on knowledge and skills in the context of determining the needs of the society and setting goals for it.”

**On the context of teaching process dimension**

**Table 6. Teaching process dimension**

<table>
<thead>
<tr>
<th>Theme</th>
<th>f</th>
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</thead>
<tbody>
<tr>
<td>Multidimensional thinking</td>
<td>1</td>
</tr>
<tr>
<td>Regarding the features of age</td>
<td>2</td>
</tr>
<tr>
<td>Readiness</td>
<td>1</td>
</tr>
<tr>
<td>Individual differences</td>
<td>1</td>
</tr>
<tr>
<td>Rhetoric</td>
<td>1</td>
</tr>
<tr>
<td>Diction</td>
<td>1</td>
</tr>
<tr>
<td>Presentation</td>
<td>1</td>
</tr>
<tr>
<td>Regarding cognitive, affective and psychomotor features</td>
<td>1</td>
</tr>
<tr>
<td>Abstraction</td>
<td>1</td>
</tr>
<tr>
<td>Deciding related to teaching</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
</tr>
</tbody>
</table>

As seen in table 6, there is a development in the subjects such as features of age (P2, P4), multidimensional thinking (P1), readiness (P2), individual differences (P5), rhetoric (P3), diction (P3), presentation (P3), cognitive, affective and psychomotor features (P4), abstraction (P6) and deciding related to teaching (P8).

P1: Our study has let us learn empirical, therapeutic, cybernetic aspects, etc. Also it made us gain the pedagogical skills, multidimensional thinking by holding a topic as a whole and creative thinking skills.

P3: Pedagogy is a teacher-centered education. More precisely, we can say teaching. We can also accept it as the science and art of raising children; that is to say, teaching is an art of human education. The activities we prepared were pedagogical tools for conducting pedagogical training and that is especially because of the fact that they include all generated tools. For this reason, I think that if we accept our activity as a tool, it gives us pedagogical skills in many dimensions. We have thought of many things such as how to give education, how to talk on the board, how to present the activity and we have gained skills such as self-confidence and personal development.

P8: It has made us gain pedagogical skills in deciding and determining what, how and when to teach. Through a certain goal, it has let us gain skills in creating activities by regarding the emotional, mental and social development of children.

P10: When we explained the subject to the students, we learned what and how to give it them. From this point of view, we reduce the number of bored students who do not pay attention to the lesson. Class control is also provided. It contributed mostly to the development of creative and critical skills.

**On the context of using material dimension**

New things produced together with the pre-service teachers made them feel more important in the process. P1: “It contributed to our individual development. That is... We did it based on the examples of activities. The communication we have with our friends has been strengthened and the control of the class and the creation of new things together have had an impact on feeling special.”
It is also stated that visual materials prepared for different purposes and following individual differences are beneficial for the learner. P2: “Because of the fact that the subject is child, the more effective and different materials we use, the more useful it will be for the child’s perception in accordance with multiple types of visual intelligence.”

According to the statements of the pre-services, the materials prepared in accordance with the quality and level have served the lesson, facilitated learning and increased the functionality of teaching, contributed to their mental development. P3: “There are many useful dimensions of our study in terms of material use. These materials serve the processing of the course. And it increases the functionality of the subjects. It becomes much easier to understand material since it is prepared for a level suitable for mental development.”

According to the statements of the pre-services, produced materials provide multiple learning, provide effective and permanent learning, increase interest and attention, embody abstract information and ensure the permanence of learning. P5: “…In the studies, the use of materials provides multiple environments by increasing the number of sensory organs involved in the learning process. By providing effective and permanent learning, it increases students’ interest and attention to the lesson and supports the efficacy dimension by ensuring that abstract information becomes concrete for learners.”

According to the statements of the pre-services, time and economic costs, create dimension of the loss. P7: “Material is seen as a very important tool in our activity as it provides trace of permanent learning by using visual and audio tools in education.”

Materials which were produced according to the statements of pre services provides to materialize concepts but the problem of providing materials creates a limitation. P9: “Since the study has mostly abstract concepts, concepts can materialized with the use of materials, but it will be difficult to get the material since limited material can be used on the subject.”

The materials, which were produced according to the statements of pre services, increase active participation. P10: “In our activities, we mostly paid attention to the use of materials, because the students like lessons with the materials more and participate actively in the lesson.”

### On the context of producing activities dimension

<table>
<thead>
<tr>
<th>Sub theme</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>The knowledge and experience in preparing the activity</td>
<td>8</td>
</tr>
<tr>
<td>Regarding the suitability for class level</td>
<td>2</td>
</tr>
<tr>
<td>Regarding the suitability for student level</td>
<td>1</td>
</tr>
<tr>
<td>Organizing activity according to interests</td>
<td>1</td>
</tr>
<tr>
<td>Organizing activity according to ability</td>
<td>1</td>
</tr>
<tr>
<td>Developing cognitive process</td>
<td>1</td>
</tr>
<tr>
<td>Developing in communication skills</td>
<td>1</td>
</tr>
<tr>
<td>Skill of presentation</td>
<td>2</td>
</tr>
<tr>
<td>Skill of activity and lesson management</td>
<td>1</td>
</tr>
<tr>
<td>Time management</td>
<td>1</td>
</tr>
<tr>
<td>Skill of perception and evaluation</td>
<td>1</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>1</td>
</tr>
<tr>
<td>Responsibility</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
</tr>
</tbody>
</table>

According to table 7, there is a development in the subjects related to the dimension of activity examples’ contribution to the producing activity such as mostly the knowledge and experience in preparing the activity (P1, P4, P5, P6, P8, P10, P11, P12), regarding the suitability for class level (P1, P2), developing in communication skills (P3, P7), skill of presentation (P3, P7), the suitability for
student level (P2), organizing activity according to interests (P1), developing cognitive process (P2), skill of activity and lesson management (P11), time management (P11), skill of perception and evaluation (P9), sensitivity (P9) and responsibility (P9).

P2: In the theoretical part there were more activities to improve the cognitive process. This also guided us. The suitability of the given examples to the student level attracted our attention.

P3: In theoretical activities, we theoretically learned how to adjust our tone of voice in the classroom environment, how we should act and behave, how we can determine our speech and our style how we can present confidently in small community settings such as the classroom. It drew the route of how to follow this path and provided such a development.

P6: The activities given in the theoretical part were the first activities that we implemented in the classroom. In this regard, it was a nice experience. This was an important experience for the activities we will prepare and implement in the future.

P7: In the activity we held in the theoretical part, we think that it improved firstly, how we should address our students through the eyes of a pre-service teacher, and also our personal development such as the duration of the lessons.

Findings related to the result of implementation process, evaluation of pre-service teachers

Evaluation of the process in the results of implementation process

A result evaluation has been made to the pre service teachers about the level and in what subjects the implementation process helped students make inferences about how to teach the student with ABT. Looking at the answers from here; it has been stated that the teaching of thinking is a pedagogical necessity and is a sensitive issue that should be dealt with (P1, P3). P3: “Our study has given us perhaps the most important function of the teaching profession by letting us think about the question of how to teach thinking to the student. The teacher is just as successful as what he can transfer, not how much he knows. I think the fact that this problem comes to mind is the key point of this profession. This fact includes how to explain an idea to a young person in which level and in what style, what materials are used, how a lesson or idea or concept addresses the student and learning how to have fun.”

They have gained more concrete information on how and by which methods of empathetic thinking skill will be gained to the student. P2: “We tried to support this, especially with the movies watched. We made the child think critically by empathizing. Previously, we had no idea about how we could do this. We thought that we could just convey this with questions as what you would do if you were in someone else’s shoes. But we realized that many materials such as movies, photographs, case studies, news, stories, legends, documentaries and concept maps are materials for empathy.”

While preparing activities to improve their thinking skills, they considered individual differences. P4: “Different activities were included considering the student may have individual differences.” It was thought that the activities should be reinforced with practice. P6: “For example, before taking the environmental pollution activity in lesson, we made an inference about how the students would make this activity more effective after the activity and immediately afterwards, we also thought of applying the garbage collection in the garden of the school. We planned to take the students to a Kızılay Blood Donation Center after the event, before implementing the Kızılay event. The implementation led to the inference of the outcome importance from the achievements for the sake of the society.” P7: “It helped us make inference in means of solving problems, regarding and respecting human rights and freedoms, being aware of citizenship rights and responsibilities and observing the
principles of justice and equality. Our necessity to produce activities is realized, that can let the individual think.” P8: “We learned in a practical way how the human brain works practically when it is in trouble.”

The pre-service teachers have experienced that they can be a guide to teaching thinking, can enable children to activate their minds and provide information, direct them to think by guiding them, as well as enable students to manage their own thoughts and produce thoughts and make them think critically by providing them with guiding questions. P9: “In our study, to teach the thinking, teacher as a guide can develop and teach the students by drawing a road map to them, activating the students’ minds with various questions and directions, and bringing them to knowledge through various questions and directions (P11, P9).” P11: “by standing on a guide position, we have directed our students to the answer with the clues.”

**Evaluation of the individual development in the results of implementation process**

At the end of the implementation process, pre-services were asked to make self-assessment with the question of “if you criticize yourself, how would you evaluate your positive and negative aspects?” According to the results appeared in this direction: They realized that they had some contradictions about how to put some theoretical issues into practice and they were inadequate (P6, P2, P12). P2: “We understood that we were not at a sufficient level in terms of narration and transfer of techniques and activities by going down to the level of children before implementation. However, we believe that after taking this course, we will make them more effective.”

At the end of the implementation, they experienced how it would be possible to be an effective teacher. They also discovered how they can activate the students. P3: “We learned how a teacher can be active and productive in this lesson through both activities and theoretical processes. We understood how our education model should make the student effective and how a teacher can be a guide.”

It has been realized that an individual’s hidden skills can be revealed and it is possible and useful to design activities for this (P4, P5, P6). P5: “We realized that our creative thinking skills have improved, we have been able to design different activities with these skills and we have seen that the individual reveals multiple talents that he does not realize in himself.”

They have learned how a teacher would get rid of the point of view that a teacher only tells the lesson through the presentation and learned that lesson can be effective, clear, understandable and fun with various methods and techniques in which the student is active while the teacher is the guide (P8, P10). P8: “We have learned how a teacher would get rid of the point of view that a teacher only tells the lesson through the presentation and learned that lesson can be effective, clear, understandable and fun with various methods and techniques in which the student is active and the teacher is the guide. The teacher should always be creative and produce new things. However, if we manage to be determined and decisive, if we internalize teaching as a target and making money as a tool, then we can become a more qualified teacher.” They saw the contribution of their creative sides in producing events (P10, P11). P10: “I have seen the benefit of my creative side.”

**DISCUSSION AND CONCLUSION**

In this research, social studies pre-service teachers were provided to develop activities designed for their thinking skills. It is aimed to investigate the effects of these activities in the context of professional competencies. Accordingly, data were obtained and evaluated on the context of professional development, skill, value, and professional competence: lesson planning, teaching process, material use and contribution to activity production and, at the end of the implementation process; on the dimension of evaluating the implementation process and personal development.
When the contribution of activities to teacher development from skill dimension is evaluated by the pre-service teachers; it was determined that ABT developed creative thinking, critical thinking, thinking from different perspectives, original thinking, reflective thinking, high-level thinking, problem solving, scientific thinking, analytical thinking, attentive thinking, empathetic thinking, objective thinking (rational thinking), aesthetic thinking, thinking with a broad perspective, collaborative thinking and questioning skills. It is known that activities can be integrated into different areas where they do not cover a single discipline. Social studies, which is in a social alliance such as a physical education lesson (Buell & Shirley, 1993), has a natural structure that needs the support of different disciplines. The common point of disciplines is that they need to think at a certain rate. Particularly, different disciplines show themselves in the field of social sciences. The dominance of any discipline from time to time leaves other disciplines behind by creating “disciplines hierarchy” indirectly. The same is true for thinking frameworks. For example, if we are dealing with historical thought, other thinking approaches which are away from being compulsory is usual (Smith, 2017). This unique structure of thinking is also related to the development of thinking skills. According to Gelen (2011), in order to develop thinking skills, sub-skills such as problem solving, analytical thinking, and creative thinking should be developed. In the research conducted by Özmen (2015) with pre-service teachers, historical thinking skills were associated with the number of reading books. This is supported by educational activities such as conferences, seminars and symposium. An important skill development that emerged in this research is critical thinking. According to Savich (2009), when critical thinking skills are integrated into lessons, academic success increases and a deeper and more meaningful understanding of history is obtained and questioning methods have a positive effect on critical thinking skills. On the other hand, the critical thinking skill gained in the context of pre-services combining ABT approaches with this educational philosophy will be a key gain in the learner’s perspective. According to Pohl and Beaudry (2015), social studies is generally perceived as a course consisting of names, places, and dates among other teaching courses. None of these approaches supports critical thinking, which is necessary for learners in the 21st century. Literacy and social researches offer strong potential to develop critical thinking. Teaching meaningful forms of interaction through historical fiction, films, and questioning, by putting alternative approaches into practice and redirecting them to research and analyze complex social and global problems create an important opportunity in the development of critical thinking. Teacher-centered methods such as active participation require a variety of learning styles, collaborative activities, and technology to motivate the student and develop critical thinking skills (Sayre, 2013). In the research conducted by Baysal et al (2016), most of the teachers responsible for teaching skills are aware that skills are teachable. According to Enciso and Daza (2017), Instructors in teacher education programs have an enormous opportunity to help teachers become critical thinkers and these students will help their future students develop their critical thinking skills. These research results are compatible with current findings of research.

Another skill developed in the results of this research is analytical thinking and high level thinking. Analytical thinking and critical thinking are seen as distinctive features in individuals (Yılmaz, 2019). According to the research conducted by Arseven, Derişiğli and Arseven (2015), it was concluded that pre-service teachers’ analytical thinking skills developed the most. On the other hand, the opinion expressed by Tuncer and Kaysi (2013) that some pre-service training activities will be useful in developing the metacognition thinking skills of pre-service teachers developed the results of this study. According to this view, education and teaching staff should use their metacognition thinking skills in the teaching process and should provide their students with opportunity to model these skills as role models. Pre-service teachers should be provided with the basic skills required by the profession (Güneş, 2016). As a matter of fact, according to Tok and Sevinç (2012), creative thinking skills of teachers should be developed in order to make the students gain creative thinking skills. Aesthetic thinking, which goes along with creative thinking, is included in the perspective of this study. Activities for the development of aesthetic thinking provide powerful tools that encourage creative discovery and products by developing aesthetic sensitivity (Dolapçıoğlu, Gürkan, & Karakuş, 2019). According to Özbil and Aydoğan (2017: 259); “Aesthetic education aims to use the knowledge
of something in a good way.” This aesthetic understanding establishes an artistic connection between teaching and learning in the design of activities, in the enjoyment and efficiency of the lessons.

Considering the contribution of the activities to the development of the pre-service teachers from the value dimension; it is determined that it develops some values such as justice, empathy, patriotism, austerity, respect, trust, self-confidence, solidarity, diligence, responsibility, friendship, honesty, self-control, patience, helpfulness, love, as well as appreciating of art and awareness of human rights.

When the contribution of pre-service teachers to their development from the professional competency dimension is evaluated; it has been determined that it has developed knowledge and experience about matters related to self-expression in professional life, the process of knowledge and practice about contemporary principles and methods, presenting them with different activities (drama, etc.), combining theory and practice, enriching the course through activities, reducing knowledge to student’s level, making the lesson fun, and regarding active participation and effective teaching. On the other hand, the research made them have opportunity to make inferences about the teaching of thinking skills with activities, how to interact with the student, how they can direct them, how to achieve class control and provided them to look with a multidimensional and in-depth way at the subjects and made them internalize. It has led the way of being able to develop democratic attitudes and behaviors, to create an aesthetic lifestyle, to act together with the group, to establish a cause-effect relationship, to create creativity and imagination and it has given opportunity to create questioning. It has also helped practice in means of using time efficiently. Pre-services learned to be able to produce original activities regardless of the textbook. In the study conducted by Kılıç (2006), there was a difference between the implementation and observation levels in 75% of the pre-service teachers’ behavior throughout the teaching process. This result was interpreted as pre-service teachers failing to acquire these behaviors at a sufficient level. It can be said that the developments expressed in this study are important outcomes in increasing the qualifications of pre-service teachers. The skillful realization of teaching and its being based on activities increase academic success in the classroom, and it is also beneficial to understand the topics in question and to support concept teaching (D’souza, 2017). The contributions of pre-service teachers from the professional competency dimension in this research are very important developments that support the contemporary teacher competencies of the Ministry of National Education. According to Seferoğlu (2004); The deficiency of knowledge in matters that are inadequate in professional terms can be supported with electronic resources. Successful experience develops more self-confidence with the realization of their own abilities and skills. This situation leads to efforts and searches for self-improvement in an effective and efficient way.

When the contribution of pre-service teachers to development from lesson planning and preparation dimension is evaluated; it has made them gain situations related to the lesson planning and preparation process, the details of teaching and planning, the ability to develop an existing plan/program, to activate creativity and to produce something new, to realize the logic and philosophy of the implementation process of the plan, and to make course effective, efficient and permanent experience. On the other hand, the process provided an estimate of the meaning and significance of preparing a lesson plan, what would be the consequences of careless and random planning from a serious point of view. It also provided the pre services with an awareness of the needs of the individual and society in preparing ABT lesson plans.

Contribution to development from the use of material; it has provided development on the subjects related to the age features, multidimensional thinking, readiness, individual differences, communication skills (such as rhetoric, diction and presentation), cognitive, affective, psychomotor features, abstraction and decision making. New things produced together with the pre-services made them feel more important in the process. It has been realized that visual materials prepared in accordance with different and individual learning differences are valuable for the learner. In the process, the materials prepared according to the pre-services are qualified and appropriate with their
level, served the lesson, facilitated the learning and increased the functionality of teaching, contributed to active participation and mental development. Some negative situations were emphasized during the experience. Accordingly, time and (economic) cost are seen as the loss. Materials which were produced according to the pre services make the concepts concrete, but the problem of providing materials creates a limitation. According to Priyono, Wena and Rahardjo (2017); Teaching with activities is a very important approach to develop students’ three learning areas (their cognitive, emotional, and psychomotor) equally. In terms of the learning process, it ensures the active participation and creativity of the students. In this case, an appropriate balance must be appeared between physical, mental, emotional, and intellectual activities. On the other hand, knowledge, attitude and skills need to develop in a balanced and harmonious way. In other words, it supports the importance of its holistic development. In this context, it is possible to state that pre-services reach these developments and that there are important outcomes for the teachers who will be responsible for ensuring the competencies of the students in the future. According to Lefstein (2002), the efforts of associating knowledge with real life in formal education and the attempt to encourage learners to it are fed from authentic sources. Collaborative trends in team work create an environment for working in groups distributed from time to time by creating opportunities for peer communication. The teacher cannot observe all students at the same time or easily control their attention. According to Vitulli and Pitts (2013: 117); Leading students to develop an additional way to integrate visual images into social studies lessons and to provide opportunities to study and evaluate the perspective of art, analyze and evaluate the art elements and question the principles of images, and to view and analyze the world around the students. It is stated that the implementation of effective comprehension strategies in social studies lessons is effective in increasing the students’ success, skills, and confidence. This approach allows them to understand the rich content and concepts offered in Social studies curriculum. Determining effective teaching strategies for effective understanding in social studies lessons is essential for students to learn (Bartz, 2016).

When the contribution of pre-service teachers to the development regarding the implementation process result is evaluated; pre services stated that the teaching of thinking is a pedagogical requirement and a sensitive subject to deal with. They obtained information about teaching through evidence-based activities on how and by which methods and techniques of empathetic thinking skills will be gained to the student.

It has been experienced that the implementation discussed in this research can be as a road map in teaching thinking, enabling children to activate their minds and provide information, direct their thinking by guiding them as well as enable students to manage their own thoughts by taking part in the activity therefore they can produce thoughts and to make them think critically by making inquiries with key questions. In the study conducted by Kösterelioğlu, Bayar and Kösterelioğlu (2014), it was stated that the activity-supported learning saves teaching from passivity and increases communication with the group members, has a positive effect on learning and permanence, makes socializing and feeling themselves valuable, and provides a better understanding of what is learned.

According to Anwer (2019); Despite the difficulties in schools, it is possible to create teaching materials and use teaching techniques. Participation in in-service training programs is very important for teachers equipping with up-to-date methods and techniques.

When the contribution of the development to the evaluation of the personal development is evaluated in the results of the implementation process; it was observed that they realized that they had suffered from some contradictions and how inadequately some theoretical issues were put into practice. It has been observed that the individual’s implementation can reveal the hidden skills of the learners and be able to design activities for this. They got rid of the point of view that a teacher only tells the lesson only through the presentation, and they have seen that the lesson can be active, the teacher is a guide, the course can be effective, clear, understandable and fun with various methods and techniques; and the effect of their creative aspects in producing activities is important. In the study conducted by Çelik, Yorulmaz and Çokçalıskan (2019), it was observed that pre-service teachers
evaluated themselves with a high average score that can be considered high in terms of general competencies of teaching profession. In general, in the evaluation, the expressions of development that emerged from the opinions of the pre-services from the competence dimension can be evaluated as having similarity at this point.

**Recommendations**

ABT should be handled separately with each content and within the framework of detailed activities in order to develop thinking skills in social studies lesson.

- In the curriculum of the education faculties of the pre-service teachers, the emphasis should be on producing original activities for the content of the social studies course in the appropriate content.
- In the faculties of education, the development of thinking skills handled in Social Studies education should be based on examples of activities, and the process should be followed and controlled in an order.
- Teacher training institutions should redesign their curriculum to provide sufficient time and space for activity-based learning.
- Pre-service and in-service teacher training programs should be directed to the theoretical and practical which are knowledge required for the successful implementation of ABT.

**REFERENCES**


The Relationship Between Perceived Parental Rejection and Dating Anxiety: The Mediating Role of Interpersonal Cognitive Distortions

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Abstract

The aim of this study was to examine the mediating role of interpersonal cognitive distortions between perceived parental rejection and dating anxiety in emerging adults. The study also examined whether gender and grade level also differ in terms of dating anxiety. Participants were 574 (334 women, 240 men) university students studying in a state university in Turkey who were reached with stratified sampling method. The data were collected with Adult Parental Acceptance-Rejection Questionnaire-Short Form, Dating Anxiety Scale and Interpersonal Cognitive Distortions Scale. The results of the study showed positive correlations between perceived parental rejection and dating anxiety and interpersonal cognitive distortions. According to the path analysis results, interpersonal cognitive distortions were partial mediator in relationship between perceived maternal rejection and dating anxiety. However, it was found that paternal rejection had a direct effect on dating anxiety, and cognitive distortions did not have a mediating role on this relationship. It was found that dating anxiety did not differ significantly in terms of gender, while it differed in terms of grade level. Warmth and acceptance centred parent-child relationship can be considered as a protective factor that can increase the dating anxiety by increasing the cognitive distortions.

Keywords: Parental Acceptance-Rejection, Interpersonal Cognitive Distortion, Dating Anxiety, Emerging Adult, Mediating Role.

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INTRODUCTION

Perceptions of children about their relationships with their parents in early years of their lives are effective on their development in adolescence and adulthood (Conger, Cui, Bryant, & Elder, 2000; Repetti, Taylor, & Seeman, 2002). University years defined as “emerging adulthood”, which is an important period that makes it difficult for individuals to adapt, take place between the ages of 18 and 25, they occur after adolescence and before adulthood; and they are defined as a period in which both various opportunities are seized and also certain difficulties are experienced regarding work, love and the world (Arnett, 2000). The aforementioned life period is evaluated somewhere between adolescence and young adulthood (Arnett, 2007) and it can be expressed as a difficult period in which responsibilities are taken for many areas of individual’s life and maturation processes are experienced. If individuals are not resistant to the difficulties brought by this process, they feel powerless in the face of problems and the process of adaptation to this period becomes difficult.

In parallel with the formation of family relationships, individuals develop adaptation problems in the later life periods and their perceptions about acceptance or rejection in the family have an important role in the emergence of these adaptation problems (Bouma, Ormel, Verhulst, & Oldehinkel, 2008; Davies & Windle, 1997). Studies conducted support that parental acceptance and rejection affect both the course of all developmental areas of the individuals and their lives in adulthood (Rohner, Khaleque, & Cournoyer, 2005; Sanders, 2000; Varan, 2005). PART-Parental Acceptance-Rejection Theory which was developed by Rohner and which is defined as a socialization theory examining the effects of perceived parental acceptance and rejection on individuals’ lives in childhood and later developmental periods was born out of this need (Rohner, 1975; 1986). PARTH theory acts with the basic assumption that all individuals in the world need to receive a positive response or warmth from people who are of primary importance to them in their lives (Rohner 1986). The theory originally called PARTH theory mostly focused on the perception of parental acceptance and rejection and its connection with adjustment in childhood, adolescence and adulthood. In 2000s, it became interested not only in parent-child relationship but also in close relationships in adulthood and other important relationships in life. The theory which focused on parents was transformed and renamed as Interpersonal acceptance-rejection theory (IPARTH theory) which focused on interpersonal relationships. However, parts of the theory still continue to include the consequences, reasons and other connections of children’s perceptions of parental acceptance and rejection and adults’ memories of parental acceptance and rejection in their children (Rising and Rohner 2020).

Interpersonal Acceptance-Rejection Theory (IPARTH theory) builds acceptance-rejection region on a continuous line. It assumes that parental acceptance is on the positive end of continuity on a linear line, while parental rejection is on the negative end. Parental acceptance indicates a relationship in which parents feel and express love, affection and comfort towards their children, while parental rejection indicates lack of love, affection and comfort parents show towards their children (Khalequea & Rohner, 2001). Theory acts on the basic assumption that all people in the world need to get positive reaction from people important for them, in other words, to feel warmth from them (Rohner & Khaleque, 2005).

In the related literature, it has been shown that parental rejection is associated with variables related with interpersonal relationships such as rejection sensitivity (Downey & Feldman, 1996; Ibrahim, Rohner, Smith, & Flannery, 2015), fear of intimacy (Rohner, 2016a), loneliness (Rohner, 2016b), negative sense of identity (Bilen, 2013), problems in social relationships (Kandemir Özdinç, 2019; Paley, Conger, & Harold, 2000). Studies examining the effects of parents on individuals’ romantic relationships have shown that parents’ warmth and support helps individuals to develop healthy romantic relationships (Akiun, 2019; Collins & Read, 1990; Dinero, Conger, Shaver, Widaman, & Larsen-Rife, 2011; Seiffge-Krenke, Shulman, & Kiesinger, 2001). In addition, Del Toro (2012) showed that parental attitude predicted anxiety about romantic relationship. These studies reveal the long-term effect that parental influence may have on the individual’s later romantic life.
Khaleque and Rohner’s (2002) meta-analysis on Parental Acceptance-Rejection Theory (PARTheroy) shows that acceptance or rejection by parents does not affect only children’s emotional and behavioural development but also their social and cognitive development. The theory emphasizes that parental rejection leads to a negative worldview in individuals and in later stages of development individuals’ cognitive schemes are distorted and they become extremely sensitive to rejection. This situation causes individuals to misinterpret social clues and to have a negative mental pattern both about themselves and others (Rohner & Khaleque, 2010).

Mental representations created by perceived parental acceptance-rejection in childhood affect the psychological adaptation both in childhood and adulthood and personality patterns and social relationships (Rohner, 2004) and they include individuals in a risk group that consists of life long social and emotional problems (Khaleque & Rohner, 2001). These mental representations for mothers and fathers are also the determinant of orientation towards romantic relationships (Hendrix, 1990).

Studies conducted show that parental rejection is associated with cognitive distortions (Cassidy, Kirsh, Scolton, & Parke, 1996; Dodge, 1993; Özbiler, Taner, & Yalcinkaya, 2019; Salama, 1990; Tezcan, Erden, & Yigit, 2017). Rejection causes cognitive automatic thought patterns that form a basis for the emergence of the expectation of rejection in adulthood and this affects their approach in all their close relationships (Downey & Feldman, 1996; Levy, Ayduk, & Downey, 2001) because rejected individuals do not consider themselves worth loving (Rohner, 2004).

In university years, which are accepted as the last adolescence period in which transition to adulthood from adolescence is experienced, problems about romantic relationships are considered as one of the important problem areas of individuals (Creasey, Kershaw, & Boston, 1999). Romantic relationships in this period provide very important opportunities for individuals to better adapt to adult life by gaining the necessary behaviours (Furjman & Schaffer, 2003; Mosher & Danoff-Burg, 2007; Moss & Schwebel, 1993; Ponzetti & Cate, 1988). In addition to these positive aspects, dating anxiety which may occur as a result of the effects of some cognitive patterns (Allen, Bourhis, Emmers-Sommer, & Sahlstein, 1998) is expressed as experiencing anxiety and distress in establishing and maintaining romantic relationships with someone from the opposite sex (Chorney & Morris 2008; Hope & Heimberg, 1990).

Studies conducted show that dating anxiety is associated with some variables that may be considered negative. Significant relationship has been shown between dating anxiety and peer relationship anxiety and depression (Glickman & La Greca, 2004), negative interaction (La Greca & Mackey, 2007), social anxiety, social media use (Stevens & Morris, 2007), life satisfaction (Adamczyk & Segrin, 2016), and problematic internet use and loneliness (Odaci & Kalkan, 2010). In addition, it has been shown that individuals with low social skills experience more dating anxiety (Larsen & Shackelford, 1996) and young people with high social anxiety show behaviours such as postponing establishing relationships or dating or avoiding romantic relationships (Davila & Beck, 2002; La Greca & Harrison, 2005). When the studies above are examined, it can be seen that studies related with dating anxiety are mostly associated with social relationship patterns. And also, there are limited numbers of studies showing the relationship between dating anxiety and early life experiences. For example, Kalkan and Karadeniz-Özbek (2011) emphasized the relationship between dating anxiety and early life experiences. In their study it was found that childhood abuse experiences were significant predictors of dating anxiety.

Parental acceptance-rejection perception, which is one of the concepts related with early life experiences, shows that behaviours and approaches in adult emotional relationships are associated with perceived parental acceptance-rejection in childhood (Ali, Khaleque, & Rohner, 2015). Attention expected from the primary caregiver in early childhood is replaced with the attention expected from friends and romantic partner in adolescence and adulthood (Rohner, 2008) and consequently individuals reflect the relationship they build with their parents in their childhood to their relationships in their adulthood (Downey & Feldman (1996). Individuals who experience rejection in early periods
of their lives may choose not to get in a romantic relationship to protect themselves from being rejected (Downey, Bonica, & Rinco, 1999), may show hostile or avoidant reactions to romantic relationship (Downey & Feldman, 1996; Downey, Feldman, & Ayduk, 2000) and they tend to become self-sufficient individuals (Gullestad, 2001; Zvělc, 2010).

Dating anxiety, which has not been researched sufficiently although it is a common problem among university students (Chorney & Morris), has been associated with cognitive variables such as cognitive distortions and beliefs associated with both the source and the continuation of the problem (Neumann, Critelli, Tang, & Schneider, 1988). Cognitive distortions, which are also called systematic errors in the information processing period and which form the basis of individual’s negative thoughts (Beck, 2005), can cause individuals to interpret the events they experience or come across according to their own belief system different from what they really are and thus to have negative thoughts (Mobini et al., 2005; Szentegotai & Freeman, 2007).

When the related literature is considered, it is important to reveal parent and child experiences related with early life periods and individuals’ romantic relationship patterns in terms of taking protective and preventive measures. In addition, it is also thought that they can be taken into consideration during the process of shaping interventions on emerging adults experiencing dating anxiety. In line with these explanations, the aim of this study is to examine the mediating role of cognitive distortions in the relationship between perceived parental rejection in childhood and dating anxiety. In other words, it is argued that childhood parental rejection will have an effect on cognitive distortions in relationships in later periods of life and that these cognitive distortions will affect level of dating anxiety. In addition, it will also be examined whether gender and grade level cause a difference in terms of the variables of the study. Accordingly, answers were sought to the following questions:

1. Are there significant relationships between parental rejection perception, dating anxiety and interpersonal cognitive distortions?
2. Do interpersonal cognitive distortions have a mediating effect in the relationship between parental rejection perception and dating anxiety?
3. Does dating anxiety differ significantly in terms of gender and grade level?

**METHOD**

**Research Model**

Correlational survey model was used in the present study. Correlational survey model is a research model which aims to determine the presence and degree of change between two or more variables (Karasar, 2009). Within the scope of this model, the present study will examine the relationships between parental rejection perception, dating anxiety and interpersonal cognitive distortions. Figure 1 shows the research model.

![Figure 1. Research Model](image-url)
Participants

The study group consists of 574 university students studying in a state university in Turkey who were reached with stratified sampling technique. It is a sampling type which aims to represent the sub-groups/layers in the sample in proportion to their weights in the population (Büyüköztürk, Çalışkan, Akgün, Karadeniz & Demirel, 2019). Accordingly, considering the number of students studying in faculties, their distributions by grade level and gender were taken into consideration. 334 (58.2%) of the university students who participated in the study were women, while 240 (41.8%) were men. 26% of the participants were in their first grade, 24.6% were in their second grade, 25.6% were in their third grade and 23.9% were in their third grade. Participants’ ages ranged between 18 and 28 and average age was found as 20.89.

Materials

The data in the study were collected with Adult Parental Acceptance-Rejection Questionnaire-Short form (PARQ), Dating Anxiety Scale (DAS), Interpersonal Cognitive Distortions Scale (ICDS) and Information Form.

**Adult Parental Acceptance-Rejection Questionnaire – Short Form (PARQ-S):** The questionnaire developed by Rohner (1975) has three versions as adult, child and parent for the sixty-item standard form. PARQ-S, which was turned into a short form with 29 items in 2005 by Rohner, was adapted into Turkish by Dedeler, Akün and Durak-Battgüm (2017). The Questionnaire finds out how adults perceive their parents’ behaviours to them were when they were between 7 and 12 years old. In other words, the related measurement instrument evaluates the parental acceptance-rejection perceptions individuals remember about their childhood. The lowest score that can be obtained from the scale is 24 and the highest score is 96. A high score taken from the 4-Likert type questionnaire shows high perceived parental rejection. When the reliability coefficients of the questionnaire were examined, Cronbach’s Alpha internal consistency coefficients were found to range between .75 and .92 for mother form and between .85 and .96 for father form. Validity level of the questionnaire was tested with construct validity, criterion related validity and distinctive validity criteria and it was stated that the questionnaire was a valid and reliable scale in Turkey sample (Dedeler et al., 2017). In the current study, internal consistency coefficient (Cronbach alpha) was found as .66 for both mother and father form.

**Dating Anxiety Scale (DAS):** The scale, which was developed by Kalkan (2008) to find out the dating anxiety adolescents experienced during their relationship with the opposite sex, consists of 46 questions. The lowest score that can be obtained from the scale is 46 and the highest score is 230. High score taken from the 5-Likert type scale shows that dating anxiety is high. Cronbach’s alpha internal consistency coefficient of the scale was calculated as .96. As a result of validity and reliability studies, the scale was found to have a valid and reliable quality (Kalkan, 2008). According to the reliability analysis results conducted on university students, Cronbach’s alpha internal consistency coefficient of the scale was .85 (Çiftçi & Gülacı, 2019). Cronbach’s alpha internal consistency coefficient obtained from the present study was .97.

**Interpersonal Cognitive Distortions Scale (ICDS):** The scale was developed by Hamamcı and Büyüköztürk (2004) to evaluate individuals’ cognitive distortions in their social relationships. The 5-Likert type scale has 19 questions. The lowest score that can be obtained from the scale is 19 and the highest score is 95. High scores taken from the scale show that individuals have cognitive distortions. Cronbach’s alpha internal consistency coefficient was found as .67. As a result of the validity and reliability studies conducted, it was stated that the scale had a valid and reliable quality (Hamamcı & Büyüköztürk, 2004). In the current study, Cronbach’s alpha internal consistency coefficient was calculated as .80.
Information Form: This form which was developed by the researchers includes questions regarding the socio-demographic characteristics such as age, gender and grade level.

Procedure

First of all, the ethical permissions were taken from Social and Human Sciences Ethics Committee in University of Ondokuz Mayis. The data were collected from volunteering university students studying at different faculties of a state university during class hours. The participants were informed about the aim of the study and questions about research and/or data collection instruments during the application were answered by the researchers. The response time took approximately 20 minutes.

Data Analysis

First, normality and homogeneity assumptions were examined. Kurtosis and skewness coefficients were found as .51 and 1.04 for PARQ-S, as -.27 and .58 for DAS, as .72 and .19 for ICDS. Kurtosis and Skewness coefficients being within ±1.5 and close to 0 is evaluated as a proof of normal distribution (Tabachnick & Fidell, 2020). According to this, the data of dating anxiety scale were found to be normally distributed. Multivariate normality assumptions of perceived parental rejection, cognitive distortions and dating anxiety variables were examined with Scatter Plot Matrix. When Scatter Plot diagram was examined, it was found that the distribution was close to ellipsis shape and the data were normally distributed. Next, the homogeneity of variances was examined with Levene test for univariate analyses, while it was examined with Box’s M test for multivariate analyses. As a result of Levene test (p=.473, p>.05) and Box’s M test (Box’s M=22.063, p=.411), the groups were found to be similar and the assumption of homogeneity of variances was found to be met.

After normality and homogeneity assumptions were met, path analysis was conducted to find out the mediating effect of cognitive distortions in the relationship between parental rejection and dating anxiety. In path analysis, direct and indirect effects between the variables can be determined and the amount of error resulting from measurement can be minimized (Yener, 2007). A model was formed in line with the information regarding the effects of parental rejection perception on romantic relationships. Direct and mediating effects of the variables were calculated with path analysis and model fit indices were examined.

Finally, two-way ANOVA and Bonferroni test were conducted to test whether dating anxiety levels of university students differed significantly in terms of gender and grade level. The data obtained were analysed by using SPSS 22 and AMOS 20 programs. The significance of the statistics obtained was tested at the .05 level.

RESULTS

1- Are there significant relationships between parental rejection perception, dating anxiety and interpersonal cognitive distortions?

Table 1 shows descriptive statistics and Pearson correlation coefficient values of perceived parental rejection, interpersonal cognitive distortions and dating anxiety variables.

<table>
<thead>
<tr>
<th>Table 1. Descriptive statistics and correlation coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Maternal rejection (1*)</td>
</tr>
<tr>
<td>Paternal rejection (2*)</td>
</tr>
<tr>
<td>Dating anxiety (3)</td>
</tr>
<tr>
<td>Cognitive distortions (4)</td>
</tr>
</tbody>
</table>

**p<.001
* High score taken from the PARQ-S scale shows high level of perceived rejection
As can be seen Table 1, a positive high correlation was found between perceived maternal rejection and perceived paternal rejection ($r = .68, p < .001$), while a positive low correlation was found between perceived maternal rejection and dating anxiety ($r = .24, p < .001$), and perceived maternal rejection and interpersonal cognitive distortions ($r = .18, p < .001$). In addition, a positive low correlation was found between perceived paternal rejection and dating anxiety ($r = .23, p < .001$), and perceived paternal rejection and interpersonal cognitive distortions ($r = .14, p < .001$). A positive moderate correlation was found between dating anxiety and interpersonal cognitive distortions ($r = .34, p < .001$).

2- Do interpersonal cognitive distortions have a mediating effect in the relationship between parental rejection perception and dating anxiety?

Path analysis was used in this study which examined the mediating effects of cognitive distortions in the relationship between perceived parental (maternal and paternal) rejection. Before the mediating effect was tested, whether some prerequisites were met was checked. These prerequisites were whether there is significant relationship 1) between independent and dependent variable, 2) between mediating variable and independent variable, 3) between mediating variable and dependent variable while both mediating and independent variable predict the dependent variable together (Kalaycı, 2010). In the present study, independent variables are perceived parental rejection and parental rejection, dependent variable is dating anxiety and the mediating variable is cognitive distortions.

According to the results obtained as a result of examining the prerequisites, there is a significant relationship (first prerequisite) between perceived maternal rejection and dating anxiety ($\beta = .24, p < .001$) and perceived paternal rejection and dating anxiety ($\beta = .23, p < .001$). There is a significant relationship (second prerequisite) between perceived maternal rejection and interpersonal cognitive distortions ($\beta = .18, p < .001$) and perceived paternal rejection and interpersonal cognitive distortions ($\beta = .14, p < .001$). Finally, there is a significant relationship (third prerequisite) between mediating variable cognitive distortions and dating anxiety while perceived maternal rejection and cognitive distortions are predicting dating anxiety together ($\beta = .30, p < .001$). In addition, finally, there is a significant relationship (third prerequisite) between mediating variable cognitive distortions and dating anxiety while perceived paternal rejection and cognitive distortions are predicting dating anxiety together ($\beta = .31, p < .001$). In this case, it was found that the prerequisites were met and the mediating effect of interpersonal cognitive distortions was tested with path analysis.

According to the path analysis results of the first model, it was found that the standardized direct effect of perceived paternal rejection on interpersonal cognitive distortions was .04 ($p > .05$) and not significant; in other words, it was found that perceived paternal rejection was not a significant predictor of cognitive distortions. Therefore, the model which describes the mediating role of interpersonal cognitive distortions in the relationship between perceived paternal rejection and perceived maternal rejection and dating anxiety was not confirmed. For this reason, it was decided to exclude the perceived paternal rejection variable from the model. With the exclusion of perceived paternal rejection variable from the model, the mediating role of cognitive distortions in the relationship between perceived maternal rejection and dating anxiety was examined. The mediating effect of the last model created was tested with impact path analysis. The direct and mediating effects in the corrected model are given in Figure 2.
In the first analysis between the independent variable (perceived maternal and paternal rejection) and dependent variable (dating anxiety), if the statistically significant relationship decreases with the inclusion of the mediating variable (cognitive distortions) in the analysis, it is possible to mention the presence of a mediating effect between the two variables. With the inclusion of the mediating variable in the analysis, if the relationship between dependent and independent variable becomes insignificant, there is full mediation; if the relationship between the variables is significant but there is an amount of decrease in the standardized value of this path, there is partial mediation (Holmbeck, 1997). When the standardized coefficients of the paths given in the model in Figure 2 are examined, it can be seen that while perceived maternal rejection was a significant predictor of dating anxiety (β=.24, p<.001), standardized coefficient was found to decrease (β= .11, p<.001) with the inclusion of cognitive distortions in the model as mediating variable. Thus, it was found that cognitive distortions had a “partial mediation” role in the relationship between perceived maternal rejection and dating anxiety. While perceived maternal rejection explains 3% of cognitive distortions, these two variables explain 15% of dating anxiety together. Perceived maternal rejection explains 15% of dating anxiety; however, cognitive distortions do not have a mediating role. Model fit indices of this model are $\chi^2$/df=1.023, p=.359, RMSEA=.006; GFI=.99, AGFI=.99; NFI=.98. $\chi^2$/sd value being lower than 3 (Kline, 2005), p value being higher than .05 (Çokluk, Şekercioğlu, & Büyüköztürk, 2018), RMSEA vale being lower than .05 (Jöreskog & Sörbom, 1993), GFI and NFI values being higher than .95 (Hooper, Caughlan, & Mullen, 2008), CFI value being higher than .97 (Sümer, 2000) show that the model is within good fit limits. According to this, it can be said that the model created in the study shows a good fit.

### Table 2. Two-way ANOVA results

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of squares</th>
<th>Sd</th>
<th>Mean of squares</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.003</td>
<td>1</td>
<td>.003</td>
<td>.000</td>
<td>.999</td>
</tr>
<tr>
<td>Grade level</td>
<td>21393.45</td>
<td>3</td>
<td>7131.15</td>
<td>5.180</td>
<td>.002*</td>
</tr>
<tr>
<td>Gender*Professional experience</td>
<td>156.351</td>
<td>3</td>
<td>52.117</td>
<td>.038</td>
<td>.990</td>
</tr>
<tr>
<td>Error</td>
<td>779149.93</td>
<td>566</td>
<td>1376.59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7078885.0</td>
<td>574</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows that dating anxiety score averages of men and women did not differ significantly ($F_{(1.566)}=0.000$, $p>.05$), while the participants’ dating anxiety scores differed significantly in terms of grade level ($F_{(3.566)}=5.180$, $p<.01$). Bonferroni test was conducted to find out between which groups this difference was. According to Bonferroni test result, dating anxiety of first grade (14.14, $p<.05$) and second grade (15.69, $p<.05$) students were found to be significantly higher when compared with third grade students. When the joint effect of gender and grade level was examined, it was found that the value obtained was not significant ($F_{(3.566)}=0.038$, $p>.05$). This result shows that there is no significant difference between dating anxiety of women and men in terms of grade level.

**DISCUSSION**

The results obtained in the study show a positive relationship between perceived maternal rejection and dating anxiety and interpersonal cognitive distortions. There is also a positive relationship between perceived paternal rejection and dating anxiety and interpersonal cognitive distortions. This result shows that perceived maternal rejection increases cognitive distortions and dating anxiety. Similarly, perceived paternal rejection can also be seen to increase cognitive distortions and dating anxiety. This finding is in parallel with the view that the relationships an individual build in early periods of life with other people, especially the parents, have the ability to affect the later periods of life (Conger, Cui, Bryant, & Elder, 2000; Repetti, Taylor, & Seeman, 2002). Studies which support this finding show that individuals who remember a warm and positive relationship with their mothers in their early life have high current marital adjustment (Carnelley, Pietromonaco, & Jaffe, 1994; Furukowa et al., 2002). Individuals can also use the parent-child relationship to gain interpersonal skills in their future romantic relationships. In other words, this finding can be accepted as an important indicator that individuals use their relationships with their parents as a template of how they will behave in their romantic relationships through modelling. Similar studies which show the significant relationship between perceived maternal and paternal rejection and cognitive distortions show that perceived parental rejection is associated with cognitive distortions (Cassidy, Kirsh, Scolton, & Parke, 1996; Dodge, 1993; Salama, 1990). Rejection causes cognitive automatic thought patterns that prepare a basis for the emergence of expectation of rejection in adulthood and this affects individuals’ approaches in all their close relationships (Downey & Feldman, 1996; Levy, Ayduk, & Downey, 2001).

Another finding obtained from the study shows that interpersonal cognitive distortions have a mediating role between perceived maternal rejection and dating anxiety. According to this finding, students who have high perceived maternal rejection have more cognitive distortions and they experience higher dating anxiety. No studies were found in literature discussing the mediating role of cognitive distortions in the relationship between parental rejection and dating anxiety. However, the fact that the quality of the relationship established between the parent and the child in the early periods of life is accepted as the main point where the ability to create and maintain romantic relationships is learned (Collins & Sroufe, 1999; Hazan & Shaver, 1987) is in line with the results obtained from the study. During the process of gaining this skill, the individual first of all develops expectations and cognitive schemes for his/her relationship with parents; then from this point of view, the individual internalizes close relationships model. These internalized models have the ability to determine romantic relationships in adult life (Collins & Sroufe, 1999; Hazan & Shaver, 1994; Hendrix, 1990; O’Neil & Parke, 2000; Shulman & Collins, 1995). Therefore, it can be said that the attitudes in adult life towards dating can be shaped through cognitive distortions that occur as a result of parental attitude.

As a result of the study, it was found that cognitive distortions do not have a significant mediating effect in the relationship between perceived paternal rejection and dating anxiety. In the first hypothesis of the study, a significant relationship is seen between perceived paternal rejection and cognitive distortions and dating anxiety. However, it can be seen that cognitive distortions do not have a significant mediating effect in the relationship between perceived paternal rejection and dating anxiety. The reason for this can be the fact that mothers are accepted as the parent primarily
responsible of raising the child, especially in traditional societies and that mothers spend more time with the child. It can be said that mothers’ reflecting the cognitive distortion process they experience in their individual relationships in a way that will shape the child’s behaviours is also effective. In their study Rosnay, Cooper, Tsigaras and Murray, (2006) stated that children observed the behaviours of family members, especially mothers, and reflected these behaviours in their lives in the future and accepted them as the primary determinants of their behaviours.

Another finding of the study is that dating anxiety experienced by university students does not differ significantly in terms of the gender of the participants. The results of other studies conducted on the topic show contradictory results. Some researchers report that men experience more dating anxiety than women (Glickman & La Greca 2004); while some others report that women experience more dating anxiety (Boyle & O’ Sullivan, 2013; La Greca & Mackey, 2007). Similarly, Kan, McHale and Crouter (2008) reported that girls may experience more dating anxiety since parents are more restrictive to their daughters. However, they allow their sons to behave more autonomous. Researches on differences between genders related with dating anxiety show contradictory results. In traditional societies, men are expected to be social and women are expected to be shy. For this reason, it can be said that dating anxiety experienced by women or men results from the gender roles in the society they are in. The fact that the study was conducted on university students may have caused dating anxiety not to show difference in terms of gender.

Another finding of the study is that dating anxiety of university students differ according to their grade level and that first and second grade students have higher dating anxiety when compared with third grade students. In parallel with this finding of the study, it was found in a study conducted that tenth graders experienced more dating anxiety when compared with eleventh graders and twelfth graders (Glickman & La Grec, 2004). The fact that they have the chance to experience fewer number of dating in younger ages may be effective in this result. As the number of experiences increase, they will no longer feel anxiety about having a relationship with the opposite sex and they will no longer avoid this anxious state and they will have crossed an important milestone in developing healthy romantic relationships. Therefore, it is very important to resolve these concerns as soon as possible and to develop the skills required to create a romantic relationship.

CONCLUSION AND SUGGESTIONS

The study shows a positive relationship between perceived parental rejection and interpersonal cognitive distortions and dating anxiety. Path analysis results shows that cognitive distortions mediate the relationship between perceived maternal rejection and dating anxiety. However, it can be said that cognitive distortions do not have a mediating effect in the relationship between perceived paternal rejection and dating anxiety. It was found that dating anxiety did not show significant difference in terms of the gender of the participants, while it was found to differ in terms of the grade level and first and second grade students were found to have higher dating anxiety when compared with third grade students.

Dating anxiety has been researched less than other areas of anxiety. As a result of this, the factors that prepare the basis and sustain the development of this anxiety have not been clarified sufficiently. In this context, the results of the present study are very important in removing this deficiency because romantic relationships in adolescence are also accepted as the precursors of healthy romantic relationships created in adulthood. The results of the study can be used in developing skill education programs for dating anxiety and in individual and group counselling for those working in the field.

While the study reveals significant results, it also has some limitations. The sample of the study consists of university students. This does not provide data on how parental acceptance-rejection in earlier ages accepted as middle adolescence explains dating anxiety through cognitive distortions. The fact that the sample of the study consists of university students requires generalizations to be
made in this direction. In order to be able to test the reliability of the results of this study, studies to be conducted on individuals with different sample groups are needed. It is thought that in future studies it will be significant to discuss the variable of optimism which may have a mediating role in the relationship between perceived parental acceptance-rejection and dating anxiety in broken families and also in future studies to discuss variables such as perfectionism, optimism and self-esteem which may have a mediating role in the relationship between perceived parental acceptance-rejection and dating anxiety.

REFERENCES


Investigation of the Effect of Different Teaching Methods on Students’ Engagement and Scientific Process Skills*

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Abstract

The aim of this study is to compare the effects of using different teaching methods in "Cell and Division" and "Force and Energy" units on students' engagement in the lesson and scientific process skills. In each of the five randomly selected groups, the lessons were taught with Multiple Intelligence, Problem Based Learning, Peer Instruction, Combined and the method proposed by MONE (2017). In the research, quasi-experimental method, one of the quantitative research approaches, was used. The sample of the study consists of 185 seventh grade students studying in two secondary schools in Yakutiye district of Erzurum province. As a data collection tool in the research; Student Engagement Scale and Scientific Process Skills Test were used. As a result of the analysis, statistical difference was determined in the engagement levels and scientific process skills of students studying in different groups. In terms of the variable of engagement to the lesson, a significant difference was statistically determined in favor of the groups in which Peer Instruction and Combined Method were used. Also in this study in terms of scientific process skills, a statistically significant difference was found in favor of Problem Based Learning and Combined Method groups.

Keywords: Students Engagement, Scientific Process Skills, Problem Based Learning, Peer Instruction, Multiple Intelligence, Combined Method

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INTRODUCTION

Today, the development of technology at a dizzying pace has increased the importance of science (Grunberg & Grunberg, 2011). In this respect, many countries attach special importance to science teaching in order to be a leader in technology or to maintain their superiority (Ayas, 1995; Elçiçek, 2016; Ünal, 2003). There are many reasons for this situation. These; The first is the continuous development, change and expansion of information as a result of developments in science and technology. Accordingly, the scope of science has reached a wide range and diversity (Giacomelli & Giacomelli, 2005). Second, some science subjects include abstract spaces that we can only feel with our intuition. The third is the discovery of new disciplines that human beings were not aware of, and the interpretation of the universe from a new perspective (Gülseçen, 2002; Taşcan & Ünal, 2015). Fourthly, people make judgments about a subject by blending their own opinions with the beliefs and opinions of the society they live in while learning. Accordingly, human beings can sometimes interpret natural phenomenons correctly and sometimes incorrectly. This situation appears as misconceptions in educational literature (Bozdoğan, 2009; Halim et al., 2018; Selvi & Yıldız, 2009). Fifth, every person has many innate abilities. This causes them not to perceive and learn every topic in the same way. This situation makes it compulsory for people to receive education in the areas they love, care about, learn easily, be successful and be talented (Ayverdi & Aydın, 2020).

Considering all these reasons, it is concluded that it is both impossible and unnecessary for a person to learn everything. This situation make it necessary to change the understanding of education. Since we can't teach everything, the shortest and rational way is to teach people how to learn (Çakır & Sarıkaya, 2018). Constructivist approach comes to the fore in this regard. This approach is to shape the new information that the individual has learned with the knowledge and experiences in his own cognition. In this context, in the constructivist approach, the student will be active and at the center of learning activities in the learning process (Alavi & Dufner, 2005). In this approach, the teacher is the guide who actively manages the learning activities of his students. In other words, from a teacher-centered to a student-centered education approach has switched. On the other hand, this situation forces students to learn better. Because, they learn not only scientific concepts but also their relationships. Realization of these conditions causes students to participate actively in class activities (Erbaş & Demirer, 2019).

On the other hand, in the subjects that students have difficulty in understanding, their interest and engagement in the lesson decreases. Active learning methods should be used to prevent this situation (Türkben, 2015). Thanks to active learning methods, students who assume their own learning responsibilities can perform high level learning by participating actively in class activities (Bonwell & Eison 1991; Keyser, 2000). In this regard, students with a high level of engagement will be purpose-oriented, constructive and active, in constant communication with their social and physical environment during their teaching activities.

The engagement of students in the lesson basically includes four dimensions. These are behavioral, emotional, cognitive and agentic engagement. Behavioral engagement is related to the observable features of the students in the lesson. In addition to, students’ behaviors such as answering the questions posed to them, asking questions, complying with the rules, participating in activities are associated with this engagement dimension (Fredericks et al., 2004). Emotional involvement is related to the student's feelings. Fears, anxiety, love and desire of the students are related to this engagement. (Fredericks, Blumenfeld & Paris, 2004; Reeve & Tseng, 2011). Cognitive involvement is associated with the student's uses mental processes in accordance with the objectives of the lesson. It is about this engagement dimension that students solve problems, create original strategies and make plans. (Young, 2007). Agentic engagement is reinforcement activities that the student performs during the teaching activities (Reeve & Tseng, 2011). Students' expressing their own opinions on the subject, having a positive contributions to the lesson is an example of this engagement (Reeve, 2012; 2013). Considering that the above mentioned engagement types have a positive relationship with each other,
it can be said that the possible increase in one type of engagement increases the other types of engagement (Hıdıroğlu, 2014; Li & Lerner, 2013; K, 2016; Reeve, 2013; Reeve & Tseng, 2011).

On the other hand, students can learn the main reasons underlying the events instead of learning the subjects by memorizing many formulas and numbers. In such a case, they can apply their knowledge to other events and situations. In this respect, instead of memorizing formulas and solutions, they learn where they come from and how they can be transformed. In this way, they can see the interconnections between events and apply a knowledge to different situations. Thus, they do not have to grapple with a pile of information to memorize (Aldemir & Kermani; Büyükcengiz, 2017; Celep & Bacanak, 2013; Yenice, 2019). This will also contribute the development of students’ research skills scientifically to. In this respect, the methods and technical knowledge of their related to research process of students with improved research skills will improve. As a result, scientific process skills, which have an important place in education today, will be gained to students (Deveci, 2018; Yurt, 2013). Scientific process skills basic and high level skills as are divided into two. Students with basic skills; while having the skills of observation, classification, establishing space-time relationship, making predictions and inferences; Students who have high level skills can analyze the events they encounter to the finest detail and make scientifically logical synthesis using skills such as problem determination, hypothesis, determining variables, controlling, designing an experiment and interpreting data (Aydoğdu, 2014).

On the other hand, countries compete with each other in the field of education in order to maintain their development and to train better qualified personnel. Therefore, the general trend in worldwide, we have see that focuses on the skills to use the information. One of the best examples of this is the PISA exam, a worldwide educational project of the “Economic Cooperation and Development Organization” (OECD). This exam has been held in three-year periods since 2000 and aims to measure the science and mathematics literacy and reading skills of students in the age group of 15 (OECD, 2014). Another example is the TIMSS exam, an international educational achievement assessment project. This exam measures knowledge and skills of mathematics and science 4th and 8th grade students. In this respect, the quality of the education systems of the countries is determined with this exam held every 4 years (OECD, 2016). The PIRLS exam is a Development Project in International Reading Skills. It is applied to 10-year-old students every five years. In these exams are also applied questionnaires about students’ motivations, opinions about themselves, learning styles, school environments and their families (TIMSS & PIRLS International Study Centre, 2016). In short, if we want to improve the quality of our education system, the training methods we apply should teach many gains that we have mentioned and not mentioned above.

Considering all these variables, the necessity of developing students in many ways emerges. In this respect, it is important to raise individuals who actively participate in teaching activities and who have acquired scientific process skills. Considering this stated importance, the purpose of this study is to examine the effects of using different teaching methods on students’ class engagement and scientific process skills.

DATA and METHOD

In the study, quasi-experimental design from quantitative research approaches was used. McMillan and Schumacher (2006) stated that quasi-experimental research design should be used in studies where the effects of more than one teaching method on various factors were examined. In this study, four application groups in which lessons based on Multiple Intelligence, Problem Based Learning, Peer Teaching and the Combined Method were taught, and a comparison group in which lessons were taught according to the teaching method proposed by the Ministry of National Education (MONE) in 2017. Also, in the study, the nonequational control group design, which is one of the quasi-experimental research model, was used.
In application groups, the lessons were taught by the researcher. The researcher constantly attended the classes in the comparison group. In addition, the researcher was followed by one observer while he was teaching his lessons. It was ensured that it was equidistant to the groups and that the activities were carried out completely. In addition, intermediate tests were applied by the teacher in the process and students were informed about their development.

**Sample**

The sample of this research consists of 185 seventh grade students who were studying in two secondary schools in the Yakutiye district of Erzurum. In the study carried out within a 10-week period, the application groups consisted of 153 students (MIG n = 36, PIG n = 41, PBLG n = 37 and CYG n = 39), and the comparison group consisted of 32 students.

**Working Groups and Methods**

In the teaching of topics and concepts related to Cell and Division and Force and Energy units;

Lessons were taught according to Multiple Intelligence Theory in MIG.

- In this group, heterogeneous groups were created by considering the intelligence types of students.
- Students with different intelligence types come together to provide opinions on the tasks they will undertake in projects.
- After the tasks were distributed among the students, the courses were divided into 10-minute sections.
- It was briefly taught subjects by the teacher according to the intelligence types of the students (presentations, instruments, drama, writing composition, group discussions etc.).
- Three weekly course hours students developed materials according to their intelligence types. Later, students presented their products to other friends in the classroom.
- Finally, the reports prepared by the students in the groups were presented to the teacher.
- These applications were repeated throughout the process.

Problem-Based Learning Method was used in teaching the subjects and concepts of related units in PBL.

- In this group, students have divided into groups of five and four people heterogeneous in terms of their success.
- Then, the students were presented with problem scenarios by the teacher.
- The students provided solutions suitable for the problems by using scientific process steps.
- The students discussed the solution suggestions for the problems with their group friends.
- Then, until the next lesson, the students conducted resource research.
- In the next lesson, the students solved the problem by making a group discussion and made a presentation to the class.
• Finally, the reports prepared by the students in the groups were presented to the teacher.

• These applications were repeated throughout the process.

In another group, PIG, the lessons were taught by considering the Peer Instruction Method.

• In this group, students were given reading assignments. The purpose of this assignment is to ensure that they are familiar with the subject.

• Lessons was divided into sections by the teacher. In the first 15 minutes, the teacher explained the concepts related to the subject.

• Then, the concept questions were asked to the students through the smart board in the lesson.
  o Initially, the students gave their individual answers to the concepts questions by thinking themselves.
  o When the correct answer rate of the question is too high, the other conceptual question is reflected on the smart board.
  o If 30-70% of the students answered correctly, they were asked to give repeat their answers after having group discussions.
  o If less than 30% of the students give the correct answer, the teacher teaches the subject again.

• These applications were repeated throughout the process.

In CYG, the Combined Method was used in the teaching of the concepts related to the units.

• Multiple Intelligence, Problem Based Learning and Peer Instruction Methods were used in combining methods.

• In the lessons taught according to this method, heterogeneous groups have been formed by taking into account the students' lesson success and intelligence types.

• In this group, the students prepared for the lessons through reading assignments before the lesson.

• In the first lesson, students read and answered the questions in problem scenarios (Applications in PBL were carried out in this group respectively).

• During the other lesson hours, concept questions were asked by the teacher and group discussions were held. These practices have continued in the next lesson (Applications in PIG) were carried out in this group respectively.

• In the last lesson of the week, students developed products based on their intelligence.

• These applications were repeated throughout the process.

In CG, Lessons were taught according to the methods in MONE (2017) curriculum.

• The teacher have started the lesson by preparing models related to subject.
After the teacher explained the subject on the models, students were divided into groups and played a question and answer game under the guidance of the teacher.

In the process, the concepts related to the subject were embodied through simulation.

In the next lessons, the students came to the lesson by preparing a presentation.

After five randomly selected students making their presentations, discussed with their friends on topics and concepts.

These applications were repeated throughout the process.

**Process**

One year before the study, it was decided by randomly selected which method to apply in which class. In the previous semester, the lessons were taught according to the specified methods so that students are familiar with the methods. In this way, it have been ensured that each working group is familiar with the methods. In the next semester, a pilot study was started three weeks before the main study with a different group of students than the groups where the main study would be applied. The possibility that the MoNE could change the curriculum made it necessary to conduct the pilot study in the specified period. Conducting the pilot study shortly before the main study have helped the researcher to identify and solve the problems immediately that may be encountered. In this process, the reliability and validity levels of the scales and materials to be used in the main study were determined. In addition, in the main study, the problem scenarios to be presented to the students and the sections that were not understood on the concept questions were determined and the necessary corrections were made in a short time. Pretests were applied to student groups one week before the main study. In the main study, the practices continued during the nine weeks. In the tenth week, the study was ended by applying posttests to the students.

**Data Collection Tools**

**Student Engagement Scale**

The scale, developed by Reeve and Tseng (2011) in order to determine the level of student engagement, was adapted to Turkish through the study of Hıdıroğlu (2014). The Student Engagement Scale (SES), consisting of 22 items in a 4-point Likert structure, measures four sub-dimensions. In scale; emotional engagement with four items, cognitive engagement with eight items, behavioral engagement with five items and agentic engagement with five items was measured. The cronbach alpha coefficient of the adapted scale was reported by the researchers as .82. In this study, it was calculated as .84 for behavioral engagement dimension, .86 for cognitive engagement dimension, .82 for emotional engagement dimension, .85 for agentic engagement dimension, and internal consistency coefficient for the entire scale was .93. In addition, it was found that the scale scores of the students in the upper and lower 27% slice were statistically significant (p <.05). These findings are an indication that the scale is reliable and valid.

**Scientific Process Skills Scale**

The Scientific Process Skills Scale (SPSS), developed by Aydoğan, Tatar, Yıldız and Buldur (2012), consists of a total of 27 multiple choice items prepared to measure basic and high level skills. While the number of items that measure the basic skills dimension (observation, classification, measurement, recording data, establishing number and space relationship, estimating, inferring, communicating and using numbers) is nine, the number of items that measure upper level skills (hypothesis, interpreting data, experimenting, modeling, functional definition and controlling variables) is eighteen. The cronbach alpha coefficient of the scale was reported by the researchers as
.84. In this study, it was determined that the reliability coefficient was .81 and the test scores of the students in the upper and lower 27% slices were statistically significant (p <.05). These findings are an indication that the scale is reliable and valid.

**FINDINGS**

Normality tests were applied to determine whether the data had a normal distribution before inferential statistics were made in the study. In order to decide the data whether the data have normally distribution or not, skewness and kurtosis values should be between +/- 2 values, the sig value in the test of normality table greater than .05 (In large samples p value may be lower than .05), the data in the histogram graph should be close to the normal distribution, and finally the values in the detrended normality curve should not form meaningful shapes on the zero line (Palant, 2016). In this study, it was determined that the data obtained from Scientific Process Skills Scale (SPSS) had a normal distribution, but the data obtained from the Student Engagement Scale (SES) was not distributed normally. For this reason, while in the inferential statistics section, parametric tests were used in the analysis of data related to SPSS, while non-parametric tests were used in the analysis of data related to SES.

**Findings Related to the Equivalence of Groups**

**Pre-Application**

Before starting the study, preliminary tests related to student engagement and scientific process skills were carried out to determine whether the scientific process skill and student engagement levels of different groups were statistically different from each other. Since there are five different groups in the study, one-way analysis of variance was performed to determine whether the students in the groups were equivalent in terms of scientific process skills before the study. Findings from variance analysis are presented in Table 1.

**Table 1 One Way ANOVA Analysis Regarding the Total Scores of the Groups Before Application.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source of variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Process Skills</td>
<td>Between groups</td>
<td>186.66</td>
<td>4</td>
<td>46.66</td>
<td>2.3</td>
<td>.55</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>3562.56</td>
<td>180</td>
<td>19.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When the values in Table 1 are examined, it is seen that the scientific process skill levels of the students in the groups where the lessons will be taught according to different teaching methods are similar to each other before starting the application (p >.05).

Kruskal-Wallis H test was performed to determine whether the groups differed in terms of student engagement before the application (See, Table 2).

**Table 2 Kruskal-Wallis H Table Regarding the Total Student Engagement Scores of the Groups Before Implementation**

<table>
<thead>
<tr>
<th>Student Engagement</th>
<th>Groups</th>
<th>f</th>
<th>Mean Rank</th>
<th>Sd</th>
<th>Chi-Square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIG</td>
<td>36</td>
<td>94,14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PBLG</td>
<td>37</td>
<td>93,43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>41</td>
<td>99,28</td>
<td>4</td>
<td>2.67</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>39</td>
<td>81,29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>32</td>
<td>97,44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>185</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When the values obtained from the Kruskal-Wallis test are analyzed, it can be said that the engagement of students in the classes was similar to each other before the application (p > .05).

**Inferential Statistics**

After the application, dependent groups t test was performed to determine how the groups changed in terms of scientific process skills (see, Table 3).

**Table 3 Pretest-Posttest Results in Terms of Scientific Process Skills of Students in Different Groups**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Pre-test</th>
<th>Post-test</th>
<th>Mean Difference</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIG</td>
<td>9.94</td>
<td>11.17</td>
<td>-1.22</td>
<td>5.04</td>
<td>0.84</td>
<td>-1.45</td>
<td>.15</td>
</tr>
<tr>
<td>PBLG</td>
<td>11.59</td>
<td>16.38</td>
<td>-4.78</td>
<td>4.87</td>
<td>0.80</td>
<td>-5.97</td>
<td>.00</td>
</tr>
<tr>
<td>PIG</td>
<td>11.54</td>
<td>12.56</td>
<td>-1.02</td>
<td>3.41</td>
<td>0.53</td>
<td>-1.92</td>
<td>.06</td>
</tr>
<tr>
<td>CYG</td>
<td>9.90</td>
<td>15.75</td>
<td>-5.78</td>
<td>4.88</td>
<td>0.81</td>
<td>-7.11</td>
<td>.00</td>
</tr>
<tr>
<td>CG</td>
<td>12.53</td>
<td>11.78</td>
<td>0.75</td>
<td>4.42</td>
<td>0.78</td>
<td>0.96</td>
<td>.34</td>
</tr>
</tbody>
</table>

When Table 3 is analyzed, it is seen that there is an increase in the scientific process skills total scores of the students in the other groups except the students in the comparison group. However, among these increases, only the increase in the scores of PBLG and CYG students is statistically significant. These findings show that the lessons taught according to the Problem Based Learning Method and the Combined Method contribute to students' scientific process skills.

According to different groups to determine how students' engagement levels changed was conducted the Wilcoxon test. The values calculated as a result of the analyzes are presented in Table 4.

**Table 4 Wilcoxon Test in which Groups are Examined in Terms of Student Engagement Total Score**

<table>
<thead>
<tr>
<th>Groups</th>
<th>Post-test</th>
<th>Pre-test</th>
<th>N</th>
<th>Mean Ranks</th>
<th>Sum of Ranks</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIG</td>
<td>Negative rank</td>
<td>15</td>
<td>19.53</td>
<td>293.00</td>
<td>-0.36</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td>PBLG</td>
<td>Negative rank</td>
<td>18</td>
<td>18.19</td>
<td>327.50</td>
<td>-0.86</td>
<td>.93</td>
<td></td>
</tr>
<tr>
<td>PIG</td>
<td>Negative rank</td>
<td>13</td>
<td>17.92</td>
<td>233.00</td>
<td>-2.56</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>CYG</td>
<td>Negative rank</td>
<td>5</td>
<td>15.90</td>
<td>79.50</td>
<td>-4.33</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>CG</td>
<td>Negative rank</td>
<td>19</td>
<td>17.89</td>
<td>340.00</td>
<td>-1.42</td>
<td>.15</td>
<td></td>
</tr>
</tbody>
</table>

When the values in Table 4 are analyzed, it is seen that only the students in the PIG and CYG among the students studying in different groups made a statistically significant difference. The level of student engagement in other groups has not changed. This is an indication that Peer Instruction and the Combined Method are more beneficial for student engagement.
In terms of SES total scores, Kruskal Wallis H test was performed to determine whether posttest scores differ among groups. The data obtained from the analysis are presented in Table 5.

<table>
<thead>
<tr>
<th>Groups</th>
<th>f</th>
<th>Mean Rank</th>
<th>Sd</th>
<th>Chi-Square</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student Engagement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIG</td>
<td>36</td>
<td>79.28</td>
<td>4</td>
<td>37.17</td>
<td>.00</td>
</tr>
<tr>
<td>PBLG</td>
<td>37</td>
<td>80.32</td>
<td>4</td>
<td>37.17</td>
<td>.00</td>
</tr>
<tr>
<td>PIG</td>
<td>41</td>
<td>109.04</td>
<td>4</td>
<td>37.17</td>
<td>.00</td>
</tr>
<tr>
<td>CYG</td>
<td>39</td>
<td>128.06</td>
<td>4</td>
<td>37.17</td>
<td>.00</td>
</tr>
<tr>
<td>CG</td>
<td>32</td>
<td>59.81</td>
<td>4</td>
<td>37.17</td>
<td>.00</td>
</tr>
<tr>
<td>Total</td>
<td>185</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 5 is analyzed, it is seen that there is a significant difference between the groups in terms of students' engagement levels. In order to determine between which groups this difference is, post hoc of k samples test was done (see, Table 6).

<table>
<thead>
<tr>
<th>Groups</th>
<th>Groups</th>
<th>Test statistics</th>
<th>S.E</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIG</td>
<td>PBLG</td>
<td>-1.05</td>
<td>12.53</td>
<td>.93</td>
</tr>
<tr>
<td>PBLG</td>
<td>PIG</td>
<td>-29.76*</td>
<td>12.22</td>
<td>.01</td>
</tr>
<tr>
<td>PBLG</td>
<td>CYG</td>
<td>-48.79*</td>
<td>12.37</td>
<td>.00</td>
</tr>
<tr>
<td>PBLG</td>
<td>CG</td>
<td>-19.46</td>
<td>13.00</td>
<td>.13</td>
</tr>
<tr>
<td>PIG</td>
<td>MIG</td>
<td>.05</td>
<td>13.00</td>
<td>.13</td>
</tr>
<tr>
<td>PIG</td>
<td>PBLG</td>
<td>-28.71*</td>
<td>12.14</td>
<td>.02</td>
</tr>
<tr>
<td>PIG</td>
<td>CYG</td>
<td>-47.74*</td>
<td>12.28</td>
<td>.00</td>
</tr>
<tr>
<td>PIG</td>
<td>CG</td>
<td>-20.51</td>
<td>12.92</td>
<td>.11</td>
</tr>
<tr>
<td>CYG</td>
<td>MIG</td>
<td>29.76</td>
<td>12.22</td>
<td>.01</td>
</tr>
<tr>
<td>CYG</td>
<td>PBLG</td>
<td>28.71*</td>
<td>12.14</td>
<td>.02</td>
</tr>
<tr>
<td>CYG</td>
<td>PIG</td>
<td>-19.03</td>
<td>11.97</td>
<td>.11</td>
</tr>
<tr>
<td>CYG</td>
<td>CG</td>
<td>49.22*</td>
<td>12.62</td>
<td>.00</td>
</tr>
<tr>
<td>CG</td>
<td>MIG</td>
<td>48.79*</td>
<td>12.37</td>
<td>.00</td>
</tr>
<tr>
<td>CG</td>
<td>PBLG</td>
<td>47.74*</td>
<td>12.28</td>
<td>.00</td>
</tr>
<tr>
<td>CG</td>
<td>PIG</td>
<td>19.03</td>
<td>11.97</td>
<td>.11</td>
</tr>
<tr>
<td>CG</td>
<td>CYG</td>
<td>68.25*</td>
<td>12.77</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>MIG</td>
<td>19.46</td>
<td>13.00</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>PBLG</td>
<td>20.51</td>
<td>12.92</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>-49.22*</td>
<td>12.62</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>-68.25*</td>
<td>12.77</td>
<td>.00</td>
</tr>
</tbody>
</table>

*p < .05

When Table 6 is analyzed, it is seen that there is a significant difference in favor of PIG and CYG in terms of students' engagement levels. These values show that teaching subjects and concepts according to the Peer Instruction Method has a positive effect on students' engagement. So the level of engagement of students, who had discussions on concept questions with peer groups and who had to answer the questions posed to them, was positively affected. On the other hand, the use of the activities used in the Peer Teaching Method in the Combined Method also making a positive effect on the level of engagement of CYG students.

In groups where lessons are taught according to different teaching methods, one-way ANOVA test was performed over the total scores of SPSS post-test in order to determine how students' scientific process skills changed. Values obtained from ANOVA test are as in Table 7.
Table 7 Comparison of Posttest Scientific Process Skills of Students in Different Groups: One Way Anova Test Results.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Source of variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scientific Process Skills</td>
<td>Between groups</td>
<td>814.93</td>
<td>4</td>
<td>203.73</td>
<td>8.72</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>Within groups</td>
<td>4134.02</td>
<td>177</td>
<td>23.36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

When the values in Table 7 are analyzed, it can be seen that the post-test SPSS total scores of students in different groups differ statistically. The Bonferroni test, which is preferred in the equality of variances, was used to determine which groups this difference is between. Values obtained from Bonferroni test are as in Table 8.

Table 8 Comparison of Students in Different Groups in Terms of Scientific Process Skills Post-Test Scores.

<table>
<thead>
<tr>
<th>Groups</th>
<th>Groups</th>
<th>Mean Difference</th>
<th>S.E</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIG</td>
<td>PBLG</td>
<td>-5.21</td>
<td>1.13</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>-1.39</td>
<td>1.10</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>-4.58*</td>
<td>1.14</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>.61</td>
<td>1.17</td>
<td>.99</td>
</tr>
<tr>
<td>PBLG</td>
<td>MIG</td>
<td>5.21*</td>
<td>1.13</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>3.82*</td>
<td>1.10</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>.63</td>
<td>1.13</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>4.60*</td>
<td>1.17</td>
<td>.00</td>
</tr>
<tr>
<td>PIG</td>
<td>MIG</td>
<td>1.39</td>
<td>1.10</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>PBLG</td>
<td>-3.82*</td>
<td>1.10</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>-3.19*</td>
<td>1.10</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>.78</td>
<td>1.14</td>
<td>.99</td>
</tr>
<tr>
<td>CYG</td>
<td>MIG</td>
<td>4.58*</td>
<td>1.14</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>PBLG</td>
<td>-.63</td>
<td>1.13</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>3.19*</td>
<td>1.10</td>
<td>.04</td>
</tr>
<tr>
<td></td>
<td>CG</td>
<td>3.97*</td>
<td>1.17</td>
<td>.01</td>
</tr>
<tr>
<td>CG</td>
<td>MIG</td>
<td>.61</td>
<td>1.17</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>PBLG</td>
<td>-4.60*</td>
<td>1.17</td>
<td>.00</td>
</tr>
<tr>
<td></td>
<td>PIG</td>
<td>-.78</td>
<td>1.14</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td>CYG</td>
<td>-3.97*</td>
<td>1.17</td>
<td>.01</td>
</tr>
</tbody>
</table>

*p < .05

When the values obtained from the Bonferroni test are analyzed, it is seen that the groups that the lessons are taught according to the Problem Based Learning and the Combined Method are more successful than the other groups (p <.05). These values are an indication that the processing of lessons according to Problem Based Learning and the Combined Method contributes to students’ scientific process skills.

DISCUSSION AND CONCLUSION

In today’s work environments, it is not enough for an engineer, teacher or doctor to know only his own field. These people need the support of their colleagues, students and other professional groups. This situation requires individuals to have a high level of social and academic skills. Given that robots will do ordinary jobs in a world where computer and information technologies are constantly developing, people need to be more qualified and have high-level skills. For this reason, individuals are expected to participate actively in the academic process and to be able to produce suitable solutions to the problems they may encounter.
On the other hand, in order to create the desired human profile, modern methods should be used in the education-training process. When the effects of the methods on the specified variables are discussed, respectively; Peer Instruction Method is a method in which students interact constantly with each other, increasing their level of interest and engagement in the lesson (Fagen, Crouch & Mazur, 2002; James, 2006). In the method, students do their reading homework, discussion of the concept questions individually and in a group affects students' engagement in the lesson positively (Crouch & Mazur, 2001; Mazur, 1997). In this study, it was determined that students' engagement levels differ in terms of the methods used (see, Table 2,4,5). Especially in groups where the lessons are taught according to the Combined Method and Peer Instruction Method, the meaningful increase in students' engagement levels supports many studies in the literature (Green, 2003; James, 2006; Mazur, 1997; Nicole & Boyle, 2003; Sumangala & Stephen, 2000). The fact that the other groups lag behind CYG and PIG in terms of the engagement variable shows the importance of the activities in the Peer Instruction Method. The main reason for the successful of the Peer Teaching and the Combined Method in terms of the engagement variable is the assignment of reading assignments, the use of conceptual questions and student discussions. This result supports the studies in the related literature. Because the studies in the literature emphasize that teaching practices in Peer Instruction Method has a positive effect on students' behavioral, emotional and cognitive engagement (Akkurt, 2010; Fagen, Crouch & Mazur, 2002; Kalem & Fer, 2003).

It is another result of this study that problem based learning applications have a positive effect on scientific process skills. In this teaching method, the students' generating ideas about the solution of the problems by using the scientific process steps contribute to the development of students' scientific process skills (Açıkyıldız, 2004; Tavukcu, 2006). In this study, the positive effect of Problem Based Learning and Combined Method on scientific process skills was determined (see, Table 1,3,7,8). While Problem Based Learning and Combined Method groups were similar in terms of scientific process skills, students in other groups lagged behind PBLG and CG in terms of this variable. This situation proves the positive effect of Problem Based Learning and Combined Method on students' scientific process skills. Students' searching for solutions to problem situations by using scientific process steps have improved their scientific process skills. The use of problem-based learning activities in the group where lessons are taught according to the Combined Method has led to the improve of scientific process skills of students studying at CYG. Similar to this study, many studies stating that Problem Based Learning activities have a positive effect on students’ scientific process skills are available in the literature (Aydoğdu, 2012; Bayrak, 2007; Gürses, Açıkyıldız, Doğar & Sözbilir, 2007; Karaöz, 2008; Keil, Haney & Zoffel, 2009; Tatar & Oktay, 2011; Tavukçu, 2006).

As a result, rational combining of different teaching methods such as Multiple Intelligence, Peer Instruction, Problem Based Learning completes the shortcomings of each method. Thus, in the combined method, the strengths of each method are used. The findings of this study support the stated statements.

Investigating only the effect of methods on student engagement and scientific process skills is the weakness of this study. Because in this study, no special efforts were made to provide students with lesson engagement and scientific process skills. If it is desired to contribute to the teaching of lesson engagement and scientific process skills at a high level, additional activities can be given both inside and outside the classroom at CYG. Thus, success in teaching these two variables can be maximized.

Suggestions

- In line with this study, some suggestions were made for the future studies. These;
- Combined methods should be preferred in order to benefit from the positive outcomes of more than one method instead of the lessons being taught by adhering to one method.
While combining the methods, the structure of the course and the subject should be taken into consideration.

REFERENCES


Celep, A., & Bacanak, A. (2013). Perceptions of teachers who are attending on their master’s degree regarding the science process skills and their attainment. Journal of Turkish Science Education, 10(1), 56-78.


Karaöz, M. P. (2008). *İlköğretim fen ve teknoloji dersi "kuvvet ve hareket" ünitesinin probleme dayalı öğrenme yaklaşımlı öğretmenin öğrenme becerilerinin ve öğrencilerin bilimsel süreç becerileri, başarıları ve tutumları üzerine etkisi* [The effect of teaching the unit of “power and motion” in primary school science course using the problem based learning approach on students science process skills, success and attitude]. Yayınlanmamış Yüksek Lisans Tezi, Muğla Üniversitesi Fen Bilimleri Enstitüsü, Muğla.


Yurt, Ö. (2013). *60-72 aylık çocuklara bilim öğrenmeyi geliştirme testinin geçerlik güvenirlik çalışması ve araştırmasına dayalı bilim eğitim programının bilim öğrenmeye etkisinin incelenmesi* [The validity and reliability study on science learning assessment test for 60-72 months children and an examination of the effect of inquiry based science education program on science learning]. Yayınlanmamış Doktora Tezi, Gazi Üniversitesi, Eğitim Bilimleri Enstitüsü, Ankara.
Views of Pre-Service Mathematics Teachers and Mentor Teachers about School Practicum: A Model for Web 2.0 based Supervision

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Abstract

The current research was conducted to evaluate the views of mentor and pre-service teachers participating school-based practicum about the effectiveness of Web 2.0 based supervision. The implementation process with a pilot study in the research lasted two years. In the pilot study, the evaluation of school-based practicum was made within the meetings among the lecturer and preservice teacher at the faculty. It was found that there should be an environment independent of time and place to give feedback to preservice teachers during the practicum. In this context, four of the groups of pre-service teachers were randomly selected. A responsible lecturer and mentor teacher were assigned to each group. Google Classroom environment was created to offer pre-service teachers an opportunity to receive feedback from different stakeholders such as a lecturer-mentor-perservice teacher. During the school based practicum, preservice teachers recorded their teaching practice in class and shared their teaching videos in online environment. The data obtained from tools such as video recording of classroom practice, online discussion and interviews were evaluated in the qualitative analysis program. As a result, it was determined that school based practicum in the online environment has its weaknesses and strengths. It was discovered that preservice teachers and teachers have differing views as well as overlapping views. In light of all these views, suggestions regarding school based practicum were made for a model for Web 2.0 based supervision.

Keywords: School Practicum, Web 2.0 Environment, Mathematics Teaching, Feedback, Pre-service Teachers

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INTRODUCTION

Education holds various essential functions such as socializing, gaining personality, having the knowledge and skills required in life, and acquiring a profession. Besides, individuals mostly benefit from their teachers to achieve these functions throughout their education life. However, sometimes we may encounter situations where teachers’ help is insufficient. The statement “I had to learn to teach after I actually started teaching” is the most striking indicator that there is a conflict between the theoretical knowledge taught in teacher education programs and the application and that the advisors in the university and the mentor teachers in the schools cannot meet the requirements of preservice teachers. The way to resolve this incompatibility is by establishing links among the theoretical knowledge taught and classroom practices at schools (Bulunuz & Bulunuz, 2016).

Preservice teachers gaining professional skills is a team job. The theoretical knowledge they learn at university or their applications is inadequate. Consequently, by providing professional competence development of teachers in the Faculty-School cooperation (CoHE, 1998) within the framework of preservice education process implemented in Turkey, it is aimed to gain the ability to apply theoretical knowledge they have obtained in a real classroom environment and to adopt a positive attitude towards the teaching profession (Akgün et al., 2015). The organization of the communication and information sharing process among stakeholders is essential in ensuring this model’s functionality. Yet, preservice teachers may face several problems during the applied training process. Throughout the teaching practice process, preservice teachers not getting feedback concerning their practices and lesson plans, insufficient practice, communication problems with the application instructor and mentor teacher, inability to establish a connection between the theoretical knowledge learned and school practices (Boz & Boz, 2006; Arkün, 2011; Unver, 2016) can be listed among these problems (Cepni & Aydın, 2015; Demir & Camlı, 2011; Simsek, Alkan, & Erdem, 2013; Taşdere, 2014; Yeşilyurt & Semerci, 2011). It was also discovered that preservice teachers were not adequately counselled by coordinator faculty members (Aydın & Akgün, 2014). In this context, it is perceived that not providing sufficient feedback to preservice teachers is related to all in education faculty. In another research examining the opinions of preservice teachers on teaching practice, it was concluded that they did not gain sufficient practice opportunities and that sufficient feedback could not be obtained concerning the practices (Eraslan, 2009). As a result of the research, the feedback-correction process, which will be carried out in regulating the limitations in question by ensuring cooperation between stakeholders in field experiences, should be considering the stage that needs attention.

The feedback-correction process on preservice teachers’ performances concerning their field experiences plays an essential role in their professional development (Hurioğlu, 2016; Shantz & Ward, 2000; McFadzien, 2015). An online model that brings together the trio of instructors, mentor teachers and preservice teachers was introduced during the school implementation process to reduce the experienced problems in the faculty-school cooperation process (Arkün, 2011; Arkün-Kocadere & Aşkar, 2013; Gökmen, 2015; Ozan & Odabasi, 2016). Using social media platforms, which are of great importance nowadays, can help overcome the current problems in the applied lessons (Akgün et al., 2015). Particularly, Web 2.0 applications, which have become one of the rapidly advancing internet-based technologies in recent years, will make a significant contribution to ensuring cooperation among stakeholders by facilitating the change of ideas and information (Durusoy, 2011; O’Reilly, 2007). Google Classroom is one of the online environment. The classes created with Google Classroom, having a web 2.0-based working principle, maintain the communication among the teacher and the student with the homework, content sharing, and the feedback process it provides. Based on the importance of students, instructors, and mentor teachers’ collaboration to carry out the teaching practice process efficiently, a Web 2.0-based online teaching application was implemented in this study.

It is believed that Web 2.0 based supervision applied within this research scope will bring an alternative dimension to the teaching application process regarding its importance, mainly in the preservice education process. In this study, it was aimed to reveal the opinions of preservice teachers.
and teachers who participated in the practice, for determining the effectiveness of getting feedback in a Web 2.0-based online environment, which is implemented to increase the effectiveness and function of the teaching practice course. Therefore, an answer to the following research question was sought:

- What are the opinions of preservice teachers and mentor teachers about Web 2.0-based supervision? How do these views differ?

**Theoretical Framework**

Teaching is a respectable profession that undertakes essential duties in transmitting social values to future generations, such as bringing existing knowledge to individuals who require it. The teacher is the most crucial power that allows students to develop their talents and grow up with knowledge, skills, and values that are beneficial to themselves, the nation, and humanity (Demirel, 2012). Acknowledging that a nation can gain strength and value through the effective use of knowledge, it is impossible not to recognize how education and teachers’ concepts are important for a nation. Consequently, to increase the value of a society, it is essential to enhance teachers’ qualifications first. Since teachers are the most critical element of the education system, the obstacle of raising qualified teachers is always up to date. Studies on determining teacher competencies in Turkey officially started in 1998. As a result of long-lasting studies, they were presented in a comprehensive report in 2017 (General Directorate of Teacher Training and Development, 2017).

In this report, the areas where the general competencies of the teaching profession will be applied in teacher training and development processes are defined as preservice teacher training, teacher employment, preservice teacher training process, self-evaluation, performance evaluation, career development and rewarding, and continuous professional development (Figure 1).

![Figure 1. Usage areas of teacher competencies (General Directorate of Teacher Training and Development, 2017)](image)

The report notes that it is crucial to improve the competencies of preservice and in-service teachers. The preservice teacher training process, which is among these indicators, is defined as a training area, and the theoretical and practical training is emphasized (Unver, 2016). For preservice teachers to provide professional competencies and be trained expertly, the academic courses conducted in a theoretical context should be well evaluated. In this sense, following theoretical courses as Special Teaching Methods-I-II, Assessment and Evaluation, Instructional Technologies and Material Development and Classroom Management that preservice teachers have taken in their undergraduate education, School Experience, also Teaching Practice courses are offered, which allow them to reflect
the knowledge in this context practically (COHE, 1998). For training qualified teachers, it is thought that the contents of the courses in question should be updated, new practices should be carried out, and the results should be evaluated.

Unquestionably, teachers treasure the lessons they practiced the most, primarily from the lessons they received before the service (Büyüksahin & Sahin, 2017). Among the branch, pedagogical and practical courses, the teaching practice course, a preliminary study in the profession, is the crucial one where unforgettable experiences are undergone (Paker, 2008). Yet, the question remains. Is the teaching practice lesson adequately conducted? Does it achieve its purpose? Many studies in the literature aim to find answers to these questions through teacher candidates’ opinions on teaching practice lessons. When these studies were considered, it was determined that the candidates were aware of the importance of the course but thought that the course was not efficient due to several reasons (Batman & Saka, 2019; Karasu Avcı & Ibret, 2016; Eraslan, 2009). Collectively, these reasons cause the teaching practice lesson to become insignificant. Kazu and Yenen (2014) identified the faculty-school cooperation program’s problems that generated the teaching practice course to be considered insignificant. One of these problems was asserted as the application lecturers’ inability to provide the required feedback and corrections to the candidates on time. Ayvacı, Ozbek, and Bülbul (2019) emphasized the feedback process provided by the responsible mentor and instructor throughout school applications and point out the significance of preservice teachers’ gaining professional experience. Likewise, Paker (2008), in a study conducted to determine the problems encountered by preservice teachers with the guidance of mentor teachers and in-service lecturers, preservice teachers declared that the course they were observed was not well planned and that they could not provide enough feedback for their lectures. It is thought that preservice teachers require feedback from teaching staff, and this problem will be reduced via planning the teaching practice lesson by centering the feedback process.

The literature is in a consensus on the implementation of the Teaching Practice course under its purpose and practice in terms of the measures that can be taken to improve the teaching profession’s quality. When the studies are considered, various models are suggested and/or applied for the functioning of the lesson (Bulunuz & Bulunuz, 2016; Baki & Arslan, 2015; Arkün-Kocadere & Aşkar, 2013; Tunc-Pekkan, Karagöz Akar & Akcan, 2019). Besides, it can be understood from the literature that the pre-service teachers did not receive any feedback concerning their teaching, or the feedback they received was not effective. In this sense, beneficial feedback by observing the teaching practice of pre-service teachers is required. Thus, it is aimed to ensure the functionality of the feedback mechanism within the activities by conducting the teaching practice process, which is held within the scope of the research in the Web 2.0 based supervision among the participation of all stakeholders.

**METHOD**

**Research Design**

In this study, which was carried out to examine middle school preservice mathematics teachers’ teaching practice processes and mentor teachers in an online environment, a case study, one of the qualitative research methods, was conducted. Based on the experiences of preservice teachers and mentor teachers in this process, the factors concerning the online environment’s teaching practice process were discovered. Case study, factors related to a situation (environments, individuals, events, processes, etc.) are examined in a holistic approach (Merriam, 1998) and focuses on how they affect the relevant situation and how they are affected by the relevant situation (Yıldırım & Simsek, 2011).

**Participants**

This research consists of two stages as the pilot study and the main application. In the pilot study of the research, a state university’s mathematics teaching department in the Black Sea region in
the spring semester of 2017-2018 academic year covers the 4th-grade preservice teachers. In the main study, the participants consisted of the mentor teachers in the assigned schools and the preservice teachers studying in the 4th grade of mathematics teaching department in the 2018-2019 academic year. During the research process, four application schools were defined, and it was planned to assign four students to each school. Thus, the participants of the study consist of 16 preservice teachers and four mentor teachers. Still, since participation in the study should be voluntary, two mentor teachers took part in the online teaching practice process but did not comment on evaluating the process.

**Implementation**

In this study, in which the implementation period was two years, teaching practice activities were carried out in two stages as a pilot and main study. Per the pilot study’s scope, the teaching practice activities were carried out in a face-to-face classroom environment, and the main study in an online virtual environment. The researchers took an active part in both stages, and their roles in this process differ. The roles of bringing preservice teachers together in the faculty for pilot study have evolved to bringing preservice teachers and teachers participating in the practice online in the main study. In both studies, the researchers, who were the lecturers of the course, gave feedback to the candidates of their activities in teaching practice concerning their mathematics lectures. The feedback process includes classroom management throughout the candidates’ lectures, the teaching of the subject and the conceptual errors in this process, the evaluation of the course, etc. While the researchers gave feedback, they created a discussion environment in both studies and provided peer evaluations. During the pilot study, feedbacks were provided in the meetings held at the faculty members’ offices by determining the appropriate hours for the preservice teachers and faculty members. Since the appropriate time and place cannot be created, it was not performed in the practice school. The meetings were held with approximately 40-50 minutes of video recording. Thus, the opportunity to be watched later was created. In the main study, a new plane was created due to the pilot study results. A flexible feedback process has been ensured by designing an online environment where other preservice teachers, in-service teachers, and lecturers in the group are involved. In this sense, a group of four preservice teachers was randomly assigned to the lecturers who will attend the course within the teaching practice course scope. The main study was carried out with four separate groups. Together with these preservice teachers, the mentor teachers also participated in the online environment, intending to have various stakeholders in the same environment. Since the pilot study data laid the groundwork for providing feedback online, this situation became more evident when the preservice teachers expressed the obstacles and suggestions concerning the application and the contribution of the application. As a result of the practices within the pilot study’s scope, the general view about the opinions of the preservice teachers in the feedback process they had together with their peers and teaching staff is depicted. Accordingly, it was reported that the candidates saw their shortcomings, had the opportunity to do self-criticism, but could not realize them. They owned various perspectives by hearing from their peers, and the application lecturer about the deficiencies and mistakes that might have been neglected. Thus, they put right their mistakes and made up their deficiencies. Following the pilot study, the second phase of the research, namely, the main study process, was carried out to include different stakeholders. The candidates, who accepted the application to continue, thought that the process would be improved and be more beneficial with suggestions such as the involvement of mentor teachers in the process, and discussion of feedback in an environment independent of time and place. In this context, firstly, an online feedback-correction environment was provided by creating a setting in which each instructor had preservice teachers belonging to his/her group in the Google Classroom. After the preservice teachers uploaded the video regarding the lectures, they evaluated themselves by self-criticism, and then the other candidates evaluated their peers who performed presentations. In the online environment, the instructor took on the role of the moderator while the preservice teachers were evaluating each other. In other words, the instructor was in the position of moderator directing these discussions. Another role of the lecturer is to create the required discussion environment for the preservice teachers to recognize the conceptual mistakes done during the lecture. The preservice teachers were encouraged to recognize each other’s mistakes and make suggestions or constructive criticisms on how mathematics teaching could be.
Thus, an interactive environment was created for preservice teachers to assess each other in the online environment.

After the preservice teachers’ lecture process at the school was video recorded, it was shared online. Besides, the preservice teachers shared the plans, worksheets, and activities of the lessons they taught online. Consultancy (feedback-correction) was provided in an online environment within the 14-week teaching practice course scope. The classroom lecture-performances of each candidate were monitored weekly and evaluated in the Google Classroom environment by the advisor, instructor, and other group members.

**Data Collection Tools**

The semi-structured interview technique was applied in the process of collecting data on research participant views. One-on-one interviews were conducted with 16 preservice teachers and two mentor teachers. These interviews lasted about 30-40 minutes. The interviews documented by taking audio recordings under the participants’ permission were later converted into written transcripts and taken as the research data.

**Data Analysis**

The analysis of research data initially started from student opinions. Themes were created with the data obtained from student views. The researchers first evaluated the written data individually and created codes for the data. Then, the researchers combined the codes and formed themes. For example, technical difficulties, anxiety, procedural problems, etc. experienced in video shooting to upload it online have been classified as the theme “shortcomings” of making an online evaluation. Therefore, four different themes have emerged concerning the evaluation of the online environment. These themes have been recognized as the strengths and weaknesses of giving feedback online, the preference for receiving feedback online, and suggestions on how to get better feedback online. After the analysis of student opinions, teachers’ opinions were evaluated. Teacher views were analyzed by these four themes obtained from student views. Still, according to these four themes, while some sub-themes are the same, others may differ. For example, it was determined that while there was a code named “evaluation of stakeholders” in preservice teachers’ opinions about the strengths of the online environment, there were codes such as “giving students time to see their mistakes” in the online environment. In determining the codes in teacher and student opinions, researchers discussed the incomprehensible codes. The flow reflecting the formation of themes from codes is given in Figure 3.

![Figure 2. Data Analysis Process](image)

Obviously, the data analysis process was performed in a loop. Consequently, the researchers agreed to clarify the codes, sub-themes, and themes. Findings were confirmed by quoting the opinions of teachers and preservice teachers who participated in the application. In performing the findings, the
teachers participating in the application were coded as "T1, T2", and the teacher candidates as "P1, P2". The data set obtained analyzed in the MAXQDA Analytics Pro 2018 qualitative analysis program.

**FINDINGS**

Findings reflecting the opinions of middle school mathematics preservice teachers and mentor teachers concerning the evaluation of the process of conducting the teaching practice course online are shown below. The findings related to the process were evaluated with the help of hierarchical maps reflecting the views of preservice teachers and mentor teachers. The themes and sub-themes included in the maps were detailed by supporting one-to-one quotations from the candidates’ and teachers’ opinions.

The themes and sub-themes included in the maps were detailed by supporting one-to-one quotations from the candidates’ and teachers’ opinions.

![Figure 3. Map reflecting the views of preservice teachers in the pilot study](image)

When studying Figure 3, the preservice teachers’ views regarding the application carried out in the online environment are gathered under four themes: the weaknesses of the application, its strengths, the recommendations for the application, and the preference for the application. While the candidates mostly make explanations about the strengths and weaknesses of the application, it can be said that they have fewer suggestions concerning their preference to receive feedback-correction in the online environment and how this environment can be.

Figure 4 shows the map formed by the mentor teachers’ views on the process. Teachers’ views were gathered under the same themes as preservice teachers. Still, the suggestions of the teachers who participated in the application for better management and more efficient passage of the process stood out. In other words, it can be assumed that teachers have more striking opinions about the suggestions for the elimination of these aspects by expressing the deficiencies of the application carried out online.
Figure 4. Map reflecting the views of mentor teachers about the process

Although the views of the preservice teachers and teachers overlap as themes, they vary in sub-themes. In the following section, teachers’ and preservice teachers’ similar and different views on the process are covered according to these four themes (strong, incomplete, preference and suggestion).

Strengths of the Application

It was discovered that preservice teachers and teachers had diverse opinions and similar views concerning the application carried out online. It was observed that the preservice teachers emphasized the online environment’s strengths more than the teachers who participated in the practice. The opinions of preservice mathematics teachers tagged with the theme of strengths of the application consist of sub-themes of sharing video recordings, flexibility, and feedback. The preservice teachers found it beneficial to share the video recordings online for noticing their performance improvements and watching them again. Likewise, the teachers who participated in the practice found it useful to share the video recordings to watch them again. They stated that sharing and watching video recordings online will contribute to the preservice teachers’ deficiencies. T1 coded teacher saying, “It is something different for the preservice teacher to watch oneself. If we record and watch ourselves, we can recognize many aspects of us that we cannot notice” supports this situation. Teachers stated that sharing videos online would contribute to preservice teachers’ self-evaluation, but also stated that it did not contribute much to their performance improvement. Unlike teachers, most of the preservice teachers declared that getting feedback online contributed to their awareness of their performance improvements. The preservice teachers stated that they focused on the problems related to classroom management at the onset of the application process, then with their feedback, focused on teaching mathematical concepts. For them, the mathematics teaching process specific to the acquisition varied, so the preservice teachers focused on concept teaching. They also emphasized that the feedback given by various stakeholders assisted them to focus on conceptual learning. According to them, field experts (faculty members who teach the course) have more influence on their focus on conceptual learning. As a result of the application, P14 coded preservice teachers saying, "With the training I received, I realized how important even a small subject is. I also understood that knowing mathematics is not enough to explain it. I saw that everything has a conceptual cause, proof of
everything is based on somewhere, and the student needs to find it” reveals that he has developed an awareness of the importance of conceptual learning. Besides, preservice teachers who received feedback in the online environment stated that the process of planning their following lessons by focusing on conceptual learning has also improved. Because the comments made online are permanent, and they can reread the comments to correct their mistakes. Thus, they have made the following lesson plans by looking at the previous comments written in Google Classroom. They emphasized that if a face-to-face feedback environment was formed, the feedback given by various stakeholders would not be permanent and would not directly contribute to the next course preparation process. Consequently, it is understood that feedback from various stakeholders in an online environment provides the preservice teacher a distinct perspective. The preservice teachers also stated that if they and their peers, together with different stakeholders, receive multiple comments online, they can better realize their mistakes. For example, the statement of the P5 coded preservice teacher as “I watched it over and over and saw my mistakes, this is the first positive aspect. The second aspect is that it is online. For example, if you had come to the practice school, only one person would come. I would only see the errors you noticed. Yet, when the evaluation is made online, at least 4-5 people can comment. In this way, we can get multiple comments; a thing missed by someone else…” confirms this situation.

Preservice teachers and teachers found it beneficial to share video recordings online since it provides flexibility in space and time. For example, the P8 coded preservice teacher’s statement as “You could evaluate us every week. So, we had feedback corrections every week. We saved space and time; yes, it is advantageous in this regard…” statement supports this situation. Besides, the P4 coded preservice teacher’s statement as, “There are certainly many positive aspects. We don’t have a lot of lessons at school anyway, we come once or twice a week. This application really saves a lot of time. We already have a transportation problem. See, P1 stays in Seyitler, his transportation is a problem and so on...I think there is a better environment ing time…” supports this situation. Likewise, the T2 coded teacher expressed the online feedback process’s flexibility in terms of time and space by saying, “He can watch videos wherever he wants. He can watch in his house, or on the road... He can watch while traveling, shortly one can always watch it, anyway. It is something that can be watched as long as there is internet access…”. Also, the teachers emphasized the online environment’s strengths by expressing that a more comfortable environment is created online, unlike the preservice teachers.

**Shortcomings**

According to the interviews for the evaluation of the online environment, the preservice teachers, and the teachers who participated in the application had similar views about the shortcomings of the online environment. These standard views cross the idea that videos do not reflect the natural math classroom environment. The preservice teachers and the teachers emphasized that the preservice teachers and the students were not comfortable while shooting the videos. The preservice teachers stated that they faced many difficulties while shooting the videos, which were uploaded to Google Classroom to get online feedback. Unlike the teachers, the preservice teachers discussed these problems in terms of different variables, such as the difficulties in video shooting and uploading the videos due to the performance. For example, the P7 coded pre-service teachers’ “I am trying to forget the T3 coded teacher while lecturing; it was not just about the camera. So I cannot say, well, our anxiety is increasing, and this is not its bad aspect. Because I don’t think it changes anything. So even if you but not the camera is there, we will be nervous likewise. Maybe we will even be more nervous. In that respect, I think the only negative aspect is that we get exhausted while shooting the video. We keep it like this for 40 minutes, the video is being interrupted or so. We have delays in the delivery of videos. We are disturbing you, so I think it might have been more likely to be implemented if there was a more straightforward method...." discourse is one of the problems faced by preservice teachers. Besides, since there is no fixed camera in the classroom, the preservice teachers stated that they gave each other the camera, but the shooting was exhausting. Besides, some of the preservice teachers who teach two different lessons
each week choosing the record they performed better and uploading it on the online environment were stated as missing aspects of the application. The preservice teachers believe that the anxiety of making mistakes during the lectures affects their performance, and the teachers support their view. The mentor teachers who expressed similar views stated that too many people shooting or watching the video may create anxiety in the preservice teachers. The preservice teachers’ other source of their anxiety was the candidates watching them during the video shooting and the videos being watched by more than one person. For example, preservice teachers with code P2 discourse as, “Most importantly, we are videotaped, and 3-4 preservice teachers and a teacher observe us from the backside. We are also being videotaped. Well, there is anxiety like ‘if I make a mistake, it will be recorded’. Stress increases while trying not to make mistakes and we tend to make more mistakes...” supports this situation. It confirms that teachers also voice this situation, and too many people being in video shooting or watching from Google Classroom may cause anxiety in the preservice teacher. For example, the T2 coded teacher’s “If there is excitement, a person cannot teach as efficiently as he/she wants. I would be excited too if someone would come and watch me. For example, while I was completing my internship, the inspector came and joined the lesson. Usually, I am a very comfortable lecturer, I do not have any trouble. When the inspector came, I got confused, I forgot what to tell The children are 7th grade; I was telling about the 6th grade... Moreover, as the students did not understand, I started saying, ‘Why don’t you understand, friends, what is happening to you?’....” discourse supports this situation. Likewise, it was stated by both teachers and preservice teachers that the comments written to Google Classroom could be misunderstood, and the written language and the verbal language may differ. For example, the P10 coded preservice teacher’s expression as, “I think this is the biggest problem of online teaching practice. It is not expressed correctly or it is very susceptible to misunderstanding. You know, I actually said that...” was similar to the discourse that was also voiced by the teachers. Besides, preservice teachers stated that, unlike teachers, they had technical problems while uploading videos online to give feedback by various stakeholders. According to them, there was no technical notification regarding the feedback given online, such as when uploading a video online. The dialogue between the P3 coded preservice teacher and the researcher, which can be an example of this situation, is given below.

[...] 

Researcher: Don’t you receive any notification?

P3: No, we have to enter, and do it ourselves; we have to look.

Researcher: For example, isn’t there a notification saying ‘The teacher coded T2 commented’?

P3: If you just mention it. For example, let’s say you mentioned me at one stage, I got a notification that you talked about me there. Otherwise, it does not come; you have to enter and look.

Preference

In the interviews concerning the online environment’s evaluation, according to the statements of the teachers and preservice teachers, the online environment is preferred to the face-to-face environment, the face-to-face environment is preferred or that both environments will support each other. It was observed that one of the teachers who participated in the application was more willing to give feedback in a face-to-face environment but stated that they could be supported when the two were together. The other teacher said that he could prefer teaching practice online. Thus, the number of preservice teachers who prefer to use both media together is relatively high. For example, the P3 coded pre-service teacher said, “We can post comments late online on our part, so I don’t see any benefit. I think it would be more useful if we could be a little more instant as a group. That’s why teaching online is nice. But I think it may also be beneficial to meet in some weeks, for example. I think it should be both online and face to face.” Still, it is observed that some preservice teachers
unquestionably prefer to receive feedback in a face-to-face environment. For instance, according to the expression of the P6 coded preservice teacher as, “I would love to get it to face to face. Because you came to watch it in the first week, between the first lesson. Maybe you don’t always make mistakes, but you did. Then P5 corrected himself in the second hour. For example, it is a bit hard to teach because the students in the classroom display such a profile. Therefore, this problem is not caused by us...You can see the class, but you cannot see the class in the video; thus, you cannot say anything. For example, there are worse classes that we teach than that class. So it would be better if it was face to face instead of online” the preservice teacher preferred to give feedback in a face-to-face environment.

**Recommendation**

Due to the interviews conducted on evaluating the online environment, it was determined that the teachers brought more suggestions than the preservice teachers. Besides, it was noted that the suggestions of teachers and preservice teachers on getting better feedback in the online environment vary from each other. Preservice teachers indicate the lack of immediate feedback in Google Classroom as a deficiency. For example, the P16 coded preservice teacher’s, “I think it should be immediate face-to-face feedback. Because I think it would be more accurate to discuss and correct something there and then. In the Classroom, this process takes a little bit of time, it doesn’t happen instantly. The person does not remember that exact moment in the lesson he taught. For example, you have something on your mind at that moment and you can forget it, so I’m in favor of giving immediate feedback. In the Classroom, this process takes a bit longer...” expression supports this situation. Unlike preservice teachers, teachers, on the other hand, present deferred feedback as a suggestion. Since to notice their mistakes, the preservice teachers should have time to think on their own. For example, in T2 coded teacher’s discourse as, "For example, the problem changes a lot when we do not mention the side lengths in the angle-edge relations integers. You know decimal numbers are required. The solution also changes. He did not write in 2-3 questions, he wrote a whole number in the last question. ‘Sir,’ he said when we went out to recess. ‘I was supposed to write an integer here, too.’ I noticed, I said. You can write it in the next lesson, I said, it wouldn’t be a problem...” states that the preservice teacher has already noticed the error by him/herself. Therefore, the teacher believes that the time until they give feedback in Google Classroom will provide the preservice teachers to consider their mistakes. Besides, teachers stated that if an effective discussion environment is created in Google Classroom, it would be like a face-to-face feedback process. They stated that the others would watch the video from Google Classroom and write comments with a preservice teacher to create an effective discussion environment. According to them, a preservice teacher attending the lesson would reduce his/her anxiety, and arouse curiosity on something which the preservice teacher had never followed in Google Classroom. They would participate in the discussion environment effectively. Also, it was discovered that teachers brought forward more than one proposal for planning the online environment. For example, they recommended that shooting videos for a shorter period facilitated monitoring and giving feedback. Before giving feedback in the online environment, they suggested holding face-to-face meetings with the stakeholders and teacher candidates and giving comprehensive information about the process. They also stated that there should be posts concerning the lesson from Google Classroom. The preservice teachers offered recommendations for the online environment’s planning, expressing that the lesson plans should be shared from Google Classroom. For example, the P9 coded preservice teacher’s expression as, "I’m a student now, if you ask me, I would not want to do it online. But if I were a teacher, I would. Well, we were keeping the report for the lesson we’re about to teach. I would probably like every student to bring a report, even a rough sketch. I would like this in the following way: If we had shared reports in Classroom since the beginning of the period, well, I could download them and use them in the following years.” supports this situation. Besides, preservice teachers offered suggestions to discuss the shortcomings face to face, the stakeholders to watch the real environment simultaneously, to make the camera shooting more functional and on the shortcomings of the application. The preservice teachers recommended that there should be a fixed camera in the classroom due to the difficulty in shooting videos. Thus, they would get used to the camera’s existence after a while, and the natural environment could be
recorded. Another suggestion of the preservice teachers is regarding the simultaneous feedback of the stakeholders. When a simultaneous feedback environment was created in Google Classroom, it was seen that they believed they would get more efficiency from the process. For instance, “I don’t know, but I think time should be given. Like ‘Comments to be entered until this time’. Everyone should actively gather in Classroom at that moment ..” discourse supports this situation.

DISCUSSION AND CONCLUSION

In this section, the findings obtained from preservice teachers and teachers’ opinions about Web 2.0-based online teaching practices are discussed by the guidance of relational maps. The results obtained from the research are presented. Also, suggestions for results are included. Since the themes gathered are common, these themes are presented respectively by including quotations from preservice teachers and teachers’ opinions. Although these themes are the same, as mentioned before, the sub-themes and the emphasized ideas differ. Thus, it is approved to classify the results obtained from the findings in this section as the results obtained from the preservice teachers’ opinions, the opinions of the teachers, and the opinions of both.

1-Discussion and results regarding the opinions of the teacher candidates

Based on the study findings, it can be assumed that the preservice teachers found the application carried out within the course efficient and beneficial and that the process contributed to them. It has been observed that the practice of teaching online has many strengths, as it is different from conventional teaching practices. As shown on the map in Figure 4, preservice teachers stated that the application has many strengths. Since indicated by the strong relationship between the theme of strengths of the practice and the sub-theme of feedback, the “feedback” sub-theme is outstanding. The fact that the feedback the preservice teachers experienced in the online environment within the application’s scope was permanent, it shed light on them in planning their next lessons and allowed them to make self-evaluation. They could notice the increase in their performance thanks to the feedback’s diversity as the process progressed, revealing the strengths of the online teaching practice on giving feedback.

![Figure 5. Relational map obtained from the opinions of preservice teachers](image)
The importance of feedback (Hattie & Timperley, 2007; Black & Wiliam, 1998; McFadzien, 2015) which should be included in every educational situation and one of the elements that define the quality of educational services, has once again been acknowledged with this study. The lack of this essential element in the process of teaching practice was stated in many study results such as the inability of preservice teachers to get adequate guidance from lecturers and mentor teachers, not getting enough feedback for their reports (Ozmen, 2008), and not providing enough feedback for their lesson presentations (Paker, 2008; Eraslan, 2009). In the studies of the literature, according to the preservice teachers’ adverse conclusions concerning the teaching practice lesson, they stated that they did not teach enough and receive feedback under the instructor (Aslan & Sağlam, 2018; Kazu & Yenen 2014; Boz & Boz, 2006). In other words, it can be mentioned that if the candidates receive useful feedback for their observed lessons, they believe that the teaching practice lesson will contribute to their development.

It is stated that applying feedback and correction activities together in the teaching-learning process is essential in motivating further learning (Reece & Walker, 2007). As it can be understood from the influential relations among the strengths of the application and the sub-theme of the application in the relational map in Figure 6, it is assumed that the candidates consider the given feedback needed, thus gain different perspectives, use these gains while preparing their next lessons, and thanks to this chain, each passing lecture is better. This situation tells us that the preservice teachers’ progress is not only due to the weekly lectures but also from the feedback they receive from their peers and the application lecturer. It is observed that peer evaluations contribute to preservice teachers in the process of receiving and giving feedback in an online environment. Demiraslan-Çevik (2014) found that both sides were satisfied in his study, where he determined the preservice teachers’ opinions on the question of "Who is satisfied? The one who gives the feedback or the one who receives the feedback..." in an online environment. Emphasizing the importance of feedback in improving learning, Al-Bashir, Kabir, and Rahman (2016) argue that most educators maintain the process of giving feedback traditionally. Still, this process can be more effective thanks to modern and developing technologies. Besides, in a study carried in a web-based environment according to a socio-cognitive perspective, it was determined that students who gave feedback to t higher-level cognitive strategies such as critical thinking more than those who did not (Wang & Wu, 2008). It can be assumed that the anxiety of the preservice teachers, who were evaluated by the stakeholders in the study and who took lessons for their future studies, decreased from all these positive relationships.

Saving the video recordings online, sharing them with other stakeholders participating in the application, and providing the chance to be watched again can be counted among the application’s strong results. Calık Uzun et al. (2019) presented "Creating environments in which lecturers, mentor teachers and preservice teachers take part as stakeholders, independent of time and space, and "researching the efficiency of practice lessons to be conducted in these environments" as a study proposal to the researchers due to the result of their study. They reviewed the opinions of preservice teachers on their experience of improving their teaching practice performance. In this study, considering this suggestion, teaching practice lesson was conducted by providing time and place flexibility in an online environment. When the findings gained from the opinions of the preservice teachers are examined, the sub-themes of "time" and "space" under the theme of "flexibility" are among their views on the strengths of the study. Thus, it can be assumed that preservice teachers find it positive in terms of being evaluated online to be independent of time and place. Simultaneous discussions are conducted online to allow for the potential to reflect the participants’ opinions depending on their response times (Black, 2005). The preservice teachers believe that the simultaneous feedback feature in the Google Classroom environment, which is covered in the research, contributes positively to the online feedback process’s functionality.

The themes that determine the weaknesses and the strengths of the implementation and the relationships between them can be seen on the map (See Figure 6). It can be assumed that the preservice teachers presented more opinions on the procedural problems, technical problems, and feedback sub-themes in the shortcomings of the application. Procedural problems are at the top of the
difficulties with video shooting. Per Law on the Protection of Personal Data in Turkey, official permission is required for video recordings to be performed in the classroom. Besides, students’ faces cannot be shown in the relevant records. This situation inevitably generated a problem in recording the candidates’ lectures throughout the application process in the research. Official permission was obtained from the meetings with the Directorate of National Education regarding the point in question to ensure the research’s sustainability. The recording of the lectures of the candidates with video is limited. Thus, video recordings were shot of the front rows during the lesson. Naturally, this situation led to the inability to follow the class as usual by those who watched the video recording. The relationship between preservice teachers’ thinking that course records do not reflect the natural environment and procedural problems can be explained thus and so.

Besides, the preservice teachers stated that they encountered technical problems while uploading their presentations to their classes created in the Google Classroom application. The fact that the quality and duration of the video they are trying to upload are at the top of these difficulties made the candidates express these obstacles due to the study’s deficiency. Although these problems are resolved by applying utilities that enable them to reduce files, the time spent transferring the records to the system may have led them to a negative thought. When evaluated from this point of view, although the content design included in the online education process is regarded as essential in the success of online learning environments (Davis, 2000; Fayer, 2017), it shows the importance of the principles in planning lessons in the multimedia environment (Mayer & Fiorella, 2014).

An impressive result obtained in the study is that the "feedback" sub-theme attracts attention with a strong connection among the themes that constitute the application’s deficiencies. Preservice teachers genuinely expressed the shortcomings of the feedback received online. The lack of face to face of the feedback creating less discussion environment since the criticisms made in the online environment are written, the reader misunderstanding in different ways than what the author is trying to express, and this situation increasing their anxiety can be counted among the results obtained. A related situation was emphasized in Klemm’s (2000) study, and it was reported that the students did not make the required contribution besides being content with reading what is written in online discussion platforms. It is thought that students should be guided in revealing their reflective views in their discussion texts.

Candidates who stated their opinions on the shortcomings of the application had suggestions to eliminate these deficiencies. It can be said that their suggestions are in a strong relationship with their preferences. The candidates offered suggestions to plan the online environment in a way that would also allow face-to-face discussion. In this context, their choice is to run an online and face-to-face environment together.  

In summary, preservice teachers perceived the online environment healthy in terms of allowing them to evaluate the online environment regardless of time and place, to be able to watch the course records again, to have permanent feedback, to see their performance improvements concretely. They found the practice incomplete due to reasons such as the fact that the discussion environment was not practical since the feedback was not face to face in the same environment, and that the written language was open to misunderstanding, which increased their concerns. In this sense, it is understood that communication among the person who receives and gives feedback is essential. In many studies, attention has been drawn to the mutual interaction between the recipient and the person giving it for effective feedback (Brinko 1993; Thurlings, Vermeulen, Bastiaens & Stijnen, 2013). Therefore, they stated that using this application within the scope of the course will serve the candidates. Still, face-to-face feedback and discussion environment will be more beneficial for them. In this context, the preference of the candidates was more to use online and face-to-face applications together.
2-Discussion and results regarding the opinions of the mentor teachers

It is observed that teachers’ opinions, one of the other participants of the study, are mostly focused on the deficient aspects of the application, and the themes of suggestions (Figure 7). It can be assumed that this is due to the different roles of the preservice teachers and teachers during their studies. It is encouraging for the teachers, who have an evaluative mission, to present their observations on the shortcomings of the implementation and suggestions to correct them.

![Figure 6. Relational map obtained from the opinions of mentor teachers](image)

Teachers who experience related thoughts with the preservice teachers regard it as a great comfort to watch the presentations recorded in the application, particularly in several places. They express the ability to watch the recordings repeatedly whenever they want, wherever internet access is available (Lin & Hsieh, 2001). The feedback theme stands out as another strength of the application. Teachers find it positive that the online environment’s feedback gives the candidates time for self-evaluation and recognizing their mistakes. The opinions of the teachers about the shortcomings of the application are under the theme of video shooting. In addition to the procedural difficulties that the preservice teachers have similar views, one of the teachers thinks that all the preservice teachers’ presence during the course registration increases the anxiety of the preservice teacher. He suggests that only the teacher should be present in the classroom and that the other candidates should watch their friends online. Teachers support the idea that preservice teachers’ writing online can be misunderstood, and that would increase the candidates’ anxiety. Teachers who offer suggestions for planning the online environment to make up for this deficiency stated that at the beginning of the application, it would be helpful to hold a meeting with the candidates for the feedback and to warn them to pay attention to the written language.

Teachers’ opinions on whether the feedback is only online or together in face to face and online environments differ. One of the teachers describes the study’s deficiency as having feedback only online and not having discussions face to face. He argues that face-to-face feedback should be available to discuss this deficiency and that the online environment should be used as a supportive
one. It would not be wrong to mention the effectiveness of blended learning environments (Picciano, 2006; Vaughan, 2007) in the face of this aspect of the teacher. The other teacher claims that the entire application should be online, each candidate should lecture alone, and other stakeholders should evaluate the candidate online. According to this teacher’s feedback, postponing rather than giving it right after the lesson is more effective in giving the preservice teacher time to make self-assessment and realize his/her mistakes.

When Figure 6 is reviewed, teachers’ opinions about the process also affect their preferences. By completing the application’s specified deficiencies, the results of online execution and running face to face and online together have been obtained.

In summary, the teachers found the practice efficient in allowing the records to be reviewed and evaluated independently from the location. Due to the online environment’s permanent feedback, the preservice teachers improved their performance and were allowed to make self-evaluation. Teachers’ suggestions concerning the shortcomings of the application vary. These can be expressed as:

- The teaching practice course should be carried online. The design can be updated as follows: Only the narrator teacher should be in the classroom; other stakeholders should monitor and evaluate the trainee online. Thus, all stakeholders can have the opportunity to watch the lecture for the first time and evaluate it in detail. Instead of giving immediate feedback after the lecture, the preservice teacher will have time to make his/her self-assessment, thanks to the postponed feedback.

- Teaching practice courses should be conducted online and face to face. Lessons should be recorded for a shorter period, and the recordings should be used to identify the deficiencies. All stakeholders should watch as many lectures as possible, prompt, and face-to-face feedback should be given right after the lecture presentations. A rich discussion environment should be constructed.

3-Discussion results regarding the common views of preservice teachers and mentor teachers.

![Relational map obtained from the opinions of preservice teachers](image-url)
The sub-themes labelled in red in the relational map given in Figure 7 indicate the standard views of preservice teachers and teachers concerning the application. The results obtained from the map can be summarized as follows.

- Stakeholders evaluate the application efficient and beneficial since the permanent feedback given in the online environment, the opportunity to be watched again by providing flexibility in terms of time and place, and the opportunities it affords for self-assessment and eliminating the shortcomings of the candidates.

- Stakeholders think that video footage is limited due to procedural reasons, and hence the recordings do not fully reflect the real environment.

- The preservice teachers thought that the online environment’s feedback was misunderstood due to the written language and consequently caused them to worry about making mistakes. Besides, teachers support the candidates’ opinions by expressing that this anxiety will increase if the other stakeholders are in the class and that having too many people in the course may disturb the preservice teacher. According to the teachers, talking with the preservice teacher about the dose and style of criticism will prevent misunderstandings from the written language at a meeting to be held before the application starts.

- For stakeholders, designing the online environment to complement face-to-face feedback is the more dominant suggestion.

**SUGGESTIONS**

Some suggestions can be offered based on the results obtained within the research.

- The first suggestion can be given over the methodological model in which the study was conducted. As a result of the research’s re-design with an experimental model, studies that reveal the differences in the control group can be carried. Active participation in online learning environments is an essential issue for reflecting the ideas critically and contributing to learning products. Before the applications to be carried out, students should be notified of this issue.

- It is also possible to present suggestions for researchers who want to carry out the teaching practice process online. Participants within the scope of this study consisted of preservice teachers studying in elementary mathematics education. Related studies can be carried out in which the research group consists of candidates from different departments to ensure the research’s generalizability.

- In this research, discussions via videos were conducted over Google Classroom. Online discussions can be handled on other programs considered to be more beneficial than this one.

- Feedback corrections made online and face-to-face throughout the period can be applied together.

- Besides, it is seen that the current COVID-19 pandemic process has adversely affected life in almost all areas. This unfavorability also includes the education process, and the educational activities carried out at all education levels were negatively affected. When considered in terms of learners, the mentioned educational activities emerge as a situation that should not be neglected. With the awareness of this situation, the concept of distance education has gained importance. It has been recognized that
countries around the globe are trying to carry out their educational activities for students through online platforms. Preservice teachers are not expected to be deprived of these practices in case of any unfavorable situation that may occur, considering the importance of practical lessons within the scope of teacher training activities. If the current COVID-19 epidemic process and its consequences are assessed within the scope of these negativities, likely, preservice teachers will not be physically involved in school environments. At this point, distance education environments where simultaneous and nonsynchronous communication opportunities are offered can be implemented to ensure school applications. The active participation of students in applications carried out through online environments is regarded as necessary for the applications’ efficiency. In this sense, the students’ level of readiness who will participate in the applications should not be overlooked by determining the necessary improvements within the scope of pilot applications.

REFERENCES


The Examination of the Postgraduate Theses on Models and Modelling in Science Education in Turkey

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Abstract

The models and modelling takes an important place in the teaching of science. The purpose of this research was to examine the postgraduate theses made in Turkey about models and modelling in the science education field by using the content analysis method. When the postgraduate theses were examined in respect to the purpose of the research, it has been determined that the number of the experimental research studies which were aimed to examine the efficiency of the model/modelling based teaching method was more than the others. In the examined theses, it has been identified that quantitative methods were more preferred as a research method. In the sense of the research sample, it has been determined that the number of research studies on the middle school level, especially those on 7th grade students was numerically more. It was seen that the most used data collection tool was conceptual test. The most examined variables in the theses were the achievement level and the mental model of the participants. The most preferred subjects were the “Atom and its structure” and the “Astronomy”. Based on the results, some suggestions were presented to future research studies related to models and modelling in science education.

Keywords: Content Analysis, Postgraduate Thesis, Models in Science Education, Modelling in Science Education.

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INTRODUCTION

The students have many difficulties in science education. In many research studies about science education, it was stated that students could not understand science concepts in the scientific sense (Bayram et al., 1997; Çalış, 2010; Coştu et al., 2007; Kurnaz & Değermenci, 2012). Science contains abstract concepts and processes due to its nature. Thus, the models are widely used to help people to understand and embody the abstract concepts and complex processes in science. In these premises, models and modelling have become a crucial and central role in both doing and teaching of science (Devi et al., 1996; Düşkün & Ünal, 2015; Güneş et al., 2004; Ogan-Bekiroglu, 2006; Treagust et al., 2002).

Gilbert et al. (2000) mention three aspects about the importance of models:

- The models are the basic tools in the process of an individual's perception and understanding of a fact/knowledge.
- The phases of developing a model and testing it play an important role in the process of developing, testing and sharing scientific knowledge.
- The models are one of the most important outputs and products of science.

When the literature examined, it was seen that different definitions of models are made by various researchers. According to Ingham and Gilbert (1991), a model is a simplified representation that concentrates on specific aspects of a system. According to Paton (1996), a model is scientific and mental activities used to ease the events that are seen as complicated by people. As to Gilbert (2011), a model is a system comprising of objects, symbols and connections so as to represent a system in real world which is called as 'target'. According to Gilbert et al. (2000), it is a representation of an object, fact, process or idea. According to Hestenes (2006), a model is a simple representation of actual or imaginary structures which are interrelated to each other. A model can be a representation of a concrete object or process (Harrison & Treagust, 1998). Similar to the variety of the definition of models, it was observed that there was a variety in the definition of modelling process. According to Greca and Moreira (2000), modelling is correlating semantic relations between the facts/objects and the theories. According to Gilbert et al. (2000), modelling is a crucial process in constructing, evaluating, and spreading the scientific knowledge. As to Schwarz et al. (2009), the modelling is the central part of science literacy; it is a scientific process which contains constructing a model, using the model, evaluating the model and revision of the model.

Similar to the variety of the definition of models, it is seen that there is also differences in the categorization of the models. Harrison and Treagust (2000) have categorized models as; scale models, pedagogical analogical models, symbolic (iconic) models, mathematical models, theoretical models, maps, diagrams and tables, concept process models, simulation, mental models, synthetic models. Ünal and Ergin (2006) have categorized models as; open models and mental models. On the other hand, Ornek (2008) have categorized models under two headings as; mental models and conceptual models.

The use of models and modelling as a teaching/learning way in the science classes has brought out “models or modelling based teaching” concept. Model based teaching is a teaching approach where the involved knowledge sources, teaching activities and teaching strategies are used all together to simplify the construction of a mental model within both individuals and learning groups (Gobert & Buckley, 2000). Besides, modelling based teaching is a teaching approach in where modelling activities are conducted in the teaching process, and in where students comprehend the nature of science better and take an active role in the process through setting a model and model constructing activities (Harrison & Treagust, 1998; Schwarz, 2009; Sins et al., 2009; Windschitl et al., 2008).
When the literature examined, it was seen model/modelling based teaching method helps students to:

- develop a positive attitude against science lessons,
- increase their motivations towards science lessons,
- take an active role in the teaching process,
- build and develop their mental models,
- raise their academic success.

As a result of the literature search, any research which analysis the articles or postgraduate theses on models and modelling in science education has not been encountered. Examining of the research studies on models and modelling in science education is of great importance in terms of identifying tendencies in these research studies, revealing the deficiencies in the related literature and shedding light on future research studies.

The purpose of this research was to present the tendencies of the 91 postgraduate theses that conducted on model and modelling in science education in Turkey by using the content analysis method. The obtained findings of the research are believed to light the way for future research studies by revealing the general condition of the research studies on models and modelling in science education.

**RESEARCH METHODOLOGY**

In this research, the Turkish postgraduate theses about models and modelling in science education have been examined. While the research has been planned as a qualitative research, document review has been used as the data collection method. According to Yıldırım and Şimşek (2011), document reviews are the analysis of the materials containing the knowledge about the events and facts that are aimed to be examined. The content analysis method has been used for analysing the obtained data. The purpose of the content analysis is to reveal the concepts, that can explain the obtained data, and the connections between these concepts, and to present these in a system that readers can understand by categorizing them in particular frameworks of the subject (Yıldırım & Şimşek, 2011). Theses within the scope of the research were theses that conducted on model and modelling in science education in Turkey. This research was completed in January 2020.

**Population and Sample**

As of November 2019, the number of completed theses in the field of "Education and Training" in Turkey was 49,261 of which 40,948 were master's thesis and 8,248 were doctoral dissertation (T.C. Council of Higher Education Thesis Center, 2019). The purpose of this research was to examine the trends of theses that were conducted on model and modelling topics in science education. The population of the research was the Turkish postgraduate theses about models and modelling in science education. Therefore, the target population was all theses on the subject of science education and model and modelling. The target population was 91 theses, as described in the subsection.

**Data Collection and the Analysis of Data**

In the process of collecting the data, a search has been made for the postgraduate theses which was under the 'Education and Training' subject area in the Turkish Council of Higher Education Thesis Center, and which contains the 'model' and/or 'modelling' keywords. As a result of the search, 1576
thesis records were reached. The abstracts, keywords and titles of the theses obtained were examined to analysis whether the theses were about model and modelling in science education. The 91 of these were determined to be related to science education and these research studies were included to the present research for detailed examination. These theses were completed between 2001 and 2019. 8 of 91 theses were in English. A thesis analysis form (TAF) that is presented in the Appendix 1 was used to analyse and codify the theses. While creating the TAF, the criteria used in the studies examining articles or theses on different topics in the literature by using content analysis method were taken into consideration. The postgraduate theses were independently reviewed by both researchers using the TAF. Cohen Kappa statistics were calculated among the coders for the reliability of the research. According to the calculated Cohen Kappa coefficient (> 0.80), compatibility between coders is excellent (Landis & Koch, 1977). The postgraduate theses were examined in detail and coded by using the TAF according to their publication years, purposes, methods, samples, data collection instruments, research variables, and the subject to be focused. By using the TAF, the collected data has been presented in the findings in graphics and tables together with percentages and frequency values.

RESULTS

The findings obtained as a result of the analysis of the Turkish postgraduate theses according to the determined criteria in TAF has been shown in graphics and tables together with percentages and frequency values by using the descriptive statistics method. The postgraduate theses reviewed are shown in Figure 1 according to their publication years.

![Figure 1. The distribution of the theses examined according to their publication years](image_url)

According to Figure 1, it was seen that the number of the Turkish theses on models and modelling in science education had increased to the present day. Within the examined theses, the number of the theses in year 2018 was the highest (about 16%).

The distribution of the theses examined according to their research purposes are given in Table 1.
Table 1. The distribution of the theses examined according to their research purposes

<table>
<thead>
<tr>
<th>Purpose of research</th>
<th>Doctoral dissertation</th>
<th>Master’s thesis</th>
<th>Total</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The examination of the effects of model/modelling based teaching method</td>
<td>23</td>
<td>35</td>
<td>58</td>
<td>63.7</td>
</tr>
<tr>
<td>Determination of the mental models of participants of a selected concept</td>
<td>1</td>
<td>21</td>
<td>22</td>
<td>24.2</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>8</td>
<td>11</td>
<td>12.1</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>64</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 1, almost all of the doctoral dissertations and more than half of the master theses in Turkey were aimed to examine the effects of models or modelling based teaching process on different variables (63.7%). In most of these research studies, quasi-experimental design was used, and the effect of models or modelling based teaching process had been examined by using experimental and control groups. Most of the resting research studies were those aimed to examine the mental models of a target group about a specified subject. These were generally designed as a survey or case research. It was seen that five studies aimed to examine the respondents' views about models/modelling and their use in science or science education, while two of them aimed to examine the effect of various teaching methods on the development of mental models of students. Moreover, one research which aimed to develop a scale for evaluating modelling skills, one research which aimed to develop the modelling skills of students, one research which aimed to determine the factors affecting the modelling process, and one research focused on designing/constructing models and modelling process were included in “other” category.

Table 2 shows the distribution of the theses examined according to their selected/used research method.

Table 2. The distribution of the examined theses in terms of their research methods

<table>
<thead>
<tr>
<th>Research method</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative</td>
<td>43</td>
<td>47.3</td>
</tr>
<tr>
<td>Qualitative</td>
<td>29</td>
<td>31.9</td>
</tr>
<tr>
<td>Mixed</td>
<td>19</td>
<td>20.9</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>100</td>
</tr>
</tbody>
</table>

According to Table 2, it has been detected that the quantitative method (47.3%) was further more used in the postgraduate theses. It was followed respectively by the qualitative research method with 31.9% and the mixed method with 20.9%.

The distribution of the theses examined in this research content according to their sample is given in Table 3.

Table 3. The distribution of the theses examined according to their sample

<table>
<thead>
<tr>
<th>Sample</th>
<th>Sample Group</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>Pre-service science teachers</td>
<td>17</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Pre-service physics teachers</td>
<td>5</td>
<td>3.9</td>
</tr>
<tr>
<td></td>
<td>Pre-service chemistry teachers</td>
<td>4</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Pre-service primary school mathematics teachers</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Pre-service preschool teachers</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Pre-service elementary school teachers</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Pre-service secondary school mathematics teachers</td>
<td>1</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>Medical faculty students</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>
According to Table 3, it has been specified that the Turkish postgraduate theses on models and modelling in science education were further more applied with middle school students (41.7%). In the middle school level, the research studies were mostly conducted with 7th grade students (18.9%). The most research in the undergraduate level (26%) conducted with pre-service science teachers (13.4%). In some of the theses examined, the sample consisted of respondents from different educational levels. It was found that the numbers of the theses conducted with associate degree students and primary school students were quite low. No research studies conducted with preschool students have been encountered. All of the examined theses except one have included students in their samples. Moreover, there have been theses in which the sample includes teachers and lecturers as well as the students.

The distribution of the theses examined according to their selected/used data collection tools is presented in Table 4.

### Table 4. The distribution of the theses examined in terms of the data collection tools used

<table>
<thead>
<tr>
<th>Data collection tool</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement test</td>
<td>37</td>
<td>17.5</td>
</tr>
<tr>
<td>Activity papers/documents</td>
<td>7</td>
<td>3.3</td>
</tr>
<tr>
<td>Conceptual test</td>
<td>51</td>
<td>24.1</td>
</tr>
<tr>
<td>Diary</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td>Interview</td>
<td>46</td>
<td>21.7</td>
</tr>
<tr>
<td>Observation</td>
<td>12</td>
<td>5.7</td>
</tr>
<tr>
<td>Scale</td>
<td>27</td>
<td>12.7</td>
</tr>
<tr>
<td>Skill test</td>
<td>16</td>
<td>7.6</td>
</tr>
<tr>
<td>Survey</td>
<td>9</td>
<td>4.3</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td>Total</td>
<td>212</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 4, the most used data collection tools were conceptual tests (24.1%) and interviews (21.7%) in the theses examined. Besides these, achievement test (17.5%) was frequently used as data collection tool in the theses examined. While drawings and open-ended questions were
used in most of the conceptual tests, it has been seen that two-tier, three-tier, multiple-choice, and true/false question types were less used in the theses examined. On the other hand, it has been seen that the majority of the achievement tests consisted of multiple-choice questions. The interview as a data collection tool was generally used to determine the respondents’ mental models and their conceptual understanding levels on a specific subject/concept, or to determine their views on the teaching applications used in the research. Also, in a lot of the research studies, it has been seen that more than one data collection tool was used together. Exam scores of students, student homeworks and etc. were rarely used as data collection tools in the theses examined, so they were included in “other” category.

The distribution of the theses examined according to their examined variables is shown in Table 5.

Table 5. The distribution of the theses examined in terms of their examined variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement Level</td>
<td>37</td>
<td>18.6</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Attitude</td>
<td>13</td>
<td>6.5</td>
</tr>
<tr>
<td>Conceptual Change</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Conceptual Understanding Level</td>
<td>33</td>
<td>16.6</td>
</tr>
<tr>
<td>Critical Thinking Skill</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Logical Thinking Skill</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Mental Model</td>
<td>37</td>
<td>18.6</td>
</tr>
<tr>
<td>Modelling Skill</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Motivation</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Participant Views</td>
<td>27</td>
<td>13.6</td>
</tr>
<tr>
<td>Retention</td>
<td>12</td>
<td>6.0</td>
</tr>
<tr>
<td>Scientific Creativity Level</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Scientific Process Skill</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Spatial Skill</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Views on the Nature of Science</td>
<td>4</td>
<td>1.5</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 5, the achievement level (18.6%) and the mental model (18.6%) were the most examined variables in the theses examined. These variables were followed by conceptual understanding level (16.6%) and participant views (13.6%) variables. “Self-efficacy”, “learning approaches”, “problem solving skill”, “goal setting strategy tendencies”, and “ontological belief” variables were included in “other” category. In a great deal of the theses, it has been seen that more than one variable was examined. On the other hand, it has been seen that the number of the research studies which were oriented to research 21st century skills like the problem solving and critical thinking were very low.

The distribution of the theses examined according to the concepts/subjects to be focused is seen in Table 6.
Table 6. The distribution of the examined theses in terms of the subjects to be focused

<table>
<thead>
<tr>
<th>Field</th>
<th>Concept/Subject</th>
<th>( f )</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
<td>Cell/Cell Division/Inheritance</td>
<td>8</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Circulatory system</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Digestive System</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Environment and Environmental Issues</td>
<td>6</td>
<td>6.3</td>
</tr>
<tr>
<td></td>
<td>Foods</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Microorganisms</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Plants</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Reproduction System</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Respiratory System</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Urinary System</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>27</td>
<td>28.4</td>
</tr>
<tr>
<td>Physics</td>
<td>Astronomy</td>
<td>12</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>Dynamic</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Electricity</td>
<td>9</td>
<td>9.5</td>
</tr>
<tr>
<td></td>
<td>Energy</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Light</td>
<td>3</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Machines</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Pressure</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Projectile Motion</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Sound</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>32</td>
<td>33.7</td>
</tr>
<tr>
<td>Chemistry</td>
<td>Chemical Bonding</td>
<td>7</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>Atom and Its Structure</td>
<td>12</td>
<td>12.6</td>
</tr>
<tr>
<td></td>
<td>Earth Crust</td>
<td>2</td>
<td>2.1</td>
</tr>
<tr>
<td></td>
<td>Chemical Reactions</td>
<td>4</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>Gases</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Solutions</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Electrochemistry</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>Matter and Heat</td>
<td>8</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>36</td>
<td>37.9</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 6, it has been determined that the most researched field was chemistry (37.9%) in the theses examined. The most studied subject in chemistry was “Atom and Its Structure” (12.6%). The field of chemistry was followed by physics (33.7%) field and biology (28.4%) field. While the most studied subject in the field of physics was astronomy (12.6%), the most studied subject in the biology field was cell / cell division (8.4%). It has been seen that some theses have studied on more than one subject. This was the reason why the total number of subjects is 95 in Table 6.

**DISCUSSION**

It has been seen that the first Turkish thesis which was accessed and studied on models and modelling in science education field was published in the year 2001. It can be deduced that the number of the theses on models and modelling in science education have increased to the present day. However, the upward trend observed after the year of 2011 was not as high as in 2001-2011. The reason for this may be that the recent theses on models and modelling in science education have focused on a specific type of models such as analogy, simulation, and etc., rather than using of all types of models. Moreover, the authors may not be emphasized that the teaching materials (analogy, simulation, etc.) used in their thesis are the types of model. The recent research studies in this field could be presented within the following contents like analogies, multimedia use, augmented reality, virtual reality, mobile learning, etc.

According to the aims of the theses examined, it was seen that they were gathered into two categories. These were; a) the research studies which aim to examine the effect of model/modelling
based instruction method in terms of different variables such as students understanding level and achievement or to develop participants’ mental models on a specified subject, b) the research studies which aim to find out the existing mental models of the participants towards a specific subject/concept. Almost all of the doctoral dissertations and most of the master theses were intervention research aiming to determine the effects of model/modelling based instruction on different variables. This situation shows similarity with some of the earlier research results, while it differs with some others. Deniş-Çeliker and Uçar (2015), who examined the theses on science education in Turkey, have reported that experimental research design was generally used in the examined theses and remarked that the rate of using experimental research design in doctoral dissertations was higher than that in master theses. While various literature review studies on mathematics education (Bakı et al., 2011; F. Ulutaş & Ubuz, 2008), physics education (Kaltakçı-Gürel et al., 2017) and science education in Turkey (Küçüközer, 2016) have reported that the studies including an intervention and having experimental design were predominant, the some literature review studies on chemistry education (B. Ulutaş et al., 2015) and biology education (Gul & Sozbilir, 2015) have reported that the research studies aiming to determine a current statement without any intervention were the majority. The rate of the intervention research studies in doctoral dissertations which are long-term and in-depth research studies are higher than that in master’s theses which are generally short-term research studies in contrast to them. Therefore, this difference in the results of various research studies may be due to the proportion of doctoral dissertations and master theses in research studies they examined in the context of their research studies.

Although it was specified that the number of the thesis using the qualitative and mixed research methods was gradually increasing towards today, it has been determined that the quantitative research method is used much more in the Turkish theses examined in this research. This result shows similarity with the results of various literature review studies on education (B. Ulutaş et al., 2015; Banning & Folkestad, 2012; Derman, 2017; Doğru et al., 2012; Kaltakçı-Gürel et al., 2017; Önder et al., 2013). Unlike this result of current research, it has been found out that while the mixed method is predominant in the various literature review studies on science education (Küçüközer, 2016), chemistry education (Teo et al., 2014), augmented reality based instructional technologies (Bacca et al., 2014). Besides, the qualitative method is predominant in the some literature review studies science education (O’Toole et al., 2018), modelling in mathematics education (Aztekin & Taşpinar-Şener, 2015; Albayrak & Çiltaş, 2017). The reason of the contradiction in the generated results of the research studies examining theses or articles could be due to the fact that the selection for the research method shows difference according to different fields, purposes, subjects and years.

When they were examined in terms of their samples, it was found that most of them were conducted with the middle school students. Especially, the number of the research studies conducted with 7th grade students was the highest. The “high school entrance exam” is performed at the end of 8th grade in Turkey. It can be said that researchers preferred 7th and 6th grade students rather than 8th grade as a sample in their studies due to this exam. In the theses examined in this research, the other group that was the most studied as a research sample was undergraduate students. It was seen that the most used sample group in undergraduate level was pre-service science teachers. However, it was determined that the number of research studies conducted with science teachers and primary school students were very low. Similarly, Küçüközer (2016) reported that the majority of the theses were conducted with pre-service teachers and middle school students, especially with 7th grade students. O’Toole et al. (2018) reported that the most preferred sample group in the research on science education was middle school students. On the other hand, the results of various studies examining research on chemistry education (Teo et al., 2014; B. Ulutaş et al., 2015), mathematical models and modelling (Albayrak & Çiltaş, 2017), physics education (Önder et al., 2013), biology education (Gul & Sozbilir, 2015) and augmented reality based instructional technologies (Bacca et al., 2014) were in harmony with this research, and it has been reported that the number of research studies conducted with undergraduate students as a sample group was higher than the other groups. It is considered that undergraduate students are preferred as the sample because they are easy and accessible for
researchers. However, the level or the character of the sample may vary depending on the research field, subject and purpose.

The most used data collection instruments in the postgraduate theses on models and modelling in science education were specified to be the conceptual tests and the interviews. This shows that it has been aimed to determine the effect of a teaching intervention based on models and modelling on student's conceptual understanding levels in most of the theses examined. At this point, an important confusion catches the attention in the theses examined in this research. It was determined that interviews, the other commonly used data collection tool in the theses, was generally used to determine the participants' mental models, conceptual understanding levels or their views about the teaching process including models or modelling process. In most of the theses examined, it was determined that more than one data collection tool was used together. Similar and different results were obtained in various research studies in the literature. In various literature review studies on biology education studies (Gul & Sozbilir, 2015), on physics education studies (Kaltakçı-Gürel et al., 2017; Önder et al., 2013) and on mathematics education studies (Baki et al., 2011), it was also reported that the most used data collection tool in the research studies was achievement test. However, in some literature review studies on mathematical models and moulding (Albayrak & Çıltas, 2017), on augmented reality (Bacca et al., 2014), it was reported that the most used data collection tool in the research studies was interview. In various literature review studies on biology education studies (Gul & Sozbilir, 2015), on physics education studies (Kaltakçı-Gürel et al., 2017; Önder et al., 2013) and on mathematics education studies (Baki et al., 2011), it was also reported that the most used data collection tool in the research studies was achievement test. However, in some literature review studies on mathematical models and moulding (Albayrak & Çıltas, 2017), on augmented reality (Bacca et al., 2014), it was reported that the most used data collection tool in the research studies was interview. In recent years, considering that the emphasis in science education research studies has been focused on concept teaching and that there has been a struggle in the research studies for improving students' understanding levels of basic science concepts by using various teaching methods and strategies, it is an expected result that the most widely used data collection tool will be conceptual tests.

In the examined theses, it has been concluded that the most discussed variables were the achievement level and the mental model. This matter shows that it is in the line with the research studies in various fields about education that success is the variable of students’ achievement (Deniş-Çeliker & Uçar, 2015; Derman, 2017; Önder et al., 2013; B. Ulutaş et al., 2015). Besides, it is an expected result that mental model is one of the most examined variables in postgraduate theses. Students' understanding levels and achievement about a subject in science depends on having scientifically correct mental models about it. Therefore, to ensure an effective concept teaching, the students' existing mental models should be defined firstly and then they should be tried to be developed. Nowadays, critical thinking, communication, knowledge management, cooperation skills are accepted as 21st century skills (Ananiadou & Claro, 2009; Binkley et al., 2012; Voogt & Roblin, 2012). Model or modelling based teaching, could help to develop critical thinking, abstraction, and problem solving skills. On the other hand, the opposite of this relation is also possible. Student's critical thinking, abstraction, and problem solving skills could affect their modelling skills. However, there were not enough research studies examining this relationship, in other words the relationship between 21st century skills and model use or modelling ability in the context of cause-effect. Moreover, it was determined that the examined postgraduate theses predominately focused on cognitive domain. It has been seen that the number of theses which examined the affective behaviours domain, which can directly or implicitly affect students’ achievement, or the important components of affective behaviours domain like motivation, attitude, self-sufficiency, self-confidence, and anxiety was quite limited.

In the postgraduate theses examined within this research, it has been specified that most of the theses were related to chemistry discipline. It was seen that the most examined subject in chemistry field was the “atom and its structure”. Due to its abstract structure, chemistry was a discipline which widely contains models and modelling. In the postgraduate theses examined within the research, it has been seen that the “astronomy” subject was the most researched subject in physics discipline, and the “cell/cell division/inheritance” subject in the biology field. These subjects being abstract, being occurred in the micro/ macro dimension, and being difficult to understand for the students could be the reason of this situation. In their research where they examined the postgraduate theses in science education, Doğru et al. (2012) have reported that “atom and its structure” in the field of chemistry,
“ecosystem and ecology” in the field of biology, and “electric” and “force and motion” in the field of physics were the most studied subjects.

**CONCLUSIONS AND IMPLICATIONS**

The aim of this research was to examine the postgraduate theses made in Turkey about models and modelling in the science education field. In this context, 91 postgraduate theses were examined in detail and coded by using the TAF according to their year, thesis type, department, purpose, method, sample and its size, data collection instrument, research variables, and the subject to be focused. When the postgraduate theses were examined in respect to the purpose of the research, it has been determined that the number of the experimental research studies which were aimed to examine the efficiency of the model/modelling based teaching method was more than the others. In the examined theses, it has been identified that quantitative methods were more preferred as a research method. In the sense of the research sample, it has been determined that the number of research studies on the middle school level, especially those on 7th grade students was numerically more. It was seen that the most used data collection tool was conceptual test. The most examined variables in the theses were the achievement level and the mental model. The most preferred subjects were the “Atom and its structure” and the “Astronomy”. In the light of the obtained findings, some suggestions were presented to future research studies related to models and modelling in science education. Based on the results of this research, following suggestions can be made:

- Research studies about models and modelling can be planned especially for primary school students.
- Research studies should use different teaching ways such as collaborative learning, problem-based learning and project-based learning together with the model-based instruction method.
- Research studies should examine the effect of 21st century skills like critical thinking, problem solving and reflective thinking on students’ modelling skill.
- Research studies on the effect of the affective factors (attitude, interest, motivation, and anxiety), which can effect students’ achievement, on the development of students’ mental models can be planned.

**REFERENCES**


### Appendix 1. The thesis analysis form (TAF)

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<td>( ) Activity Papers/Documents</td>
<td>( ) Anxiety</td>
</tr>
<tr>
<td>( ) Conceptual Test</td>
<td>( ) Attitude</td>
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<tr>
<td>( ) Diary</td>
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<td>( ) Interview</td>
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<td>( ) Critical Thinking Skill</td>
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Do Paternalist Approaches of School Principals Kill Teachers’ Autonomy?

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Siirt University

Çiğdem Çelik Şahin
Ministry of National Education

Abstract

This research aims to examine the relationship between school principals' paternalist leadership behaviours and teacher autonomy. The research is a descriptive study in which causal comparison and correlational method are used together. 292 teachers were determined by using disproportionate sampling method. In this research, the Paternalist Leadership Behaviours Scale developed by Saylık & Aydın (2020), and the Teacher Autonomy Scale developed by Çolak (2016) were used. As a result, it was revealed that school principals show moderate paternalist leadership behaviours according to teacher perceptions. It is concluded that there is a moderate and negative relationship between school principals’ paternalist leadership approaches and teacher autonomy. As the paternalist leadership behaviours of school principals increase, teachers’ autonomous behaviour decreases. Another result of the research is that there is a positive relationship between family atmosphere and benevolence dimensions and teacher autonomy.

Keywords: Paternalist Leadership, Teacher Autonomy, School Principals

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INTRODUCTION

Leadership that is as old as human history derives from natural tendencies of people such as living together. This social drive creates many interactional structures from small groups to large social associations. Interaction between people has enabled some individuals to be more dominant than others over time. Dominant individuals become leaders with the acceptance of other individuals in the group. Therefore, leadership can be evaluated as social culture in general, and the differentiation is a result of the individual’s behaviour in the group and interaction with other individuals.

Paternalist leadership, which is a relatively new approach in leadership and management literature, is a common form of leadership in regions such as Pacific Asia, the Middle East and Latin America, especially in the context of intercultural leadership (Martinez, 2003; Pellegrini & Scandura, 2006).

It is stated that the value of paternalist social culture in Turkey was significantly higher (Aycan et al., 2000, 192-221). The distance between compassion and the power structure in the family of father and son together with collectivist and hierarchical structure in Turkey reflects to working life in time. This shapes the identity of the organization manager (Canbolat, Beraha, Çeliksoy, & Türker, 2010). It can be stated that this kind of informal structure and relationships are common especially in schools with its unique structure.

Paternalism, which is known to come from the word “pater” (peder), which is used in Latin as the meaning of the father (Mill, 2009). Paternalism is defined as the behaviour of limiting the freedom or autonomy of a person, organization for the good of the other person or group (Dworkin, 2002). According to Sinha (1990), paternalist leaders are like a traditionalist father who cares and encourages with an authoritarian distinctiveness. There is an authoritarian father figure who knows the needs and makes the best decisions for their children in a traditional father-child relationship (Pellegrini & Scandura, 2008: 569).

Analysis of paternalism raises some controversial issues. It is a matter of debate that the paternal approach imposes some limitations on freedom and autonomy. In addition, the precise boundaries of the basic features of paternal actions, such as including some kind of interventionism, seeing the person exposed to the intervention as inadequate, and the problem of consent, seem to be open to debate.

It is truth that effective leaders raise the motivation and confidence of the employees. In such educational environments, the teacher can feel the freedom to choose their own teaching strategies, determine their personal development needs, and go towards professional development. Can school principals with the paternalist leadership qualities provide teachers the ability to decide on their own (Reich, 2002)?

Castle & Aichele (1994), and Barfield et. al. (2002) defined teacher autonomy as a continuous research process that promotes the learning autonomy of students in the best manner including principles, action, negotiation, understanding limitations, and collaborative support. Similarly, Aoki (2000) defines teacher autonomy as the responsibility and or freedom and capacity of a teacher to make choices regarding their teaching.

School employees, who have strong emotional ties within the school, communicate face to face, and are friendly enough to be in contact with each other, can also come together outside the school and engage in some social sharing. The collectivist culture, in which face-to-face, private and natural relationships are the determinants of the principals’ paternal behaviours also evaluates all kinds of activities and approaches in the classroom as teachers’ private areas. This makes it difficult for school principals to enter this field as they wish.
Teacher autonomy is a concept of how much authority teachers have in performing their profession and what roles they should take. Teacher autonomy includes teachers' ability to plan and implement instruction, participate in educational decisions, evaluate students' academic achievements independently, organize the classroom environment, prepare an environment in which they can use different methods and techniques, and plan activities inside and outside the classroom. Teachers must have sufficient professional autonomy to plan new activities freely (Ingersoll, 2007).

The ethical problem with paternalism was how a person see the right to behave with a paternalist approach to individuals under the protection of anyone, regardless of the situation. Therefore, paternalism is seen as a violation of individual rights such as autonomy and the right to choose (Blokland, 1997). According to Gray (2013, 633), paternalism is that it tries to protect people from themselves as if their safety is more important than their freedom. However, Mill (2009, 18) states that it is not acceptable to give up autonomy for the beneficence principle, therefore, individual paternalism should be absolutely avoided. As an organizational and managerial approach, paternalist leadership is seen to be considered as a positive value and functional approach in general, based on a deep cultural heritage in Asian societies.

Although the studies for determining the dimensions of paternalist leadership keep the concept limited to the dimensions of benevolence, morality and authoritarianism, it is stated that paternal approaches are essentially exploitative, have some limitations on autonomy, and have some kind of interventionism, finding inadequacy, mask authoritarianism with father compassion and love (Saylık & Aydın, 2020). This research is important in terms of revealing how the paternalist leadership approaches individuals' autonomy without getting stuck in the blind spots of the emic context and without succumbing to the eurocentric instinct of positivism.

**METHODOLOGY**

In this section, the method for the solution of the research problems is explained. Accordingly, the research model, population and sample, data collection tools, data analysis and interpretation are discussed.

**Research model**

This research is a descriptive study in which correlational method, and causal comparison method of quantitative research models are used together.

It is aimed to describe the relationship between two or more variables within the context of the subject being investigated (Fraenkel & Wallen, 2003). With correlational method, the relationship between teachers’ views about school principals' paternalist leadership approaches and teachers’ autonomy levels was examined. With causal comparison method, the relationships between variables, and estimations of possible reasons are examined (Balcı, 2013, 260)

**Population and sample**

The research sample consists of 292 teachers working in primary, secondary and high schools in the city center of Siirt/ Turkey. Sampling was determined by the disproportionate cluster sampling, which is the sampling type in which all elements in the population have the chance to be selected equally.

The number of samples representing the population was calculated as 371 for 95% reliability level. Forms with missing and imprecise data, and unilateral and multilateral extreme values were excluded from the evaluation. As a result, analyses were made with 292 questionnaire forms.
Demographic profile of the participants

Percentage and frequency information regarding the distribution of teachers participating in the research according to independent variables (generation, residential area, seniority, branch and length of service at school) are given in Table 1.

Table 1. Personal Information Regarding Participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generation</td>
<td>Generation X</td>
<td>25</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Generation Y</td>
<td>267</td>
<td>91.4</td>
</tr>
<tr>
<td>Residential area</td>
<td>Village-Town/ District</td>
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<td></td>
<td>City</td>
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<tr>
<td>Seniority</td>
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<tr>
<td></td>
<td>4-6 years</td>
<td>68</td>
<td>23.3</td>
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<tr>
<td></td>
<td>7-9 years</td>
<td>39</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>10 years and over</td>
<td>63</td>
<td>21.6</td>
</tr>
<tr>
<td></td>
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<td>93</td>
<td>31.8</td>
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<tr>
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<td>199</td>
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<td>109</td>
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<tr>
<td></td>
<td>2-3 years</td>
<td>110</td>
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</tr>
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<td></td>
<td>4 years and over</td>
<td>73</td>
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<td>Total</td>
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<td>292</td>
<td>100</td>
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As can be seen in Table 1, 25 (8.6%) of the participants are from X generation (those who were born between 1965-1979) and 267 (91.4%) from Y generation (those who were born between 1980-1999). It is observed that 134 (45.9%) participants spent their lives in relatively small residential areas such as villages, towns and districts, while 158 (54.1%) participants spent their lives in relatively larger residential areas such as cities and metropolitan areas. While 93 participants are working as class teachers, and 199 are working as branch teachers.

The distribution of participants to seniority groups is different from each other. While 122 people (41.8%) are in the first three years of their working life, others have at least 4 years and above. Considering the length of service at school, it is seen that the number of teachers working at the same school for 4 years or more are less than the other groups. The region where the sample was chosen is a living area where teacher mobility is experienced quite a lot.

Data collection tools

The data collection tool consists of three parts. In the first part, there is demographic information of the participants regarding various variables, in the second part, paternalist leadership behaviour levels are determined, and in the third part, teacher autonomy levels are determined. The data of the research were obtained by using the Paternalist Leadership Behaviour Scale developed by Saylık & Aydın (2020) and the Teacher Autonomy Scale developed by Çolak (2016).

Paternalist leadership behaviour scale: The Paternalist Leadership Behaviours Scale (Saylık & Aydın, 2020) is a measurement tool consisting of 30 items and 5 sub-dimensions, developed to measure the paternalist leadership behaviour of school principals. The family atmosphere measures the level of creating a family atmosphere among those working inside and outside the school. The high score that can be obtained from this sub-dimension, which consists of 4 items, indicates that school principals have a high level of behaviour towards creating a family atmosphere among those working inside and outside the school. The benevolence dimension measures the level of goodwill in school principals’ managerial attitudes and behaviours. There are 9 items in this sub-dimension and the high score that can be obtained indicates that the level of benevolence is high in the paternalist behaviour of school principals. The authoritarianism dimension measures the level of authoritarian behaviour of school principals. The high score that can be obtained from this dimension, which consists of 4 items, indicates that school principals have high levels of authoritarian behaviour. The interventionism
dimension measures school principals’ level of intervention. There are 5 items in this sub-dimension. The high score indicates that school principals have high levels of interventionist behaviour. Finding inadequacy measures the level of school principals’ finding teachers inadequate. There are 8 items in this sub-dimension. The lowest score that can be obtained from the scale is 30, and the highest score is 150. High score indicates that school principals have high level of paternalist behaviours. There are no negative statements on the scale and therefore no reverse scoring. The high alpha coefficients related to the sub-dimensions of the scale (Family atmosphere=. 82, Benevolence =. 90, Authoritarianism = .85, Intervention = .89 and Finding inadequacy= .92) show that the items in the sub-dimensions are consistent. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) results also confirmed the validity of the scale.

Teacher autonomy scale: The other scale used in collecting research data is the Teacher Autonomy Scale (TAS). The scale was developed by Çolak (2016). The scale is a Likert-type scale that is answered within the range of 1-Strongly disagree and 5- Strongly agree. Scale consists of four sub-dimensions and a total of 17 items: teaching process autonomy (6 items), curriculum autonomy (5 items), professional development autonomy (3 items) and professional communication autonomy (3 items). There are no reverse scored items in the scale.

Factor loads of items .51 to .85 and item total correlations range between .47 and .74. The total variance rate explained by the sub-dimensions of the scale is 59.49%. The increase in the score obtained from each factor in the TAS or in which the total score is obtained, means the increase of the autonomy behaviours of the teachers. Cronbach’s Alpha internal consistency coefficients of the scale range between .78 and .85.

Data analysis

While deciding which of the parametric or non-parametric test methods to use in the analysis of the data, the normality and homogeneity of the item scores were examined. Data set scores arithmetic averages distribution were analyzed according to each variable. As a result of the analysis, the sample consisted of 292 (n> 50) people; mean, median, and mod values are close to each other in all dimensions. Q-Q plot forms close to 45 degree line. It was observed that the skewness coefficients were distributed between -1 and +1. When the Levene test results were examined according to independent variables for the homogeneity of the data, it was found that the p value was greater than .05 (p> .05) in all dimensions. Similarly, Kolmogorov-Smirnov normality analysis was found significant at the level of p> .05 according to the variables. In the light of all these results, it was decided to use parametric test methods in the analysis of research data.

Teachers’ views on the research objectives were analyzed according to arithmetic mean, standard deviation and dependent coefficient of variation. In the research, t-test and anova analysis were used, and the relationship between paternalist leadership and teacher autonomy was examined by Pearson correlation coefficient.

FINDINGS

In this section, the views of teachers about school principals’ paternalist leadership behaviour and teacher autonomy, comparison of these views with the variables of residential area, generation, branch, seniority and length of service at school are included. Then, the results of the correlation analysis between the paternalist leadership behaviours of school principals and the autonomy behaviours of the teachers were included. In Table 2, descriptive statistics on the paternalist leadership behaviours of school principals and the autonomy levels of teachers according to the participants’ opinions are presented.
Table 2. Descriptive Statistics on Variables

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<td>Finding inadequacy</td>
<td>292</td>
<td>2.34</td>
<td>.87</td>
<td>.81</td>
<td>.47</td>
</tr>
<tr>
<td>Teacher Autonomy</td>
<td>292</td>
<td>3.96</td>
<td>.56</td>
<td>-.23</td>
<td>.94</td>
</tr>
<tr>
<td>Teaching Process Autonomy</td>
<td>292</td>
<td>4.11</td>
<td>.54</td>
<td>-.59</td>
<td>.20</td>
</tr>
<tr>
<td>Curriculum Autonomy</td>
<td>292</td>
<td>3.10</td>
<td>.96</td>
<td>-.91</td>
<td>.88</td>
</tr>
<tr>
<td>Professional Development Autonomy</td>
<td>292</td>
<td>3.54</td>
<td>.94</td>
<td>-.56</td>
<td>-.26</td>
</tr>
<tr>
<td>Professional Communication Autonomy</td>
<td>292</td>
<td>3.57</td>
<td>.97</td>
<td>-.38</td>
<td>-.68</td>
</tr>
</tbody>
</table>

As can be seen in Table 2, according to the opinions of teachers, it was found that school principals show paternalist behaviours at a medium level ($\bar{X} = 3.08$). According to the teachers participated in the research, school principals demonstrate behaviours regarding family atmosphere at highest level in all dimensions ($\bar{X} = 3.87$, ss= .89) Benevolence dimension ($\bar{X} = 3.68$, ss= .87). Authoritarianism ($X = 3.28$, ss = .80), Interventionism ($\bar{X} = 2.38$, ss = .83) and finding inadequacy ($\bar{X} = 2.34$, ss= .87]). It has been observed that all sub-dimensions of teacher autonomy are perceived at a high level, the Teaching Process Autonomy dimension has the highest ($\bar{X} = 4.11$), and Professional Development Autonomy dimension has the lowest ($\bar{X} = 3.54$) mean.

The results of the t-test regarding whether the opinions of the teachers participating in the study differ according to the residential area, generation and branch variables are given in Table 3.

Table 3. T-Test Results on Residential area, Generation and Branch variables

<table>
<thead>
<tr>
<th>Variable and Dimensions</th>
<th>Level</th>
<th>N</th>
<th>Mean</th>
<th>SS</th>
<th>Sd</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternalist Leadership</td>
<td>Village/Town</td>
<td>134</td>
<td>3.01</td>
<td>.39</td>
<td>290</td>
<td>-2.47</td>
<td>.01*</td>
</tr>
<tr>
<td></td>
<td>City</td>
<td>158</td>
<td>3.13</td>
<td>.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Autonomy</td>
<td>Village/Town</td>
<td>134</td>
<td>3.94</td>
<td>.51</td>
<td>290</td>
<td>-5.84</td>
<td>.55</td>
</tr>
<tr>
<td></td>
<td>City</td>
<td>158</td>
<td>3.98</td>
<td>.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation X</td>
<td>Generation X</td>
<td>25</td>
<td>3.27</td>
<td>.43</td>
<td>290</td>
<td>2.60</td>
<td>.01*</td>
</tr>
<tr>
<td></td>
<td>Generation Y</td>
<td>267</td>
<td>3.05</td>
<td>.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Autonomy</td>
<td>Generation X</td>
<td>25</td>
<td>3.79</td>
<td>.54</td>
<td>290</td>
<td>-1.60</td>
<td>.11</td>
</tr>
<tr>
<td></td>
<td>Generation Y</td>
<td>267</td>
<td>3.97</td>
<td>.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class Teacher</td>
<td>Graduate</td>
<td>93</td>
<td>2.99</td>
<td>.38</td>
<td>290</td>
<td>-2.35</td>
<td>.02*</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>Graduate</td>
<td>93</td>
<td>3.99</td>
<td>.53</td>
<td>290</td>
<td>.716</td>
<td>.47</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)

As seen in Table 3, there is significant difference between residential area and paternalist leadership behaviours [t(290) = -2.47; p <.05]. Accordingly, the participants who spent their lives mostly in relatively large settlements such as city and metropolitan stated that school principals show a higher level of paternalist behaviour.

Large metropolitans can have a more individualistic social life relationship and network, whereas small rural settlements such as villages and towns can have a more collectivist life. For this reason, it can be stated that the participants who have a relatively more individualistic lifestyle are
more sensitive in perceiving the paternalist approaches of school principals. On the other hand, there is no significant difference between levels of teacher autonomy according to the residential area \(t(290) = -0.584; p < .05\). Accordingly, teachers’ rural or urban life are not determinants in the teacher autonomy.

When Table 3 is examined, it is seen that there is significant difference between the teacher opinions related to the paternalist behaviour of school principals and the generation variable \(t(290) = 2.60; p < .05\).

According to this, generation X representatives expressed a more positive view regarding the level of the school principals’ paternalist leadership behaviours compared to generation Y representatives.

According to the participants’ opinions related to the levels of teacher autonomy, no significant difference was determined according to the generation variable \(t(290) = -2.47; p < .05\).

When Table 3 is analyzed, it was seen that there is significant difference between the participants’ opinions related to school principals’ paternalist approaches in managerial process and branch variable \(t (290)= -2.35; p < .05\). Accordingly, branch teachers (such as mathematics, science, social studies, Turkish, physics, history, geography teachers) compared to the primary school teachers who are working in primary schools (teachers starting from the 1st grade to the end of 4th grade) find school principals more paternalists. However, teachers’ branches are not determinant at teacher autonomy levels \(t(290) = .716; p < .05\).

The results of anova whether the opinions of the teachers participating in the study differ according to the professional seniority, and length of service at school variables are given in Table 4.

**Table 4. ANOVA Test Results of Professional Seniority and Length of Service at School Variables**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Variables</th>
<th>Level (year)</th>
<th>n</th>
<th>(\bar{X})</th>
<th>SS</th>
<th>Sum of squares</th>
<th>d</th>
<th>Mean of squares</th>
<th>F</th>
<th>p</th>
<th>Difference (Tukey)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paternalist Leadership Behaviours</td>
<td>Length of service at school</td>
<td>0-1</td>
<td>109</td>
<td>3.03</td>
<td>.39</td>
<td>1.335</td>
<td>2</td>
<td>.668</td>
<td>4.23</td>
<td>.01</td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3</td>
<td>110</td>
<td>3.16</td>
<td>.43</td>
<td>45.590</td>
<td>289</td>
<td>.158</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 and over</td>
<td>73</td>
<td>3.00</td>
<td>.35</td>
<td>46.925</td>
<td>291</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional seniority</td>
<td>1-3</td>
<td>122</td>
<td>3.11</td>
<td>.40</td>
<td>.322</td>
<td>3</td>
<td>.107</td>
<td>.663</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4-6</td>
<td>68</td>
<td>3.08</td>
<td>.37</td>
<td>46.603</td>
<td>288</td>
<td>.162</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7-9</td>
<td>39</td>
<td>3.05</td>
<td>.48</td>
<td>46.925</td>
<td>291</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 and over</td>
<td>63</td>
<td>3.03</td>
<td>.37</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Autonomy</td>
<td>Length of service at school</td>
<td>0-1</td>
<td>109</td>
<td>4.06</td>
<td>.53</td>
<td>1.923</td>
<td>2</td>
<td>.962</td>
<td>3.156</td>
<td>.04</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2-3</td>
<td>110</td>
<td>3.93</td>
<td>.63</td>
<td>88.069</td>
<td>289</td>
<td>.305</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 and over</td>
<td>73</td>
<td>3.86</td>
<td>.45</td>
<td>89.992</td>
<td>291</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Professional seniority</td>
<td>1-3</td>
<td>122</td>
<td>4.04</td>
<td>.59</td>
<td>1.197</td>
<td>3</td>
<td>.399</td>
<td>1.294</td>
<td>.28</td>
<td>-</td>
</tr>
<tr>
<td></td>
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<td>4-6</td>
<td>68</td>
<td>3.91</td>
<td>.48</td>
<td>88.795</td>
<td>288</td>
<td>.308</td>
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<tr>
<td></td>
<td></td>
<td>7-9</td>
<td>39</td>
<td>3.94</td>
<td>.52</td>
<td>89.992</td>
<td>291</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 and over</td>
<td>63</td>
<td>3.89</td>
<td>.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When Table 4 is analyzed, it can be seen that the paternalist leadership behaviours of school principals show a statistically significant difference according to the professional seniority variable.

When we compare the results of the Tukey test, it can be said that there is a significant difference between the ones who have 2-3 years service length at school and those who are 4 or more years in the total of the paternalist leadership behaviour scale \(p < .05\). Accordingly, those who have a 2-3 year of professional seniority perceive school principals more paternalist than those who are 4 years or more.
As seen in Table 4, the paternalist leadership behaviours of school principals do not demonstrate a statistically significant difference according to teachers' professional seniority variable. When the findings are analyzed, it can be seen that teachers with different professional seniority have similar views regarding the level of school principals' paternalist leadership behaviours. Considering that the high scores obtained from the scale represent a high level of paternalist behaviours, it can be said that as the time spent in the profession increases, the teachers consider the school principals less paternalists or those who are new in the profession consider the school principals more paternalists.

When Table 4 is analyzed, it is seen that teacher autonomy shows a statistically significant difference according to the length of service at schools variable.

When we compare the Tukey test results, it is seen that there is a significant difference in the total of teacher autonomy scale (p <.05) between those who have a 0-1 years of professional seniority and those who are 4 years or more. Accordingly, teachers who have a 0-1 year of professional seniority think that they are more autonomous than teachers who have 4 years or more. Considering that the high scores obtained from the scale represent a high level of autonomy, it can be said that as the time spent by teachers in the same school increases, their perception of autonomy decreases or those who are new in the profession perceive themselves more autonomous.

As seen in Table 4, teachers’ perception of autonomy does not show a statistically significant difference according to teachers' professional seniority variable. When the findings in the table are analyzed, it can be seen that teachers with different professional seniority have similar views on the level of autonomy. Considering that the low scores obtained from the scale represent low level of teacher autonomy, it is seen that the new teachers who have just started have the highest level of autonomy, and the ones with high professional experience have the lowest perception of autonomy.

Table 5. Correlation Values between Paternalist Leadership in Total and Sub-Dimensions; Teacher Autonomy in Total and Sub-Dimensions.

<table>
<thead>
<tr>
<th>Paternalist Leadership</th>
<th>Family Atmosphere</th>
<th>Benevolence</th>
<th>Authoritarianism</th>
<th>Interventi sme</th>
<th>Finding inadequacy</th>
<th>Scale Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching process autonomy</td>
<td>r ,135*</td>
<td>,163*</td>
<td>-.100</td>
<td>-.211*</td>
<td>-.203**</td>
<td>-283**</td>
</tr>
<tr>
<td>p</td>
<td>,014</td>
<td>,003</td>
<td>,068</td>
<td>,000</td>
<td>,000</td>
<td>,001</td>
</tr>
<tr>
<td>Curriculum autonomy</td>
<td>r ,125</td>
<td>,145**</td>
<td>-.145</td>
<td>-.229**</td>
<td>-.236**</td>
<td>-250**</td>
</tr>
<tr>
<td>p</td>
<td>,064</td>
<td>,003</td>
<td>,051</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
</tr>
<tr>
<td>Professional development autonomy</td>
<td>r ,226**</td>
<td>,262**</td>
<td>-.144**</td>
<td>-.378**</td>
<td>-.441**</td>
<td>-.460**</td>
</tr>
<tr>
<td>p</td>
<td>,000</td>
<td>,000</td>
<td>,009</td>
<td>,001</td>
<td>,000</td>
<td>,000</td>
</tr>
<tr>
<td>Professional communication autonomy</td>
<td>r ,492**</td>
<td>,212**</td>
<td>-.517**</td>
<td>-.574**</td>
<td>-.576**</td>
<td>-.534**</td>
</tr>
<tr>
<td>p</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
<td>,000</td>
</tr>
<tr>
<td>Scale Total</td>
<td>r ,235*</td>
<td>,263**</td>
<td>-.410**</td>
<td>-.411**</td>
<td>-.403**</td>
<td>-.483**</td>
</tr>
<tr>
<td>p</td>
<td>,016</td>
<td>,003</td>
<td>,007</td>
<td>,000</td>
<td>,000</td>
<td>,001</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

In the research, there is a moderate (r = 0, -.483, p <.05) negative relationship between the autonomy of teachers and paternalist leadership approaches of school principals. Accordingly, the increase of paternalist leadership behaviours of school principals decreases teachers’ level of autonomous behaviour. In the research, it is seen that there is a positive relationship between the school principals’ family atmosphere and benevolence dimensions and teacher autonomy. However, there is a negative relationship between school principals’ authoritarianism, interventionism and finding inadequacy in total and sub-dimensions of teacher autonomy.
DISCUSSION

In Turkey, instructional programs are regulated by commissions in the centralized structure of Ministry of National Education. It is known that students or parents who are in the main focus of education don’t have any impact in this process. What is striking is that, apart from rarely getting opinions of teachers online in last few years, even teachers do not have an active role in determining the content of the curriculum. This makes the teacher only a transmitter of the course content and outcomes determined by the center.

As a result of the research, it was revealed that school principals show moderate paternalist behaviour according to teacher perceptions. In his research, Cerit (2013) found that the primary school principal's paternalist leadership behaviour was moderate. Arslan (2016) stated a similar finding based on the perceptions of teachers working in secondary and high schools.


It is seen that traditional cultural value is clearly reflected in the forms of relationship (school principal-teacher, teacher-student and parent-student) among all stakeholders of the school. The teachers stated that school principals mostly show behaviours towards family atmosphere and benevolence dimensions. Karşu Cesur (2015), Saylık (2017), and Şahin (2015) also determined in their studies that the perceptions of the participants about the family atmosphere are high. Aycan (2006) states in the research of sorting the qualifications of paternalist leaders that they are trying to create a family atmosphere by giving advice to their employees in the workplace. Martinez (2003) in the research on Mexican managers also emphasizes that the effort to create a family atmosphere within the organization is a paternalist factor. On the other hand, Arslan (2016) revealed that school principals showed behaviours related to benevolence at a moderate level. Similarly, Türesin (2012) determined the level of paternalist behaviour perceptions of employees' leaders towards creating a family atmosphere in the workplace at medium level.

Teachers’ perceptions of the principals' authoritarian paternalist behaviour are moderate. According to this, school principals are moderate to tolerate behaviours such as teachers' decision-making, criticism of the tasks given. They sometimes behave strictly to works which are not done in accordance with the rules. Arslan (2016) found that school principals showed their authoritarian behaviours at a medium level.

Teachers think that school principals “rarely” show behaviours related to interventionism and finding inadequacy. The principals see the right to decide on behalf of teachers. Erben (2004) states that the leader or manager can sometimes make and implement a number of decisions on behalf of employees without asking them because they have paternalist approach, and they think as a family with their employees. According to Harris (1985, 194), the person who acts as a paternalist does not respect the wishes and decisions of others, and sees the right to intervene in their lives.

It can be argued that a shift towards autocratic approach, country governments in macro level, and organizational management in micro level in the last few years has strengthened the authoritarian dimension of paternalist leadership. And this may diminish its moral dimension.

In the study, it was concluded that there was a significant difference between the paternalist behaviours of school principals and residential area, generation, branch and professional seniority.
However, it was determined that there was no significant difference between the paternalist leadership behaviours of the school principals and the professional seniority variable of the teachers.

In a study conducted by Çetin, Özalp & Akkaya (2019) in contrast to this result of the research, it was found that teachers with 0-5 years of seniority in the profession differ significantly from those who have paternalist leadership perceptions of 16 years or more.

When the results in this study related to teacher autonomy are examined, it is seen that teacher autonomy is perceived at a high level. Similarly, Garvin (2007) concluded that 86% of teachers feel a high level of autonomy in the research in the USA. Ingersoll (1997) states that an advantage of improving teacher autonomy has a potential effect to improve standards.

Colak, Altunkurt & Yılmaz (2017) in their study in Turkey found out that teachers have autonomy behaviours above the average level. Additionally, it was concluded that there was a statistically significant difference between the professional seniority at schools and teacher autonomy.

In the study, it was concluded that teacher autonomy showed a significant difference according to the length of service at school variable. Teachers with less service time consider themselves more autonomous than teachers with more service time.

In another study supporting this result of the study (Çolak, 2016), it was concluded that teachers with 5 years and less seniority have more autonomy behaviours in the curriculum than teachers with 11-15 years seniority. In the research, Whitty (2006) found that teachers with more than 30 years of seniority experience a decrease in their autonomy. However, Forrester (2000) stated how experienced teachers maintained their autonomy unlike less experienced teachers. Şakar (2013) explained that teachers with longer professional seniority are more autonomous than those who have just started working. Although Pearson & Hall (1993) stated that the length of the teaching experience was not related to teacher autonomy, the evidence of Jiang & Ma (2012) is in the opposite side. In the literature, there are studies indicating that there is a relationship between teachers’ length of service and their autonomy levels, and there are research results advocating the opposite of this situation, as well.

It is concluded that there is a moderate and negative relationship between school principals’ paternalist leadership approaches and teacher autonomy. Accordingly, as the paternalist leadership behaviours of school principals increase, the autonomous behaviour of teachers decreases. It can be stated that the positive and negative view of paternalism is based on reading from different cultural lenses, which is essentially related to the family structure and the attitude of parents in raising children (Saylık, 2017).

As a matter of fact, there are studies (Tuncer, 2005) showing traditional family values significantly predict that they play an intermediary role between the autonomy of the individual and their attitude towards paternalist leadership. According to Fisek (1991), Turkey continued protection of traditional family values in spite of economic, social and cultural change for many years.

Another result of the research is that school principals have a positive relationship between family atmosphere and benevolence dimensions and teacher autonomy dimensions. This result coincides with the research results of Weichun, May & Avolio (2004).

It is seen that paternalist leaders transform the working environment into a family environment, build individual relationships with their employees, optimize the environments that the groups will benefit, and join the groups outside of the working environment. This type of leadership creates an environment of trust that appreciates the employees and protects their rights (Weichun, May & Avolio, 2004). However, the research revealed that school principals had a negative relationship between authoritarianism, interventionism, and finding inadequacy, and teacher autonomy.
Based on the results of the research, the following recommendations can be made:

- In this study, the dimensions of cultural values and paternalist leadership are discussed. Research can be conducted on how paternalist leadership influences other school context factors (performance, commitment, motivation, success, school culture, school climate, image, etc.). In these studies, culture can be considered as a mediator variable.

- Although paternalist leadership is a concept that is perceived as positive alone, the increase of paternalist approach level negatively affects the autonomy which is a motivating factor for teachers. In this case, it can be ensured that school principals receive seminars and trainings that will enable them to manage paternalist leadership behaviours well.

- By expanding the sample of this research, regional differences may be revealed regarding the relationship between paternalist leadership and some other organizational variables.

- Paternalism is mostly common in collectivist cultures. At this point, mixed design research may be conducted to reach clear results in small residential areas.

**REFERENCES**


Çolak, İ. (2016). Okul iklimi ile öğretmenlerin özerklik davranışları arasındaki ilişki (Muğla il örneği), (Yayınlanmış Yüksek Lisans Tezi), Muğla Sıtkı Koçman Üniversitesi, Eğitim Bilimleri Enstitüsü, Muğla


Evaluation of Competency Based Medical Education Curriculum*

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Abstract

There is an increasing interest in competency based medical education (CBME) due to the developments and changes in medical education and many medical schools have begun to apply it recently. Although its popularity in both practice and theoretical studies, there is a lack of studies focusing on evaluation of CBME curriculum. In that study, it is aimed to evaluate competency based medical education curriculum. This qualitative study is designed as a case study. It is also a curriculum evaluation study carried out systematically via Stufflebeam’s CIPP model. The study group consisted of fifteen faculty members and fifty students of a medical school in Turkey. The data was collected via semi-structured interview forms and analysed applying content analysis. Some of the important results reached in that study are the followings: The students have had mostly negative ideas about the competencies and the teaching-learning process while the faculty members have been satisfied with their practices. Both the students and the faculty members thought the CBME contributed to students’ academic and vocational developments. It is concluded that in order for CBME to provide the opportunities in medical education context, it needs to be developed, implemented and then evaluated in the frame of theoretical backgrounds and principals. Otherwise, because of the problems/deficiency in the development and implementation process, the efforts might end in vain. In the light of the results, it can be suggested that the faculty members should be supported on how to determine/write the competencies and the content; on effective teaching/learning methods. Also, CBME should be evaluated and revised regularly involving the faculty members and the students in the process.

Keywords: Competency Based Medical Education, Curriculum Evaluation, Curriculum at Higher Education

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INTRODUCTION

Higher education is placing a growing emphasis on affordability and accountability (Burnette, 2016; Fiddler, Marienau, & Whitaker, 2006). Many stakeholders, including academic accreditation organizations, employers, and academic institutions, desire to find a way to define and assess students’ attainment of educational outcomes and competencies related to their academic programs (Mintz, 2015). Due to these attempts, competency-based education (CBE) has become widespread in recent years, even though it had begun in adult-focused degree programs during the 1970s (Burnette, 2016). Interest in CBE has increased in several fields of higher education, especially in health professions education. Some think that CBE is an emerging discourse in health professions education while others believe that competency-based medical education (CBME) has gained renewed interest among health educators and policymakers in recent years because of their increased focus on outcomes related to patients, populations, and health professions education programs (Frank, Mungroo, et al., 2010; Frank, Snell, et al., 2010). CBME is believed to have become popular due to the need to reduce unacceptable variability in graduates’ skills after finishing medical training (Raymond, Kerschner, Hueston, & Maurana, 2015). With the introduction of Tomorrow’s Doctors in the UK, medical education began the transition from a time- and process-based system to a competency-based training system. The international acceptance of this paradigm shift is shown by the releases of the CanMEDS framework, The Scottish Doctor (Simpson et al., 2002), the ACGME Outcomes Project (Swing, 2009), Good Medical Practice (General Medical Council, 2006), the Australian Curriculum Framework for Junior Doctors (Graham et al., 2007), the 2009 Framework for Undergraduate Medical Education in the Netherlands (Van Herwaarden, Laan, & Leunissen, 2009) and the National Core Curriculum (NCC) Framework in Turkey.

CBME was defined by the International CBME Collaborators as [a]n outcomes-based approach to the design, implementation, assessment, and evaluation of medical curricula, using an organizing framework of competencies (Frank, Mungroo, et al. 2010). It is also an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It de-emphasizes time-based training and promises greater accountability, flexibility, and learner-centeredness (Frank, Mungroo, et al. 2010). In CBME, untethered from course material and credit hour, learners demonstrate - clearly defined and measurable- (Klein-Collins, 2012) competencies particularly at mastery level and their own pace.

Despite the growing interest in the CBME, how to plan and implement CBME has remained a big question to reach the supposed opportunities and dismiss the drawbacks: Frank, Snell et al., (2010) summarized the steps in developing CBME, namely identify the abilities needed for graduates, explicitly define the required competencies and their components, define milestones along a development path for the competencies, select educational activities, experiences, and instructional methods, select assessment tools to measure progress along the milestones, and design an outcome-based evaluation of the program. CBME curricula developed via that process can reflect a spectrum in terms of structure and time flexibility (Frank, Snell et al., 2010), which can be interconnected with different approaches of CBE (Book, 2014) like course/credit, direct assessment and hybrid approaches. Although The Council of Regional Accrediting Commissions (2015) identified these three approaches, the Carnegie Foundation, in an effort to re-examine the use of the credit hour, acknowledged that competency-based approaches occur in various contexts, and when comparing different models there are "huge variations" (Silva, White, & Toch, 2015).

As stated above, CBME was proposed nearly a century ago, but in the beginning of the 21st century, a renewed interest was seen in the medical education context. The renewed interest has been explained by Frank, Snell et al. (2010) in their comprehensive literature review study and they listed four overarching themes: a focus on outcomes, an emphasis on abilities, a de-emphasis of time-based training, and the promotion of learner-centeredness. Despite that consistency in the related literature, significant controversies remain in terms of the rationale, definition, components, pros and cons, and
implications of CBME (Leung, 2002; Frank, Snell et al., 2010). Those controversies have resulted in many papers on research topics such as rationale (Bell, Kozakowski, & Winter, 1997; Carraccio, Wolfshlat, Englander, Ferentz, & Martin, 2002; Collins, Gough, Civil, & Stutz, 2007; Long 2000; Tsuda, Scott, Doyle, & Jones, 2009), definition (Albanese, Mejicano, Anderson, & Gruppen, 2008; Bell et al. 1997; Carraccio et al. 2002; Collins et al. 2007; Harden, Crosby, Davis, & Friedman, 1999a; Harden, Crosby, Davis, & Friedman, 1999b; Leung, 2002; Long 2000; McGaghie, Miller, Sajid, & Telder, 1978), pros and cons (Frank Mungroo et al., 2010), implications (Carraccio et al. 2002; Glasgow, Wells, Butler, Gear, Lyons, & Rubiano, 2006; Harden et al. 1999a; Harden et al. 1999b; Neufeld et al. 1993).

The related literature mainly focuses on different subjects apart from curriculum evaluation. Nevertheless with the increasing number of medical schools applying CBME, it gets more important to determine effective practices of CBME and to share best practices, which makes curriculum evaluation a must. What’s more, as a field of education, medical education is needed to be revised and updated in accordance with scientific, technological, and social developments, which makes it relevant to evaluate curricula. Curriculum evaluation is defined as the process of delineating, obtaining, and providing useful information for judging decision alternatives (Stufflebeam, 2005). According to various accreditation councils around the world (Accreditation Council for Graduate Medical Education, Liaison Committee for Graduate Medical Education, Association for Evaluation and Accreditation of Medical Education Programs, World Federation for Medical Education), it is a fundamental responsibility of medical schools to make comprehensive, multifaceted, model-based, data-driven curriculum evaluation studies. In order to establish that responsibility properly and systematically, medical schools have to evaluate their curricula in accordance with one or more evaluation models. Among plenty of curriculum evaluation models, the use of the Context, Input, Process and Product (CIPP) evaluation model has been thoroughly recognized in a variety of educational and non-educational evaluation settings (Tokmak, Baturay, & Fadde, 2013; Zhang, Zeller, & Griffith, 2011). Additionally, several studies that applied this model to evaluate curriculum in the context of health professions have attracted attention in the literature in recent years (Singh, 2004; Steinert et al., 2005). However, to date, no comprehensive study has used the CIPP evaluation model to facilitate the evaluation of CBME in an undergraduate medical education curriculum so far.

The evaluation of CBME guides decision-makers on university/national/international level to determine what kind of curriculum to improve in order to implement CBME more efficiently. On the university level, the curriculum development units at the medical schools should benefit from comprehensive results of curriculum evaluation studies because curriculum evaluation must be used as a first step in order to develop a new curriculum. And it also carries importance for the curriculum evaluation unit at the faculties illustrating how to conduct an evidence based curriculum evaluation based on the theoretical foundations and appropriate evaluation models. On national level (namely in Turkey), adoption of CBME properly is likely to be slow and incremental due to the regulatory environment, so research showing what does and does not work is important as competency-based curricula continue to expand at universities. This evaluation of the CBME curriculum could not only provide insight into the effectiveness of a CBME in the evaluated context, but it might contribute to the growing field of knowledge that could help move the current regulatory environment in other national/international contexts. Additionally, leaders at medical education can use of evaluation results to determine whether CBME can offer opportunities to some/all students to improve themselves academically/vocationally. Finally, the evaluation could also serve an international role in contributing to the research on competency-based education. Even though CBME have been in practice in certain areas, few studies are available that provide evidence about their effectiveness (Barman, Silén, & Bolander Laksov, 2014).

**Aim of the study**

In that study, it is aimed to evaluate the competency-based medical education curriculum. To the end, the following questions were answered:
1. What are the views of the faculty members and the students about the CBME curriculum?

2. What are the views of the faculty members and the students about the implications of the CBME curriculum?

3. What are the opinions of the faculty members and the students about the effects of CBME in terms of academic/vocational developments of students?

Research Design

The study was designed as a qualitative case study, because case studies are one of the most appropriate qualitative research designs that can be used to understand complex phenomena (Yin, 2003). To understand the CBME, as accepted as a complex phenomenon, and to evaluate it, the CIPP model was used. For that reason, that study is also a curriculum evaluation study carried out in the Input, Process, and Product evaluation in the frame of CIPP model.

The Setting

In Turkey, the National Core Curriculum (NCC) was developed in 2001–2002 and revised in 2014 to identify standards for medical degrees, stating what a graduate is supposed to know, able to do, and competent in, within the context of local needs and realities (Bulut, 2013). However, in 2014, there made some changes and instead of content and learning objectives, NCC was grounded in competencies and tasks (Gülpınar et al., 2014). In the revised version, it is advised that pre-graduate medical education should be developed and implemented within the framework of an educational approach based on educational outcomes. In this framework, the competencies of the medical school graduates are determined and the whole education process is to be carried out in accordance with the determined competences framework. Although the NCC is an advisory document, many medical schools in Turkey have revised their curricula in that framework. One of the universities conducting CBME is University A (The university is coded like that.). That state university, situated in a small city in the middle of Turkey, has a newly founded medical school. This study was conducted in that medical school at University A. Since its beginning to accept students in 2016, the medical school has been conducting CBME. The founder dean of the medical school advocates the CBME uttering “The science of medicine, with its objective structure and practical feature, makes it a must to determine competences and measure them not only on knowledge level but also high level skills.” Table 1 explains the details of the CBME implemented in the medical school of University A to provide a context for this study. As Table 1 shows, there are inconsistencies between theory and practice in terms of the path of learning, typical assessment tool, timing of assessment and program completion, which can be regarded as a limitation for that study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>CBME (theory)</th>
<th>CBME (practice at University A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driving force for curriculum</td>
<td>Competency-knowledge acquisition</td>
<td>All of the faculty members have to determine competencies and share them before the courses so that students can study on that related theoretical background and knowledge acquisition related to competencies can be accomplished.</td>
</tr>
<tr>
<td>Driving force for process</td>
<td>Learner</td>
<td>All of the preparation and application are done based on learners’ needs and expectations. The students are always welcomed to share their ideas in formal and informal ways. There are also section representative students to meet the faculty members regularly. Their ideas are evaluated and reflected in the following educational/other regulations.</td>
</tr>
<tr>
<td>Path of learning</td>
<td>Non-hierarchical</td>
<td>The path of learning is organized based on learning outcomes in a hierarchical way.</td>
</tr>
<tr>
<td>Responsibility for content</td>
<td>Student and teacher</td>
<td>The faculty members are mainly responsible for content selection/order, but the students are expected to have a look at the content uploaded onto their system by the faculty and share their views on the content.</td>
</tr>
</tbody>
</table>
Goal of educational encounter  
Knowledge application  
The main goal is to train qualified future doctors to apply what they learn at the faculty.

Typical assessment tool  
Multiple objective measures /evaluation portfolio  
Students’ learning levels are assessed mainly via multiple choice/true-false and fill in the gaps questions in the module exams. On the one hand, they are assessed via open-ended questions in the committee exams.

Assessment tool  
Authentic (mimics real tasks of profession)  
In the second half of the six-year medical education, students will be assessed via real tasks of the profession.

Setting for evaluation  
In the trenches (direct observation)  
Especially in the last year of their education, students will be assessed via direct observation by the intern responsible faculty team.

Evaluation  
Criterion-referenced  
Students need to have many exams during each year, the evaluation criteria was determined onwards.

Timing of assessment  
Emphasis on formative  
Students are examined regularly and small intervals via module and committee exams. These are mostly summative exams.

Program completion  
Variable time  
Program completion time is fixed for all the students.

Note: The table (based on Carraccio et al, 2002) was revised and adjusted by the researcher.

Study Group

The study group included fifty students and fifteen faculty members. The students at the medical school determined via convenience sampling method included in that study. Thus, 30 female and 20 male students were interviewed, which resulted in a demographic spread of 60% female and 40% male, because of the high number of the female in the total students. Furthermore, fifteen faculty members were identified by the researcher for the interview by maximum variation sampling method among purposive sampling methods in terms of their expertise area. The aim of choosing this sampling was to form a small working group that would provide maximum participant variety; to examine if there are common cases among a variety of conditions instead of making generalizations (Yıldırım & Şimşek, 2013). In this regard the aim was reach educators from many different departments and responsible for various courses. Five professors and ten assistant professors were selected from twelve different departments of the medical school. This selection resulted in a spread of three female and twelve male with experiences in CBME between two and three years.

Data Collection and Analysis

In the study, interview method was used for data collection. As the data collection tool, two semi-structured interview forms for the faculty members and the students developed by the researcher, were used. Each form has parallel questions related to the CBME curriculum and based on the framework of CIPP. The forms include two parts. In the first parts of each form, there are questions about their demographic information. In the second part of the form for the faculty members, there are six questions, and there are five ones in the other one. All of the questions are in line with CIPP’s input, process, product evaluation.

The interviews were made face to face by the researcher at the end of the 2018-2019 academic year. Because all of the interviewees were volunteer to involve the study, they permitted recording the interviews. Each interview of the faculty members lasted among 45-60 min. and the students were interviewed individually in 20-30 min. or group of two-five in nearly an hour. Then, the researcher transcribed the whole responses. The data was analysed using a conventional content analysis method (Fraenkel & Wallen, 2000). Firstly, the data were coded, then grouped into emerging sub/themes. Finally, the themes obtained are discussed in the light of relevant researches in the literature.

For the credibility and transferability of the semi-structured interview forms, views about the forms were obtained from three different experts – two of them are in the field of educational sciences and one of them is in the field of medical education. The CBME at the medical school was described in detail, which helps the credibility of the study. In order to get variety in terms of data sources, opinions/suggestions of two main stakeholders of the evaluated curriculum, namely the students and the faculty members- were found out which increases the trustworthiness level. For this study, data
collection and analysis processes were given in detail and direct quotations were used while analysing the obtained data. In order to ensure confirmability, 20% of the data was firstly coded by two experts separately—one is the researcher and the other is a professor at the department of curriculum and instruction, who voluntarily helped the researcher as an expert. Then, in a meeting with the focus of inter-coder reliability, it was determined that the variation of codes, subthemes and themes determined by the researcher and the professor was minor and consensus was reached. After the first coding process was over, the rest of the data was coded by the researcher alone but making multiple checks. Additionally, all data was stored in order to maintain confirmability.

Role of Researcher

The interviewer was an instructor with PhD degree in the field of curriculum and instruction during the interviews. The researcher has also expertise in curriculum evaluation and qualitative analysis by participating in trainings, courses and various researches on graduate levels. She was also a member of curriculum evaluation unit of that medical school while the study was being conducted.

FINDINGS

A. Input Evaluation

For input evaluation of the CBME curriculum, both the students’ and the faculty members’ views were explained below.

1. Faculty Members’ Different Definitions of CBME

The definitions of CBME were varied due to the faculty members’ views about CBME. Their views were grouped under two themes namely content and outcomes. In other words, the interviewed faculty members generally focused on the content and the outcomes in their definitions.

For some of the faculty members, CBME is “to determine what knowledge students will learn at the end of the course” (f:8). One of them clarified his definition uttering “Medical education is such a huge area that it includes a vast of education. Students drown in knowledge, they do not know what they should know. ... CBME is an education in which students are presented only what they should know at the end of their education.” (F15). These definitions show the focus/emphasis on the course/programme.

For some of the faculty members, CBME is “an outcome-based approach” (f: 7). One of them clarified “CBME is a system where firstly the outcomes are determined, then the outcomes direct the course plan, exam questions… ” (F10). One another explained “CBME is a system that enables students to get ready for the lesson by learning what they are expected to do if they check out the predetermined outcomes.” (F13)

On the other hand, as Talbot (2004) claimed while defining CBME, it can be criticized as “a negative oversimplification of physician competence”. However, one of the interviewed faculty defines CBME as simplifying physician competence, not regarding the situation as negative or over simplification. He indicates “We aim to train medical doctors and we want to present the students what they need to have as a medical doctor. The faculty members may desire to give extended information about his/her expertise. With the help of CBME, we limit the content to what they need to know, to the basic medical knowledge level... ” (F14).

2. How to Determine the Competencies in the Frame of CBME

The competency determination process has shown some differences besides some common steps. Table 2 shows the process and different versions:
### Table 2 The Competency Determination Process

<table>
<thead>
<tr>
<th>Versions</th>
<th>The process</th>
<th>Evaluation and revision of the competencies’ appropriateness</th>
<th>The faculty members</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Determining the scope of the competencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steps</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>Examining the competences in the NCC</td>
<td>Adding new competencies when necessary</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F9</td>
<td>F13</td>
</tr>
<tr>
<td>2</td>
<td>Examining the competences in the NCC</td>
<td>Examining the related textbooks</td>
<td>Thinking about the cases which they will meet and we, as doctors meet today.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F10</td>
<td>F14</td>
</tr>
<tr>
<td>3</td>
<td>Examining the competences in the NCC</td>
<td>Adding new competencies thinking what the students will face when they graduate</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F10</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Thinking about what they have to know/learn</td>
<td>Adding some extra knowledge</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F6</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Examining the predetermined ECTS in the frame of Bologna regulations</td>
<td>Adding new competencies based on the contemporary knowledge when necessary</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F1</td>
<td>F12</td>
</tr>
<tr>
<td>6</td>
<td>Thinking about what they have to know/learn</td>
<td>Examining the related textbooks</td>
<td>Examining the exams in medical fields especially abroad</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F7</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Thinking about what they have to know/learn</td>
<td>Examining the related textbooks</td>
<td>Examining the practice of other universities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F4</td>
<td>F8</td>
</tr>
<tr>
<td>8</td>
<td>Examining the content of the course</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

As seen in Table 2, the practices in the competency determination process have eight different variations. On the other hand, the practices could be grouped into two themes determining scope of the competencies and evaluation of their appropriateness. But the sub-steps are changeable. It can be said that the faculty members used different sources while determining scope of the competencies. But the number of sources is low and they are restricted with some kind of written texts like NCC and textbooks. On the one hand, in the evaluation and revision of the competencies, only two faculty members (F2, F6) conducted some practices to evaluate and revise competencies analysing student success and its relevance with the content.

### 3. Students’ Views and Suggestions about the Competencies Shaping the Medical Education

When students were asked about their views about the competencies shaping their medical education, they generally expressed their negative views/drawbacks of the competencies and made some suggestions. For some of the interviewed students, “the competencies are not clear enough” (f:4) and most of them explained their views repeating the words “not clear” (S12, S27). For some of the interviewed students, “the competencies are too broad” (f:7). One of them explained “Competencies
are written so broadly that we get responsible for the whole of the content of the course for the exam” (S22). One of them claimed “Some faculty members write the title of the content as if they were the competencies” (S23). One of them thought “Sometimes the competencies are too general that I think they are written for the sake of duty” (S28). Finally, some of the students claimed “competencies are clues for exam questions” (f:9). One of them expressed his happiness saying “I am really happy to learn the competencies” before the exams (S40). The students also suggested that the competencies should be more clear (f:6) and limited/specific (f:8).

B. Process Evaluation

For process evaluation of the CBME, both the students’ views were illustrated in Table 3 and they were explained in accordance with the faculty members’ views.

4. Students and the Faculty Members’ Views about the Dimensions of CBME Curriculum

Students’ views about the dimensions of CBME curriculum could be grouped into three main and five sub-themes as seen in Table 3. For each theme, they indicated some positive and negative views about the CBME.

Table 3 Students’ Views about the dimensions of CBME Curriculum

<table>
<thead>
<tr>
<th>Students’ views about</th>
<th>Positive</th>
<th>f</th>
<th>Negative</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>The content</td>
<td>Well-organized 4</td>
<td>Heavy 9</td>
<td>Not clear 9</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Including difficult subjects 6</td>
<td>Not in order 4</td>
<td>Not efficient 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unnecessary 4</td>
<td>Ambiguity in term teaching 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>4</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The teaching/learning process</td>
<td>Efficient 5</td>
<td>Not interacting/one way teaching 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good 3</td>
<td>Not practical 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not bad 1</td>
<td>Not efficient 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not clear/understandable 7</td>
<td>Bad 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boring 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>9</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The materials</td>
<td>Adequate 2</td>
<td>Restricted to powerpoint presentation prepared by the instructor 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not adequate 13</td>
<td>Not clear 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>2</td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The assessment system</td>
<td>Good 7</td>
<td>Not efficient 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not bad 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Innovative 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fair 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>13</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The exams/exam questions</td>
<td>Frequent but good 3</td>
<td>Difficult 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent so stressful 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detailed 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not consistent with the competencies 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Only theoretical 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>3</td>
<td>29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>143</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When asked to the interviewed faculty members about the content dimension, they frequently explained they select and organize the content based on the most popular textbooks in the related areas (f:8). They did not mention any problems about the content and added their satisfaction (f:13) but the students stated overwhelmingly negative views about the content and they claimed the content is heavy, not clear and including difficult subjects. The students also give some clues about their expectations in terms of the content dimension of CBME curriculum. For them, the content should be clear/understandable (f:28), not including irrelevant information (f:34), and in proper order (f:8). Some of the views stated by students are as follows:

“Sometimes the content is not clear, which confuses us.” (S9)

“Some content presented us is not adequate for us to learn the subject. We hear most of the subjects for the first time. Some needs more clarification.” (S10)

“As natural –expected, the content is too heavy and difficult.” (S12)

In terms of teaching/learning experiences dimension of CBME curriculum, the students explained their views under two themes namely the teaching/learning process and the materials. They mostly explained their negative views instead of positive ones. To discover the teaching/learning process when asked to the interviewed faculty members, it was found out that they applied mostly deductive method (f:15), question-answer technique (f:9), and rarely case studies (f:3). It was also reached out the faculty members were generally satisfied with the teaching-learning process of the CBME. On the other hand, as seen in Table 3, the students overwhelmingly indicated negative views about the teaching/learning process (f:74) rather than positive ones (f:11). As understood from the statements of the students cited below, they also made some suggestions about the teaching/learning process. They think in the courses students should be active, different methods/techniques should be applied, the courses should be interacting and practical not only theoretical.

“Some instructors force us to learn deeply, but in some courses we cannot understand the issue because of heavy content and improper teaching methods.” (S13)

“Subjects are explained immediately and superficially, not in the way that students can understand” (S38)

“For students to be engaged actively in courses, the instructors should be more enthusiastic and know how to make presentations efficiently/lively “(S44)

When the interviewed faculty memberstalked about the teaching-learning process, nearly all of them explained they used PPT presentations (f:13) and included some related videos (f:6). In the same way, the students mostly criticized that the materials used in the courses are restricted to PPT prepared by the instructor and they added that the materials are not adequate. That finding shows that students expect to have different kinds of materials.

When it comes to the assessment dimension of CBME curriculum, the faculty members explained they prepared so many questions to upload to the assessment system (f:12) then they choose the most appropriate one for the related competency (f:6). The questions are generally multiple-choice (f:10) and/or true-false questions (f:10). On the one hand, students generally explained their satisfaction about the assessment system describing it especially as good and not bad. However, the students explicated their dissatisfaction about the exams as being difficult, only theoretical and detailed. Some of the students’ views are as in the followings:

“During the academic year, we have 12 exams. The assessment system is fair in terms of determining what we learn, which questions we can answer truly but we are getting more and more stressful because of frequent exams.” (S14)
“The exams are so frequent, but that frequency is good.” (S33)

C. Product Evaluation

For product evaluation of the CBME, both the students’ and the faculty members’ views were explained below.

5. The Students’ and the Faculty Members’ Views about the Contributions of CBME to Students’ Vocational/Academic Developments

The students and the faculty members thought the CBME contributed to students’ vocational and academic developments. Their views can be grouped into three as CBME totally (f_{students}: 19- f_{faculty}: 9), partly (f_{students}: 11- f_{faculty}: 4), and never (f_{students}: 10- f_{faculty}: 2) contributes to their vocational developments. Both the students and faculty members generally think that the CBME totally ensures their vocational development. Some of the students’ views are as in the followings:

“I think that our both academic and vocational success will be high in the future as the students are directed to the important things and there is no unnecessary information in our minds.” (S16)

“In this intense tempo, there are places where I go by memorizing without learning. So I think there will be a lot of things that I can’t be successful with when I am doctor in the future.” (S43).

We don’t have enough practical lessons, which means less experience in the future (S14).

In the same way as vocational development, the students’ and the faculty members’ views about contributions of CBME to students’ academic developments can be grouped into three as CBME totally (f_{students}: 24- f_{faculty}: 10), partly (f_{students}: 11- f_{faculty}: 4), and never (f_{students}: 7- f_{faculty}: 1) contributes to their academic developments. Both the students and faculty members generally think that the CBME totally ensures their academic development although some students rarely indicated doubts about her academic development claiming that “the CBME is useful only for passing the course.” (S28). But they most frequrently indicated hopes for their academic future as in the followings:

“It restricts what we need to learn. Thus, we do not have unnecessary information and our academic success increases.” (S29)

“This system improves and guides me in terms of lessons.” (S45)

RESULTS AND DISCUSSION

In this study, the competency based medical education curriculum was evaluated within the scope of input, process, and product evaluation of Stufflebeam’s CIPP model. In the frame of input evaluation, views about the CBME itself and the competencies were determined. The way that the faculty members defined the CBME is important because definitions give clues about their points of view and even their implications of CBME. In the literature, there are various definitions of CBME, emphasizing keywords like "outcomes defined, curriculum of competencies, demonstrable, assessment, learner-centred and societal needs" (Frank, Mungroo et. al., 2010). On the other hand, the interviewed faculty members made various definitions generally focusing on the content and the outcomes of the CBME. Some of the definitions made by them can be interconnected with the definitions in the literature which asserted CBME as an example of an outcomes-based approach to the curricular design (Harden et al. 1999a; Harden et al. 1999b; Glasgow et al. 2006). It is also noteworthy that the faculty members did not make any connection with the competency and students or/and
societal needs. However, the competencies should also meet those ever-changing needs (Boucher et al., 2017).

In CBME, competencies required for practice form the central component of all curricula (Boucher et al., 2017). The desired competencies of medical education are firstly identified, and then the educational experiences and assessment strategies are determined in CBME. For that reason, the competency determination process gets greater importance to reach the success at the end of the education process. The competencies must be derived from an assessment of societal needs for healthcare (Boucher et al., 2017). But for the evaluated CBME in that study, it was concluded that most of the faculty members are taken granted for the NCC and they made some minor changes to them. They think those changes are enough for adjusting the NCC to update their CBME only by adding some more specific competencies based on their own experiences and students’ observations. For the Turkish medical education system, it is a must to be in parallel with NCC; on the other hand, in the frame of CBME, it is expected to determine the competencies focusing on both local healthcare needs, students’ academic backgrounds/profiles and institutional priorities along with the universal health education standards.

The students generally explained their negative views/drawbacks of the competencies shaping their medical education and they made some suggestions. When the related literature is examined, it can be found out that students’ expectations are the features that the competencies of CBME ought to have. It can be concluded that the competencies need to be revised in terms of both the students' expectations and the related literature.

In the frame of process evaluation, the views of the faculty members' and the students about the implications of the CBME were analysed. When students’ and faculty members’ views about CBME practices were found out, it was determined that the faculty members frequently explained their positive views and pleasure with the CBME practices, on the other hand the students explained their negative views about the CBME especially in terms of the teaching/learning process. As understood from the Table 3 and their suggestions, the students expect the teaching-learning process to be more interactive, student-centered, practical, clear and so efficient. These expectations are similar to the findings of other studies. For instance, in his study carried out with 204 undergraduate students from 11 different faculties of medicine all over Turkey, Tontus (2010) found out that the students view teaching negatively, think that they are not encouraged to participate during teaching sessions and the teaching is too teacher centered. In another study, Mirzazadeh et al. (2016) concluded that the medical students were mostly dissatisfied with the medical training they received, which means it did not meet their expectations.

Unfortunately, a comparative review of research in higher education literature reveals that teaching is organized in similar ways throughout the world, and causes common problems in terms of student learning. Indeed, how faculty teach—that is, the instructional methods, learning environment and assessment tools used—is quite similar worldwide (Forrest, 2004). The findings of this study supposed Forrest’s (2004) assumption. On the other hand, it should be noted that students are not satisfied with that general tendency among the faculty members and they expect to be involved in the learning process actively. It is noteworthy that one of the fourteen Principles for Improving Higher Learning is that “Student performance is greatest when students are more actively than passively engaged in their academic work” (Angelo, 1993). In parallel with the principles, that faculty members apply different approaches to teaching is a necessity of CBME as indicated by Book (2014) as the students expect so.

These findings show that the faculty members both in and out of Turkey need pedagogical support. One of the reasons for that can be the general tendency of not only medical schools but higher education institutions in general. They only recently started to become aware that teaching, like research and the practice of any profession, demands training (Costa, 2010), which has resulted in some kinds of trainings focusing on the pedagogical needs of the faculty members. These training
courses are mainly applied as workshops, seminars and the short-term courses and related literature reveals that both the attended faculty members and their students declared their satisfaction for the training courses (Steinert et al., 2005).

When it comes to assessment of students’ learning, the faculty members explained that they generally use multiple-choice and/or true-false questions. On the other hand, they stated that with CBME, they aim to train students to apply what they learn. As related literature indicates, such question types are not proper for that aim. Instead, the faculty members should apply alternative assessment tools to determine whether the students apply what they learn.

In the frame of **product evaluation**, the views of the faculty members and the students about the effects of CBME were determined in terms of academic/vocational developments of students. The faculties and the students agreed on that the CBME helped students improve themselves both academically and vocationally. As the related literature supports, the CBME contributes to students’ academic development by involving them in the learning process and directing them in self-development process (Candy, 1991; Toohey, 1999), and to their vocational development because it focuses on the vocational studies (Smith & Dollase, 1999).

**CONCLUSION AND SUGGESTIONS**

In comparison to traditional approaches to medical education that are expert-driven, and internally produced, CBME provides a method of organizing medical education that is learner-centred and oriented around population and health care system needs (Iobst et al., 2010). It describes the expected end-product i.e. a physician at the end of training; measures whether the outcome expected is achieved; and helps to identify learners experiencing difficulties in a short time, offering opportunities for enabling achievement (Saucier et al., 2012). In order for CBME to provide the pre-mentioned opportunities in medical education context, it is needed to develop and then evaluate CBME curriculum in the frame of theoretical backgrounds and principals. Otherwise, because of the problems/deficiencies in the development and implementation process, the efforts cannot end in vain.

In order to reach the expected results, the medical schools implementing CBME and those in a desire to implement it should explain aims, principles of CBME to their faculty members and students. They should provide short term courses, workshops, seminars, booklets, and informative videos on how to determine/write the competencies and the content; on effective teaching/learning methods. They should also make the necessary regulations in order to implement alternative evaluation approach. The current study has limitations in terms of the context and the participant. The future studies can be conducted in different contexts with greater number of participants. The current study is a qualitative study, various quantitative or comparative studies can be conducted including the alumni, too.

**REFERENCES**


An Analysis of the Relationship between the Metaphorical Perceptions of Classroom Teacher Candidates Towards Computer-Assisted Mathematics Instruction and Their Learning Approaches

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Abstract

This study aims to reveal the perceptions that classroom teacher candidates have regarding the concept of computer-assisted mathematics instruction (CAMI), with the help of metaphors. Furthermore, the another aim of the study consists of an analysis of whether these metaphors differed based on the teacher candidates’ learning approaches. The descriptive and relational survey model was employed in the study. The study group was comprised of 90 teacher candidates, who were first-year students at the Department of Primary Education of a Faculty of Education in the Aegean Region. In order to determine the metaphoric perceptions of the teacher candidates, they were initially asked to complete the sentence “Computer-assisted mathematics instruction is like .........., because ..........”. The data were interpreted, using the content analysis technique. Moreover, they were subjected to a scale for the purpose of analyzing whether there were any differences between the metaphors at different levels of learning approaches. The metaphors were found to be included in the categories “CAMI with positive aspects”, “CAMI with negative aspects”, “CAMI in terms of structural aspects” and CAMI with neutral aspects”. Upon the comparison of these categories to the learning approaches, it was found that teachers, who adopted the “deep” and “strategic” learning approach, had a much more positive perception, while those adopting the “surface” learning approach had a negative perception. Additionally, it was observed that teacher candidates, who rather put emphasis on the structural aspects and conditions of CAMI, were the ones to adopt the strategic learning approach. Thus, determination of the learning approaches adopted by teacher candidates and an analysis of their perceptions towards a number of concepts are considered to be significant as they could be effective in the course of their educational lives and in the processes of becoming role models when they start the profession.

Keywords: Computer-Assisted Mathematics Instruction, Learning Approach, Classroom Teacher Candidates, Metaphor.

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INTRODUCTION

Even though it is challenging to wholly reveal the underlying reasons for human behaviour, human perceptions are known to be one of them (İnceoğlu, 2010). Therefore, it is very important to understand what affects the perception of the person and what they will cause. Senemoğlu (2011) considers past experiences and expectations as two important factors that affect perception. Being the initial factor of these two, past experiences are a topic that is probably required to be discussed more than numerous fields in the process of computer-assisted instruction (CAI).

The fact that the expressions "digital native" and "digital immigrant" have started to be used in line with the developments in technology (Prensky, 2001), manifests itself in the field of education as well. It is required to determine which experiences and opportunities borne by the teachers and teacher candidates put them into the digital native category and which ones put them into the digital immigrant category and to evaluate the respective results in terms of creating a positive perception in regards to CAI. Being another factor of importance, expectations are also a topic to be discussed with respect to CAI. CAI is considered an opportunity for the solution of several problems in the field of education. It is possible to say that expectations on this subject matter have appeared in terms of all stakeholders of the education process, as the studies show that CAI yields mainly positive outcomes. The use of CAI in the process of teaching mathematics is called "Computer-assisted mathematics instruction (CAMI)" (Baki, 2002), which is not a recent event. It is stated that the start of the general use of the computer technology in the field of education actually was simultaneous with the start of its use in the field of mathematics education (Dinçer & Doğanay, 2016). Studies conducted in the field of CAMI yield positive outcomes in terms of learners on one hand while causing increasing expectations with respect to providing more benefits on the other hand. When analyzed from this standpoint, the determination of the perceptions of teacher candidates in regard to CAMI is considered important both in terms of student achievements and in the processes of meeting the expectations created. In association with the results of the studies of similar types, it is important to conduct studies over the variables that might affect the perceptions of teacher candidates regarding CAI in the process of teaching mathematics and that therefore affect their practices.

Following the analysis of the literature, it is possible to find studies suggesting that the use of CAI in pre-undergraduate periods increases the students' achievements in mathematics, that it enables students to develop a positive attitude towards mathematics, and that these might differ based on personal variables (Aktümen Kaçar, 2003; Çeliköz, 1997). Of the studies conducted over teacher candidates, however, there are studies reporting that the participants had both positive and negative attitudes towards CAMI. For instance, in a study that they conducted with classroom teacher candidates and elementary school mathematics teacher candidates, Yenilmez and Sarır (2007) reported that teacher candidates preferred classic methods of teaching while stating that it was challenging to use computers in the teaching of mathematics. Keşan and Kaya (2007), on the other hand, put emphasis on the statements of classroom teacher candidates over the fact that it could be possible to make students more active through CAMI, that it enriched the teaching in audiovisual terms, and that it could increase the level of learning by eliminating the factor of boredom in the learning process. Thus, it is obvious that their CAMI-oriented perceptions could provide indicators with regards to the attitudes of teacher candidates and be effective both during their education lives and in their processes of teaching.

The learning approach adopted is another factor that is emphasized to be important in terms of teacher candidates’ own learning processes and the learning processes at the beginning of their careers. The learning approach is defined as a variable that may differ based on a number of factors correlated with the intentions and thoughts of the individual (Ekinci, 2009) and that affects the quality of learning (Senemoğlu, 2011). There are studies that classify learning approaches as “deep”, “surface” (Marton & Säljö, 1976), and additionally, as “strategic” learning approaches (Ramsden, 1979). Factors, such as being actively interested in the class, associating it with previous knowledge and experiences, and making research are defined as the keywords of deep learning; factors, such as making efforts for
studying, being successful in the management of time and effort, and making efforts to be successful by acting upon the criteria of evaluation, as the keywords of strategic learning; and factors, such as studying without any purpose or strategy, considering subjects to be disassociated with one another, and having a feeling of pressure-apprehension in regards to studying, as the keywords of surface learning strategy (Entwistle, McCune & Walker, 2001, c.f. Beyaztaş & Senemoğlu, 2015). Therefore, the learning approach adopted can be effective both in the processes of individuals, such as learning, doing research, acquiring information, succeeding, finding meaning and achieving results, and over the learning approaches of students particularly in the processes where teacher candidates practice the profession of teaching (Olpak, Arıcan & Baltacı, 2018). Accordingly, determining the learning approaches adopted by teacher candidates, who are at the beginning of their undergraduate studies, is important in terms of shedding light on the processes of learning of teacher candidates, interpreting their perceptions and attitudes in regards to different concepts, and even making inferences about their settings of learning.

It is stated that a stronger measurement tool is needed to analyze people’s understanding of a phenomenon that is thought to be effective in learning processes and their perceptions towards certain concepts, since the quantitative data obtained from the scales used generally do not allow detailed examinations to shed light on the learning process (Yılmaz & Güven, 2015). The fact that this tool is based on the individual's own statements instead of interpreting it through certain defined options may provide the researcher with the opportunity to obtain in-depth information, no matter how abstract or complex the phenomenon is. When the ways of expressing their thoughts are examined, it is stated that individuals use concrete concepts to explain abstract concepts (Saban, 2008; Şahin, 2013).

Metaphors are among the data collection tools, through which individuals manifest their understandings, perceptions, or associations over a specific phenomenon (Schmitt, 2005). In metaphor studies, individuals are asked to liken any given concept to any specific thing and to write down the reasons for this specific metaphor. Metaphor is defined as a bridge for establishing a connection between phenomena (Cortazzi & Jin, 1999), as a tool of measurement through which something is interpreted and expressed based on another thing (Lakoff and Johnson, 2010, p. 27), or as "a mechanism of mental mapping and modelling" (Arslan and Bayrakçı, 2006, p.103). Metaphors establish connections between “new and extant knowledge” and “language and images” (Tobin & Tippins 1996, p. 716), therefore enabling researchers to enter the inner world of the perceptions, understandings, and experiences of the participants through metaphors (Jensen 2006, p. 41).

Russell and Hrycenko (2006) stated that metaphors played a significant part in determining the perceptions of teacher candidates and in observing the development in occupational learning processes. Based on an analysis of the literature, it is possible to come across a number of studies analyzing the metaphors created by teacher candidates in regards to numerous concepts particularly on science and education (teacher, teaching, student, school, knowledge, curricula, science, scientist, technology, mathematics etc.) (Ateş, 2019; Aydın & Pehlivan, 2010; Durukan, Hacıoğlu & Dönmez-Usta, 2016; Gültekin, 2013; Güveli, İpek, Atasoy & Güveli, 2011; Koç, 2014). Nevertheless, of those studies, not even one could be found that compared the metaphoric perceptions of individuals particularly to the CAMI-oriented data. Thus, this study differs from others as it compares the learning approaches adopted by teacher candidates to CAMI-oriented metaphors. Therefore, it is believed that this study will pave the way for studies that would have the objective to estimate/analyze the learning approaches through the metaphors created by individuals thanks to intra-class-based strategies, or to analyze the effects of these variables on one another.

Primary school years are the years where the curiosity and learning capacity of the students are at high levels (Kağıtçıbaşı, Sunar, & Bekman, 2001) and the roles of classroom teachers in this process are of paramount importance. It can be said that the teacher's role in the process of learning-teaching shifted from passing down information to the side where they teach students how to learn (Baki, 2001). Rapid advances in the field of technology and the fact that learning to learn has been increasingly emphasized, bring up the discussion of the learning approaches in the processes of
learning-teaching in terms of students, and the discussion of CAI with different aspects in terms of methods of teaching. Under the light of these data, this study primarily aimed to determine the perceptions of classroom teacher candidates regarding the concept of CAMI, as well as the learning approaches that they adopted. Furthermore, the another aim of the study of this study consists of an analysis of whether the metaphors created by teacher candidates about CAMI differed based on the learning approaches that they adopted. Accordingly, the study sought answers to the research questions below:

1. Which metaphors do teacher candidates use in order to explain the concept of CAMI?

2. Under which categories can the metaphors put forward by teacher candidates be grouped in terms of their common aspects?

3. Do the metaphors of teacher candidates regarding the concept of CAMI differ based on the learning approach they adopt?

**METHOD**

This chapter explains the research design, study group, and data collection tools of the study, as well as the collection and analysis of the data.

**Research Design**

The study aimed to analyze the perceptions of classroom teacher candidates in regard to the concept of CAMI, as well as the learning approaches they adopted, and whether the metaphors they created on CAMI differed from the learning approaches they adopted. Within the framework of this objective, the model of the study was set as the survey model because it attempted to explain the current situation as it was without any intervention (Karasar, 2002). Of the survey models, the descriptive and relational survey models were employed within this framework. The descriptive survey model was employed in order to determine the perception of classroom teacher candidates regarding the concept of CAMI, as well as the learning approaches that they adopted. On the other hand, the relational survey model was used in order to analyze whether the metaphors created by teacher candidates regarding CAMI differed based on the learning approaches that they adopted. Using the relational survey model, it was aimed to put forward the correlation between variables, without any intervention on the variables (Büyüköztürk, Akgün, Demirel, Karadeniz, & Çakmak, 2015).

**Study Group**

The study was conducted on teacher candidates, who were first-year students at the Department of Primary Education. The data of the study were collected in the spring semester of the 2016-2017 academic year. The metaphor forms were administered to 90 teacher candidates in association with the fundamental problem of the study. Nonetheless, the second part of the study, which focused on its sub-problems, was conducted with 62 teacher candidates who voluntarily completed the scale of learning approaches in full.

While the first-grade teacher candidates participated in the study took the common compulsory courses (Foreign Language, Turkish Language, Computer, Atatürk's Principles and History of Revolution) through distance education in the first semester, they took Mathematics, Biology, History of Civilization and Introduction to Educational Science courses face to face. Thus, considering that teacher candidates at this grade level did not take any elective courses or courses such as field teaching and teaching methods, it is assumed that their views on CAMI are limited only to their first-term experiences and their perceptions of that period.
Data Collection Tools

Metaphor Form

A metaphor form was prepared in order to let the teacher candidates complete the sentence “Computer-assisted mathematics instruction is like ..........., because ........”. Having been provided with a short explanation of the metaphors, the teacher candidates were asked to create a metaphor regarding a sample concept. Finally, emphasizing that they had to focus on a single metaphor for the designated concept and express the reasons, the teacher candidates were given time to complete the form given. Of the metaphors created by the teacher candidates regarding CAMI, 89 were deemed valid. The metaphor given by a teacher candidate, who did not provide a logical basis for their metaphor, was deemed invalid.

The steps of the study process were reported as elaborate as possible with respect to reliability and validity, and they were submitted to be assessed by an expert, whenever needed. Moreover, direct quotations of the teacher candidates were included with regards to specific examples of metaphors and their justification. An expert, who had previously conducted metaphor studies, was asked to match the metaphors with categories. This matching and another matching done by one of the authors were compared, using the reliability formula of Miles and Huberman (1994). The reliability was calculated as 94% due to the fact that five pieces of metaphors were evaluated in a different category by the expert. The metaphors were evaluated in the categories determined upon the unanimous decision of the researcher and the expert.

The Learning Approaches Scale

“The Approaches and Study Skills Inventory for Students” was the data collection tool of choice for the purpose of determining the learning approaches of the teacher candidates. The scale was developed by Tait, Entwistle, and McCune (1998) and adapted to Turkish by Senemoğlu (2011). The entire scale consists of four parts and a total of 67 items, all of which are of the five-point Likert scale type. In the first study conducted, the reliability coefficient was found to be in the range of 0.71-0.81 for the whole of the scale and for the four parts. Whereas in the Turkish adaptation this value was found to be in the range of 0.71-0.91. This study used the first part of the scale, which consisted of three dimensions - deep, strategic, and surface learning approaches - and 52 items. The reliability coefficient of the part used was found as 0.88. Of these 52 items, sixteen measure the deep learning approach, twenty measure the strategic learning approach, while the remaining sixteen measure the surface learning approach.

Analysis of Data

Descriptive and content analysis techniques were employed for the analysis of the qualitative data in the study. In this context, the "naming and elimination", "category development" and "ensuring validity and reliability" phases (Gültekin, 2013; Saban, 2008) were followed in the process of analyzing and interpreting the metaphors created by the teacher candidates. In the first phase, the scope of the study included the metaphors created by teacher candidates, who focused on a specific metaphor and provided a valid reason in regard to this metaphor. Subsequently, the metaphors listed alphabetically were given in the findings chapter in tables. At the category development phase, the metaphor expressions were analyzed in respect of the common aspects that they had regarding CAMI. Categories were created, considering the emphasis, justification, and perspectives of the teacher candidates on this concept. In addition to the categories and sub-categories given in the results chapter, examples of metaphors and explanations are provided in Appendix 1.

Regarding the learning approaches, total points of the relevant items are not comparable to one another as the 52 items available in the first part of the scale were not distributed equally among the learning approaches. Therefore, their average was calculated in order to make the points obtained from
relevant items suitable for comparison, and the points obtained by teacher candidates from each learning approach were arranged in a way that the highest point would be 5, and the lowest 1. Subsequent calculations were carried out over these values obtained. The learning approach preferred by the student was calculated for each learning approach and determined as per the highest point.

**FINDINGS**

**Findings on Metaphors Regarding CAMI**

The first research question of the study was determined as follows: "Which metaphors do teacher candidates use in order to explain the concept of CAMI?" In this context, the metaphors produced by the participants in line with CAMI are listed in Table 1 in alphabetical order.

<table>
<thead>
<tr>
<th>Table 1: Metaphors Created by Teacher Candidates Regarding CAMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>absorbing course</td>
</tr>
<tr>
<td>antibiotics</td>
</tr>
<tr>
<td>assistant</td>
</tr>
<tr>
<td>ayran (local beverage)</td>
</tr>
<tr>
<td>baklava (dessert)</td>
</tr>
<tr>
<td>beneficial situation</td>
</tr>
<tr>
<td>book</td>
</tr>
<tr>
<td>broccoli</td>
</tr>
<tr>
<td>butterfly</td>
</tr>
<tr>
<td>cake</td>
</tr>
<tr>
<td>car</td>
</tr>
<tr>
<td>catching harmony</td>
</tr>
<tr>
<td>chewing gum</td>
</tr>
<tr>
<td>child learning how to read</td>
</tr>
<tr>
<td>cloud</td>
</tr>
<tr>
<td>communicating with a tourist</td>
</tr>
<tr>
<td>crutch</td>
</tr>
<tr>
<td>doctor</td>
</tr>
<tr>
<td>dog</td>
</tr>
<tr>
<td>dream (3)</td>
</tr>
<tr>
<td>drug</td>
</tr>
<tr>
<td>earphone</td>
</tr>
</tbody>
</table>

Table 1 shows that teacher candidates created a total of 89 CAMI-oriented valid metaphors in alphabetical order and that metaphors “dream” (f=3), "machine" (f=2), and "watching TV” (f=2) were created by multiple teacher candidates. The second research question of the study was determined as follows: “Under which categories can the metaphors put forward by teacher candidates be grouped in terms of their common aspects?” As a result of the analysis of the metaphors, the CAMI-oriented metaphors created by the teacher candidates were collected under the categories "CAMI with positive aspects", CAMI with negative aspects", "CAMI in terms of structural aspects" and CAMI with neutral aspects”. Each category and each subcategory are given in Figure 1.
Figure 1: Categories and subcategories of metaphors regarding CAMI

Figure 1 shows that the metaphors of the teacher candidates were discussed under 4 categories and 12 subcategories. Considering the category-based percentage of the metaphors, it can be seen that the teacher candidates mainly had a positive perception. Of the teacher candidates, nearly half (49%) were evaluated to have positive perceptions about CAMI as they put emphasis on the beneficial, facilitating, supportive or entertaining aspects of CAMI. A group of teacher candidates (18%) was found to have created negative metaphors, putting emphasis on the insufficient, complicated, or passivating aspects of CAMI. Nevertheless, a small portion of teacher candidates (8%) made justifications both on positive and negative aspects of CAMI, as well as on their perceptions being neutral. Following the analysis of the metaphors and justification by the teacher candidates, it was observed that some teacher candidates (26%) put emphasis on CAMI being conditional, comprehensive, or indispensable, rather than positive or negative aspects of CAMI. Each category, subcategories, examples of metaphors, and examples of explanations are given in Appendix 1.

Findings Concerning the Comparison of the Teacher Candidates’ Metaphors with Their Learning Approaches

The third research question of the study was determined as follows: "Do the metaphors of teacher candidates regarding the concept of CAMI differ based on the learning approach that they prefer?" As this part of the study was conducted with 62 teacher candidates, Table 2 gives the results concerning the distribution of the metaphor categories of the teacher candidates and their dominant learning approaches.

Table 2: Distribution of Metaphor Categories and Learning Approaches

<table>
<thead>
<tr>
<th>Metaphor Categories</th>
<th>Deep</th>
<th>Strategic</th>
<th>Surface</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Aspects</td>
<td>15</td>
<td>14</td>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>Negative Aspects</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Structural Aspects</td>
<td>4</td>
<td>11</td>
<td>2</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>28</td>
<td>8</td>
<td>62</td>
</tr>
</tbody>
</table>
Following the analysis of Table 2, it was determined that a great majority of the teacher candidates adopted the strategic (f=28) and deep (f=26) learning approaches, while a specific portion adopted the surface (f=8) learning approach. It can also be seen that nearly half of the metaphors were created to put emphasis on the positive aspects (f=30) of CAMI, while others emphasized the structural (f=17) and negative (f=15) aspects of it. No metaphors could be found among the participants of this group concerning the neutral aspect of CAMI. Figure 2 gives the distribution of the metaphor categories and the learning approaches of the participants.

Figure 2: Distribution of the learning approaches and metaphor categories

Following the analysis of Figure 2, it was found that teachers, who adopted the deep and strategic learning approach, had proportionally more positive approaches, while those adopting the surface learning approach had a negative perception. For instance, a teacher candidate, who adopted the deep learning approach, reflected their positive thoughts by using expressions, such as "it is similar to an old lady's stuff because it provides positive support as a third foot", and a teacher adopting the strategic learning approach did the same by using expressions, such as "it is similar to writing encyclopedias because numerous new information can be passed down to students through this type of teaching, enabling such information to be planted inside the brain of the students", while a teacher candidate adopting the surface learning approach expressed his negative opinion through expressions, such as "it is similar to a dream because you usually come across the opposite of what you see, which in turn disappoints you".

In addition to these opinions, it was observed that teacher candidates, who rather put emphasis on the structural aspects and conditions of CAMI, were the ones that had the strategic learning approach. For instance, one teacher candidate stated "it is similar to a puzzle because our skills improve to the extent of effort we put in", while another said, "it is similar to water filling into a hole because teaching can only occur by the completion of missing information, which solidifies the knowledge". Therefore, it is possible to say that the learning approaches adopted by teacher candidates were in concordance with the metaphors they created and with their justification.

The SPSS Exact Test was employed to determine whether there was a statistically significant correlation between the metaphors categories and learning approaches of the teacher candidates, and the results were given in Table 3.

Table 3: Correlation between Learning Approaches and Metaphor Categories

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>DF</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson's Chi-Square Test</td>
<td>12.473*</td>
<td>4</td>
<td>.014</td>
<td>.013</td>
</tr>
</tbody>
</table>

*3 cells (33.3%) have expected count less than 5. The minimum expected count is 1.94.

The chi-square test dictates that no more than 20% of the values should be lower than five. As the subject matter of the study included a 3x3 table and because the proportion of the number of
observations with theoretical values lower than 5 was more than 20% (33.3%, see Table 3), it was decided to employ the SPSS Exact Test. As a result of the analysis, a statistically significant correlation was found between the metaphors and learning approaches ($\chi^2= 12.47$, $p = .013$).

DISCUSSION, CONCLUSION, AND RECOMMENDATION

This study was conducted in order to analyze whether the classroom teacher candidates’ metaphors regarding CAMI differed from the learning approaches that they adopted. Of the study results, the first one was related to putting forward 85 different metaphors out of 89 valid metaphors in total (as some teacher candidates created similar metaphors). Considering the fact that the teacher candidates participating in the study took similar courses before and during the study, the resulting variability can be considered striking. This situation may indicate that there are individual differences between students and that the common course they take, similar course processes, or metaphors alone may not be functioning as a determinant in designating their perception.

As it was not possible to fully explain the CAMI-oriented perception by using the metaphor expression created, the justification of the metaphors was analyzed and the statements of the teacher candidates were grouped under specific categories. Of the results obtained as a consequence of the study, the second one shows that nearly half of the metaphors created by the teacher candidates were positive while one-fifth were negative in regard to CAMI. Approximately one-fourth, however, are observed to have rather focused on structural aspects of CAMI. Similarly, the results of the study conducted by Boz and Özerbaş (2020) put forward that the perception of classroom teachers concerning the use of technology in mathematics class was substantially positive. Even though these results seem to be positive at first sight, in order to interpret this situation, it is important to initially determine what teacher candidates make of the concept of CAI. When the metaphor-related statements are analyzed, it can be seen that some teacher candidates evaluated CAI mainly from its remote education aspect. Based on the statements made by some teacher candidates, such as "we cannot get efficiency as we can in a normal lesson", "it is proper that a teacher lectures the course", "remote education brings about lower quality, which makes it unnecessary", it is believed that they made negative comments on remote education, instead of CAI. This may be caused by the fact that the common compulsory courses started to be lectured remotely one year before the study took place, that this situation was a new experience for the freshmen, as well as the setbacks in the process. Some previous studies support this idea (Çivril, Aruğaslan, & Özkara, 2018; Fidan, 2017; Marsh, Mitchell & Adamczyk, 2010). For instance, in the study conducted by Yılmaz and Güven (2015), it is shown that the reasons for the negative perceptions are that the lessons are combined without a break, there is no opportunity to ask questions to the lecturer outside the lesson, and there may be technical problems from time to time.

Based on the research of Açıkgül and Aslaner (2014) on the studies conducted with pre-service teachers for the use of CAI in mathematics lessons, it can be said that pre-service teachers' computer anxiety levels, self-efficacy perceptions and attitudes also affect this result. Polat and Karakuş (2020), as a result of their study with pre-service teachers, revealed that pre-service teachers' attitudes towards CAI and their self-efficacy perceptions were generally positive and emphasized that there were other studies that yield parallel results. Another factor emerged in the study is that the higher the class level, the more positive the attitude and perception of self-efficacy. Considering that the participants of this study are first grade students, it can be concluded that if the quality of the education given increases in parallel with the increase in grade level, prospective teachers may have a better perception when they graduate. Moreover, it is reported that there is a highly negative relationship between computer self-efficacy perception and computer anxiety levels of students (Durnell & Zaag, 2002; Öztürk, 2013). For this reason, it can be thought that most of the students may not have high computer anxiety levels. Some researchers (Öztürk, 2013; Polat & Karakuş, 2020) also state that students owning a computer may also add to this result and therefore it would be beneficial to evaluate the working group from this point of view.
The third study result sets forth that teacher candidates adopting the deep and strategic learning approach had proportionally more positive perceptions while those with the surface learning approach had negative perceptions, and that there is a statistically significant correlation between the metaphor categories and learning approaches. This result seems to be in concordance with the aspects of the learning approaches. The fact that a method beyond traditional methods, such as CAI, is perceived positively and preferred by teacher candidates may be arising from the fact that the processes they have experienced and will experience are of better quality, as well as from their intentions to make use of different opportunities concerning high expectations of achievement. Even though no studies could be found that directly discussed the correlation between learning approaches and CAI, a study conducted by Doğruluk (2015) can be evaluated in terms of creating a perspective on this subject matter. In a study they conducted with teacher candidates, Doğruluk (2015) put forward that the level of surface learning approaches of teacher candidates increased in parallel with the duration of internet use. On the other hand, the same study concluded that the correlation between the self-sufficiency belief that the teacher candidates had regarding the use of the internet for educative purposes and the deep approach was more powerful, compared to the surface approach. When the study results are analyzed in this respect, it can be concluded that the proper use of technology in the field of education, beyond its usage in our daily lives, can pave the way for the creation of a quality learning-teaching process. In a study they conducted, Bozkurt and Cilavdaroğlu (2011) also set forth that even though classroom teachers used technology, they could not use it sufficiently and in a quality manner in the learning processes of the students. Classroom teachers use computer technology through interactive software and websites in order to attract attention or for visual aspects; nevertheless, they make only a little use of the software that supports different activities for creating and developing concepts in mathematics classes (Sarı & Akbaba-Altun, 2015).

The results of the study were evaluated in line with the objective of the study, and they revealed the need for different studies. There are studies in the literature that emphasize the fact that individual variables are important in terms of attitudes and that mainly those with past experiences in CAI have positive attitudes (Çeliköz, 1997). Therefore, it is also important to determine the CAI experiences of teacher candidates in the pre-undergraduate periods. Additionally, although the general CAMI-oriented perceptions of teacher candidates are not negative, it is required to elaborately research the causes of negative perceptions concerning CAMI.

The metaphors created by teacher candidates, their remarks on said metaphors, and the correlation between the metaphors and learning approaches are also significant in respect of giving an idea to the faculty members managing the program, and the outcomes should be taken into consideration. The way the teacher candidates explain specific concepts during the intra-class dialogs they had, may give some clues regarding the learning approaches that they adopt. As learning approaches are variables that can differ based on a number of factors, it is of utmost importance to elaborately analyze the underlying reasons why individuals adopt surface learning and under which circumstances they can develop deep and strategic approaches.

Rather than how densely it is used in the settings of teaching, it is significant to integrate technology into a pedagogical approach in line with educational purposes (Mumcu, Haşlaman, & Usluel, 2008). CAMI materials can be prepared that are in concordance with the programs and achievements of teacher candidates in order to effectively integrate technology into learning processes. Doing so, it could be possible to increase their awareness of this subject matter and to help them develop a positive attitude. Additionally, the prospective benefits of this teaching method in the deep and strategic learning process can be shown by preparing activities on how students can use CAMI in their own learning processes.
REFERENCES


APPENDIX 1

CAMI with POSITIVE ASPECTS

Category ➔ Subcategory ➔ Metaphor Sample ➔ Explanation

- Facilitating
  - a telephone line that shortens distances
  - we can make use of mathematics lessons even from a distance

- Providing benefits/contribution
  - lifeguard
  - comes to your rescue whenever you need it
  - time machine
  - spares you the time lost in the classes on topics

- Supporting/guiding
  - old lady’s cane
  - provides positive support as a third foot

- Entertaining
  - playing games
  - this system can be more entertaining as other courses are lectured in a standard way

CAMI with NEGATIVE ASPECTS

Category ➔ Subcategory ➔ Metaphor Sample ➔ Explanation

- Dysfunctional/Insufficient
  - non-refereed football
  - a course would be insufficient if not lectured by a teacher
  - butterfly
  - the knowledge learned is short-lived

- Complicated
  - dream
  - you see it but cannot perceive or remember it; It is abstract and baseless
  - node
  - is not easy to comprehend

- Passivating
  - tasteless bread
  - does not help us eat well. The lesson we take makes us passive
CAMI in terms of STRUCTURAL ASPECTS

- **Conditional variable**
  - **Metaphor Sample**: a person endeavouring to lose weight
  - **Explanation**: does not offer any benefits as it is irregular. What is learned is forgotten

- **Indispensable**
  - **Metaphor Sample**: one of the seven colors of the rainbow
  - **Explanation**: I cannot imagine education without technology

- **Comprehensive**
  - **Metaphor Sample**: life
  - **Explanation**: is dense, comprehensive, and has its ups and downs.

CAMI with NEUTRAL ASPECTS

- **Both beneficial and detrimental**
  - **Metaphor Sample**: drug
  - **Explanation**: may save lives if used when needed; it can be very detrimental if used at the wrong time and more than required

- **Neutral**
  - **Metaphor Sample**: zucchini dish
  - **Explanation**: would be fine whether or not you eat it
Difficulties and Achievements Throughout Career Stages: Vice Principles’ Perspectives

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Recep Tayyip Erdogan University

Abstract

This research aims to study vice-principals’ career stages and determine their difficulties and achievements in these stages. The data in the study were obtained with semi-structured interview questions. As a result of our research, twenty school vice-principals were interviewed. As a consequence of the interviews, our data were gathered under three themes in line with qualitative research methods and techniques; sub-themes suitable for the themes were created and interpreted by content analysis. According to the results, the vice principals’ main challenges in their career stages are professional competence, lack of sharing information from colleagues, sense of belonging, need for mentors, working conditions, lack of experience, inefficiency, and time management. It was revealed that some vice-principals developed and kept themselves up-to-date with in-service training to overcome the difficulties. At the same time, some received support from experienced and older administrators. Based on the interviews’ data, it was resolved that the past encounters and experiences in the challenges faced affected the vice principals. It was assumed that these difficulties were easily overcome by the experienced vice directors, who worked as a principal for a long time.

Keywords: School Vice-Principal, Career Stages, Career Difficulties, Career Achievements


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1. INTRODUCTION

Schools are the places where services are provided in education and where service elements are found. The formation of other educational institutions that are leftover from schools helps schools do their jobs more effectively. Achieving goals in education depend on the appropriate organizational structure and administration of schools (Alıç, 1991, p.25). Thus, school administrators can be expressed as individuals who practice all the means and facilities available in the school and the environment most effectively, develop and sustain them by the school (Ağaoğlu, 2005, p.4). In another definition, the school management is defined as the units that use our schools most effectively and implement the decisions by integrating all the resources and facilities they have to reach the previously planned goals (Demirtaş, 2005, p.10). The school administrator is the staff in the leading position. Therefore, he goes through certain career stages and encounters some obstacles and difficulties during them.

Career is called the stages individuals go through throughout their business life, their work at these stages, the mobility in the process, and the collection of knowledge owned and acquired. Although there are different stages in the individual’s career development, this development includes an expansive adventure that starts before birth and continues until the end of life. While school administrators have a career, teachers, and civil servants working in schools also have duties. However, considering the situation in school administrators’ career development, who manages the school staff with their decisions and play an essential role in educating students with qualified and up-to-date information, possesses various importance (Bakioğlu, A. & Özcan, K., 2001, p. 41).

Traditionally, school administrators are selected from among teachers, and teachers who meet specific criteria and experiences become administrators in schools. According to the results of the research conducted by Bakioğlu (1996), school staff who are teachers go through five different career stages during their careers and shape their careers. These are 1. Introductory career phase (covers 1-5 years), 2. Relaxation phase (covers 6-10 years) 3. Experimental phase (covers 11-15 years) 4. Specialization phase (covers 16-20 years) And 5. Calmness phase (covers 21-25 years). During these stages, teachers can continue their profession as administrators, and as a result, they may encounter some obstacles. In Bakioğlu's (1994b) study, it was revealed that school administrators experienced four career steps in this profession, which have distinct advantages and disadvantages. These are Initiation, Development, Autonomy, and Disenchantment steps.

The difficulties faced by administrators and teachers who have gone through their career stages are fundamental. For instance, not benefiting from experienced teachers’ expertise, not receiving expert support, not improving working conditions, and not promoting personal rights will create difficulties for administrators who climb the career ladder. Conditions should be provided for teachers and administrators with experience and knowledge to support other colleagues in their understanding and skills. Principals should invite experts to schools and ensure that teachers benefit from these activities at a high level. Besides, whatever teachers' origins are, they should be supported both professionally and individually. Teachers' working conditions and personal rights need to be improved (Bakioğlu & İnandı, 2001, p.525).

In the current period, school administrators' roles and duties, and the stakeholders' expectations are becoming more complex. In today's conditions where change is occurring rapidly, school administrators need to understand stakeholders very well, lead and continue their professional development to successfully move schools to the next century (Bartell & Birch, 1995).

Organizations choose individuals to be employed according to certain conditions (Balci, 2000, p. 35). These conditions generally include specific professional knowledge and skills that organizations need (Çınkır, 2000, p.86). The talents of candidate individuals are considered as indicators of success. This situation helps individuals to predict their future success and performance in the organization with their skills and abilities. On the other hand, the inadequacy of the candidates'
professional skills negatively affects their success. Therefore, it is essential for an individual to have the appropriate skills and abilities when hiring (Feldman, 1980, p. 170).

The assignment of vice principal was made voluntarily among the teachers at the school. This staff, which can be described as an intermediate manager position, is seen as a vertical hierarchy step. In this context, it is considered as a premise for the school principal. Studies on the position of vice principal require complex and systematic planning (Kartal, 2009). Apart from school principals, there are also stakeholders called educational administrators. In addition to vice directors and group heads, coordinators in charge of different subjects are contacted managers (Erdoğan, 2019, p.129).

In selecting candidates past experiences, intelligence, knowledge, skills, and abilities are considered. This situation is regarded as necessary in providing performance competence for the organization and job satisfaction for the individual (Chatman, 1991, p. 460). What is expected from individuals at all levels within the organization is to play their roles under their status and position. These roles also determine individuals' rights, duties, and responsibilities regarding their position in the organization. Choosing the necessary behaviours (competencies) for responsibilities and roles ensures that the organizational structure's interaction and the organization's system is a positive process and works. However, for a manager to be considered as a leader, he must have the power to stretch the conditions and influence the stakeholders, beyond mechanically obeying the organizational guides (orders, regulations, etc.) (Katz & Kahn, 1977). In this sense, it is thought that the vice principals' career competencies are critical in their ability to perform their administrative duty. The present study aims to reveal the difficulties the vice principals face in their career stages and what the vice-principals achieve throughout those career stages.

Studies conducted in the context of career stages in the national literature include teachers' professional development (Aydın, 2018), teachers' perceptions of school administration (Bakioğlu & Asyali, 2005), teachers' difficulties experienced by district director of national education principals (Yahşi, 2020), leadership behaviors of school administrators (Korumaz & Tufan, 2020; Çiftçi, 2007), career development of school principals (Özkaya, 2013), professional development of education supervisors according to career stages (Aküzüm & Özme, 2014). National literature is lack of studies related to the difficulties faced by vice principals in their career stages and the achievements in these stages. In this context, the present study adds a holistic perspective by including the achievements together with the difficulties. The results are important in terms of taking measures against the difficulties faced by vice principals who have important roles in school administration and developing the achievements that vice principals in different career stages have. In addition, the current study is expected to increase the awareness of education stakeholders and contribute to studies in this direction.

To this end, the present study aims to answer the following research questions:

1. What are the difficulties and achievements of vice principals?
2. What are the difficulties and achievements of vice principals in different career stages?

2.METHOD

2.1. Research Design

In line with the research's purpose, phenomenology, one of the qualitative research designs, was adopted. The phenomenological method aims to reveal individuals' cognitive structures by examining the interpretations of the phenomena experienced by them (Creswell, 2014, p. 124). With a philosophy based on making qualitative research and theories with a different perspective, it is an understanding that prioritizes social facts as research and knowledge under their conditions (Yıldırım & Şimşek, 2011, p. 39).
2.2. Study Group

The working group consists of 20 vice-principals who continue their duties in 20 state schools. When the study group was examined, there were eight classroom teachers, 3 Turkish language and literature teachers, 2 Accounting and Finance teachers, 2 Mathematics teachers, 1 Preschool Teacher 1 Religious Culture and Ethics teacher, 1 Science and Technology teacher, 1 History teacher and 1 Turkish teacher working as a vice principal. Eight of these vice-principals work in primary school, 7 in secondary school, 4 in high school, and one in preschool institutions. According to years of administrative service, participant vice-principals were distributed as five persons in the initial phase, five persons in the developmental stage, five persons in the autonomy phase, and five persons in the disenchantment phase. Information about the participants is given in Table 1.

Table 1. Demographic Information on Participants

<table>
<thead>
<tr>
<th>Career Stage</th>
<th>Branch</th>
<th>Age</th>
<th>Seniority Year</th>
<th>School Level</th>
<th>Average Class Size</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Stage</td>
<td>Accounting and Finance</td>
<td>35</td>
<td>9</td>
<td>High School</td>
<td>35</td>
<td>M1</td>
</tr>
<tr>
<td></td>
<td>Accounting and Finance</td>
<td>42</td>
<td>17</td>
<td>High School</td>
<td>35</td>
<td>M2</td>
</tr>
<tr>
<td></td>
<td>Turkish Language and Literature</td>
<td>36</td>
<td>11</td>
<td>Secondary School</td>
<td>24</td>
<td>M3</td>
</tr>
<tr>
<td></td>
<td>Classroom Teacher</td>
<td>37</td>
<td>10</td>
<td>Primary School</td>
<td>28</td>
<td>M4</td>
</tr>
<tr>
<td>Development Stage</td>
<td>Classroom Teacher</td>
<td>42</td>
<td>17</td>
<td>Primary School</td>
<td>30</td>
<td>M6</td>
</tr>
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<td></td>
<td>Classroom Teacher</td>
<td>45</td>
<td>20</td>
<td>Primary School</td>
<td>20</td>
<td>M7</td>
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<td></td>
<td>Classroom Teacher</td>
<td>41</td>
<td>14</td>
<td>Primary School</td>
<td>22</td>
<td>M8</td>
</tr>
<tr>
<td></td>
<td>Preschool and Child Development</td>
<td>40</td>
<td>14</td>
<td>Kindergarten</td>
<td>14</td>
<td>M9</td>
</tr>
<tr>
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<td>42</td>
<td>16</td>
<td>High School</td>
<td>28</td>
<td>M10</td>
</tr>
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<td>Autonomy Stage</td>
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<td>56</td>
<td>31</td>
<td>Primary School</td>
<td>27</td>
<td>M11</td>
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<td>Primary School</td>
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<td>M12</td>
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<td>55</td>
<td>30</td>
<td>Secondary School</td>
<td>27</td>
<td>M13</td>
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<tr>
<td></td>
<td>Turkish Teacher</td>
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<td>36</td>
<td>High School</td>
<td>25</td>
<td>M14</td>
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<tr>
<td></td>
<td>Math Teacher</td>
<td>57</td>
<td>30</td>
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<td>32</td>
<td>M15</td>
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<tr>
<td>Disenchantment Stage</td>
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<td>Primary School</td>
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<td>M17</td>
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<td>53</td>
<td>28</td>
<td>Primary School</td>
<td>32</td>
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<td>Religious Culture and Moral</td>
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<td>23</td>
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<td>24</td>
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<td></td>
<td>Knowledge</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Science and Technology</td>
<td>51</td>
<td>27</td>
<td>Secondary School</td>
<td>28</td>
<td>M20</td>
</tr>
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</table>
2.3. Data Collection Tool Development

Interview forms are applied to collect data in the study. During the interviews, a semi-structured interview was conducted with additional questions to the vice principals when necessary. All the questions prepared were arranged to obtain different data. The interview questions were designed by reviewing the draft questions after the literature review and evaluating expert opinions. For the interview, 15 draft questions were prepared in advance, and the interview questions with expert suggestions were reduced to 11 in the first stage. The questions were combined with the previous study, and nine questions were determined in conformity with the vice principals to ensure compliance and subject integrity. Therefore, content validity was provided. Twenty-six vice-principals were contacted before the interviews, yet twenty vice-principals accepted to participate in this study. Some sample questions from the interview form are given below:

1. What would you gain as a vice-principal? How does it affect your school's commitment, whether your thoughts are valued or not at the school where you are a vice-principal?

2. Do you find yourself competent as a manager in your career development phase as a vice-principal? What are you doing to improve the students and the curriculum?

2.4. Data Collection Tool and Data Collection

Semi-structured interview forms were used to collect the data. Semi-structured interview questions were formed by analyzing the literature reviews and expert opinions. While collecting research data, a face-to-face individual interview method was applied. Throughout the interviews, the necessary measures were taken to ensure the most appropriate research conditions by emphasizing the issues that should be considered in the scientific interview methods. Research interviews lasted 25-45 minutes on average, and the data obtained from the vice principals were analyzed with content analysis. The data collected by this means should be conceptualized first, and these emerging concepts should be made orderly with logic, and the themes should be revealed by clarifying the data (Yıldırım & Şimşek, 2011, p.45).

2.5. Data Analysis and Evaluation

During the interviews, short notes were taken, and the data were kept without missing any details, and the recorded data were converted entirely to prose. The written records obtained were read many times, and the main themes were formed. The data were separated by being compatible, and sub-themes were created. The themes prepared as drafts were revised, and the themes that were not compatible with each other were subjected to reclassification. Interpretations have been made using the available literature, with direct quotations made from the data drawing attention to specific issues and repeating them frequently by those who provide the data. Keeping the private information of vice-principals confidential is essential for the study's validity and reliability. The school administrators whose data were included in the study were coded in the given orders. For example, the number 20 expresses the total number of people, while the number 5 indicates how many people agree (5/20).

3. FINDINGS

The findings related to the first research question are classified under three main themes and several sub-themes. The analysis based on the interviews is as follows:
Table 2. Themes and sub-themes obtained from the data

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Development and Competence</td>
<td>Competence</td>
</tr>
<tr>
<td></td>
<td>Personal Benefits</td>
</tr>
<tr>
<td></td>
<td>Professional Development</td>
</tr>
<tr>
<td></td>
<td>Information Sharing</td>
</tr>
<tr>
<td>Affective Condition</td>
<td>Belonging</td>
</tr>
<tr>
<td></td>
<td>Need for a Mentor</td>
</tr>
<tr>
<td></td>
<td>Working Conditions</td>
</tr>
<tr>
<td></td>
<td>Experience</td>
</tr>
<tr>
<td></td>
<td>Capacity Utilization (Efficiency)</td>
</tr>
</tbody>
</table>

3.1. CAREER DEVELOPMENT AND COMPETENCE

3.1.1. Competence

The vice-principals (19/20) participating in the interview do not see themselves as sufficient (1/20), and the other (1/20) see themselves as acceptable. Vice principals stated that they did not find themselves competent at the beginning and development stages since they did not have full knowledge of the legislation and could not gain problem-solving and communication skills properly. At the level of disenchantment and autonomy, vice-principals assume that they are inadequate in some areas due to the changing legislation provisions, new information, and technology. At the Beginning and Development stages, the vice-principals stated that they could not contribute to their development and the curriculum due to their intense workload. Vice principals at the Autonomy and Disenchantment level stated that they contributed to students’ development and the curriculum in various subjects. Below are some of the responses given by the vice-principals at different career stages who participated in the interviews:

"I have shortcomings since I have been the vice-principal for three years. When I recognize my flaws, I try to do what is needed to fill my deficiencies. Since there are many workloads, I spend most of our time doing official work. I do not contribute much to the advancement of the students and the curriculum." (M4).

"With each passing year, I realize more and more that I have deficiencies. I look at the regulations to make up for the flaws I noticed; I get information from my experienced friends. We cannot contribute to the development of the curriculum. I am working hard enough. " (M7)

3.1.2. Personal Benefits

Vice principals who participated in the interview and who were in the initial, development, autonomy, and disenchantment stages, declared that they developed and continued to grow in many areas due to their duties (20/20). Since the raw material of education and training activities is ‘human’, good communication skills are required. Vice principals must communicate with teachers, parents, students, and NGOs due to their duties. Thanks to this continuous communication, there is an increase in communication skills. The school develops its bureaucratic skills through official correspondence and transactions with many institutions. Organizing and managing the school environment enhances management skills. Since vice-principals are the first referral office to solve the problems that arise in the school, they have to solve the emerging issues quickly without interrupting education. This expectation contributes to vice-principals to develop their problem-solving skills. Since the school is expected to use its limited and scarce resources most efficiently, it also can manage resources effectively. Below are some of the responses given by the vice-principals at different career stages who participated in the interviews:
"Thanks to my role as vice-principal, my communication skills with people have increased. By finding solutions for our students and parents who have problems, my problem-solving skills increase day by day." (M2)

"Being the vice-principal made me see the work and operation of the school closely. I realized a lot of things that I couldn't realize when I was a teacher. For instance, I realized that if teachers do not cling to their work, things do not work out; many of the problems stem from this." (M10).

3.1.3. Professional Development

As a result of our research, it is seen that the vice-principals try to improve themselves in matters they consider themselves incomplete and inadequate regardless of their career stages. At the initial stage, the vice-principals try to eliminate the lack of legislation by looking at the regulations and improving themselves professionally by following the official letters coming to the school. The vice-principals at the development stage stated that they completed their deficiencies by exchanging ideas with their colleagues and following the legislation. They stated that they renew themselves by attending in-service training courses. Vice-principals at the autonomy and disenchantment levels said differently from the vice principals in the first two steps, that they developed themselves professionally by following the Ministry of Education's official website and the unions' publications. Below are some of the responses given by the vice-principals at different career stages who participated in the interviews:

"I follow the regulations. I read all kinds of articles from higher authorities on the school subject. I always try to follow current topics whenever possible. I attend related training and seminars. " (M1).

"I follow the new circular and announcements on the official website of the Ministry of National Education. Vice principals and managers should follow the current development of institutions such as İŞKUR, SSK, Finance, and their legislation. Because something changes almost every day." (M14)

3.1.4. Information Sharing

While the vice principals in the initial, autonomy and disenchantment stages stated that regular meetings should be planned by the senior management to meet and share with other colleagues, the vice principals at the development stage said that in addition to regular meetings, school visits and sports and cultural activities could also be made. It is observed that the vice-principals who are in the development step are more willing to come together. At the beginning and development stages, the vice-principals stated that they would exchange ideas, share problem-solving, legislative information, and benefit from others' audits and experiences. In addition to the above, the vice-principals in the autonomy and disenchantment stages want to learn about the acceptable practices applied in schools and carry good examples to their schools by considering their schools' application. Some of the vice-principals' responses at different career stages who participated in the interviews are as follows:

"The higher authorities can do this with an official letter. Meetings can be held at the beginning and end of the semester. I think it would be useful to benefit from the knowledge and experience of experienced administrators. Benefiting from their experiences about the work to be done at school, discipline problems and solutions contribute to my development. " (M5).

"Regular meetings can be held to convey different experiences. Information about joint action can be exchanged. If there are mistakes, new methods and techniques can be developed by brainstorming to turn them into right. " (M9)
3.2. AFFECTIVE CONDITION

3.2.1. Belonging

The vice-principals who participated in the interviews stated that the schools they work with ask their opinions and value them. Receiving their thoughts and ideas and their contribution to the functioning of the school makes them feel valuable. While this increases their ownership and affiliation with the school, it ensures strengthening the sense of belonging between them and the institution they work. Since the sense of belonging is an effort to integrate with what concerns, it enables them to establish strong ties with their institutions. Below is one of the responses given by the vice-principals at different career stages who participated in the interviews:

“We receive all the opinions of every stakeholder at our school. The most appropriate and logical idea is put into practice. Of course, my thoughts are valuable in the working environment and increase my sense of school ownership.” (M20)

3.2.2. Need for a Mentor

Newly appointed vice-principals encounter various obstacles in individual and professional fields and need support in solving these problems. Vice principals state that they need external support at all career stages. They said that there are times when they need external help, particularly for changing and developing approaches, rapid change of information technology, legislation changes, and the implementation of new articles. They stated that the people who can provide this support are directors and vice-principals, inspectors, information technology experts, pedagogues, and personal development experts with sufficient knowledge and experience in their field. Some of the vice-principals' responses at different career stages who participated in the interviews are as follows:

“Support from experienced people is always required. In the first years of my career, more experienced and knowledgeable managers could be supported.” (M4).

“No matter how much we improve ourselves, we need a guide in places where we are incomplete since needs increase and change with the development of the society, employees, and students with the advancing technology. In this sense, the people who can support us are managers, vice principals, and inspectors who have enough knowledge and experience.” (M8).

3.2.3. Working conditions

Working conditions of civil servants are determined in laws and regulations. The personal rights, leave procedures, and working hours of the vice principals working in schools are clearly defined. The vice-principals participating in the meeting did not comment on the issues listed above since there is not much chance the manager can perform. They stated that the principals' improvements in their schools regarding working conditions are generally physical conditions and office supplies. Some administrators also emphasized that their conditions have not improved. They stated that the workload in crowded schools is high, routine work is more than necessary, and it is not in the principal’s hands to reduce this. Some of the vice-principals' responses at different career stages who participated in the interviews are as follows:

“Our principal makes the best possible changes within the facilities of the school to improve the working conditions physically. I can see that there is not much he can do about the workload.” (M5).
“Our school principal does not have such an effort. He helps with the layout of our study room in the best-case scenario. There is not much that can be done to reduce the intensity of daily routine work. The most crucial problem is the workload.” (M10).

3.2.4. Experience

Experience is all of the interests and knowledge gained in a job after a certain period. Vice principals interviewed think that they need to work for a certain period to gain experience with their duties and say that they become more professional in their jobs after at least ten years. They stated that they fulfilled their duties and responsibilities more easily thanks to their experiences. The vice-principals who have just started their jobs and are in the development stage stated that they do not have enough experience. Since vice-principals in autonomy and disenchantment levels are more experienced than vice principals at other groups, they fulfill their duties and responsibilities more efficiently. All the participating vice-principals stated that they had difficulties due to the lack of experience in the first years of their employment. Below are some of the responses given by the vice-principals at different career stages who participated in the interviews:

“I had a hard time during the first years. It was a time when I did not have full command of the regulations. In general, no matter how many years you are vice principals, we have difficulties eliminating the school’s physical and financial deficiencies. Job alternatives other than education tire us. At the end of 5 years, I would like to say that I am more experienced and working more efficiently.” (M6)

3.2.5. Capacity Utilization (Efficiency)

Vice principals stated that they spend almost all of their energies in carrying out a high number of tasks that need to be done in the school environment (student affairs, parent meetings, personnel affairs, official correspondence, routine work). They believe that they are carrying out these responsibilities efficiently by using their full capacity. In the school environment, civil servants can do these jobs. It is understood that they cannot contribute to the curriculum’s development since they devote their time to these works and cannot be productive since they cannot use their capacities in this field. It is observed that a small part of the participating vice-principals tried to use their capacities for the development of the curriculum. Some of the vice-principals' responses at different career stages who participated in the interviews are as follows:

“Due to the intensity of routine correspondence and procedures, I spend my energy on getting these things done. These jobs prevent my skills and abilities from fully emerging. I think a civil servant can do these jobs. Therefore, I am working under my capacity.” (M2)

“I use all of my current capacity in administrative affairs. I do everything I can to keep things going. Frankly, I can contribute far below my degree in student development and curriculum.” (M20)

3.3. Time Management

It is observed that vice principals have problems in time management and lack of implementation. The deficiencies regarding are working unplanned, not putting things in order of importance, not converting all kinds of activities into numerical data, not keeping regular archives, and spending too much time with parents' meetings. They emphasized the necessity of planning the works to be done to use time more efficiently and to save time, to put their work in the order of importance and priority, to have a regular archive, to have a daily weekly work schedule, to take notes and to keep statistical data of all kinds of activities. One of the answers given by the vice-principals at different career stages who participated in the interviews is given below:
“Job share is necessary. With good planning, we can use time better. No matter how much you plan in your daily work, your plan is interrupted during a busy day. In crowded schools, the desire to meet with a manager to find solutions to parents' problems constantly interrupts your plan. That is why I try to complete the work without being stuck by doing the things that need to be done first.” (M6)

3.4. FINDINGS FOR CAREER STAGES OF VICE-PRINCIPALS

Findings for second research question regarding career stages is addressed below.

Table 3. Career stages of vice-principals

<table>
<thead>
<tr>
<th>Career stages</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning stage</td>
<td>Problem-solving skills, Management skills, Enhanced in bureaucratic works, Adaptation to school, Workload, Technological support, Collaboration, Share information, Legislation, In-service training activities, Need for mentor, Putting things in order</td>
</tr>
<tr>
<td>Development stage</td>
<td>Problem-solving skills, Management skills, Improvements in bureaucratic works, Communication skills, Technological support, Supported out-of-school activities, Bureaucratic works, School climate, Exchange ideas, Legislation, In-service training activities, Unplanned work, Irregular archiving, Putting things in order, Extended parent interviews</td>
</tr>
<tr>
<td>Autonomy stage</td>
<td>Knowledge sharing, Problem-solving skills, In-service training activities, Approached retirement, Gain experience in the profession, Taking notes, Keeping the school's activities' statistics</td>
</tr>
<tr>
<td>Disenchantment stage</td>
<td>Development of the curriculum, Students due to many jobs, Values education, Guiding, Supporting the activities, Support teachers and students, Regular meetings, Share information, Taking precautions in advance, Contribute to the implementation, Putting the works in order of importance, Preparing work schedules, Preparing templates, Keeping a list of the duties, Keeping a regular archive, Keeping numerical data</td>
</tr>
</tbody>
</table>
3.4.1. 3/5 of the vice-principals interviewed in the Beginning Stage  stated that they improved their problem-solving skills, 2/5 of them improved their management skills, 2/5 of them enhanced in bureaucratic works, and 1/5 of them indicated that they achieved improvement in their abilities in terms of their achievements and expressed that their skills have increased. Valuing their thoughts enabled 3/5 of them to adopt the school and 2/5 of them to feel belonging to the school. All of the vice-principals who participated in the interview stated that they did not consider themselves competent administrators. While 3/5 of these administrators stated that they could not contribute to the development of the curriculum and their students due to heavy workload, 2/5 said they only provided technological support. They stated that 3/5 of the interviewed vice-principals use their full capacity, 1/5 of them use half of their capacity, and 1/5 of them use a small part of their capacity. All vice-principals stated that they spend their capacities on the school’s bureaucratic (routine) works. The vice-principals who participated in the interview indicated that 3/5 of the school principals did not improve their working conditions to improve themselves, and 2/5 of them were made improvements in terms of physical and office materials. 4/5 of them say that their manager is helpful and guiding; while 1/5 says their manager is not helpful. All interviewees stated that senior management should hold regular meetings to come together with other vice principals. Concerning the contributions of these meetings, 3/5 of them stated that they would gain experience from each other, 1/5 of them said that they would collaborate, share information, problem-solving skills will increase, and the activities will be evaluated. The vice-principals interviewed, to update themselves, 4/5 follow the official writings on the institution’s net, 3/5 follow the legislation, 3/5 follow the in-service training activities, 2/5 follow the technological developments. 1/5 of them stated that they follow the Ministry of National Education’s official website, educational sites, and publications in the field of education, trade union publications, and current issues. All of the vice principals stated that they had difficulties in the first months of their employment due to the lack of knowledge of legislation and lack of experience in communication and problem-solving skills. They think they will become professional as they gain experience in the profession (at least ten years). All of the interviewees stated that they needed a mentor. To meet these needs, all of them see experienced directors and assistant managers, 3/5 as inspectors, 2/5 as information technology experts, and 1/5 pedagogues as guides. The vice-principals participating in the meeting stated that 3/5 of them were unplanned working, 2/5 were trying to do different works simultaneously, 1/5 were not taking notes, and not putting things in order. They stated that 3/5 of the things to be done use time well are planned work, 2/5 as putting the duties in order of importance, keeping a regular archive, 1/5 as taking notes, making a work schedule, making use of technology.

3.4.2. In terms of the achievements of the vice-principals interviewed at the Development Stage, 2/5 of them stated that their problem-solving skills were improved, 3/5 of them improved their management skills, and 4/5 of them made improvements in bureaucratic works, and 3/5 noted that their communication skills increased. It is observed that the vice-principals in the development stage have earned more than the vice-principals in the starting stage due to their duties. Valuing their thoughts enabled 1/5 to adopt the school, 1/5 to increase their motivation, and 3/5 to feel belonging to the school. All of the vice principals who participated in the interview stated that they did not consider themselves competent as administrators, like vice principals at the beginning stage. While 1/5 of these administrators stated that they could not contribute to the development of the curriculum and their students due to the abundance of jobs, 1/5 indicated that they provided technological support, supported out-of-school activities, supported teachers and students, and organized projects and activities. The vice-principals at the development stage tried to contribute to the student and the curriculum development compared to the beginning level’s vice-principals. They stated that 3/5 of the interviewed vice-principals use their full capacity, and 2/5 of them use half of their capacity. The first two stages do not differ much in terms of capacity utilization. The vice-principals who participated in the meeting stated that school principals are trying to improve their working conditions to improve themselves and that 2/5 of these improvement areas contribute to bureaucratic works, 2/5 of them contribute to the school climate, 1/5 of them are physical. They stated that their conditions were improved, and they provided motivational support. All the vice principals participating state that their managers are helpful and guiding. 3/5 of the interviewees stated that senior management should hold
regular meetings to get together with the vice-principals, 2/5 of them indicated that school visits should be made, and 1/5 sportive and cultural events should be organized. While the initial vice-principals think that the senior management should decide to come together, half of the vice-principals at the development level are seen to create alternatives to go together. In terms of their contribution to these meetings, 4/5 of them said that they would gain experience from each other, 2/5 could exchange ideas, and share good practice examples in schools. Moreover, 1/5 of them stated that they would cooperate, and their problem-solving skills would increase. At the development stage, the vice-principals think that the meetings to be held will have a lesser impact on the subjects that will contribute to the student's development and the curriculum compared to the vice principals at the beginning level. To update themselves, the vice-principals interviewed said that 3/5 of them follow the legislation, 1/5 of them follow in-service training activities and publications in education, 2/5 of them follow the education sites and exchange opinions with the vice-principals working in other schools. As their knowledge of legislation increases compared to the beginning phase, the issue of following up legislation and official letters attracts less attention. Besides, it was observed that the vice-managers at the development stage received ideas and opinions from experienced vice-principals to improve themselves. All of the vice principals stated that they had difficulties in the first months of their employment due to the lack of knowledge of legislation and lack of experience in communication and problem-solving skills. They think they will become professional as they gain experience in the profession. All of the interviewees stated that they needed a mentor. At this stage, all assistant managers, such as a vice-principal at the beginning stage, see experienced administrators and vice-principals as guides as people who will meet these needs. Vice-principals participating in the meeting stated their shortcomings in time management, 3/5 as unplanned work, 2/5 as irregular archiving, 1/5 not putting things in order, extended parent interviews, and not doing things on time. Things to do to use time well, 3/5 to put things in order of importance, 2/5 to work planned, keep regular archives, to do things on time, 1/5 to take notes, to stay numerical data of every activity done at school, and they stated it as sharing the work. At the development stage, vice-principals think that keeping data about their work and archiving well is essential in saving time compared to vice principals at the beginning stage.

3.4.3. On the level of autonomy, 3/5 of the vice-principals interviewed at the Autonomy Stage stated that they improved their problem-solving skills. 3/5 of them improved their management skills, 1/5 of them made improvements in bureaucratic works, 3/5 said that their communication skills increased. Valuing their thoughts enabled 1/5 to adopt the school, 1/5 to increase their motivation, and 3/5 to feel belonging to the school. All of the vice-principals who participated in the interview stated that they did not consider themselves competent administrators. 2/5 of these administrators stated that they provide technical support and provide materials for educational activities, 3/5 support teachers for educational activities, and 1/5 of them, guide students. All of the vice-principals who participated in the interview stated that they used their full capacity. The vice-principals who participated in the meeting indicated that 2/5 of the school principals did not improve their working conditions to improve themselves, 1/5 of them were improved in terms of physical improvement and office materials, and 1/5 of them provided psychological support. All of the vice principals stated that their managers were helpful. All interviewees stated that senior management should hold regular meetings to come together with other vice principals. The contribution of these meetings to them is 2/5 that they will gain experience from each other, knowledge sharing, problem-solving skills will increase, good examples will be shared, and 1/5 of them will increase their motivation. The vice-managers interviewed to update themselves; 2/5 of them follow the official writings on the institution's net and follow the legislation. 2/5 of them follow the in-service training activities, 1/5 of them exchange ideas with their manager friends, watch educational films, and 3/5 of them follow MEB's official website. 4/5 of the vice-principals stated that they had trouble working as they approached retirement, while 2/5 of them were in their first years of duty. All of the vice-principals who participated in the interview think that they will become professional as they gain experience in the profession. All of the interviewees stated that they needed a mentor. As people who will meet these needs, all of them prefer experienced directors, vice-principals, and 2/5 of them see inspectors as guides. Vice-principals participating in the meeting stated that 4/5 of them were unplanned working and 1/5 of them were not
to do things on time. They stated that 4/5 of the things to be done was planned work, 2/5 as putting things in order of importance and taking notes, and 1/5 as keeping the school's activities' statistics.

3.4.4. Regarding the achievements of the vice principals who were interviewed in the Disenchantment Stage

3/5 of them improved their problem-solving skills, 1/5 had an improvement in their management skills, 2/5 of them were using resources, and 2/5 of them stated that their communication skills were increased. Valuing their thoughts stated that 1/5 of the vice-principals contributed to the school's ownership, 3/5 of them contributed to the sense of belonging to the school, and 1/5 to their motivation. All of the vice-principals who participated in the interview stated that they did not consider themselves competent administrators. While 1/5 of these administrators said that they could not contribute to the development of the curriculum and their students due to heavy workload, 1/5 was about education of values, 1/5 by guiding, 1/5 by supporting the activities, 1/5 stated that they support teachers and students. 5/5 of the vice-principals interviewed stated that they used their full capacity. Vice-principals who participated in the interviews said that physical improvements had been made regarding the progress made by school principals in working conditions to improve themselves. 2/5 of them say that their principal is helpful and guiding; while 3/5 say that their supervisor is not helpful. All interviewees stated that senior management should hold regular meetings to come together with other vice principals. The contribution of these meetings to them is that 1/5 of them will share information, 4/5 of them will increase their problem-solving skills, 2/5 of them will learn about the problems that occur in schools and take precautions in advance, and 1/5 will contribute to the implementation of good examples in schools. The vice-principals interviewed said that 3/5 of them follow the official writings on the institution's net to update themselves, 3/5 of them follow the legislation, and 1/5 of them follow the in-service training activities, the official website of the Ministry of Education, training sites, and areas. They stated that they follow the issues related, and 2/5 of them follow union publications. 3/5 of the vice principals stated that they had difficulties in the first years they started working, and 2/5 of them had problems in these years when they approached retirement. All of the vice-principals think that they will become professional as they gain experience in the profession. All of the interviewees stated that they needed a mentor. As people who will meet these needs, 3/5 are experienced principals and vice-principals, 2/5 of them are inspectors, 2 of 5 are information technology experts, 1/5 are pedagogues, and 1/5 are personal development experts. The vice-principals who participated in the meeting stated that 2/5 of them were unplanned working, 1/5 was trying to do different things simultaneously, and 1/5 spent too much time with parents. Things to do to use time well, 1/5 of the vice principal’s work in a planned way, 1/5 of them put the works in order of importance, prepare work schedules, prepare templates, and keep a list of the duties to be done. 3/5 keep a regular archive, 2/5 of them stated it as keeping numerical data of all kinds of activities.

4. DISCUSSION AND CONCLUSION

Many vice-principals working in the national education organization regard themselves as inadequate in management. Particularly vice principals at the beginning and development stages of school administrators’ career stages find themselves insufficient in legislation. Bakioğlu (1994a) stated in his study that school administrators who have just started their duties mostly find themselves in an impasse. Although at the height of their new appointment's enthusiasm, their uncertainty about their job dedicates them to learn the knowledge and skills. Vice principals at the stage of disenchantment and autonomy have trouble managing technology and new information. At this point, there is a need for experienced administrators who will explain the work and operation to newly appointed teachers and share their experiences.

At the same time, as part of their duties, vice-principals are committed to improving themselves at every stage of their careers. It can be explained as being in constant contact with parents, teachers, school principals, and staff. Thanks to the official correspondence and transactions that the school conducts with many institutions, vice-principals improve their bureaucratic skills. Organizing
and managing the school environment enhances management skills. As Aksu (2004) mentioned in his study results, although teachers' requests against the administration and being a manager are at an increased level, support and training of relatively talented vice-principal candidates who will devote themselves to this field should be pursued. Since vice-principals are the first referral office to solve the problems that arise in the school, they have to solve the emerging issues quickly without interrupting education. This expectation contributes to vice-principals to develop their problem-solving skills. Since the school is expected to use its limited and scarce resources most efficiently, it also can manage resources effectively. According to Bakioğlu (1994a), vice-principals and school administrators start to get the desired results in school administration within three or four years after they are appointed. They gain experience on the job, provide the necessary learning, and are now active in management. In this process, it is necessary to benefit from school management at the highest level since it is the period where the school's vice-principal is most productive.

In our country's education system, vice-principals continue their professional development activities incidentally, away from schools' plans and programs, with traditional attitudes and practices in our appointment system. This development occurs in a way that does not appeal to different environments and types of tasks (preschool, primary school, high school, and vocational education). Professional development, thus, encourages vice-principals to develop themselves individually (Kartal, 2009).

For managers working as vice-principals to be active in their duties, they must be equipped with the necessary management qualifications. The responsibilities of vice-principals are generally based on ordinary and repetitive tasks. The management job's progress causes the work to be done by trial and error method. Practices are an essential reason for gaining practicality in management. Therefore, school administrators must gain experience (Kartal, 2009).

According to Bakioğlu (1994b)'s views on professional development, we can say that the most comfortable career step in professional development is the development stage. In this phase, vice-principals are in their most active period. Unlike the beginning stage, there is no worry in applications. At this career stage, we encounter the school's vice-principal, who has started to facilitate professional development and learning. In this period, vice-principals put their original ideas and methods into practice.

Programming of training and information sharing is expected to make the employees more planned and programmed to work. Besides, thanks to these shares, the organization's commitment will begin to increase, and the uncertainty and role confusion among the employees will be eliminated. The fear of work in the professional field will decrease (Allen & Meyer, 1990, p.848). According to the research results, vice-principals require professional knowledge sharing, which we can define as benefiting from the elders' experiences. While the vice principals at the beginning, autonomy, and disenchantment stages stated that senior management should plan regular meetings to meet and share with other colleagues, the vice principals at the development stage say that school visits can be made in addition to regular meetings. Sports and cultural activities can be met. In this case, we can say that vice-principals need information sharing.

Sharing their opinions in the schools where vice-principals work and making them feel that their views are valuable by their institutions to make them happy and provide job satisfaction. Sharing their opinions and contributing to the school's functioning increases their ownership and affiliation to the school, thus strengthening the sense of belonging between them and the institution they work. Since the sense of belonging is an effort to integrate with what belongs, it causes them to establish strong ties with the institutions they work. As a result, it should be essential to question the sense of belonging in teachers who will be vice principals.

The teachers who have just started their vice principal career face various personal, social, and professional problems. It is revealed in the results of the research that external support is needed to
solve these problems. We can assume that vice-principals need external support at all career stages. The changing and developing approaches, the rapid change of information technology, the legislation changes, and new articles' implementation bring up the vice-principals' mentor needs. It is stated that the people who will provide this support can be principals and vice-principals, inspectors, information technology experts, pedagogues, and personal development experts who have sufficient knowledge and experience in the field. Bakioğlu & Hacıhafızoğlu (2000) stated in their study that mentoring embodies mutual trust, understanding, and empathy. Thus, it should be essential for individuals who share their experiences to perform the same profession as their vice principals.

Candidates for vice principals who have passed the selection exams must be admitted to training courses under a specific program. When the field was scanned, Bulut and Bakan (2002) found that 98.3% of vice-principals received training under "management training" compared to the results they obtained from the study participants. Vice principals need to spend a certain period in their duties to gain experience in their work. They fulfil their duties and responsibilities more efficiently, thanks to their expertise. As a result of the research, it was explained that the vice principals who have just started working and are at the stage of development do not have sufficient experience. It was revealed that vice-principals in autonomy and disconnection levels fulfil their duties and responsibilities more comfortably as they are more experienced than vice principals at other levels.

According to Kartal (2009), it is revealed that employees working as vice principals work in writing, finance, etc. When they do these jobs, it turns out that they are lacking in developing self-management skills. One of the most significant obstacles that vice-principals complain about is their inefficiency. We have mentioned that the vice-principals spend almost all of their energies in carrying out a high number of tasks that need to be done in the school environment (student affairs, parent meetings, personnel affairs, official correspondence, and routine work). These kinds of duties are not performed even though we know that civil servants can do them, and this reveals that vice-principals could not contribute to the development of the curriculum and could not use their capacities. In this case, we can assume that it is impossible to have a high level of efficiency.

Vice principals have difficulties in time management due to unplanned working in schools, not putting things in order of importance, not converting all kinds of activities in the school to numerical data, not keeping regular archives, and spending too much time with parent interviews. The research results show that it is crucial to plan the work to be done to use time more efficiently and to save time, to put their work in priority and priority, to have a regular archive, to have a daily weekly work schedule, to take notes and to keep statistical data of all activities.

5. REFERENCES


The Reasons for and Results of Ostracism at Schools and Recommendations for Solutions through Teacher Experiences

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Abstract

As in other organizations, there is ostracism also in educational organizations. Apart from the individual consequences of being ostracized, there are also undesirable organizational consequences. Considering the potential of educational organizations to transform individuals, the effect of ostracism on teachers becomes particularly important. The purpose of the study was to examine the reasons for and results of the ostracism that teachers face at schools by the school principals, and the recommendations for solutions to prevent ostracism. The study group of the study, which was structured with the phenomenology design, consisted of 12 elementary and middle primary school teachers who had personal experience with ostracism. The data collected through interviews were analyzed with content analysis. The study revealed that teachers were exposed to ostracism for political, social and/or individual reasons. Ostracized teachers experienced psychological and organizational problems. The teachers stated that preventing ostracism in schools would be possible with a more democratic and fairer organizational culture.

Keywords: Ostracism in the Workplace, School Administrator, Organizational Democracy, Organizational Culture, K-12 Teacher

INTRODUCTION

In social life, individuals experience behaviors such as being ignored, being discounted, being neglected and not being taken seriously. All such behaviors exposed can be called exclusion. However, this concept is addressed in the literature with the concepts of “exclusion”, “rejection” and “ostracism”. For example, Williams (2007) tried to define the concept of ostracism with making semantic and psychological distinctions after associating the concept of ostracism with rejection and social exclusion. In this context, exclusion means being ignored, rejection means not wanting to interact with the individual or group, and social exclusion means isolation and showing discontent openly and (Williams, 2007; Williams & Zadro, 2005). According to Leary (2001), ostracism can manifest itself in different forms such as ignoring, direct rejection, and not showing affection.

Scott (2007) stated that experimental studies on social ostracism focused on social exclusion, ignoring and isolation. According to Scott (2007), ostracism is a special form of social ostracism and has four distinctive features. These are (1) visibility (physical, social, cyber, i.e., email or internet-based), (2) motive (not ostracism, role prescribed, punitive, defensive, oblivious), (3) quantity (low to high), and (4) clarity (low to high). One or more of these taxonomic features often establishes the basis of much of social ostracism’s empirical analysis, which has been conducted predominantly employing experimental design. Williams (2001) defined “ostracism as any act or acts of ignoring or excluding of an individual or groups by an individual or groups”.

Ostracism in the workplace refers to an individual or group being ignored, shunned or rejected by another individual or group (Hitlan, Clifton, & De Soto, 2006). In addition, ostracism in the workplace is also observed in cyber space today, when flexible remote working has become widespread. In this context, Harvey, Moeller, Kiessling, & Dubicet (2018) discussed ostracism in the workplace under three categories, namely physical, psychological and cyber. Physical ostracism includes actions such as avoidance, isolation, and not speaking. Psychological exclusion, which has a broader meaning, includes actions such as being left alone, not being talked to, and actions that cause more severe psychological pain such as not making eye contact, rejection, and being ignored. Cyber ostracism refers to not being included in the e-mail list and in the conversation. For example, in a study conducted with a game in which more than five hundred managers/employees participated in a virtual environment, those who were ostracized experienced negative emotions, just as in face-to-face communication. Again, in studies examining the negative pain experience caused by physical and psychological ostracism in individuals together, psychological ostracism led to more damage to individuals than physical ostracism. As a result, all three forms of ostracism psychologically hurt individuals (Harvey et al., 2018).

As another terms, the negativities caused by exclusion to individuals can be addressed within organizational bullying. However, while negative behaviors such as bullying and mobbing describe an interaction, there is no interaction in ostracism (Robinson, O’Reilly, & Wang, 2013; Harvey et al., 2018). Therefore, it can be said that the absence of interaction is the main distinction point of ostracism.

Ostracism in the workplace is a common experience. For example, in a study conducted by O’Reilly (2015), 70% of the employees stated that they were exposed to ostracism in the past. Again, in a study conducted by the Irish government on 5,200 employees in 2001, 35% of the employees expressed that they were exposed to bullying including exclusionary behavior in the last six months of the study (cited in Hitlan et al., 2006). In a study conducted by Hitlan et al., (2006) with the participation of 5000 people, 13% of the participants stated that they were exposed to ostracism in the last six months of the study. Furthermore, in a study conducted with 2000 managers/employees in the USA, 67% of the participants stated that they did not talk to someone else deliberately, and 75% stated that they were exposed to such a behavior at least once (cited in Harvey et al., 2018). All these data support the idea that organizational ostracism is common.
Robinson et al., (2013) defined the reasons for ostracism in the workplace in two ways, purposeful and nonpurposeful. According to researchers, sometimes nonpurposeful ostracism can occur unintentionally, like forgetting to invite to an invitation. Or, in some organizations, there may be unspoken norms about which individuals should be ignored or included in the group. Behaviors such as knowing who to greet verbally, knowing who will be greeted with a smile or who will be ignored while walking through the corridor can be given as examples to these behaviors. When all parties know and understand these norms, individuals will not perceive the situations they encounter as ostracism. The researchers showed exclusion in the workplace as follows (Robinson et al., 2013, 211).

![Figure 1 Organizational Antecedents of Workplace Ostracism](image)

As the name suggests, purposeful ostracism is done with the intent to hurt, injure, and punish the other person. This kind of ostracism is known to both the ostracized and the ostracizer. In this ostracism, the ostracized individual withdraws himself or herself, does not interact, does not help the organization in many issues, and these reactions are in line with the goal of the ostracizer (Robinson et al., 2013).

Individuals react differently when faced with ostracism. According to Fiset (2017), individual responses to organizational ostracism are associated with contextual factors inside and outside the organization. Harvey et al. (2018) argued that reactions to ostracism can be explained by individuals’ self-esteem, sensitivity to rejection, and attachment. Accordingly, it can be said that those with avoidant attachment style will move away from the ostracizing group compared to those with anxious attachment. Again, according to Harvey et al. (2018), those with high self-esteem tend to maintain their relationship with the ostracizing group, while those with low self-esteem prefer to stay away from the group.

Robinson et al. (2013) explained the consequences of ostracism with a holistic model. According to this model, ostracism has pragmatic and psychological consequences. The distinction between pragmatic impact and psychological impact of ostracism is that ostracism’s pragmatic impact may not even be recognized as ostracism by ostracized individuals, whereas individuals perceive their exclusion as ostracism in the psychological impact. Robinson et al. (2013) who stated that pragmatic impacts of ostracism are not sufficiently taken into account by different researchers, pointed to the
pragmatic impact of it. For them, pragmatic impact refers to the loss of resources, information and relationships resulting from dependence on others. If this impact, which is not recognized much in contrast to the psychological impact, is ignored, the negativities in the target, information and resource cycle in the organization will continue. One of the consequences of the pragmatic effect is the loss of missed information and advices, the control of information, work relationships and functional support needed to get the job done. Second, negative behaviors such as harassment and maltreatment create pragmatic impact by decreasing social interaction as well as losing resources. In other words, based on the determination of the researchers, it can be said that the individual has a problem in performing his or her job in the pragmatic impact because ostracism gets in the way of information flow and establishing communication needed to get the job done. Psychological impacts of ostracism include withdrawal, antisocial behavior, engagement-oriented or prosocial behavior in individuals. These responses lead to negative and positive behaviors in the organization. Negative behaviors refer to individuals withdrawing from work, or individuals exhibiting unusual behaviors. Positive behaviors refer to ostracized individuals working harder to be included in the group again and their efforts to adapt to the organization (Robinson et al., 2013).

In short, the impact of ostracism on the organization and the individual is apparent. Organizational ostracism may lead to negativities particularly such as loss of productivity in the organization and deterioration of organizational culture. In addition, ostracism in the workplace brings about consequences such as decrease in the work efficiency of individuals, and not developing and maintaining reputation (Hitlan et al., 2006). On the other hand, ostracism in the workplace can threaten the psychological health of the individual. Studies showed that ostracism has negative consequences like stress, social anxiety, depression, anger, wounding emotion, and loneliness (Hitlan et al., 2006; Baumeister & Tice, 1990; Twenge, Baumeister, Tice, & Strucke, 2001; Ferris, Berry & Lian, 2008; Kaya, Ataman & Aydin, 2017).

Considering the weight of the organizational and psychological consequences of ostracism in the workplace, what can be done to reduce and prevent ostracism also gains importance. Researchers argued that developing an organizational culture which embraces inclusiveness and transparency, and an organizational culture in which the employee trusts the manager is possible with managers who know the negativity of ostracism (Whitener; Brodt; Korsgaard & Werner, 1998). Based on this argument, the organizational culture in question is expected to be realized through education principals. Educational institutions are environments where certain behavioral patterns are determined by rules and where things are carried out with a certain internal mechanism, and that have legitimacy in society. School principals’ duty in general and their duty in particular is to bring functionality to this internal mechanism with predetermined rules. In other words, school principals are responsible for the implementation of educational decisions taken by higher authorities. Undoubtedly, schools show the distinctive characteristics of the society in which they exist. However, schools are environments where change and transformation are realized. Schools are not only environments where students gain competence, but also a learning environment for teachers, principals and even parents. If there is a restriction on or pressure against actions such as free, participatory, questioning, critical and self-expression in a learning environment, there can be no transformation in such an environment.

In spite of the schools’ expectations for a much freer educational environment, there are discriminatory situations in schools as in other organizations. For example, in a study, teachers stated that they were subjected to discrimination by school principals due to sex, age, religion, political opinion, relations with administration, race and ethnic origin, performance and personality traits (Polat & Hicyilmaz, 2017). Similarly, in their study, Eickholt & Goodboy (2017) determined that approximately 26% of teachers were “seldom” exposed to incidents of ostracism at school, 7% of them were “sometimes” exposed, 2% of them were “frequently” exposed, and 1% of them were “often” exposed.

While there are studies conducted on social ostracism’s effect on students in Turkey, there are only limited number of studies on teachers (Abaslı, 2018; Dönmez & Mete, 2019; Erdemli & Kurum,
2019; Halis & Demirel, 2016; Yılmaz, 2018) has been the subject. These studies examining teachers determined that teachers’ perception of ostracism is low (Abaslı, 2018; Dönmez & Mete, 2019; Yılmaz, 2018). Although these data are positive, the study conducted by Erdemli & Kurum (2019) with school principals and teachers concluded that the participants experienced ostracism in schools due to being a member of a different union, having different political views, differences in belief, seniority, branch and sex. Having only limited number of studies on the subject in the literature and the ostracism that teachers are exposed to by school principals not being addressed in studies increase the importance of the subject. Starting from this importance, the present study aimed to examine the reasons for and results of the ostracism faced by teachers from their school principals and the recommendations for ostracism at schools.

**METHOD**

**Study Design**

The in-depth examination of the ostracism experienced by teachers at schools through teacher experiences required the study to be designed with phenomenology. Phenomenology design focuses on phenomena that are known but that we do not have a detailed understanding of. These phenomena can take different forms such as experience, perception, orientation and case. In other words, phenomenology focuses on explaining the meanings individuals ascribe to phenomenon or phenomena (Patton, 1990; Yıldırım & Şimşek, 2011). Here, qualitative studies seek answers to the questions of “why” and “how” in addition to the question of “what” (Punch, 2014, 16-17). From this point of view, benefitting from qualitative inquiry, the phenomenon that is focused on in the study process is the reasons teachers are exposed to ostracism at schools, the results of this ostracism and recommendation for solutions for ostracism.

**Study Group**

The study group consists of 12 elementary and middle school teachers who were working in public schools in Karadeniz Ereğli district of Zonguldak during the 2019-2020 academic year. In phenomenological research, the researcher needs individuals from a specific group who have sufficient knowledge and experience about the phenomenon that he or she will study in depth (Yıldırım & Şimşek, 2011). For this reason, criteria sampling technique and snowball sampling technique, two of the purposeful sampling methods, were used as the basis for determining the study group. The criterion determined in the study was that the teachers participating in the study “had been exposed to ostracism by the school principals at the school they were working at” and “had been working at the same school for at least one year”.

Teachers participating in the study were coded as T1, T2, T12, and their institution and real identities were not presented in the study. General information about the teachers participating in the study is given in Table 1.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Sex</th>
<th>Professional Seniority</th>
<th>Working Time (year)</th>
<th>Branch</th>
<th>Educational Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>Female</td>
<td>22</td>
<td>2</td>
<td>English</td>
<td>Master Degree</td>
</tr>
<tr>
<td>T2</td>
<td>Female</td>
<td>10</td>
<td>4</td>
<td>English</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T3</td>
<td>Male</td>
<td>18</td>
<td>3</td>
<td>Science and Technology</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T4</td>
<td>Female</td>
<td>18</td>
<td>5</td>
<td>Math</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T5</td>
<td>Male</td>
<td>11</td>
<td>2</td>
<td>Visual Arts</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T6</td>
<td>Male</td>
<td>4</td>
<td>2</td>
<td>Music</td>
<td>Master Degree</td>
</tr>
<tr>
<td>T7</td>
<td>Female</td>
<td>17</td>
<td>11</td>
<td>Turkish</td>
<td>Master Degree</td>
</tr>
<tr>
<td>T8</td>
<td>Female</td>
<td>12</td>
<td>5</td>
<td>Classroom</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T9</td>
<td>Male</td>
<td>14</td>
<td>6</td>
<td>Turkish</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T10</td>
<td>Female</td>
<td>5</td>
<td>2</td>
<td>Guidance</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T11</td>
<td>Female</td>
<td>9</td>
<td>3</td>
<td>Classroom</td>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>T12</td>
<td>Male</td>
<td>13</td>
<td>2</td>
<td>Math</td>
<td>Bachelor Degree</td>
</tr>
</tbody>
</table>
Data Collection Tool

The study data were collected with a structured interview form. While developing the interview form, the related literature was reviewed, and the related concepts were determined. The determined concepts were associated with the purpose of the study, and a question draft was developed and presented for expert opinion for the final form. In the interview form, the participants were asked about “the types of ostracism they were exposed to”, “the reasons for being ostracized”, “the effects of ostracism” and “recommendations for solutions to prevent ostracism”. In addition, the personal information of the participants (education status, school type worked, professional seniority and administration seniority) was included in the interview form.

Data Collection

The data were collected by the researcher between 06.05.2020 and 30.05.2020. During the aforementioned dates, face-to-face interviews were limited to only three teachers due to the COVID_19 pandemic, and interviews with the other nine participants were conducted via Zoom. As it is known, internet interview is also listed among the data collection options (Creswell, 2013; Merriam, 1998, Akt: Creswell, 2016). After the first interview was conducted with the first teacher the researcher knew, the other participant, who was believed to be ostracized, was reached with the name and contact information received from the first participant, and was included in the study following the same method. Before the interviews, a preliminary interview was held with the teachers, and interviews were held on the dates and times determined on a voluntary basis. The interviews were recorded on the voice recorder as well as on the Zoom program. During the interviews, the researcher avoided directing the participants, and by asking different questions that were not related to the subject before the interviews, the researcher also tried to create a preparatory environment for the interview. The interviews lasted 30-45 minutes. After the records were transcribed, the transcriptions were sent to the relevant participant via e-mail. The purpose of following this path was to prevent data loss and to verify the statements of the participants.

Data Analysis

A repeatable and valid analysis technique used to make meaningful inferences about the content, content analysis technique was employed in data analysis. In content analysis designed with phenomenology, there is an effort to conceptualize the data and reveal the themes that can define the phenomenon. The results reached are presented in a descriptive narrative, and direct quotations are frequently included. In addition, the findings are explained and interpreted within the framework of the emerging themes and patterns (Yıldırım & Şimşek, 2011, 75). Content analysis is known for focusing on the subject or the context as a method, emphasizing the similarities and differences within the categories or codes, and addressing both explicit and hidden content within the text (Kızıltepe, 2017, 254-255). In the data analysis, the steps suggested by Miles &Huberman (1994), “data reduction”, “data display” and “conclusion drawing/verification” was employed respectively (Baltacı, 2017). For this purpose, first all the interview transcripts were read several times, then the answers to each question were read separately, and notes were taken on them to determine the codes, sub- and main-themes. Second, the similarities and differences in the data were determined, and the data were combined into a whole. At the last stage, participants’ statements were included. Tables were used for easier understanding of the data, and codes, themes and sub-themes were placed in the tables.

Reliability and Validity Works

Expert opinions were taken to increase the content validity of the interview form developed in the study. Within the framework of these opinions, necessary changes were made in the interview questions. Again, the codes and themes determined to increase validity were developed with two experts (Yıldırım & Şimşek, 2011). For validity and reliability works in qualitative research, it is necessary to clearly define the characteristics of the participants, to explain the study data collection
and analysis process in detail, and to support the findings with direct quotations from the participants’ views (Yıldırım & Şimşek, 2011). Accordingly, the personal information of the individuals forming the study group was clearly presented. In addition, data collection, analysis process and interpretation of the findings are explained in detail. Again, the researcher received help from a colleague for reliability. The reliability percentage was calculated with the Miles & Huberman (1994) formula (Reliability Percentage = Agreement / (Agreement + Disagreement) x 100). According to the formula, the result (48/59x100=81.35%), and this result was deemed sufficient to continue the analysis.

RESULTS

The findings obtained in the study are presented separately according to the reasons for ostracism, ostracism types, results of ostracism and recommendations for solutions to prevent ostracism.

The themes, sub-themes and statements developed based on the reasons for ostracism faced by the participating teachers at school are given in Table 5.

### Table 2 Reasons Teachers are Exposed to Ostracism at School

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>Sub-Themes</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasons for Ostracism</td>
<td>Political (Different union / political view)</td>
<td>The reason why I was ostracized is because of my political and union choices (T9)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I was ostracized because my school principle was the union leader and I was not a member and had different views (T7)</td>
</tr>
<tr>
<td></td>
<td>Social (Not having the same common values)</td>
<td>I am not from the same group, I am marginal (T6).</td>
</tr>
<tr>
<td></td>
<td>Individual (Being critical, age)</td>
<td>Whatever it is, I tell the truth everywhere, I criticize (T3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Being younger than the others (T10)</td>
</tr>
</tbody>
</table>

As can be seen from Table 5, teachers stated that they were exposed to ostracism for political, social and individual reasons. According to teachers, the political reasons that they believe are the causes of ostracism are having different political views and being member of different unions. Social reasons refer to not sharing the same values with the group. Individual reasons were given as being critical and their age.

The themes, sub-themes and statements developed based on the types of ostracism that teachers are exposed to in their schools are presented in Table 3.

### Table 3 Types of ostracism Teachers Experience at School

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>Sub-Themes</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types of Ostracism</td>
<td>Physical (Not being invited to common joint activities, others staying away, not getting answers to questions)</td>
<td>I am not getting invited to activities outside the school not related to school (T2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I can’t get answers to my questions most of the time (T8)</td>
</tr>
<tr>
<td></td>
<td>Psychological (Being threatened with an investigation, unjust workload)</td>
<td>They constantly imply that I may get punished (T4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>They give me more hours than the other teacher in my branch group (T3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>They don’t say hi even if I say hi to them (T7)</td>
</tr>
<tr>
<td></td>
<td>Cyber (Being taken out of cyber groups)</td>
<td>With the direction of the principle, they began to sign out from the Whatsapp group one by one. When I asked my friend, she told me that they switched to Telegram. I wasn’t included in the new Telegram group, and the Whatsapp group was terminated. So, our communication was cut (T1)</td>
</tr>
</tbody>
</table>
As can be seen from Table 3, teachers stated that they were exposed to physical, psychological and cyber ostracism. Physical ostracism took the forms of not being invited to common joint activities, others staying away, and not getting answers to questions. Psychological ostracism took the forms of not being greeted, being threatened with an investigation, unjust workload, and discriminatory practices, while cyber ostracism was done by taking the person out of the cyber groups.

The themes, sub-themes and statements developed based on the results of ostracism at school are presented in Table 4.

Table 4 Results of Ostracism at School

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>Sub-Themes</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results of</td>
<td>Psychological (Sadness/stress/Psychometric disorders/ feeling of loneliness/Retiring into one’s shell)</td>
<td>When you are not accepted as you are, you retire to your own shell, and the gap grows even more. The feeling of loneliness starts to develop (T1)</td>
</tr>
<tr>
<td>Ostracism</td>
<td></td>
<td>I started to get sick in my stomach (T5)</td>
</tr>
<tr>
<td></td>
<td>Social (Not being able to communicate/Superficial communication)</td>
<td>I usually don’t communicate. I don’t go to places that have teachers. I have only one friend that I spent time with. I ask my questions to her (T2)</td>
</tr>
<tr>
<td></td>
<td>Organizational (Loss of motivation, being satisfied with low performance)</td>
<td>I lost the excitement at my job, what else can you ask for? (T11)</td>
</tr>
<tr>
<td></td>
<td>Individual (Fighting for justice)</td>
<td>I do my job minimally, I am not interested in other things at all (T2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I should also mention here that this situation and the problems faced by all my friends who experienced ostracism at school pushed me to fight (T7)</td>
</tr>
</tbody>
</table>

As can be seen in Table 4, teachers stated that they experienced the psychological, social, organizational and individual results of ostracism. Psychological consequences of ostracism took the form of sadness/stress, loneliness, and psychosomatic disorders. Social consequences were non-communication or superficial communication. While organizational results of ostracism were loss of motivation and unwillingness to work, individual result of ostracism was fighting for justice.

The themes, sub-themes and statements developed based on solutions recommended for ostracism at school are presented in Table 5.

Table 5 Solutions for Ostracism at School

<table>
<thead>
<tr>
<th>Category/Theme</th>
<th>Sub-Themes</th>
<th>Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solutions</td>
<td>Organizational communication (Direct communication, open communication)</td>
<td>In order to avoid this, the teacher should be able to talk to the school principal. Can the principal stop communicating with the teacher? (T9)</td>
</tr>
<tr>
<td>Recommended for Ostracism</td>
<td></td>
<td>Keeping the communication channels open and using equal communication language (T12).</td>
</tr>
<tr>
<td></td>
<td>Organizational democracy/justice (The use of legal remedies, Equal/just workload, Tolerance for differences)</td>
<td>Understanding, being tolerant, accepting the other person as they are, division of labor and equal distribution of tasks can be effective in solving problems (T6). We should be able to tell the wrongdoing right away (T1). It can be prevented by establishing fairer systems. This can be achieved by applying more democratic and equal rules (T8).</td>
</tr>
</tbody>
</table>

As can be seen from Table 8, teachers believed that solutions will be found for ostracism through organizational communication and organizational democracy/justice. Organizational culture
includes trust and open communication. Organizational democracy, on the other hand, includes fair distribution of workload, tolerance of differences and the use of remedial mechanisms.

CONCLUSION AND DISCUSSION

In the study, it was aimed to reveal the reasons for and results of the ostracism that teachers face at school, and the recommendations for solutions for ostracism. The study determined that teachers are exposed to ostracism at school.

Teachers explained the reasons for the ostracism they face at school as political, social and individual. The studies conducted also showed results supporting these findings. Erdemli and Kurum (2019) concluded in their study that teachers are exposed to ostracism mostly due to their different political views. The study of Polat and Hicyılmaz (2017) revealed that teachers are discriminated by their school principals due to sex, age, religion, political view, relations with administration, race and ethnic origin, performance and personality traits. Among these, political reasons are explained by being members of different unions than the school principals. In some societies, different membership in unions may not have a very significant effect but has a very significant effect in Turkey. Even in the appointment of school principals, unions close to the political administration can step in. Studies conducted on the subject (Akcan, Polat, & Ölçüm, 2017; Özaydn & Han, 2014) confirmed this determination.

Hofstede (1993; 2001) defines the dimension of “power distance” in his Cultural Dimensions Theory as the degree of inequality of the power distribution between individuals. In societies with a high-power distance, the more centralized structure of organizations is considered normal. In addition, in organizations with high perception of power distance, status is determined and promotion opportunities are less. Therefore, individuals with lower power are expected to follow different methods in order to gain strength (Leslie & Gelfand, 2012). In a country like Turkey where power distance is high, public organizations have a centralized structure. Thus, the effect of politics on schools is not considered an odd outcome. Furthermore, it will not be considered odd for individuals to engage unions close to the government and to gather under the umbrella of the unions in order to gain a little more power. As such, meeting along the same political line instead of merit may increase the likelihood of being ostracized for teachers who do not share the same line. Indeed, this situation which can be defined as reference support in the literature on management further explained in the Turkish literature on the same topic by school workers believing they need reference support in order to get promotion (Argon, 2016; Aydoğan, 2009; Özkanan & Erdem, 2015).

The social and individual characteristics that teachers listed as the reasons for ostracism can also be considered within the framework of Hofstede’s (1993; 2001) theory. The Individualism versus Collectivism dimension specified in the theory distinguishes the characteristics of societies. In individualistic cultures, people define themselves independently from other people in society. They act in line with their own desires and goals. In collectivist cultures, people define themselves as part of their families or communities they feel important. They put the interests of the community before their own. According to Hofstede and Minkov’s (2010) study, because of its characteristics, Turkey is a country with “high power distance” and “low individualism”. School principals not seeing teachers as members of the same community or crowd may lead to ostracism. In addition, within the understanding of power distance, the expectation that the orders given from top to bottom will be accepted without question, and personal / biological characteristics such as cultural codes, being critical and age can be considered as the reasons for ostracism by school principals.

According to the study findings, teachers were exposed to physical, psychological and cyber ostracism types. Studies also drew attention to these three types of exclusion (Harvey et al., 2018; Scott, 2007; Williamson, 2007). While physical ostracism refers to being avoided, cyber ostracism refers to being kicked out from cyber groups. The psychological ostracism, on the other hand, refers to unfair practices. A study (Keskinkılıç-Kara, 2016) put forth that teachers who were exposed to
discrimination due to political reasons experienced behaviors such as being prevented from using their personal benefits at school, being prevented from making extracurricular activities and being given excessive workload.

The present study revealed that ostracism had psychological, social, organizational and individual consequences for the teachers. Psychological consequences refer to withdrawal, stress and psychosomatic disorders. This result of the study is also similar to the other study results (Hitlan et al., 2006; Baumeister et al., 1990; Twenge et al., 2001; Ferris et al., 2008; Kaya et al., 2017).

Organizational consequences of ostracism for teachers are loss of motivation and low performance. Undesirable situation in organizations, this result is similar to many studies. The studies put forth that various negative business behaviors are exhibited in the face of communication problems, conflicts, harassment and aggressive behaviors that employees encounter in the workplace (Averill, 1983; Gibson & Callister, 2010; McCardle, 2007; Meier & Semmer, 2012; Sloan, 2004). Employees decrease their productivity behavior in the face of such negativities in the workplace and may consider such negativities they are exposed to as unfair. Studies also revealed that increased perception of injustice reduces the productivity behavior (Holley, 2012; Lee & Allen, 2002; McCardle, 2007).

The individual consequence of ostracism for teachers is the selection of the way of struggle against ostracism, in other words, displaying opposing behavior for the pursuit of democracy. This behavior, which will be defined as the open/vertical type of organizational opposition, is carried out in order to clearly indicate the dissatisfaction felt to the members of the organization that may affect the organizational structuring, as stated by Kassing (1998). Previous studies also support this. That is, a positive association was found between organizational opposition and organizational democracy. According to the results of the researches conducted on the subject (Ataç & Köse, 2017; Sadykova & Tutar, 2014), in organizations that make their members feel valued and respect their rights and freedoms, there is a positive relationship between organizational democracy and having the means to openly communicate the regulations and criticisms within the organization to the senior management. As organizational opposition behavior increases, organizational democracy increases.

This study also inquired potential solutions against ostracism in schools. In this respect, teachers stated that ostracism can be solved through organizational democracy and organizational communication. As in political democracy, organizational democracy includes employee participation in decision-making processes (Crane & Matten, 2005; Harrison & Freeman, 2004; Pausch, 2013), as well as employee sovereignty, respect, the idea of equality, and securing rights (Beetham & Boyle, 1998; Bowles & Gintis, 1993). In addition, some researchers tend to define organizational democracy as the mode of communication in organizations (Cheney, 1995; Russell, 1997). When the subject is approached from this point of view, it would not be wrong to say that the organizational communication suggested by teachers against ostracism is indeed a part of organizational democracy. In fact, whether it is called democracy or communication, teachers basically long for a participatory, critical school climate in which they can express themselves and are accepted by their identities.

As a result, teachers were exposed to ostracism by school principals, that ostracism negatively affected their performance and that it could be prevented by organizational democracy. As stated in the introduction section of the study, organizations (including schools) show the characteristics of the society in which they are in. In societies where democratic culture prevails, it is expected that there will be less ostracism in the workplace. Although making a determination related to the culture of democracy in Turkey beyond the limits of this study, the fact that the participating teachers suggested organizational democracy to prevent teacher ostracism can be interpreted as a clue in the context of the subject because schools are environments where change and transformation can be initiated, and teachers and principals are expected to be pioneers in this regard.
Suggestions

This study is important in terms of discussing in-depth the reasons for and results of the ostracism, and also potential solutions. Because, it will be possible to include other concepts and dynamics that may have an impact on ostracism in the schools. The effects of many phenomena such as organizational culture, organizational silence, organizational justice, organizational support level and organizational opposition on exclusion are a matter of curiosity. In addition, the relationship between ostracism at school and social culture would be a topic for another research. Furthermore, school principals having knowledge about ostracism at school will contribute to developing a more participatory, more critical, and more democratic school climate. Courses on ostracism can be included in the trainings of school principals.

REFERENCES


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Depression and Subjective Well-Being as Predictors of Pet Owner University Students’ Personality Traits

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Abstract

The pet ownership has a crucial role in individuals’ lives, which offers many beneficial effects. By examining the relationship between pet ownership and owners’ well-being, researchers have found that pets typically made their owners feel well. This study examines the ways in which pet owners’ depression and subjective well-being levels predict their personality traits. It also aims to examine the relationship between these variables and of the participants’ pet preferences. Totally, 307 pet owners participated in this study; all participants were university students living in Turkey. In addition, all participants were aged 18 and older. The Center for Epidemiologic Studies Depression Scale (CES-D) was used to determine the depression levels of the participants; the Subjective Well-Being Scale (SWBS) was used to determine their subjective well-being levels, and an Abbreviated Form Of The Revised Eysenck Personality Questionnaire (EPQR-A) was used to determine personality traits. Data was analyzed using path analysis. The study found that pet owners’ depression and subjective well-being scores predicted their neuroticism and extraversion scores. Subjective well-being and depression predict neuroticism and extroversion in personality traits, and goodness of fit index of this model has been found to be at acceptable levels. It is important to conduct more experimental and correlational studies involving the same variables; these studies may focus on pet owners, as well as their difference with those who do not own pets. They may also focus on specific age groups, such as children, adults, and the elderly.

Keywords: Pets, Pet Owners, University Students, Depression, Subjective Well-Being, Personality Traits.

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INTRODUCTION

The number of multi-dimensional studies on the effects of owning pets has increased recently. Studies that focus on the relationship between humans and animals have revealed that people are highly interested in owning pets; in addition, it has also been revealed that people are highly interested in animal-assisted therapeutic interventions. Although some studies have focused on pet ownership in Turkey (Cevizci, Erginöz, & Baltaş, 2009; Karayazı-Muslu & Conk, 2011; Pamuk, 2015), this is the first study of its kind to explore the Turkish context. Based on this need, this study focuses especially on young adult and adult pet owner students at several universities in Turkey, and aims to examine the effects of pet ownership on the following psychological factors: subjective well-being, depression, and personality traits. This study also aims to examine the relationship between these variables and of the participants’ pet preferences. In line with this purpose, this study is structured by qualitative method on exploratory and predictive correlational models. Totally, 307 pet owner students aged 18 and above participated in this study; all participants lived in Turkey. Data was collected using an online questionnaire, and the participants were recruited using the snowball sampling technique.

Literature review reveals that pets and their owners typically form strong links with each other (Daly & Morton, 2006; Walsh, 2009). Studies have also focused on the positive effects owning a pet has on children (Bierer, 2000; Melson, 2003), adults (Allen, Blascovich, Tomaka, & Kelsey, 1991; Lewis, Krägeloh, & Shepherd, 2009; McConnell & Brown, 2011; Stanley, Conwell, Bowen, & Van Orden, 2014; Valeri, 2006; Wells, 2009) and older adults (Garrity, Stallones, Marx, & Johnson, 1989). In particular, these studies focus on the effects of strong attachment to pets; studies have also focused on aspects such as physiological status (Brodie & Biley, 1999; Chandler, Fernando, Barrio-Minton, & Portrie-Bethke, 2015; Garrity et al., 1989; Lewis et al., 2009; Trigg, Thompson, Smith, & Bennett, 2016; Valeri, 2006) and social development (Merrill, 2012; Silberstein, 2013).

By examining the relationship between pet ownership and owners’ well-being, researchers have found that pets typically made their owners feel well; owners also report that pets reduce their stress levels significantly. Owners also report that they typically develop strong bonds with their pets and that owning a pet not only requires responsibility but also enables one to become more responsible. In addition, owners also view their pets as friends and companions. It has also been found that owning pets improves one’s capacity to interact and communicate with others; it is also known to improve the quality of family and friendship interactions. More interestingly, pet owners report that pets contribute significantly to the development of personal and spiritual values, and they also report that pets make them feel more aware and more connected with nature (Chandler et al., 2015). McConnell and Brown (2011) note that dogs contribute significantly to the well-being of their owners; in fact, dog owners’ well-being was found to be higher than the well-being of those who did not own dogs. By examining the relationship between pet ownership and peoples’ tendency for and frequency of laughter, Valeri (2006) found that cat and dog owners tend to laugh more on a daily basis than those who did not own pets. The presence of pets is also associated with decreased stress levels. A study also found that women who were accompanied by their pets felt less stressed while performing stressful and demanding tasks than women who were accompanied by their friends (Allen et al., 1991); the former also reported feeling less threatened by the task and the circumstance.

Another study has examined the relationship between pet ownership and loneliness among the elderly who live alone (Stanley et al., 2014); the study found that pet owners felt less lonely than those who did not own pets. Antonacopoulos and Pychyl (2010) found that pet owners, especially dog owners, with strong social skills and a good support system were less lonely than people who did not own pets. Moreover, dog owners also reported feeling less hopeless than those who did not own a pet (Beals, 2009).

Studies have also examined the relationship between pet ownership and owners’ personality traits. For instance, Merrill (2012) found that women who owned cats and dogs felt more empathy than women who did not. Interestingly, men and women who prefer to own cats as pets were found to
be highly empathetic, open-minded, gentle, and pleasing. In addition, Beals (2009) found that female dog owners who lived alone and were not involved in an emotional relationship at the time of the study had more self-esteem than those who did not have pets. Moreover, primary school children who had both cats and dogs as pets were found to be more empathetic than children who owned either a cat or a dog, as well as those who owned neither. In addition, children who preferred to own a horse or a bird were also found to be highly empathetic (Daly & Morton, 2006).

Studies have also focused on the attitudes of pet owners toward pets, as well as the interplay between pet ownership and variables related to attitudes and dispositions toward animals. Positive attitude toward animals is known to positively influence one’s psychological well-being. For example, dog owners who were more conscientious and loving in raising their pets were found to be more capable of satisfying their social needs (McConnell & Brown, 2011). In an empirical study measuring the effects of people’s attitudes toward pets on the negative mood, it was emphasized that there is a positive effect on dog owner women’s mood who do not have an emotional relationship and have positive attitudes toward pets. Participants with generally positive attitudes toward their pets were found to be happier than those who were generally not very positive toward their pets. The study also found that dog owners with positive attitudes toward their pets were also more attached to them, and this emotional attachment contributed significantly to the owners’ well-being (Beals, 2009). A study that focused on elderly pet owners who had few close friends found that those who were more emotionally attached to their pets experienced less stress and distress (Garrity et al., 1989). Owners who are emotionally attached to their pets typically include them in their daily activities. For instance Douglas (2005) found that dog owners who were highly attached to their pets typically included them in their family activities; they also showed keen interest in their dogs. Cat owners who are highly attached to their pets are known to buy gifts for their cats; they also tend to prefer being physically near to their cats.

However, some studies claim that pet ownership has no significant relationship with quality of life and psychological well-being (Antonacopoulos & Pychyl, 2010; Friedmann, Katcher, Lynch, & Thomas, 1980; Lewis et al., 2009; Pelletier, 2007) or physical health (Maynard, 2013, Winefield, Black, & Chur-Hansen, 2008). It has also been claimed that pet owners typically tend to feel separated from other people (Brown & Katcher, 2001). Another study suggests that pet owners tend to reject social relations (McConnell & Brown, 2011), which typically leads to debt, anxiety, loss, mourning, loneliness, and depression (Antonacopoulos & Pychyl, 2010). Also, Lem, Coe, Haley, Stone and O’Drady’s (2016) study’s results indicated that pet ownership is associated with fewer symptoms of depression. Considering all these situations, this study examines the ways in which pet owners’ depression and subjective well-being levels predict their personality traits. It also aims to examine the relationship between these variables and of the participants’ pet preferences. The hypothesis of this study are as follows: (1) Depression level of pet owner university students in Turkey predicts neuroticism and psychotism positively; and extraversion negatively. (2) Subjective well-being level predicts neuroticism and psychotism negatively; and extraversion positively. (3) Depression, subjective well-being levels and personality traits differ according to pet preferences.

**METHOD**

This section is compulsory, and it should provide a specific description of the methodology. All descriptions of materials and methods should be included here in the main paper. It should have the following structure.

**Study Group**

Totally, 307 pet owners aged 18 and above participated in this study; all participants are university students lived in Turkey at the time of the study. Data was collected using an online questionnaire between March-June 2019, and participants were recruited using the snowball sampling technique. As per this technique, participants recruit other participants for a study until the target
sample size is attained (Şahin, 2014). Accordingly, university students were asked to spread the scale and share it with other student acquaintances through social media accounts. A total of 50 men and 257 women participated in the study, and the participants were aged between 18 and 43 years old. The average age of the participants was 21.49.

**Instruments**

The following measures were used in this study: the Center for Epidemiologic Studies Depression Scale (CES-D), the Subjective Well-Being Scale (SWBS), and an Abbreviated Form of the Revised Eysenck Personality Questionnaire (EPQR-A).

**Center for Epidemiologic Studies Depression Scale (CES-D):** This scale was developed by Sheehan, Fifield, Reisine, and Tennen (1995) in order to gauge and evaluate the symptoms of depression in the general population. The scale was made relevant to the Turkish context by Tatar and Saltukoglu (2010). CES-D is a Likert-type scale, and it consists of 20 items, where 0 = rarely or none of the time to less than one day and 3 = all the time to 5-7 days. Items 4, 8, 12, and 16 are scored in reverse. The highest possible score on this scale is 60, whereas the lowest is 0. High scores indicate the prevalence and level of depression. The test-retest reliability coefficient for this scale was found as 0.69; the Guttman Split-half coefficient was 0.89, whereas the internal consistency coefficient was between 0.75 and 0.90. Four sub-dimensional structures of the scale were tested, and confirmatory factor analysis revealed that goodness of fit was 0.84. The scale’s extent of similarity with Beck Depression Inventory was found to be 0.77. The scale was found to be 81.7% effective in distinguishing between patient and non-patient groups (Tatar and Saltukoglu, 2010).

**Subjective Well-Being Scale (SWBS):** Developed by Diener (1984), this scale is used to determine the subjective well-being of people. It was made relevant to the Turkish context by Tuzgöl-Dost (2005). The scale consists of individual judgments about positive and negative emotional expressions and living space. SWBS is a Likert-type scale, which consists of 46 items, (e.g., “I generally feel active and vigorous”), where 1 = very untrue of me and 5 = completely true of me. As many as 20 items represent negative statements, and they are scored in reverse. The highest possible score on the scale is 230, and the lowest possible score is 46. High scores indicate high subjective well-being. The scale is also constituted by 12 subscales: comparisons of own life, positive and negative emotions, goals, self-confidence, optimism, activities, friendships, future outlook, family relationships, envy, coping, and pessimism. The test-retest reliability coefficient for this scale was 0.86, and Cronbach's alpha reliability coefficient was 0.93. Corrected item-test correlations were found to vary between 0.32 and 0.63. Factor analysis revealed that the KMO coefficient was 0.861 (Tuzgöl-Dost, 2005).

**Abbreviated Form Of The Revised Eysenck Personality Questionnaire (EPQR-A):** The Eysenck Personality Questionnaire was developed by Francis, Brown, and Philipchalk in 1992. The original questionnaire has since been abbreviated. The questionnaire was made relevant to the Turkish context by Karancı, Dirik, and Yorulmaz (2007). It consists of 24 items and 4 sub-dimensions, which are extraversion, neuroticism, psychoticism, and lie. The “lie” subscale is not used to assess personality, but to prevent bias and to control its validity. Each sub-dimension consists of six items, and participants are required to choose either Yes (1) or No (0). Items 3, 5, 7, 10, 15, 16, 17, 19, 20, and 22 are scored in reverse. The highest possible score for each personality trait is 6, whereas the lowest is 0. Each sub-dimension indicates a different personality trait. The test-retest reliability coefficients for the extraversion, neuroticism, psychoticism, and lie subscales were 0.84, 0.82, 0.69, and 0.69 respectively; their internal consistency coefficients were found to be 0.78, 0.65, 0.42, and 0.64 respectively. In order to determine the validity of the scale, the extent of its similarity with scales such as the Rosenberg Self-Esteem Scale, the Abbreviated Perceived Parental Attitudes-Child Form (EgnaMinnenBarndomsUppfostran/EMBU), and the Fear Survey Schedule was assessed. Results suggested that the scale was valid (Karancı et al., 2007).
Design and procedure

This is a quantitative study based on exploratory and predictive correlational models. Studies based on correlational models seek to understand an event by analyzing the relation between one or more variables without any intervention. Predictive correlation involves the prediction of an unknown property of another variable from a known value of a variable (Büyüköztürk, Kılıç-Çakmak, Akgün, Karadeniz, & Demirel, 2016).

Data analyses

One-way ANOVA and independent group t-test analyses were performed to investigate whether depression, subjective well-being, and personality traits differed according to the categorical variables used in the study. The Pearson Product-Moment Correlation analysis was performed in order to determine the relationship between the scores obtained for CES-D, SWBS, Extraversion, Neuroticism, and Psychotism. A path analysis was conducted to examine the predictability of Extraversion, Neuroticism, and Psychotism scores by using the CES-D and SBWS scores.

RESULTS

Since this is mostly the first research of its kind in Turkey, the focus was on identifying some traits of the pet owner students who participated in this study. Table 1 summarizes the traits of the sample group in terms of the answers given to some questions about their pets.

Table 1. Frequency and Percentage Values for the Sample Group

<table>
<thead>
<tr>
<th>Variables</th>
<th>F</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet preference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cat(s)</td>
<td>174</td>
<td>56,7</td>
</tr>
<tr>
<td>Dog(s)</td>
<td>47</td>
<td>15,3</td>
</tr>
<tr>
<td>Other(bird, fish, turtle)</td>
<td>25</td>
<td>8,1</td>
</tr>
<tr>
<td>Multiple (several different animals)</td>
<td>61</td>
<td>19,9</td>
</tr>
<tr>
<td>Time spent with pets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>41</td>
<td>13,4</td>
</tr>
<tr>
<td>1–3 year</td>
<td>93</td>
<td>30,3</td>
</tr>
<tr>
<td>3–5 year</td>
<td>44</td>
<td>14,3</td>
</tr>
<tr>
<td>Over 5 years</td>
<td>129</td>
<td>42,0</td>
</tr>
<tr>
<td>Time spent with pets during the day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 hour</td>
<td>20</td>
<td>6,5</td>
</tr>
<tr>
<td>1–2 hours</td>
<td>47</td>
<td>15,3</td>
</tr>
<tr>
<td>2–3 hours</td>
<td>58</td>
<td>18,9</td>
</tr>
<tr>
<td>3–5 hours</td>
<td>72</td>
<td>23,5</td>
</tr>
<tr>
<td>Over 5 hours</td>
<td>110</td>
<td>35,8</td>
</tr>
<tr>
<td>Whether or not the pet has an illness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has an illness</td>
<td>17</td>
<td>5,5</td>
</tr>
<tr>
<td>No illness</td>
<td>290</td>
<td>94,5</td>
</tr>
<tr>
<td>Traveling with pets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take it with me</td>
<td>39</td>
<td>12,7</td>
</tr>
<tr>
<td>Entrust it to someone</td>
<td>122</td>
<td>39,7</td>
</tr>
<tr>
<td>Have not traveled since I began owninga pet or pets</td>
<td>12</td>
<td>3,9</td>
</tr>
<tr>
<td>Taken care of by a family member who remains at home</td>
<td>58</td>
<td>18,9</td>
</tr>
<tr>
<td>I can leave my pet alone at home on short trips</td>
<td>64</td>
<td>20,8</td>
</tr>
<tr>
<td>I entrust my pet to the animal hotel</td>
<td>12</td>
<td>3,9</td>
</tr>
</tbody>
</table>

N: 307

First, the attitudes of the sample group toward pets were gauged using a few questions (see Table 2). To the question, "How much of the responsibility to care for your pet belongs to you?", as many as 8 participants chose "never care for" (2,6%); as many as 20 participants chose "I do not care for" (6,5%). 53 participants chose "rarely care for" (17,3%), and 55 participants chose "care for" (17,9%). On the other hand, another 55 participants chose "usually care for" (17,9%), whereas 116
chose "completely care for" (37.8%). This shows that the majority of pet owners who participated in the study tended to care for their pets. To the question, "How attached are you to your pets?", only 1 participant chose "not attached at all" (0.3%), whereas 3 participants chose "very less attached" (1%). As many as 4 participants chose "little attached" (1.3%), whereas 16 chose "sort of attached" (5.2). The number of participants who chose "very attached" was 37 (12.1%), and the number of participants who chose "quite attached" was 87 (28.3%). Interestingly, 159 participants chose "strongly attached" (51.8%). Thus, it can be observed that most of the participants were attached to their pets. To the question, "How sad would you be if your pet passed away?" only 1 participant chose "would never feel sad" (0.3%), and 2 participants chose "would barely feel sad" (0.7%). The number of participants who chose "would be a little sad" was 8 (2.6%), whereas 11 chose "would be sort of sad" (3.6%). The number of participants who chose "would be very sad" was 21 (6.8%), and 21 participants also chose "would be quite sad" (6.8%). As many as 230 participants chose "would be extremely sad" (74.9%). According to the findings, it was observed that the majority of the participants reported that they would feel intense sadness in case of loss of their pets.

Table 2. The attitudes of the sample group toward pets

<table>
<thead>
<tr>
<th>How much of the responsibility to care for your pet belongs to you?</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>never care for</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td>I do not care for</td>
<td>20</td>
<td>6.5</td>
</tr>
<tr>
<td>rarely care for</td>
<td>53</td>
<td>17.3</td>
</tr>
<tr>
<td>care for</td>
<td>55</td>
<td>17.9</td>
</tr>
<tr>
<td>usually care for</td>
<td>55</td>
<td>17.9</td>
</tr>
<tr>
<td>completely care for</td>
<td>116</td>
<td>37.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How attached are you to your pets?</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>not attached at all</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>very less attached</td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td>little attached</td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td>sort of attached</td>
<td>16</td>
<td>5.2</td>
</tr>
<tr>
<td>very attached</td>
<td>37</td>
<td>12.1</td>
</tr>
<tr>
<td>quite attached</td>
<td>87</td>
<td>28.3</td>
</tr>
<tr>
<td>strongly attached</td>
<td>159</td>
<td>51.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How sad would you be if your pet passed away?</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>would never feel sad</td>
<td>1</td>
<td>.3</td>
</tr>
<tr>
<td>would barely feel sad</td>
<td>2</td>
<td>.7</td>
</tr>
<tr>
<td>would be a little sad</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td>would be sort of sad</td>
<td>11</td>
<td>3.6</td>
</tr>
<tr>
<td>would be very sad</td>
<td>21</td>
<td>6.8</td>
</tr>
<tr>
<td>would be quite sad</td>
<td>34</td>
<td>11.1</td>
</tr>
<tr>
<td>would be extremely sad</td>
<td>230</td>
<td>74.9</td>
</tr>
<tr>
<td>Total</td>
<td>307</td>
<td>100.0</td>
</tr>
</tbody>
</table>

ANOVA and an independent group t-test analysis were performed to test the correlation between some categorical variables (pet choices, time spent with pets, time spent with pets during the day, traveling with pets, and whether your pet has a chronic illness) and continuous variables (CES-D, SWBS, Extraversion, Neuroticism, Psychotism). Please see Table 1 for more details.

The following values were obtained for “pet choices”: CES-D is (F(3,303) = 1.487, p > .05); SWBS is (F(3,303) = 2.058, p > .05); Neuroticism is (F(3,303) = 2.368, p > .05); Psychotism is (F(3,303) = 2.257, p > .05); and Extraversion is (F(3,303) = 1.762, p > .05). The following values were obtained for “time spent with pets”: CES-D is (F(3,303) = 2.145, p > .05); SWBS is (F(3,303) = 1.378, p > .05);
Neuroticism is \( F(3,303) = 2.041, p > .05 \); Psychotism is \( F(3,303) = 1.291, p > .05 \); and Extraversion is \( F(3,303) = .918, p > .05 \). The values obtained for “time spent with pets during the day” are as follows: CES-D is \( F(4,303) = .646, p > .05 \); SWBS is \( F(4,303) = 1.682, p > .05 \); Neuroticism is \( F(4,303) = 1.641, p > .05 \); Psychotism is \( F(4,303) = .930, p > .05 \); and Extraversion is \( F(4,303) = .592, p > .05 \). The following values were obtained for “traveling with pets”: CES-D is \( F(5,301) = 1.875, p > .05 \); SWBS is \( F(5,301) = .882, p > .05 \); Neuroticism is \( F(5,301) = .618, p > .05 \); Psychotism is \( F(5,301) = 2.163, p > .05 \); and Extraversion is \( F(5,301) = 1.357, p > .05 \). The values obtained for “whether your pet has a chronic illness” are as follows: CES-D is \( t(305) = −.822, p > .05 \); SWBS is \( t(305) = −.456, p > .05 \); Neuroticism is \( t(305) = −.757, p > .05 \); Psychotism is \( t(305) = 1.877, p > .05 \); and Extraversion is \( t(305) = −.030, p > .05 \).

In order to determine whether the variables had normal distribution, skewness and kurtosis values were calculated before performing the Pearson Product-Moment Correlation analysis and path analysis. The skewness and kurtosis values of the variables were found to be between -2 and +2 respectively (see Table 3).

**Table 3. Pearson Product-Moment Correlation Analysis Results and Descriptive Statistics Used to Determine Correlation between CES-D, SWBS, Extraversion, Neuroticism, and Psychoticism Scores**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>CES-D</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SWBS</td>
<td>- .710*</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>- .163*</td>
<td>.435*</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.596*</td>
<td>- .658*</td>
<td>- .244*</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Psychotism</td>
<td>.127**</td>
<td>- .115**</td>
<td>.047</td>
<td>.056</td>
<td>-</td>
</tr>
<tr>
<td>( \bar{X} )</td>
<td>16.55</td>
<td>170.55</td>
<td>3.72</td>
<td>2.83</td>
<td>2.02</td>
</tr>
<tr>
<td>SS</td>
<td>11.334</td>
<td>29.674</td>
<td>1.974</td>
<td>2.034</td>
<td>1.164</td>
</tr>
<tr>
<td>Skewness</td>
<td>.674</td>
<td>- .472</td>
<td>- .542</td>
<td>.058</td>
<td>.268</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>- .305</td>
<td>- .020</td>
<td>- .976</td>
<td>-1.304</td>
<td>- .032</td>
</tr>
</tbody>
</table>

CES-D = Center for Epidemiologic Studies Depression Scale; SWBS = Subjective Well-Being Scale; *p < .01 **p < .05 (N = 307).

As shown in Table 3, there was a statistically significant correlation between CES-D and SWBS scores in the negative direction at the p < .01 level (r = −.710; p < .01). When CES-D and personality trait scores were examined, CES-D scores were negatively correlated with Extraversion scores (r = −.163; p < .01); the scores were also found to be positively correlated with Neuroticism (r = .596; p < .01) and Psychotism (r = .127; p < .05). The correlation between SWBS scores and personality traits was also examined. There was a statistically positive and strong correlation between SWBS scores and Extraversion scores (r = .435; p < .01). The correlation between neuroticism scores (r = −.658; p < .01) and psychoticism scores (−.115; p < .05) was found to be negative.

![Figure 1. Path analysis figure and the extent to which CES-D and SWBS scores predict pet owners’ Extraversion, Neuroticism, and Psychoticism scores](image-url)
Table 4. Path analysis results of the extent to which CES-D and SWBS scores predict owners pet owners' Extraversion, Neuroticism, and Psychotism scores

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Neuroticism</th>
<th>Extraversion</th>
<th>Psychotism</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>SE</td>
<td>T</td>
</tr>
<tr>
<td>CES-D</td>
<td>0.260*</td>
<td>0.011</td>
<td>4.379</td>
</tr>
<tr>
<td>SWBS</td>
<td>−0.474*</td>
<td>0.004</td>
<td>−7.992</td>
</tr>
</tbody>
</table>

CES-D = Center for Epidemiologic Studies Depression Scale; SWBS = Subjective Well-Being Scale; *p < .01 (N=307).

Figure 1 shows the form of the path analysis, whereas Table 4 shows the results of the path analysis. The SWBS scores predict the personality traits of Neuroticism ($\beta = -0.474; p < .01$) and Extraversion ($\beta = 0.643; p < .01$). However, SWBS scores are not a predictor of Psychotism ($\beta = -0.050; p > .01$) scores. When we compare the CES-D scores with the related variables, we find that they predict Neuroticism ($\beta = 0.260; p < .01$) and Extraversion ($\beta = -0.294; p < .01$) scores, but do not predict Psychotism scores ($\beta = 0.091; p > .01$).

Table 5. Comparison of Goodness of Fit and Research Results

<table>
<thead>
<tr>
<th>Goodness Criteria</th>
<th>Good Fit</th>
<th>Acceptable Fit</th>
<th>Compliance values obtained from the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>0 ≤ $\chi^2$ ≤ 2 df</td>
<td>2 df ≤ $\chi^2$ ≤ 3 df</td>
<td>1.163</td>
</tr>
<tr>
<td>P values</td>
<td>0.05 ≤ p ≤ 1</td>
<td>0.01 ≤ p ≤ 0.05</td>
<td>0.322</td>
</tr>
<tr>
<td>$\chi^2$/df</td>
<td>0 ≤ $\chi^2$/df ≤ 2</td>
<td>2 ≤ $\chi^2$/df ≤ 3</td>
<td>1.08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0 ≤ RMSEA ≤ 0.05</td>
<td>0.05 ≤ RMSEA ≤ 0.08</td>
<td>0.023</td>
</tr>
<tr>
<td>NFI</td>
<td>0.95 ≤ NFI ≤ 1.00</td>
<td>0.90 ≤ NFI ≤ 0.95</td>
<td>0.999</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.97 ≤ NNFI ≤ 1.00</td>
<td>0.95 ≤ NNFI ≤ 0.97</td>
<td>0.997</td>
</tr>
<tr>
<td>CFI</td>
<td>0.97 ≤ CFI ≤ 1.00</td>
<td>0.95 ≤ CFI ≤ 0.97</td>
<td>0.999</td>
</tr>
<tr>
<td>GFI</td>
<td>0.95 ≤ GFI ≤ 1.00</td>
<td>0.90 ≤ GFI ≤ 0.95</td>
<td>0.996</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.90 ≤ AGFI ≤ 1.00</td>
<td>0.85 ≤ AGFI ≤ 0.90</td>
<td>0.978</td>
</tr>
<tr>
<td>RFI</td>
<td>0.90 ≤ RFI ≤ 1.00</td>
<td>0.85 ≤ RFI ≤ 0.90</td>
<td>0.977</td>
</tr>
</tbody>
</table>

(Schermelleh-Engel, Moosbrugger, & Müller, 2003)

The path analysis conducted to test the model's goodness of fit suggests that the values are included in the goodness criteria. The following values were obtained from the path analysis: chi-square $\chi^2 = 1.163; (P < .01); (\chi^2 / sd) = 1.08; RMSEA = .023; GFI = .996; AGFI = .978; NFI = .999; CFI = .999; and RFI = .977. The obtained model meets the required standards as indicated by the goodness indices (see Table 5).

DISCUSSION

The benefit of animal and human interaction for the improvement and protection of health cannot be ignored. The pet ownership has a crucial role in individuals' lives, which offers many beneficial effects. Pets may supply ongoing comfort and reduce feelings of sadness, loneliness, and helplessness during stressful events. Psychological well-being is defined as managing existential challenges such as pursuing meaningful goals, personal development and building quality relationships with others (Keyes, Shmotkin & Ryff, 2002). Well-being of university students is of special importance for the society. The future well-being of a nation depends on the well-being of the students. Although there are many studies examining the well-being of university students (Cenkseven & Akbaş, 2007; Doğan, 2006; Selçukoğlu, 2001; Taysi, 2000, the relationship between psychological well-being and pet ownership has not been studied. Based on this need, this study focuses especially on pet owner university students living in Turkey, and aims to examine the effects of pet ownership on the following psychological factors: subjective well-being, depression, and personality traits. It also aims to examine the relationship between these variables and of the participants' pet preferences. This is the first study of pet owner university students in Turkey. It was conducted by
quantitative method based on exploratory and predictive correlational models. Let us first focus on owners' attitudes toward their pets.

As it is known, many research findings highlight the importance of increased awareness among youth service providers of the potential impacts of pet ownership for people. In this study, results supported the notion that, the pet ownership has a crucial role in participants’ lives, which offers many beneficial effects. The findings of this study show that a large number of the participants are strongly attached to their pets; they also tend to take full responsibility to care for their pets. A large number of the participants also reported that they would feel extremely sad if their pets passed away. It is also important to consider the participants’ profile while interpreting the variables. A large number of the participants were found to care for their pets, and this finding may have an effect on the results.

According to the findings, owning a cat, dog, or other animals (bird, fish, tortoise), or owning more than one animal as a pet, does not cause any impact on the participants’ depression, subjective well-being, or personality traits. On the other hand, some studies have shown that preference for a certain pet animal can impact the ways in which individuals measure their empathy and self-esteem (Beals, 2009; Daly and Morton, 2006; Merrill, 2012). When participants were asked about the time spent with their pets and the average time spent with pets during the day, it was found that most of them were pet owners for more than 5 years. In addition, most of them spent more than 5 hours with their pets during the day. However, these factors also do not have an impact on the participants’ depression, subjective well-being, and personality trait scores.

Having positive attitudes toward pets is known to increase individuals' well-being and reduce their stress and distress levels (Beals, 2009; Garrity et al., 1989). In order to assess the participants’ attitudes toward their pets, this study focused on the ways in which the participants plan their vacations—whether they take their pets along, whether they leave them alone, or whether they arrange someone to care for their pets. To this end, the study also focused on whether the participants knew if their pets had a disease. Contrary to expectations, these factors had no significant impact on participants’ depression, subjective well-being, and personality traits.

The relationship between depression, subjective well-being, and personality traits was examined using the path analysis model. Subjective well-being and depression predict neuroticism and extraversion in personality traits, and goodness of fit index of this model has been found to be at acceptable levels. While depression predicts neuroticism positively, subjective well-being predicts neuroticism negatively. On the other hand, depression predicts extraversion negatively, whereas subjective well-being predicts extraversion positively. Subjective well-being has been found to be more predictive than depression for both personality traits.

The findings also reveal that individuals with high depression scores also have higher neuroticism and psychoticism scores. Other studies have suggested that depression scores are associated with neuroticism, extraversion (Fergusson, Horwood, & Lawton, 1989; Jardine, Martin & Henderson, 1984; Jylhä & Isometsä, 2006) and psychotism (Garcia-Torres & Alos, 2014). Studies that focus on pet owners typically focus on variables such as stress levels, hopelessness, and loneliness. In addition, these studies often compared pet owners with those who do not own pets (Allen et al., 1991; Beals, 2009; Garrity et al., 1989; Stanley et al., 2014). On the other hand, this study focused on the pet owners’ symptoms of depression; it also examined the relation between depression and three sub-dimensions of personality traits. This study reveals that pet owners with high levels of depression also have high levels of neuroticism and psychotism, but low levels of extraversion. These findings are similar to the findings reported by studies that focus on the general population.

Previous studies have shown that pet ownership contributes to subjective well-being (Chandler et al., 2015, McConnell & Brown, 2011, etc.). This study examined the relationship between subjective well-being and the personality traits of pet owners. It was found that subjective
well-being is positively correlated with extroversion scores. Thus, it is feasible to state that pet owners with high levels of subjective well-being also tend to be extroverted. In addition, subjective well-being has been found to be negatively correlated with the participants’ psychoticism and neuroticism scores. Studies that have focused on the subjective well-being of adults have found that subjective well-being is associated with neuroticism, psychoticism, and extroversion (Alver, Dilekmen, & Ada, 2010; Hayes and Joseph, 2003; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002). The results of this study show that the relationship between the above factors is similar for the general population, as well as pet owners.

The study is not without a number of limitations, however. First, the results of the study have been acquired from self-report scales, which may have biases in the answers, as individuals tend to be defensive and present themselves well in self-report-based evaluations. Second, the sample group was limited to university students. Although some studies have focused on pet ownership and animal-assisted therapy in Turkey (Cevizci, Erginöz, & Baltas, 2009; Karayazı-Muslu & Conk, 2011; Pamuk, 2015), this is the first study of its kind in to explore the Turkish context. In this context, it must be mentioned that it is important to conduct more experimental and correlational studies involving the same variables; these studies may focus on pet owner students, as well as their difference with those who do not own pets. They may also focus on specific age groups, such as children, adults, and the elderly. These studies are likely to make significant contributions in the field of educational sciences and psychological counseling and psychotherapy, especially in terms of therapy techniques and treatments. While the effects of animal-assisted therapy have been studied quite extensively abroad, they have not received enough scholarly attention in Turkey. This is all the more important because findings reported by the studies conducted abroad have had significant impact on human life (Berge, 2019; Saliba, 2016). The centers offer psychological support to students, are available at many universities in Turkey. While these centers offer psychological support, they can offer support to students’ well-being considering these practices in different ways.

REFERENCES


Emergency Distance Education Experience Of Primary School Teachers Teaching First-Grade Students

Derya Uysal¹
Alanya Alaaddin Keykubat University

Abstract

This study aims to ensure a better understanding of the stages ten primary school teachers have gone through after finding out that they are expected to offer online courses due to COVID-19 conditions. Contrary to the majority of articles that tend to emphasize the advantages of distance education while minimizing its difficulties, this study intends to arrive at a proper understanding of the phenomenon from the unique perspectives of practitioners. The phenomenological approach was particularly adopted to understand the experience of teachers, and the data obtained from the interviews were analyzed inductively. Study participants include 10 teachers who teach the first-grade students in a private primary school in Eskisehir, Turkey. The study results indicated four categories including “first reactions”, “adaptation period”, “ongoing process”, and “suggestions for a better distance education”. In line with the aim, the study also presents both negative and positive aspects of emergency distance education.

Keywords: Distance Education, Primary School Teachers, First Grade, COVID-19, Phenomenological Approach.

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INTRODUCTION

In today’s information age, learning is no longer confined within the concrete walls of a classroom. Additionally, an instructor armed with a coursebook is no longer the only source of knowledge. Information sources are available everywhere and people can access them anytime (Chute, 2003). Thus, distance education has become a necessity rather than an alternative to traditional education. Although distance learning and knowledge management are the building blocks of the 21st century, distance education has a long history (Chute, 2003). According to Peters (2003), the practice of distance education dates back to 150 years ago. Both written and printed worlds along with railway and postal services are the foundations of distance education. The latest technologies also aim to provide students at a distance with a richer learning environment and connection to learning organizations and instructors (Shearer, 2003; Bozkurt, 2019).

The history of distance education technologies is divided into three generations (Bozkurt, 2019). These generations are illustrated in table 1.

<table>
<thead>
<tr>
<th>Name</th>
<th>Dominant technologies used</th>
<th>Target group</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correspondence Education</td>
<td>Postal services, correspondence (printing technology)</td>
<td>Adults who had been traditionally left out of the formal education process</td>
<td>Providing educational opportunities to disadvantaged people</td>
<td>Cost and complexity limiting the usefulness and absence of social presence</td>
</tr>
<tr>
<td>Visual-Auditory Distance Education</td>
<td>Audio (e.g., radio), visual-auditory (e.g., television) technology</td>
<td>Adults and younger learners from different backgrounds</td>
<td>Mediated interaction (two-way communication)</td>
<td>Teacher-centered instruction</td>
</tr>
<tr>
<td>Computer-Based Distance Education</td>
<td>Higher quality computer-based multimedia, and synchronous and asynchronous instruction</td>
<td>Life-long learners (all people)</td>
<td>Flexibility of engaging with existing problems or interests.</td>
<td>Absence of scaffolding and controlled learning environment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Networked connections</td>
<td>Learners may start to feel lost or confused</td>
</tr>
</tbody>
</table>

As seen in Table 1, the first generation distance education was driven by a basic requirement of providing access to learning for those most in need of education. The primary goal of the educators was to make learning accessible to all individuals in need, irrespective of the background and context (Granger & Bowman, 2003).

Arguments and counter-arguments about distance education have developed along with technological advances in the field. Pioneering theorists such as Peters (2000) and Wedemeyer (1971) were the advocates of self-study and independent learning. They defined the key characteristics of independent learning as pacing, convenience, low-cost education opportunity, and self-determination of goals and activities (Garrison, 2000). They focused on learning and teaching, and individuals as opposed to groups. In this context, there was no place for conversation. Unlike them, another theorist, Holmberg (1989) stated that feelings of personal relationships could be revealed via well-developed self-instructional materials, so it was the responsibility of course developers to create simulated conversation. Thus, Holmberg (1989) was the first to emphasize groups as opposed to individuals. He defined the role of distance education practitioners as conversation-makers. However, concerns emerged against this theory that a written communication might not substitute for real sustained communication. Recently, third-generation technologies have allowed two-way communication between teacher-student and student-student (Anderson & Dron, 2011; Bozkurt, 2019). Thus, the conversational deficiency of distance education has been remedied.

The majority of existing articles tend to minimize the difficulties of distance education while emphasizing its virtues (Hara & Kling, 2001). However, some researchers state that distance education...
is not problem-free (Hara & Kling, 2001, Can, 2020). According to Nolan (1998), compared to traditional education, the cost of distance education is not relatively low rather high due to limitless demands for instructor’s time and vastly expanded overhead requirements such as equipment, upgrades, maintenance, and technical support staff. Opposed to the claims about extending educational access to those unable to get it, he stated that web-based education is a result of political leaders’ desire to hold a monopoly over the knowledge that is the lifeblood of future knowledge-based industries as well as the university administrators who see it as a way to improve the image of their institutions. The results of Can’s (2020) study, conducted 22 years after Nolan’s (1998), demonstrated that problems related to technological infrastructure impede the settings of distance learning in Turkey.

Kling (1994) groups the theories of distance education into three genres – technological utopian, technological anti-utopian, and social realism. Technological utopians focus on its advantages without considering the negative aspects. On the other hand, technological anti-utopians primarily focus on the disadvantages of the new form of education. Unlike these two extreme perspectives, social realists take both negative and positive aspects into consideration.

Problem and significance of the study

Regardless of the advantages or disadvantages, emergency distance education has recently become a reality that all educators have to embrace due to the outbreak of the COVID-19. The pandemic has affected all people all around the world, thereby forcing both practitioners and politicians the reality from their perspectives.

The confluence of the need to continue formal education during the COVID-19 while maintaining social distance has pushed education authorities and practitioners to use distance education tools available. Some studies examined the difficulties faced by instructors in delivering distance education courses; however, these studies were mostly carried out at higher education level (Kim & Schniederjans, 2004; Bayram, Deniz & Erdoğan, 2008; Osborn, 2001; Bonk & Cummings, 1998). Similarly, various studies in Turkish literature explored or defined the distance education process in higher education during the COVID-19 pandemic (Keskin & Özer, 2020; Kürtüncü & Kurt, 2020; Durak, Çankaya, & İzmirli, 2020). Unlike these studies, this paper examines the experience of primary school teachers who were obliged to teach the first-grade students at a distance due to the COVID-19 conditions.

Distance education for adults is not a new phenomenon and existing comprehensive studies surrounding the field well define its current stage. However, in recent years, a growing number of distance programs have been aimed at primary and secondary school students. The forces fueling K-12 distance education courses are the national education policies to expand educational opportunities to all students, overcrowding classes, and the exploration of alternative routes for education (Rice, 2006; Sewart, Keegan & Holmberg, 2020).

In the context of primary school education, the experience of first-grade teachers is particularly significant for some reasons. First of all, first grade is critical for students to adapt to the school environment (teachers, students, routines, and so on) and gain basic skills such as how to read and write. Due to the immediate nature of the COVID-19 outbreak, both teachers and parents were unprepared for the new form of education. As it is a mandatory distance education initiative, the new form of education has been named emergency distance education in this paper. While teachers had to take a quick step to offer online lessons to continue formal education, parents were needed to be involved in the process to provide their children in first grade with technical support to attend online lessons. Additionally, some of the first-grade students could not find enough time either to adapt to school or gain basic skills. They were also not capable enough to become self-directed learners as expected by the advocates of distance education. Considering all these problems, it seems worth to shed a light on teachers’ experiences in emergency distance education.
This study intends to ensure a better understanding of the stages primary school teachers have gone through after finding out that they are expected to offer online courses due to the COVID-19 conditions. The majority of existing articles tend to emphasize the advantages of distance education while minimizing its difficulties (Hara & Kling, 2001). This study intends to arrive at a proper understanding of the phenomenon from the unique perspectives of practitioners.

**METHOD**

**Design**

This study adopted a phenomenological approach. Researchers in phenomenological mode attempt to understand the meaning of events and interactions to ordinary people in particular situations (Bogdan & Biklen, 1997). This study attempts to understand the meaning of emergency distance education to primary school teachers teaching first-grade students. Phenomenologists don’t know what certain things mean to people they are studying. Researchers act like they don’t know what these things mean and study them to find out what is actually taken for granted (Bogdan & Biklen, 1997). By embracing this approach, the researcher has defined interactions, weaknesses, strengths, and problems related to emergency distance education considering the study participants. Subsequently, one-to-one interviews were conducted with 10 teachers teaching first-grade students in a private school 3 months after the start of online courses.

The researcher didn’t follow a linear, but a zigzagging research process during the interviews. For conducting an empirical research study, Aspers (2009) proposes a zigzagging process including seven steps: define research questions, conduct a preliminary study, choose a theory and use it as a scheme of reference, study first-order (and bracket the theories) and second-order constructs, check for unintended effects, and relate the evidence to the scientific literature.

He also states that a researcher should not allow a theory to guide all the research processes. Empirical data should be utilized to add dimensions to the research in order to construct meaning from all participants’ perspectives. In this study, a similar approach has been adopted. First, three research questions were formulated in a preliminary form which was sent to an expert in curriculum and instruction. The expert suggested some minor revisions and the final form included the following research questions.

1. How did teachers feel when they were informed about online lessons?
2. How did teachers prepare for online lessons?
3. What do teachers think about the ongoing online education process?

After conducting preliminary interviews with 2 teachers teaching in a similar context, two more research questions were formulated in line with new dimensions that are adaptation period and suggestions for better online lessons:

4. What did teachers go through during the adaptation period?
5. What suggestions do they offer on how to improve online lessons?

Also, during data collection, the interview questions were constantly updated. The interviews that lasted 26 to 47 minutes were individually conducted via Zoom application. Additionally, they were audio and video-recorded.

After the interviews, first-order constructs entailed meanings the teachers constructed about distance education and how these meanings relate to each other. The final form of the data was then
related to the theories and the results of the existing studies. Consequently, second-order constructs were obtained and presented in the discussion part.

**Participants and Context of the Study**

The study participants include ten teachers teaching first-grade students in a private primary school in Eskisehir, Turkey. Four of them are the class teachers of first-grade classes in the school and their job experiences range from 17-35 years. Also, one of them was retired from a state school and hired by the private school. The other three class teachers have been teaching in the school for more than ten years. Additionally, two English language teachers, one German language teacher, one music education teacher, one physical education teacher, and one art education teacher participated in the study. Their job experiences range from four to ten years.

All the participants are female and have been experiencing distance education for the first time in their teaching careers. Only the art education teacher had offered online lessons to a university student before, but it is the first time for her to offer online lessons to the first-grade students. Instead of their real names, nicknames assigned to the teachers were used while reporting the results.

Regarding the context of the study, the research was conducted in a private primary school in Eskisehir. Prior to the COVID-19, the first-grade students were offered 9 face-to-face courses a day (45 courses a week) which lasted 45 minutes. The class teachers were teaching Turkish, maths, and life science courses (16 hours a week). There were 13 English language courses (1 course with a native speaker) and other courses (German language, physical education, art education, music education) were conducted either one or two hours a week. With the spread of the COVID-19, the class teachers started teaching 10 courses a week and the English teachers taught 5 courses a week while other teachers conducted 1 course a week in the online setting. The time span of the lessons has been reduced to 30 minutes. Also, the courses have been offered via a distance education tool allowing two-way communication (teacher-student, student-student) and synchronous method has been typically utilized for the courses (Clark, 2020). At the outset of the distance education process, the administrators and technical staff held a meeting to inform teachers about the problems and expectations of distance education and how to use the education tool. Also, the teachers and parents were constantly provided with technical support in case of any problems.

**Data Analysis**

Inductive approach was used to analyze the qualitative data obtained from the interviews and generate the categories. After the collection of data, the audio records were transcribed verbatim. In the coding stage, the researcher followed 5 steps suggested by Creswell (2014):

1. initial reading of the transcribed texts,
2. identifying specific text segments,
3. labeling the text segments to create categories,
4. reducing overlap and redundancy among the categories,
5. creating a model incorporating the most important categories.

Initially, the data was thoroughly read to obtain a general sense. Subsequently, descriptions or sub-themes and categories were determined in the second and third stages. After the overlap and redundancy among the categories were reduced, the teachers’ experiences of emergency distance education were examined in four main stages – first reactions, adaptation period, ongoing process, and suggestions for better distance education.
The member checking technique was used to ensure the validity of the study findings (Creswell & Miller, 2000). In this process, the data were first analyzed separately for each participant. The researcher prepared a mind map demonstrating the meanings constructed about emergency distance education and how these meanings relate to each other. The mind maps were written in Turkish, as the researcher shared the analysis of the results with the teachers. They were then asked to confirm the results or make corrections in case of misunderstandings or misinterpretations. Two of them requested correction for certain misunderstandings while three of them added some new categories to the existing ones. Other teachers confirmed the analysis of their results and didn’t request any change in the categories or sub-categories.

Subsequently, the analyses of all the results were combined to define the distance education process of teachers under the shared categories and sub-categories. This model was examined by an expert in curriculum and instruction in terms of the relevance of the sub-categories to the main ones and the overlap or redundancy among the categories. Lastly, the final model was translated into the English language by the researcher and an expert. The researcher is an ELT (English language teaching) instructor in a foreign language school of a state university and has an M.A degree in ELT. Similarly, the expert is an ELT instructor in a foreign languages school of a state university and has M.A and Ph.D. degrees in ELT.

RESULTS

The study results revealed that after realizing that they are obliged to offer lessons in a virtual environment, the primary school teachers teaching the first-grade students have gone through four stages - first reactions, adaptation period, ongoing process, and suggestions for a better distance education process (figure 1).

<table>
<thead>
<tr>
<th>first reactions</th>
<th>adaptation period</th>
<th>ongoing process</th>
<th>suggestions</th>
</tr>
</thead>
</table>

**Figure 1. Stages the teachers have gone through after being informed about the Emergency Distance Education**

**Results of the first stage – first reactions**

The teachers experienced feelings of surprise and worry as the first reactions. The factors leading to these feelings are illustrated in figure 1.
Figure 2. Factors leading to worries about the emergency distance education

*Numbers in parentheses show the number of teachers commenting about the –sub-categories.

As illustrated in the figure 2, the primary factor evoking the feeling of worry among the teachers is offering online courses for the first time in their professional teaching career. Thus, all teachers were worried about using the distance education tool (Zoom) effectively and experimenting with the technology more frequently than before, although they had been using computers from before. As they had never offered courses in an online setting before, they were worried about falling behind the curriculum, giving a negative impression about learning and education to the students, or coping with students’ problems.

Beren: “Our hesitation stems from experiencing something like this for the first time. Something that I never thought of after thirty-four years of experience. But I actually use computer, I like it, but we were afraid as it was the first time, could we be enough for the children? So can we explain the topics as we want? I don’t know if we can instill in children the love of lesson and school.”

Another aspect that worried the teachers about offering online courses is third parties listening to the lessons. Especially the judgements of parents about the teaching ability or subject matter knowledge of teachers worried them.

Helin: “We try to talk to the children by simplifying the language at a certain level. If something turns out to be wrong, words, and so on. So what I want to say is, judgment, I mean, if parents think that she can’t say this yet or something turns out wrong, I get very excited while teaching and I confess this to my children during lessons. I get excited and say something incorrectly, for example, I will feel very sorry if they think that her proficiency level is really so low.”

Results of the second stage – adaptation period

The adaptation period is the second stage the teachers have gone through while teaching during the COVID-19. It entails two main categories – preparations for distance education and
problems encountered in the initial lessons. Teachers’ preparations before offering online courses are illustrated in figure 3.

![Figure 3. Teachers’ Preparations for Online Courses](image)

As illustrated in the figure, before offering online courses, teachers searched for prepared study materials and conducted trial courses to test audio and vision, experiment with the education tool, and check the effectiveness of diverse methods and techniques in an online learning environment. They asked for help from the technical staff or family members who are good at technology. The trial courses were conducted with family members and/or colleagues which helped the teachers feel comfortable with the distance education tool during the initial courses. The second category of the adaptation period is the problems the teachers faced during these courses (figure 4).

![Figure 4. The problems encountered during the adaptation period](image)

Several problems arose during the adaptation period, as it took time for not only the teachers but also the parents and students to adapt to the recent learning environment, causing the teachers to encounter various problems. However, after this period, those problems were handled effectively and courses continued in a natural mode. As illustrated in the figure 4, teachers felt mentally and
physically exhausted because of stress and long-lasting preparation for the courses. Also, the difficulty in establishing authority in online courses and giving a chance to all students to have their say are among the problems experienced during the adaptation period.

Aycan: “Distance education is not exactly what I want, but I’m trying different things. If I was at school, why wouldn’t I be so tired? Materials at school. I have a lot of ready-made things. I always prepare extra materials, I never felt mentally exhausted, but now I am feeling mentally exhausted. The thought of what I can do. I spend a serious process before each topic. How should I explain this topic?’”

Also, the students were not accustomed to the distance education learning setting. Therefore, they had difficulty in sticking to the new rules during the lessons and using the tool without parental support. Besides, they were confused about whether they were on holiday or not and perceived the teacher as a guest at home. Lastly, they made noises or used the education tool in a disruptive way which distracted their attention from the lessons.

Feray: “What challenged us at first? At first, the children didn’t fully realize that this was a lesson because they were at home, for example, some students took his cat in his arms. He showed that he would play later. I didn’t say anything at first, but this time, when one shows it, the next day and the next day, it costs 5/10 minutes every lesson. Then I banned it. I said you can meet, but do not do this during the lessons. They said okay, they perceived it as if I was visiting their home, not as if it was a lesson, the children thought that way. Now they take it a little more seriously, they are aware that they are in the lesson.”

The teachers also had parent-oriented problems, as the students were at home with their parents during the online lessons.

Helin: “The parents are at home, they are in the room, maybe, we don’t see them, but somewhere they hear us. The children panicked. I was noticing it. They were answering in a panic way. What if I made a mistake, or mom thought my daughter couldn’t speak English? Even the most extroverted ones were like this. They’ve changed now, they’ve gotten used to online lessons. But they were especially worried at first.”

**Results of the third stage – ongoing process**

The ongoing process is the third stage the teachers experienced after starting the online courses. This stage is examined in terms of its positive and negative aspects. The categories and sub-categories of these aspects are demonstrated in figure 5.
As demonstrated in the figure 5, the ongoing process is about the negative or positive experiences of teachers regarding the ongoing distance education process. In terms of negative aspects, lesson preparation was found to be time-consuming, which resulted from (1) the need for materials that are convenient for online learning and (2) existing materials which are inconvenient for the home environment. Secondly, teachers encountered problems in classroom management during the online courses due to the following reasons (table 2).

Table 2. Problems in classroom management

<table>
<thead>
<tr>
<th>Disruptive noises (4)</th>
<th>students’ problems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lack of eye contact(6)</td>
</tr>
<tr>
<td></td>
<td>minimized view of students on screen(4)</td>
</tr>
<tr>
<td></td>
<td>problems about verbal warnings</td>
</tr>
<tr>
<td></td>
<td>inefficiency of verbal warnings (1)</td>
</tr>
<tr>
<td></td>
<td>offensiveness of verbal warnings (4)</td>
</tr>
<tr>
<td></td>
<td>distracting students’ attention from lesson (2)</td>
</tr>
<tr>
<td></td>
<td>overcrowding classes (2)</td>
</tr>
<tr>
<td></td>
<td>parents’ existence challenging the teachers’ authority(1)</td>
</tr>
<tr>
<td></td>
<td>abundancy of distracting factors at home environment (3)</td>
</tr>
<tr>
<td></td>
<td>necessity to continue the lesson (1)</td>
</tr>
<tr>
<td></td>
<td>difficulty in addressing student differences (1)</td>
</tr>
<tr>
<td></td>
<td>reduced communication due to muting students (3)</td>
</tr>
<tr>
<td>Difficulty in controlling students</td>
<td>difficulty in coping with students’ problems</td>
</tr>
<tr>
<td></td>
<td>affective (boredom, demotivation,) (6)</td>
</tr>
<tr>
<td></td>
<td>physical (bleeding, sickness, being physically passive) (3)</td>
</tr>
<tr>
<td></td>
<td>cognitive (about subject matter)(2)</td>
</tr>
<tr>
<td></td>
<td>difficulty in addressing students’ problems immediately(3)</td>
</tr>
<tr>
<td></td>
<td>Absenteeism(3)</td>
</tr>
<tr>
<td></td>
<td>Reduced lesson time span (30 minutes)(1)</td>
</tr>
<tr>
<td></td>
<td>Audial problems disallowing chorus/group activities(2)</td>
</tr>
<tr>
<td></td>
<td>Difficulty in giving a chance to all students to have their say(1)</td>
</tr>
</tbody>
</table>
As seen in the table, the participants had some problems in classroom management. First, disruptive noises impeded the flow of lessons. As a result, the teachers frequently muted the students during lessons, which however reduced the communication between student-teacher and student-student. Thus, both muting and unmuting the students were problematic in terms of classroom management.

Feray: “It’s not like in the classroom. Because there are other things in the house that distract the students. His mother doing something, a noise comes from somewhere else. Pets are coming, they are distracted”.

Secondly, they had difficulty in controlling the students. In relation to the first subcategory, a lack of eye contact was the primary reason for the difficulty in controlling the students. Other significant factors were minimized view of the students on screen, problems about verbal warnings, distracting factors at home environment, and reduced communication due to muting the students.

Aycan: “I cannot eye-contact with the students or get into verbal communication with each one of them. I cannot approach all the students equally. Those are what tires me most.”

Concerning the third category, teachers had difficulty in coping with students’ problems and addressing them immediately, as they were teaching at a distance.

Nuran: “A student is raising his finger, I’m moving. I cannot stop. Because if I stop, the lesson will stop and our bodies will cool down as we have to go through a certain course of movement. Therefore, for example, I can't stop the screen, I can't get questions. So I can't get it at that time. For example, a child was sick. I couldn’t understand, actually, he tried to explain to me by raising his finger. But I could not get it because I could not stop. When we talked to his parents later, I found out. I was very sorry”

Other problems regarding classroom management are as follows: absenteeism, reduced lesson time span (30 minutes), audial problems disallowing chorus/group activities, and difficulty in giving a chance to all students to have their say. The second main category of the negative aspects is the problems in providing feedback.

**Table 3. Problems in providing feedback**

| Time-consuming process of checking assignments day and night (4) |
| A need for cooperation between teacher & parents |
| parents unable to exercise authority over students (2) |
| parents not sharing teachers’ feedback with students (1) |
| parents that can’t find time to help students with homework(1) |
| Difficulty in giving immediate feedback (5) |
| Difficulty in providing private feedback (2) |

As seen in the Table 3, the first negative aspect of giving feedback is that the teachers find the process of assignment checking time-consuming. The parents would send photos of the completed assignments to teachers to receive feedback. The assignments could be sent during the day or night, as there was not a definite time to send them, causing the teachers to feel exhausted.

Beren: “Assignments, I check them and draw a smiling face on pages in the classroom, easier to motivate kids. In an online environment, I still do it but checking homework takes longer. In the classroom, for example, we will check homework, we can take
22 students’ notebooks at the same time and check. But here, it is during the day or night, as they don’t come at the same time. I don’t like experimenting with technology, but I am always on my phone. When the homework comes, I check it so that I can give feedback, but it starts in the morning at eleven or ten. Time was extended in terms of checking the homework. If we request the parents to send homework at a definite time, they will be stressed. That’s why we check it all day long. Homework is sent even at 11 pm. I tolerate the parent, check, and give feedback.”

A lack of cooperation from parents is the second difficulty teachers experienced while checking assignments. Checking homework is not effective enough if the parents don’t exercise authority over the students, share the teacher’s feedback with them, or help them with the assignments.

Aycan: “The parents need to help in checking assignments. Now, I am trying to check the pictures sent. I can’t go too much into detail. Well, sometimes I write comments, but the behavior at home is important over that comment. When I say that you should capitalize this sentence, the family should show this comment to the child and say, “Look, let’s correct it, let's capitalize it.” Otherwise, my comment and control will be wasted.”

Lastly, teachers had difficulty in giving private and immediate feedback.

Gözen: “I cannot do everything I have done before in an online setting. Children cannot do it. Because I cannot take children away from the screen and intervene. For example, we are folding something. He says, “mine is not like what you have done.” He is probably missing something somehow. I want to take it there and fold it and show it with my hand, but I can’t.”

The fourth category of the negative aspects of emergency distance education is weaknesses that the teachers feel when teaching at a distance (table 4).

Table 4. Weaknesses the teachers feel when teaching at a distance

| Difficulty in improving writing skills of students | limited opportunities for social chat (6) |
| Diminished affective interaction with students | a lack of encouraging body language (6) |
| limited opportunities for sharing feelings of students (success, joy, sore) (2) |
| Technological inefficacy (4) | A lack of school context (3) |

Teachers feel weakness when teaching at a distance, which are the aspects they fail in an online setting. Firstly, the teachers had difficulty in improving the writing skills of the students. As first-grade students in the primary school had just started learning how to write, they needed private and immediate feedback to improve their writing skills. However, since distance education learning settings disallow immediate and private feedback, improving writing skills became one of the weaknesses the teachers feel when teaching at a distance.

Özel: “I can show kids a visual or play org. But saying them to get notebooks. This is “the treble staff”, this is written in the middle. There will be many inaccuracies as I am not exactly applying this in front of the students. I'm not good in this area. In order to do it, the child should be with you so that he does not make a mistake. If he is not with you, it will not
be enough, if he opens his notebook and shows it to the cam. Better not to teach than to teach wrong.”

Diminished affective interaction is the second sub-category related to teachers’ weaknesses because they could not find enough opportunities to have social chat with the students. They could neither use encouraging body language such as stroking, hugging, or kissing on the cheek. Also, they had limited opportunities to share their feelings like joy or soreness. Thus, they struggled to ensure affective interaction with the students.

Nuran: “When we succeed in something together, they are so happy that they come and hug us. We provide that emotional transition and children become happy as they achieve something, but I cannot control this in online lessons. Frankly, I cannot observe how happy the children are.”

A lack of school context is another weakness of teachers teaching at a distance. School entails social relationships and routines, not just subject-matter knowledge. Whereas, it doesn’t seem possible to provide students with a complete school context in distance education settings.

Feray: “School is not just about teaching. There are not only teachers but also friends in the school. There is a garden. For example, the children love to play on the grass when they have a break. If they cannot go out to the garden even if the weather is cloudy, they feel sorry, so they are very upset. We shouldn't think of school only in terms of education or academically, you know that it is also very good for friends and socializing. In other words, it is a good place to learn the rules of living in society, how to be respectful to each other, what are their responsibilities, and how to fulfill them. If you do something negative, how is the reaction in return, or if you do something positive, how is the reaction? He learns life at school.”

Some of the teachers also felt technologically weak while teaching in an online environment. They had difficulty in using all features of the education tool, as they were not technologically self-efficient. Even though they were good at using technology, they had difficulty in using the technology for preparing enjoyable lessons in an online environment.

Feray: “We think we have learned about settings and features of the distance education tool. However, there are still many things we need to learn. I still don’t think I am good at using the tool. For example, an update changes something and I don’t know what to do in this case.”

Students spend a long time in front of the screen, which is the last negative aspect of distance education from the participants’ perspective. This is because they think spending such a long time in front of the screen is disadvantageous in terms of excessive exposure to technology and physical inactivity, which may cause students to suffer from various diseases, especially eye diseases.

Contrary to the negative aspects, distance education has several positive aspects for both teachers and students. The first positive aspect is the advantages of distance education for teachers (Table 5).
Table 5. Advantages of emergency distance education for teachers

- more enjoyable lessons thanks to the parents’ contributions to lessons (1)
- opportunity to know the home environment of the students (2)
- distance education experience (4)
- awareness about the opportunity of cooperation with different teachers/students free of place (1)

Students being at home was seen as a disadvantage in terms of the abundance of factors distracting their attention from the lessons. However, it was assessed as a positive aspect in terms of learning students’ characteristic features, relationships with their parents, or the home environment because they behave naturally and feel comfortable at home.

Gözen: “Online lessons have made a nice contribution to me. I couldn’t chat with the kids so much in school. You know, I could talk to them before the breaks, but here, there are a lot of things to see in their home environment, their homes, and how they communicate with their family. I mean, it was nice and I felt that I knew the children more.”

Although the teachers didn’t voluntarily offer online lessons at the outset of the process, it has provided them with the opportunity for experiencing distance education.

Asude: “Maybe we had to wear it quickly, but after we got out of the shock, we recovered very quickly. I believe something useful happened. It turned into an opportunity. We have teachers even at the age of 65 at our school. This is something difficult for them. For example, getting them quickly involved was very important and valuable because I think it would not be otherwise. I mean, those people wouldn’t even have imagined it, but they set up virtual classrooms now, offer online courses, and mute or unmute. Somehow they present educational support to the students with the technological tools. In this sense, it was a good opportunity for professional development.

According to the teachers, distance education also has many advantages for the students.

Table 6. Advantages of emergency distance education for the students

<table>
<thead>
<tr>
<th>In terms of technological skills</th>
<th>experimentering with technology (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>adapting to requirements of the technology age at a very early age (1)</td>
</tr>
<tr>
<td></td>
<td>raising awareness about technology use for learning (1)</td>
</tr>
<tr>
<td></td>
<td>having self-discipline required by distance education learning settings (2)</td>
</tr>
<tr>
<td></td>
<td>new learnings as to technology (1)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In terms of continuity of school context</th>
<th>opportunity of coming together with classmates and teachers (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>students appreciating school environment (1)</td>
</tr>
<tr>
<td></td>
<td>continuity of formal education (3)</td>
</tr>
<tr>
<td></td>
<td>continuity of student learning (3)</td>
</tr>
</tbody>
</table>

As seen in Table 6, distance education is advantageous in terms of upgrading technological skills of the students.

Feray: “We have taught many new topics, so they have not fallen behind the curriculum. They have continued to learn. That is important. Also, they have found the opportunity to come together with their teachers and classmates.”

The last positive aspect of distance education is the teacher’s strengths, indicating the aspects the teachers think they have done well during the process (Table 7).
Table 7. Teacher’s Strengths in the Emergency Distance Education Process

- encouraging extensive reading (1)
- checking assignments (1)
- supportive feedback in distance learning setting (1)
- well-prepared lesson plans (2)
- use of diverse sources during the lessons (1)
- trying to respond to both cognitive and affective needs of students (2)
- activities that support the active participation of students (1)
- giving a chance to all students to have their say (1)
- arousing feeling of unity among the students (1)
- empathy with the current situation of students (2)

Results of the fourth stage – suggestions for a better distance education process

As the last stage, the teachers sought ways to improve the courses offered in an online setting, which is called suggestions in this study. The suggestions for increasing the efficiency of online courses are demonstrated in Table 8.

Table 8. Suggestions for increasing the efficiency of online courses

<table>
<thead>
<tr>
<th>Meticulous preparation for distance education</th>
<th>creating a pool for instructional materials/activities (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in affective interaction with students</td>
<td>adapting existing materials to distance education learning environment (1)</td>
</tr>
<tr>
<td>Extra lessons for core subject matters (Turkish, Maths) (3)</td>
<td>extra lessons for having social chat with the students (2)</td>
</tr>
<tr>
<td>Starting distance education process with a familiar group (2)</td>
<td>Upgrading distance education pool so that it allows chorus activities (2)</td>
</tr>
<tr>
<td>Stronger parental support (1)</td>
<td></td>
</tr>
</tbody>
</table>

As seen in the table, the teachers came up with some suggestions about the preparations for online courses. As they had to start the online courses quickly, they made suggestions about planning and preparation that entailed creating a convenient activity pool and adapting instructional materials to the online learning setting.

DISCUSSIONS AND SUGGESTIONS

This study ensures a better understanding of the stages the primary school teachers experienced while teaching first-grade students after finding out that they are expected to offer online courses because of the COVID-19. Although the study has revealed abundant results of distance education, the results related to the adaptation process of the teachers, classroom management, parents’ involvement in the process, and the teachers’ weakness when teaching at a distance are worthy of discussion.

Firstly, it is obvious that all teachers – irrespective of their age or branch – demonstrated similar behavior, surprise, and worry after finding out that they would offer online courses although some of them expressed that they were actually good at using technology. This result is consistent with the results of a previous study that explored the experiences of science teachers during the COVID-19 period (Bakioğlu & Çevik, 2020). However, it is inconsistent with an existing study (Horzum, Albayrak & Ayvaz, 2012) that explored the beliefs of primary school teachers about distance education. According to the researchers, prior technological experience or technological skills of teachers affected their beliefs about the use of technology for education. As younger teachers have a greater tendency to experiment with technology, they are more knowledgeable about recent applications used in distance education. This helped them evaluate the effectiveness of distance
education tools in a realistic way. According to the results of the present study, all participants – regardless of their age – agreed that traditional teaching settings are more efficient and preferable in terms of the students’ learning and conforming to social norms. The difference between these two groups is that the younger ones find distance education effective as an alternative route while their older counterparts perceive it as completely inefficient and problematic.

However, parallel to the results of the study by Horzum, Albayrak, & Ayvaz (2012), the teachers (3 in total) who have been teaching for more than 30 years were more pessimistic about the long- or short-term gains of the students in a distance education setting compared to their colleagues who have up to 20-year experience in the teaching profession.

The difficulties the teachers had in using technology in all four stages demonstrate that technology may become a source of anxiety for teachers offering online courses. The study participants experienced problems in using technology in the adaptation and ongoing education processes. Also, they made suggestions about the use of technology for enjoyable lessons, which is an indicator of high anxiety. These results confirm the results of the two studies (Hara & Kling, 2001, Bonk & Cummings, 1998). In the study by Hara & Kling (2001), technical problems and the absence of personnel to provide technical support were among the sources of distress for both learners and instructors.

The present study also demonstrates that some teachers may not be enthusiastic enough for experimenting with technology, which is consistent with the results of the study by Bonk & Cummings (1998). Technological problems encountered during lessons may be irritating and exhausting for teachers and/or students. Also, some teachers might be unwilling to experiment with technology.

In our case, essential technological devices to offer online lessons had been delivered to the teachers, which didn’t reduce the problems arising from the technology. Teachers and students had difficulty in offering or attending the online courses due to technical problems such as internet connection, a computer with a damaged screen, or a lack of quality computer. The teachers also had difficulty in group/chorus activities as the distance education tool disallows them. Audial problems especially impeded several students to speak at the same time. Thus, it seems technological conditions were not optimized, maybe due to the quick start of emergency distance education during the COVID-19 pandemic period.

Can’s (2020) study proves that for a qualified education process, there is a need for improving the technological infrastructure of distance education applications in Turkey. In distance education, several critical factors need to be reviewed before considering how courses will be presented and function. These factors include audience characteristics and technologies available to audiences and organizations (Shearer, 2003).

Another result parallel to the results of the existing studies is the time-consuming process of checking homework. Teachers generally find the distance education process exhausting due to the need for detailed preparations for lessons and the obligation to check and give feedback for the homework sent during day or night. Similarly, Nolan (1998) states that distance education imposes limitless demands on instructors, so teachers are reluctant to embrace the recent phenomenon.

Regarding the results of classroom management, the researcher evidences that teachers are mostly concerned about reduced or the absence of social interaction. Apparent lack of eye contact and opportunity to give immediate and private feedback, difficulties in addressing the differences between learners, reduced interaction due to muting, or the difficulty in coping with students’ problems could be assessed within the social interaction – a component of the affective domain. Similar concerns are expressed in the related body of literature. One of the greatest concerns surrounding the literature of studies on distance education is the absence of social interaction and its potential harm to younger
students. The perception of student isolation in the virtual environment is one of the drawbacks of distance education (Rice, 2006). Likewise, teachers find the interaction they have with their students in a virtual environment inadequate or limited. They think this causes difficulties in classroom management and coping with the students’ problems.

The results about immediate and private feedback are parallel to the results of an existing study that explored the problems adult learners encountered during online courses. The study proved that the lack of prompt feedback from instructors is the major source of anxiety and frustration for students (Hara & Kling, 2001). The concept of feedback is fundamental to the effectiveness of distance education programs as well as traditional ones (Bonk & Cummings, 1998). Consequently, the difficulties in providing feedback in online education settings should be remedied. Bonk & Cummings (1998) recommended e-mails or personal forums for giving private feedback, but phone call remains a better option for the first-grade students as they are not skillful enough to use technology.

Similarly, one of the weaknesses of teachers when teaching at a distance is the loss of social interaction. The results show that the teachers want to share more with their students and perceive the lack of school context that entails relationships and routines as a weakness. Similarly, Garrison (2000) states that despite a great deal of rhetoric about the need to adopt distance education methods, there is a scarce body of literature about creating a viable plan for adopting distance education methods congruent with institutional values and goals. Educators need strategies that meet the needs of their institutions and students when teaching at a distance. Despite the development and use of two-way communication technologies, the present study shows that teachers remain deeply suspicious of reduced social presence at distance education because school is a discourse with routines, social relationships, and rules, and students learn how to conform to them. Thus, distance education tools are unable to overcome these weaknesses (Bozkurt, 2019). For social interaction, mail pals or different channels within the same classroom are recommended by Bonk & Cummings (1998). These recommendations could solve the problems if they are used effectively. They require teachers as well as learners to be skillful technology users, which doesn’t seem possible for the students aged 6 or 7 years.

In distance education, control has three dimensions – power, independence, and support. While power refers to the affective state of learners, support refers to parental or organizational support. The dynamic balance between these three factors determines the ultimate success of learners attending courses at a distance (Shearer, 2003). In our case, all requirements related to the dimensions were fulfilled for some students; however, there were problems concerning the dimensions of power and support for others. Absenteeism is a sign of students’ demotivation. The parents not sharing the teachers’ feedback with the students or not finding time for homework are the indicators of a lack of parental support and they affect the students’ learning negatively.

Existing studies may explain why some students did not receive parental support during the COVID-19. According to the results of a study conducted with the parents of kindergarten and primary school students (Lau & Lee, 2020), parents demanded better support from the school as they could not find enough time for their children. Similarly, the results of a study on parents’ experiences and struggles during the COVID-19 showed that they had difficulties in balancing responsibilities (Arbe, Ogurlu, Logan & Cook, 2020).

Some people, mostly the advocates of technological utopianism, call the field of researching and developing computer systems that support group activities “computer-supported cooperative work”. This definition implies that the group mentioned in this system needs to be cooperative; however, other kinds of social relationships in work groups such as combat and conflict are ignored (Kling, 1994). Similarly, considering the distance education tools as a computer-supported cooperative work, primary school teachers need to cooperate not only with their students but also parents for an effective learning process. The way and the extent of cooperation offered by students during lessons and parents after lessons affect how much primary school, particularly first-grade students, learn from
the teachers at a distance. This is because the parents or/and students might not always give full cooperation.

In this study, the teachers had to mute the students due to discipline problems and disruptive noises that impeded the flow of lessons. On the other hand, muting them is disadvantageous in terms of interaction and it may have evoked the feeling of separation among the learners. The greater the level of interaction, the lower the feeling of separation in distance education (Shearer, 2003). Controversially, one of the weaknesses felt by the teachers was the loss of affective interaction with the students. Dialogue between students and teacher is a significant part of affective interaction and muting the students causes loss of dialogue. This point shows that teachers give priority to subject matter i.e., cognitive domain despite being concerned about the loss of feelings i.e., affective domain. Like cognitive, the affective domain plays a significant role in determining a student’s success (Pierre and Oughton, 2007). The teachers don’t find the interaction they have with their students meaningful enough and seek other ways such as extra lessons for social chat, which shows that the types of dialogues in distance education settings need to be explored more deeply.

In conclusion, the main concern of educators, particularly the ones teaching at the primary level, is how to support sustained communication. They are worried about losing school routines and interactions that happen at schools, as they are unable to replicate face-to-face interaction by mediated means. The studies exploring the characteristics of spoken and written communication by mediated means will contribute to the development of theories that help teachers understand the use of mediated communication for educational purposes. As Moore (1991) states, the most distant program has low dialogue and a low structure design, while the least distant one has high dialogue and a high structure design.

To view the interaction issue in an online setting from a different perspective, according to prominent defenders of independent learning as well as contributors to the theories of distance education (Garrison, 2000), isolation from the group and determining one’s learning route is one of the main characteristics of distance education. Therefore, as long as one could achieve as an independent learner, she/he does not need social interaction. Thus, the question is whether a student aged 6 or 7 years should be allowed to be an independent learner. Maybe, distance education should not be viewed as one-for-all-levels-or-grades. According to Mezirow (1985), no learner is self-directive nor do they want to be, because no learner is completely shut off from the influences of society and learning organizations. The amount of control is critical in distance education because neither too much nor too little structure is appropriate. While the former may force students to drop out, the latter may cause them to get lost and feel confused.

Studies exploring the relationship between personality traits and academic achievement were carried out in distance education environments. However, these studies were conducted with an elder group of students such as junior-level college students (Kim & Schniederjans, 2004), young adult learners (Bayram, Deniz & Erdoğan, 2008), or higher education students (Osborn, 2001, Bonk & Cummings, 1998). The results of these studies demonstrated that the personality traits positively correlated with academic achievement include high ideals, attaching great importance to power, commitment to work and learning orientation, and high motivation. While some of these personality traits may be applicable to primary school students, such traits as high ideals or attaching importance to power, they are impossible to generalize to this group of students. Thus, it is obvious that there is a need for studies that explore how personality traits relate to the academic performance of primary school students. The first question of this relationship is which personality traits necessary to succeed in a web-based learning environment could be expected from primary school students. Another question is whether it is possible to make students gain ideal personality traits at an early age to succeed in distance education settings that will probably dominate the learning activities in the future.

The study results shed a light on the deficiencies of distance education from the practitioners’ perspectives. One of the significant implications is that as distance education may substitute for
traditional in-person education due to various reasons, its weaknesses should be discussed. Firstly, Wagner & McCombs (1995) disagree with the common perception that the achievers of distance education are self-directed, intrinsically motivated, and self-efficient. All learners benefit from instruction in which they are motivated and can exercise control over it. Thus, it is appropriate to develop systems that are more likely to serve the needs of all students. Reduced social interaction is the most explicit drawback of distance education. Workshops involving not only practitioners but also administrators and parents could provide better routes to overcome this deficiency.

REFERENCES


Social Innovation And Lateral Thinking Tendencies Of Preservice Social Studies Teachers

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Abstract

Changes in various areas of life have increased the need for individuals who can think differently and are open to innovation. Education and training activities are important in meeting this need. This study aimed to investigate the social innovation and lateral thinking tendencies of preservice social studies teachers, who will be among the important components of educational activities in the future, in relation to various variables (gender, year of study, grand point average, and level of openness to innovation). The study used a survey research design. The working group consisted of 272 preservice social studies teachers from two different universities who volunteered to participate in the study. The data were collected using the “Social Innovation Scale” and the “Lateral Thinking Disposition Scale”. As a result of the Kolmogorov-Smirnov test conducted to check the normality of the data, the data were found to be not normally distributed. Thus, the data were analysed using the nonparametric measures including Mann-Whitney U test, Kruskal-Wallis H test, and Spearman’s rank correlation coefficient. The analysis results showed that the preservice social studies teachers’ social innovation and lateral thinking tendencies did not significantly differ according to their gender and grade point average (GPA). In contrast, their social innovation tendencies differed statistically significantly according to the year of study, while both social innovation and lateral thinking tendencies differed statistically significantly according to their level of openness to innovation. The analysis results also showed a positive significant correlation between social innovation and lateral thinking, where lateral thinking is a predictor of social Innovation. Accordingly, to promote individuals’ social innovation tendencies, the relationship between different thinking and social innovation can be explored and strategies focused on thinking skills can be developed.

Keywords: Innovation, Social Innovation, Thinking, Lateral Thinking, Social Studies

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INTRODUCTION

Individuals with innovative and different thinking skills have become an essential need at every stage of life. In particular, educational activities should be restructured to address this need. As a result of this restructuring process, innovation and various thinking skills can become more involved and dispersed in social life. Being open to social innovations and developing a different perspective on a number of events in society can contribute to accelerating this dispersed.

The concept of innovation entered the agenda of countries in the 1980s and has become an important factor that shapes national policies since the 1990s. Technological advances have accelerated the production of information, thereby causing problems and needs to change faster. This has led to more innovation (Eren, 2010, pp. 9, 22). The dissemination of mass media has increased the interaction among individuals despite their differences in language, religion, and status. Worldwide changes in the physical and political geography constructions have also necessitated a number of innovations (Yahyagil, 2001, p. 7). Thus, it is of critical importance to identify critical key concepts that play a role in solving problems that are diversifying day by day. In producing solutions to emerging problems, it is necessary to look for accurate and relevant information and avoid irrelevant information. Creativity is needed, especially when problems cannot be solved using traditional means. Here, lateral thinking comes into play (Yılmaz, 2017, p. 18). It can be said that lateral thinking is crucial in the development of innovative thinking.

Social Innovation

The concept of innovation has two dimensions. The first is the individual dimension, which involves the emergence of innovation as a result of an individual’s creativity. The second is the pluralistic dimension. This dimension includes the transformation of interaction arising from pluralistic effort into innovation (Yahyagil, 2001, p. 10). Innovation has several forms and social innovation is one of them. The concept of social innovation has been discussed by scholars from different disciplines, referring to various aspects. Some argue that social innovation cannot go beyond being a fashionable concept, while others treat the concept as a critical type of innovation (Pol & Ville, 2009, p. 878).

Social innovation encompasses innovative activities expanded through social organizations with the goal of meeting a social need (Mulgan, 2006, p. 146). Social innovation has no strict limit. Thus, it exists in many sectors including public, private, and non-profit organisations (Murray, Caulier-Grice, & Mulgan, 2010, p. 3). Social innovation creates social change that is not produced in stereotypical practices (Cajaiba Santana, 2014, p. 43). Social innovation is driven by social development (Martin, 2006, p. 41). As social innovations are implemented through entrepreneurial practices, social innovators must have social entrepreneurship skills (Uslu & Mansur, 2017, p. 59).

Social innovation can be achieved in two ways. These are social intrapreneurship and social entrepreneurship. While social intrapreneurship is defined as the place where innovation is designed and implemented within the formation, social entrepreneurship is considered as the process in which a new formation is established in a new social innovation (Pitt-Catsoupes & Berzin, 2015, p. 407). Embodying creative actions or ideas is always necessary for social innovation. Before that, since not every idea can be embodied, a choice should be made between ideas (Krlev, Bund & Mildenberger, 2014, p. 203).

Lateral Thinking

With the reflection of findings that cognitive psychology highlight on educational practices, theoretical frameworks underpinning the objectives of education have changed, thereby changing the structure of curricula. High-order thinking skills such as reflective thinking, problem-solving, and metacognitive thinking have been incorporated into curricula. Lateral thinking is also a high-order
thinking skill. Lateral thinking, also referred to as comprehensive thinking, is a skill that allows people to reflect on an event from different angles (Ünveren Kapanadze, 2019, pp. 84, 85, 88).

Lateral thinking, proposed by Edward de Bono, can be defined as processing data that everyone has in different ways and drawing distinct conclusions (Gökalp, 2019, p. 261). Lateral thinking, described as multi-alternative thinking, entails breaking out of traditional thinking patterns. Different ways are sought in problem-solving through lateral thinking. The six thinking hats approach is an example of lateral thinking (Yılmaz, 2019, p. 2).

Lateral thinking can be expressed as a student who can generate new ideas from a known idea (Arsad, Sanusi, Majid, Ali, & Husain, 2012, p.15). Lateral thinking is mainly about generating ideas and approaches that focus on the process as well as the final results. Lateral thinking, a tool for reconstructing thinking structures and enabling new ideas to emerge, is one of the ways to handle knowledge (Waks, 1997, p.246). Lateral thinking is a gradual thinking method (Hernandez & Varkey, 2008, p.27). Lateral thinking will help students use their imaginations and develop different and creative perspectives on problems or situations (Srikongchan, Kaewkuekool, & Mejaleurn, 2020, p.234; Chatsuwan, Koraneekij, & Na-Songkhla, 2020, p.16).

**Relationship Between Social Innovation and Lateral Thinking**

Lateral thinking, which embodies productivity, is about the creation of new ideas. Thinking forwards rather than thinking backwards is essential before addressing innovation (de Bono, 1970, pp. 7, 8, 74). Fixed ideas are among the major obstacles to social innovation (Martin, 2006, p. 41). One of the most major ways to get rid of fixed ideas is to have different thinking skills. Thus, it is of utmost importance to think about alternatives or approach problems creatively to pave the way for innovation.

Changes in the social sphere also cause a number of changes in the thinking structure. Social innovation is also needed to keep up with such changes (Esen, Esen, & Kaya-Özbağ, 2020, p. 23). In this regard, innovation is also needed to develop different thinking skills. Innovation and thinking skills have become more included in recently revised curricula and textbooks. In particular, the Social Studies Curriculum published in 2018 incorporated both innovation and various thinking skills (critical, reflective, etc.) in learning areas at different grade levels, aiming to help learners acquire these skills. The concept of innovation was treated as innovative thinking and incorporated into basic skills (MoNE [Ministry of National Education], 2018, p.7). The incorporation of innovative thinking skills into curricula shows that the concepts of innovation and thinking are interrelated.

The literature includes a number of studies focusing on social innovation (Hillgren, Seravalli, & Emilson, 2011; Mumford, 2002; van der Have & Rubalcaba, 2016). The literature also includes studies that investigated innovative behaviours (Esen et al., 2020) and tendencies (Esenaliev, 2019; Seçkin Halac, Eren, & Bulut, 2014; Sütcü, 2019; Yüce & Samsa, 2017) in different groups. Previous research has also examined lateral thinking in university students studying classroom teaching (Yıldız & Yılmaz, 2020), Turkish teaching (Karagöz, 2019), civil engineering (Tantekin Çelik, Aydnlı, & Bağrıaçık, 2018), and sports management, sports coaching and recreational sports (Beyaz, Keten, Caba, & Pekel, 2020), students taking pedagogical formation training (Semerci, 2017), university students in general (Sevinç, 2020), students (Mustofa & Hidayah, 2020), and older adults (Pandya, 2020). However, there has been little research that addresses social innovation and lateral thinking together and focuses on their relationship. It is hoped that this study fills a gap in the literature by investigating social innovation and lateral thinking together.

**Research Purpose**

The main aim of the study was to explore preservice social studies teachers’ social innovation and lateral thinking tendencies. To this end, answers were sought to the following questions:
• Do preservice social studies teachers’ social innovation and lateral thinking tendencies differ according to gender?

• Do preservice social studies teachers’ social innovation and lateral thinking tendencies differ according to the year of study?

• Do preservice social studies teachers’ social innovation and lateral thinking tendencies differ according to grade point average (GPA)?

• Do preservice social studies teachers’ social innovation and lateral thinking tendencies differ according to the level of openness to innovation?

• Is there a relationship between preservice social studies teachers’ social innovation and lateral thinking tendencies?

• Do lateral thinking tendencies significantly predict social innovation tendencies?

**METHODS**

This section outlines the research design, sample, data collection, and data analysis.

**Research Design**

This study used a survey research design. Survey research aims to explore, reveal, and clearly define the structure of societies, objects and institutions or the functioning of events (Hocaoğlu & Akkaş Baysal, 2019, p. 79). This study examined preservice social studies teachers’ social innovation and lateral thinking tendencies.

**Study Group**

The study group consisted of 272 preservice social studies teachers who were studying at two different universities (in the Black Sea and Central Anatolia Region) in the 2019-2020 academic year and volunteered to participate in the study. Table 1 presents information on the study group.

<table>
<thead>
<tr>
<th>Table 1. Data on the Study Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year of Study</th>
<th>Frequency (f)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>68</td>
<td>25</td>
</tr>
<tr>
<td>2nd Year</td>
<td>63</td>
<td>23.2</td>
</tr>
<tr>
<td>3rd Year</td>
<td>63</td>
<td>23.2</td>
</tr>
<tr>
<td>4th Year</td>
<td>78</td>
<td>28.7</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
<td>100</td>
</tr>
</tbody>
</table>

As seen in Table 1, a total of 272 people, 190 women and 82 men, were included in the study. Additionally, 4th-year preservice social studies teachers composed the maximum number of participants (f = 78, 28.7%).
Data Collection Instruments

The data were collected using the “Social Innovation Scale” developed by Seçkin Halaç et al. (2014) and the “Lateral Thinking Disposition Scale” developed by Semerci (2016).

Social Innovation Scale

The Social Innovation Scale developed by Seçkin Halaç et al. (2014) was used to determine preservice social studies teachers’ social innovation tendencies. The scale has one dimension and consists of 8 items. In the exploratory factor analysis results, it was found that the 8-item unidimensional structure of the scale showed good fit. As a result of the confirmatory factor analysis, it was determined that the variables were significantly loaded ($\chi^2=5.61$, CFI=.951, NFI=.941, NNFI=.931, IFI=.951, GFI=.962, RMSA=.078). The Cronbach’s alpha of the scale was reported as 0.858 (Seçkin Halaç et al., 2014). The Cronbach’s alpha was found to be 0.881 in the present study.

Lateral Thinking Disposition Scale

Another scale used in the study is the Lateral Thinking Disposition Scale developed by Semerci (2016). The scale has one dimension and consists of 9 items. The scale is rated on a 5-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. The lowest score that can be obtained from the scale is 9 and the highest score is 45. The factor load of the scale takes values between .41 and 167. The Cronbach Alpha internal consistency coefficient of the scale is .79 (Semerci, 2016). The Cronbach’s alpha was found to be 0.844 in the present study.

Data Analysis

As part of the study, the Kolmogorov-Smirnov test was performed to check whether the data obtained from both scales were normally distributed. Table 2 shows the test results.

Table 2. The Kolmogorov-Smirnov Test Results

<table>
<thead>
<tr>
<th></th>
<th>Kolmogorov-Smirnov Test</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistics</td>
<td>df</td>
<td>p</td>
</tr>
<tr>
<td>Social Innovation</td>
<td>.110</td>
<td>272</td>
<td>.000*</td>
</tr>
<tr>
<td>Lateral Thinking</td>
<td>.079</td>
<td></td>
<td>.000*</td>
</tr>
</tbody>
</table>

*p<.05

The Kolmogorov-Smirnov test results showed that significance is $p < .05$ on both scales. In addition, histogram, Q-Q Plot, and the values of skewness and kurtosis between -1.5 and +1.5 (Tabachnick & Fidell, 2013) were examined. As a result of the analysis, it was determined that the data were not distributed normally. In this case, nonparametric analysis methods were used in the data analysis, taking into account the number of categories in variables. The data were analysed using the Kruskal-Wallis H test according to the gender variable and using the Mann-Whitney U test according to the year of study, GPA, and level of openness to innovation. The Mann Whitney U test was used to determine the groups between which significant differences occurred among the variables with multiple categories. The Spearman’s rank correlation coefficient was calculated to explore the correlation between social innovation and lateral thinking tendencies. The significance of the data ranged from $p < .05$ to $p < .01$.

FINDINGS

The data obtained were analysed and a number of findings were reached. Table 3 displays the results of the analysis of preservice social studies teachers’ social innovation and lateral thinking tendencies.
Table 3. Analysis Results for Social Innovation and Lateral Thinking Tendencies

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>X̄</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Innovation</td>
<td>272</td>
<td>1.25</td>
<td>5.00</td>
<td>4.19</td>
<td>.65</td>
</tr>
<tr>
<td>Lateral Thinking</td>
<td>272</td>
<td>1.89</td>
<td>5.00</td>
<td>3.17</td>
<td>.55</td>
</tr>
</tbody>
</table>

Given the arithmetic mean of the preservice social studies teachers’ scores on the Social Innovation Scale and Lateral Thinking Disposition Scale, their social innovation tendencies ($X̄ = 4.19$) were higher than their lateral thinking tendencies ($X̄ = 3.17$). Based on these results, it can be said that participants’ social innovation tendencies are high, while their lateral thinking tendencies are moderate.

The Mann Whitney U test was used to determine whether preservice social studies teachers’ social innovation and lateral thinking tendencies differ significantly according to gender. Table 4 shows the test results.

Table 4. Mann Whitney U Test Results for Social Innovation and Lateral Thinking Tendencies According to Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>U</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Innovation</td>
<td>Male</td>
<td>82</td>
<td>147.30</td>
<td>12079.00</td>
<td>.55</td>
</tr>
<tr>
<td>Female</td>
<td>190</td>
<td>131.84</td>
<td>25049.00</td>
<td>6904.00</td>
<td>.136</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral Thinking</td>
<td>Male</td>
<td>82</td>
<td>146.63</td>
<td>12026.50</td>
<td>.55</td>
</tr>
<tr>
<td>Female</td>
<td>190</td>
<td>132.13</td>
<td>25104.50</td>
<td>6959.50</td>
<td>.162</td>
</tr>
<tr>
<td>Total</td>
<td>272</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As seen in Table 4, preservice social studies teachers’ social innovation ($U = 6904.000, p > .05$) and lateral thinking ($U = 6959.000, p > .05$) tendencies did not differ significantly according to gender. In other words, preservice social studies teachers’ social innovation and lateral thinking tendencies do not vary depending on their gender.

Table 5 shows the Kruskal Wallis H test results for preservice social studies teachers’ social innovation and lateral thinking tendencies according to the year of study.

Table 5. Kruskal Wallis H Test Results for Social Innovation and Lateral Thinking Tendencies according to the Year of Study

<table>
<thead>
<tr>
<th>Year of Study</th>
<th>N</th>
<th>Mean Rank</th>
<th>df</th>
<th>$X^2$</th>
<th>p</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Innovation</td>
<td>1st Year</td>
<td>68</td>
<td>146.60</td>
<td>3</td>
<td>9.714</td>
<td>.021*</td>
</tr>
<tr>
<td></td>
<td>2nd Year</td>
<td>63</td>
<td>139.70</td>
<td>3</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td></td>
<td>3rd Year</td>
<td>63</td>
<td>109.98</td>
<td>3</td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>4th Year</td>
<td>78</td>
<td>146.54</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral Thinking</td>
<td>1st Year</td>
<td>68</td>
<td>150.02</td>
<td>3</td>
<td>4.097</td>
<td>.251</td>
</tr>
<tr>
<td></td>
<td>2nd Year</td>
<td>63</td>
<td>126.98</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3rd Year</td>
<td>63</td>
<td>126.75</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4th Year</td>
<td>78</td>
<td>140.27</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* $p < .05$

Looking at Table 5, it is apparent that preservice social studies teachers’ scores on the Social Innovation Scale differed statistically significantly according to the year of study ($X^2_{(3)} = 9.714, p < .05$). The Mann-Whitney U test was performed to determine the groups where social innovation tendencies differed statistically significantly. The test results showed that the significant difference was between 1st- and 3rd-year preservice social studies teachers, 2nd- and 3rd-year preservice social studies teachers, and 3rd- and 4th-year preservice social studies teachers. Given the mean rank of 1st-year (MR = 146.60) and 3rd-year (MR = 109.98) preservice social studies teachers, the difference was in favour of 1st-year preservice teachers. Given the mean rank of 2nd-year (MR = 139.70) and 3rd-
year (MR = 109.98) preservice social studies teachers, the difference was in favour of 2nd-year preservice teachers. Given the mean rank of 3rd-year (MR = 109.98) and 4th-year (MR = 146.54) preservice social studies teachers, the difference was in favour of 4th-year preservice teachers. To put it differently, 3rd-year preservice social studies teachers had lower social innovation tendencies compared to others.

Preservice social studies teachers’ scores on the Lateral Thinking Disposition Scale did not differ significantly according to the year of study ($X^2(3) = 4.097, p > .05$). Table 6 shows the Kruskal Wallis H test results for preservice social studies teachers’ social innovation and lateral thinking tendencies according to GPA.

**Table 6. Kruskal Wallis H Test Results for Social Innovation and Lateral Thinking Tendencies according to GPA**

<table>
<thead>
<tr>
<th>GPA Range</th>
<th>N</th>
<th>Mean Rank</th>
<th>df</th>
<th>$X^2$</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Innovation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00-1.00</td>
<td>2</td>
<td>154.75</td>
<td>3</td>
<td>.517</td>
<td>.915</td>
</tr>
<tr>
<td>1.01-2.00</td>
<td>16</td>
<td>145.09</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.01-3.00</td>
<td>161</td>
<td>137.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.01-4.00</td>
<td>93</td>
<td>132.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Lateral Thinking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.00-1.00</td>
<td>2</td>
<td>161.25</td>
<td>3</td>
<td>4.656</td>
<td>.199</td>
</tr>
<tr>
<td>1.01-2.00</td>
<td>16</td>
<td>175.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.01-3.00</td>
<td>161</td>
<td>135.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.01-4.00</td>
<td>93</td>
<td>130.31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As seen in Table 6, participants’ social innovation ($X^2(3) = .517, p > .05$) and lateral thinking ($X^2(3) = 4.656, p > .05$) tendencies did not statistically significantly differ according to their GPA. In other words, preservice social studies teachers’ GPA did not statistically affect their social innovation and lateral thinking tendencies.

Within the scope of the study, five different levels were defined (from 1 = lowest to 5 = highest) to identify participants’ level of openness to innovation. Social innovation and lateral thinking tendencies were measured accordingly. Table 7 shows the Kruskal Wallis H test results for preservice social studies teachers’ social innovation and lateral thinking tendencies according to the level of openness to innovation.

**Table 7. Kruskal Wallis H Test Results for Social Innovation and Lateral Thinking Tendencies according to the Level of Openness to Innovation**

<table>
<thead>
<tr>
<th>Level of openness to innovation</th>
<th>N</th>
<th>Mean Rank</th>
<th>df</th>
<th>$X^2$</th>
<th>p</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Social Innovation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td>5</td>
<td>31.60</td>
<td>3</td>
<td>65.245</td>
<td>.000*</td>
<td>2-4, 2-5</td>
</tr>
<tr>
<td>Level 3</td>
<td>33</td>
<td>75.20</td>
<td>3</td>
<td></td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Level 4</td>
<td>111</td>
<td>117.03</td>
<td></td>
<td></td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>Level 5</td>
<td>123</td>
<td>174.78</td>
<td></td>
<td></td>
<td></td>
<td>4-5</td>
</tr>
<tr>
<td><strong>Lateral Thinking</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 2</td>
<td>5</td>
<td>81.10</td>
<td>3</td>
<td>62.298</td>
<td>.000*</td>
<td>2-5</td>
</tr>
<tr>
<td>Level 3</td>
<td>33</td>
<td>74.58</td>
<td>3</td>
<td></td>
<td></td>
<td>3-4</td>
</tr>
<tr>
<td>Level 4</td>
<td>111</td>
<td>114.23</td>
<td></td>
<td></td>
<td></td>
<td>3-5</td>
</tr>
<tr>
<td>Level 5</td>
<td>123</td>
<td>175.46</td>
<td></td>
<td></td>
<td></td>
<td>4-5</td>
</tr>
</tbody>
</table>

* $p < .05$

As shown in Table 7, participants’ both social innovation ($X^2(3) = 65.245, p < .05$) and lateral thinking ($X^2(3) = 62.298, p < .05$) tendencies differed statistically significantly according to their level of openness to innovation. Looking at participants’ scores on the Social Innovation Scale, there were significant differences between those with Level 2 openness to innovation and those with Levels 4 and 5 openness to innovation, between those with Level 3 and those with Levels 4 and 5, and between those with Level 4 and those with Level 5. Looking at the levels of innovation, the significant difference was in favour of those with Level 5 openness to innovation (MR = 174.78) in comparison to those with Level 2 (MR = 31.60), Level 3 (MR = 72.20), and Level 4 (MR = 117.03) openness to innovation.
innovation. The other significant difference was in favour of those with Level 4 openness to innovation in comparison to those with Level 2 (MR = 31.60) and Level 3 (MR = 72.20) openness to innovation.

Participants’ lateral thinking tendencies differed statistically significantly between those with Level 2 openness to innovation and those with Level 5 openness to innovation, between those with Level 3 and those with Levels 4 and 5, and between those with Level 4 and those with Level 5. The significant difference between those with Level 2 (MR = 81.10) and those with Level 5 (MR = 175.46) was in favour of those with Level 5. The significant difference between those with Level 3 (MR = 74.58) and those with Levels 4 (MR = 114.23) and 5 (MR = 175.46) was in favour of those with Levels 4 and 5. Finally, participants with Level 5 openness to innovation (MR = 175.46) also had a significantly higher mean rank compared to those with Level 4 (MR = 114.23).

Participants’ scores on the Social Innovation Scale and Lateral Thinking Disposition Scale differed according to the level of openness to innovation that they reported. Looking at the mean rank, it is apparent that both social innovation and lateral thinking tendencies have a higher rank in participants with Level 5 openness to innovation. Accordingly, it seems that those with a high level of openness to innovation also have a high tendency to social innovation and lateral thinking. Additionally, the fact that innovative people have developed innovative thinking skills in various areas of life and put different perspectives on situations or problems can also account for high tendencies in both social innovation and lateral thinking.

The relationship between preservice social studies teachers’ social innovation and lateral thinking tendencies were examined. Table 8 displays the findings.

Table 8. Relationship between Social Innovation and Lateral Thinking Tendencies

<table>
<thead>
<tr>
<th>Lateral Thinking</th>
<th>Social Innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r</td>
</tr>
<tr>
<td></td>
<td>.634</td>
</tr>
<tr>
<td></td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>272</td>
</tr>
</tbody>
</table>

* Correlation is significant at p < .01.

As seen in Table 8, there was a positive significant relationship between preservice social studies teachers’ social innovation and lateral thinking tendencies (r = .634, p < .01). To clarify, as participants’ social innovation tendencies increase, their lateral thinking tendencies also increase. A possible explanation of this finding might be that both social innovation and lateral thinking have components in common such as innovation, alternative thinking, problem-solving, and creative thinking.

Finally, Table 9 shows the results as to whether lateral thinking tendency predicts social innovation tendency.

Table 9. Regression Results for the Prediction of Social Innovation Tendency by Lateral Thinking Tendency

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>Standard Error</th>
<th>β</th>
<th>T</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.93</td>
<td>.17</td>
<td>11.33</td>
<td>.00*</td>
<td></td>
</tr>
<tr>
<td>Social Innovation</td>
<td>.53</td>
<td>.04</td>
<td>.62</td>
<td>13.27</td>
<td>.00*</td>
</tr>
</tbody>
</table>

R = .62, R² = .39, F = 176.20, *p < .05

The results in Table 9 show that lateral thinking tendency is a significant predictor of social innovation tendency (β = .62, p < .05).
CONCLUSION, DISCUSSION AND RECOMMENDATIONS

Innovation has been treated as a way of thinking or tendency in recent years. Innovation has been also classified into various types such as individual, technological, and social innovation. Several studies on innovation perceptions and innovative thinking tendencies have focused on both overall innovation and innovation types and found that innovation, individual innovation, and innovative thinking tendencies are low (Bodur, 2018; Kılıç, 2015) and high (Deveci & Kavak, 2020) in different sample groups. This study found that participants’ social innovation tendencies are generally high. This result might be due to the nature of the sample group (studying social studies teaching). The study also found that preservice social studies teachers’ lateral thinking tendencies are generally moderate. Likewise, Lawrence and Xavier (2013) reported that preservice teachers’ lateral thinking tendencies were moderate. In contrast, Tantekin Çelik et al. (2018) found that most of the civil engineering students in the sample have a high level of lateral thinking tendency. This inconsistency may be due to the different number of participants or the different disciplines/fields of study that they were enrolled in.

Research has reported that gender does not affect the level of individual innovation in particular (Kılıç, 2015). Similarly, this study found that social innovation, which is a type of innovation, did not differ significantly by gender. These results may indicate both women and men have similar views on creating innovative solutions to a number of social problems.

As a result of Sevinç’s (2020) study, it was found that the lateral thinking tendencies of senior university students differ significantly by gender in favor of males. Contrary to this situation Yıldız and Yılmaz (2020) concluded that preservice teachers’ scores on the Lateral Thinking Disposition Scale did not significantly differ by gender. Likewise, in a study with students taking pedagogical formation classes, Semerci (2017) found that lateral thinking tendencies did not significantly differ by gender. Similarly, in the present study, preservice social studies teachers’ lateral thinking tendencies did not significantly differ by gender. This may indicate that male and female participants have similar lateral thinking tendencies.

Durmuş İskender, Kaş Güner, and Oluk (2018) reported that the level of individual innovation did not differ according to the year of study, while 3rd-year participants had the lowest mean score. In contrast, the present study found a significant difference in social innovation tendency according to the year of study. Accordingly, 1st- and 4th-year preservice social studies teachers had a higher level of social innovation tendency. On the other hand, preservice social studies teachers’ lateral thinking tendency did not differ significantly according to the year of study. Similarly, Karagöz (2019) reported that preservice Turkish teachers’ lateral thinking tendency did not differ according to the year of study. However, in their study with preservice classroom teachers in the 2016-2017 academic year, Yıldız and Yılmaz (2020) found that 4th-year participants had a higher level of lateral thinking tendency. This discrepancy could be attributed to the fact that the studies were conducted in different periods and different departments/fields of study.

GPA was another variable treated in the study. The analysis results showed that participants’ social innovation and lateral thinking tendencies did not significantly differ by GPA. However, participants’ social innovation and lateral thinking tendencies differed significantly according to their level of openness to innovation. Accordingly, participants with a high level of openness to innovation also had a high level of social innovation and lateral thinking tendencies.

Bodur (2018) concluded that the high level of innovation also increases entrepreneurial tendencies. Studies have found a positive relationship between individual innovation and critical thinking tendency (Durmuş İskender et al., 2018; Özgür, 2013). Previous studies on social innovation tendencies have found that social innovation is interrelated with individual innovation (Çağlıyan, Esenalieva, & Attar, 2019), sustainability perceptions and individual creativity (Esen et al., 2020), corporate social responsibility (Sütcü, 2019), and corporate entrepreneurship (Esenalieva, 2019).
Previous studies on lateral thinking tendencies have found significant correlations between lateral thinking and critical thinking (Yıldız & Yılmaz, 2020) and conscious awareness (Beyaz et al., 2020). As a result of their studies, Mustofa and Hidayah (2020) found that the problem-based learning model had an effect on lateral thinking ability. The present study found a positive significant relationship between social innovation and lateral thinking. Additionally, lateral thinking is a significant predictor of social innovation.

Different thinking tendencies are needed to keep up with the times, follow innovations, and produce solutions to problems faced at every moment of life. Thus, it is of key importance to determine individuals’ distinct thinking tendencies. The findings of this study have some implications for future practice. Further research may be undertaken to reveal the relationship between different types of thinking other than lateral thinking and social innovation so that teacher training curricula can be revised to promote preservice teachers’ social innovation tendencies. Training preservice teachers to develop diverse thinking skills and a high level of social innovation may help educate generations who can think innovatively and produce different solutions. Further research may investigate social innovation and lateral thinking tendencies in different age groups or students studying different disciplines.

REFERENCES


Deveci, İ & Kavak, S. (2020). Innovativeness perceptions and innovative thinking tendencies of middle school students: an exploratory sequential design. Journal of Qualitative Research in Education, 8(1), 346-378. DOI: 10.14689/jiss.2148-2624.1.8c.1s.15m


Sevinç, Ş. (2020). *A research on the investigation of lateral thinking tendencies of university students*. (Master’s Thesis). Erciyes University Institute of Educational Sciences, Kayseri.


Examination of the Postgraduate Theses on Teachers’ Views of Values Education in Turkey: A Meta Synthesis Study

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Abstract

This research study carried out to examine the postgraduate theses on teachers’ views of the values education in Turkey was designed as a meta synthesis study. Postgraduate theses were obtained from the National Thesis Center of the Council of Higher Education. During the research process, these steps were followed: (1) determining the research subject, (2) selecting the studies to be included in the study, (3) picking and presenting the data, (4) ensuring validity and reliability and (5) analyzing the data and explaining the synthesis. Content analysis was used in the analysis of the data. The qualitative findings of the 24 theses included in the study were examined singly and as a result of the examination three main themes were determined: Applications practiced to gain values education and problems encountered, The values that should be gained by the students according to the teachers and the factors effective in gaining these values, The problems that the values education can deliver solution and the behavioral changes observed in the students after the values education practices. From the findings of the research, it was concluded that the teachers mostly used the drama method to gain of values education, that there were problems experienced caused by the family in practice, and that the practices could solve the problem of injustice the most.

Keywords: Values Education, Teachers’ Opinions, Meta Synthesis

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INTRODUCTION

With the developing science and technology, the characteristics expected from the individual have also changed, and in line with this differentiation, the ability to live in harmony, to be sensitive, to take responsibility, to be fair, to share, to produce original solutions to problems and many similar values have gained importance. Therefore, values education has become an essential part of education.

The concept of value is defined by Ulusoy and Dilmaç (2015) as “Abstract measure determining importance in something, return, preciousness, high and useful quality”, Özkan (2010) defined the concept of value as “social behavior patterns that guarantee individuals' life in society and facilitate their lives” in one of his studies. Similarly, the concept of value was expressed by Kaşkaya and Duran (2017) as a whole of rules and norms that exist in all areas of life. While Halstead (1996) defines the concept of value as the standards and principles we use in making correct decisions, according to Arthur (2003), value is defined as a set of interrelated personal principles that lead a person to take an action. Also Lockwood (2009) expressed the concept of value as the criteria a person uses when making a decision about an object, person or action. Although the definitions seem to be expressed in different ways, in fact there are basic points that they have in common, which is just like the universality of values. Based on the common points in all these definitions, the concept of value can be defined as a set of certain principles or behavior patterns that build a bridge between the individual and life and affect the individual in making decisions and in practice. Considering that the priority and importance of the society in which the individual lived in gaining these patterns is effective, it can be concluded that the values differ, and these differences cause different classifications. When the classification of values is examined, it is observed that the value classifications of Spranger, Rokeach and Schwartz are mostly the ones taken part in the literature. While Spranger classified values under six headings as scientific, economic, aesthetic, social, political and religious (Hermans and Oles, 1994), Rokeach divided values into two as ends and means. He stated the ends goals as individual life goals (inner harmony, comfortable life, mature love etc.) and as social goals (world peace, equality, national security etc.) on the other hand, he defined the means goals as personal characteristics or behavior syndromes (ambitious, independent, loyal, responsible etc.) (Mueller and Wornhoff, 1990). Schwartz who defines the concept of value as the changing and desired transition goals that serve as the guiding principles in a person's life classified values personally and culturally and he revealed ten motivational values from this classification; achievement, helpfulness, compliance, hedonism, strength, security, self-direction, stimulation, tradition and universalism (Devos, Spini and Schwartz, 2002; Schwartz, 1994; Spini, 2003).

Considering that education plays an important role in the formation of these principles, it can be said that the emergence of the concept of "value education" is inevitable. This concept can be expressed as a design that enables a person to develop social, moral, aesthetic and spiritual aspects, and teaches to protect and transfer our cultural values (Venkataiah, 2007; Genc & Eryaman, 2008). It is a known fact that this design is carried out first in the family and then in schools. Halstead and Taylor (2000) also emphasize that the school has two important roles; to enable children to think and make sense of their own developing values and to support these values.

Studies on values education in Turkey were put into practice with the values education directive issued by the Board of Education in 2010 and with this directive, practices of values education in all primary and secondary schools started (MEB, 2010). In 2017, a statement on "On Our Studies for Renewal and Change in the Curriculum" was published by the Board of Education and ten main values were identified, namely justice, friendship, honesty, self-control, patience, respect, love, responsibility, patriotism, and helpfulness (Topal, 2019). An effective value education application in schools may bring solution for many problems that may arise in the education system. For example, in a study conducted by Çafoğlu and Somuncuoğlu (2000), it was determined that students' dishonesty, impatience and violent behavior decreased as a result of the implementation of a program developed for values education. Osterman (2000) determined that at the end of the values education program he applied, students' negative behaviors related to inability to express themselves, violence and non-
communication changed in a positive way. Kunduroğlu (2010) found that students exhibit positive behaviors of scientific value as a result of the values education program implemented in a study he conducted. In the studies conducted by Aladağ (2009), Aydemir Özay (2019), Dilmaç (2007) and Hayta Önal (2005), positive developments were observed in students' responsibility behaviors. Another study in which positive results were revealed in gaining the value of being fair with the practice of values education was carried out by İzgar (2013) and İpekçi (2018). Also, it was concluded that the classroom activities conducted by Öğretici (2011) regarding the values of sensitivity and responsibility provided the students with the gains regarding these values. In this context, it is thought that taking teachers’ opinions in order to improve values education practices and make them more effective and efficient will contribute to the functioning of the researcher. Therefore, the main purpose of the research was determined as the examination of the postgraduate theses conducted on teacher views regarding the values education in Turkey by meta synthesis approach and the following questions were sought:

1. What are the applications made for the acquisition of values education and what are the problems encountered in these applications?

2. According to teachers, what values should students gain and what are the effective factors in gaining these values?

3. What are the teachers' opinions on the problems that values education can solve and the behavioral changes observed in students after the values education practices?

METHOD

Research Model

The research is designed as a meta synthesis study. Meta synthesis is a research approach that includes the analysis, method and findings of qualitative research done on a subject (Paterson, Thorne, Canam, & Jillings, 2001). This approach shows how data from qualitatively conducted studies can be brought together and summarized effectively and their results can be revealed with a more holistic view (Major & Savin-Baden, 2010). Starting from this, postgraduate theses on teachers’ views on values education between the years 1999-2020 in Turkey were examined in this study. The theses were accessed from the Higher Education Council National Thesis Center.

Research Process

When literature on meta-synthesis and studies designed with meta-synthesis are examined, it is seen that the research process follows similar steps with small differences (Denner, Campe, & Werner, 2019; Lachal, Revay-Levy, Orri, Morro, 2017; Paterson, Thorne, Canam and Jillings, 2001; Tannenbaum and others, 2015). Therefore, the following steps were followed in the research process of this study:

1. **Determination of the research subject**: In determining the research subject, firstly the literature on education of values was examined and the subjects in which the studies were concentrated were determined. In applied studies, it was determined that there are studies about examining the values often contained in textbooks, reflections of values education on education programs, determining the effectiveness of applied values education programs and receiving teacher and student opinions on values education. Then, the postgraduate theses on values education in Turkey were examined and it was determined that 291 theses were written in total. Of these theses, 226 are at master's level and 65 are at doctoral level. When the distribution of the theses by years is examined, it is determined that the least number of theses were made in 1999, 2007 and 2009, with 2 theses each. The highest number of theses on the subject belongs to 2019 (104), and the number of master theses made this year is 96 and the number of doctoral theses is 8.
2. Selecting the Studies to be included in the Study: In the research, studies particularly involving teachers’ opinions were included. Because it is thought that values education program can best be evaluated by the teachers as practitioners. For this purpose, in order to determine the theses to be included in the study, two keywords were determined; values education and teachers’ opinions. Each study was examined one by one, they were checked whether they had the specified keywords, and whether the methods and data analysis sections of the theses were explained in detail. As a result of the examination, it was determined that there were 40 theses in which teachers’ opinions on values education were examined. When the determined 40 theses were examined, it was seen that a total of 5 mixed studies were conducted, one in 2013, 2016 and 2017, and 2 in 2019. When the distribution of studies conducted by quantitative method by years is considered, it was determined that a total of 9 studies were conducted, one in 2008, 2010, 2016, 2015, 2 in 2017, and 3 in 2019. When the distribution of the studies using the qualitative method by years is examined, it was determined that a total of 26 postgraduate theses were made, one in 2008, 2010, 2012 and 2020, 2 in 2013 and 2016, 3 in 2015, 4 in 2017, 7 in 2018, and 18 in 2019.

3. Picking and Presenting the Data: Due to the purpose and nature of meta-synthesis studies, 26 postgraduate theses in which teachers’ views on values education where qualitative data are collected were re-examined and since the opinions of the teachers who participated in a project on education of values in two theses were evaluated, these theses were sorted out and 24 theses were examined in the research. 24 theses included in the study were coded as T1, T2, T3, T4... starting from thesis 1 and classified in terms of their subjects. According to the classification; it was determined that there are 4 theses (T1, T13, T18 and T22) in which opinions on applications were received, 2 theses (T12 and T14) in which the opinions about the teaching materials produced and used were received, 5 theses (T2, T10, T16, T19 and T20) in which general opinions are examined, 3 theses (T4, T5 and T11) in which opinions on values education and practices are discussed together, 3 theses (T15, T17 and T21) about the examination of values education in the textbook and 7 theses (T3, T6, T7, T8, T9, T23 and T24) related to values education in the curriculum. In the findings of the participants in these studies, it was determined that the opinions of preschool (4) teachers, then social studies teachers (2), elementary school teachers (2) and Quran course teachers (2) were consulted the most. The branches from which at least (1) opinion were taken are Geography, science, visual arts, primary school, secondary school, English and high school teachers. As data collection tools for receiving opinion, it was determined that semi-structured interview form was used in 18 of the theses, semi-structured interview form and document analysis form were used in 5 of the theses and semi-structured interview form and observation form were used together in 1 of them. Content analysis (14), descriptive analysis (9), descriptive and content analysis techniques (1) were used in the analysis of the data obtained from these theses, respectively.

4. Validity and Reliability: An external evaluator was used to ensure reliability in the findings (Smart, 2004). The external evaluator examined a total of 7 theses selected from the research sample, one for each year. The collected data were coded and themed independently by the external evaluator and the author and rearranged in order to ensure the reliability of the study. In calculating the reliability, the reliability formula R (reliability) = Na (consensus) / Na (consensus) + Nd (disagreement) suggested by Miles and Huberman (1994) was used and the reliability of the research was determined as 0.72 as a result of the calculation. Since the reliability calculations found to be above 70% are considered reliable for the research (Miles & Huberman, 1994), the result obtained was considered reliable for the research. As stated by Yıldırım and Şimşek (2005), in order to ensure the validity of the results, the research questions were clearly stated, detailed information about the analyzed data was presented and direct quotations were included in the interpretations of the findings obtained from the theses.

5. Analysis of Data and Explanation of Synthesis: Content analysis technique was used in the analysis of the data obtained from the research. Content analysis enables the findings to be brought together within the framework of certain concepts and themes that are similar to each other, and organized and interpreted in a way that the reader can understand (Yıldırım & Şimşek, 2005).
qualitative findings of the 24 theses included in the study were examined singly and as a result of the examination three main themes were determined; Applications practiced to gain values education and problems encountered, The values that should be gained by the students according to the teachers and the factors effective in gaining these values, The problems that the values education can deliver solution and the behavioral changes observed in the students after the values education practices. The results of the synthesis were presented in the form of comments in tables in the findings section of the research, and the citations made from the examined theses were given directly.

FINDINGS

In this part of the research, the findings related to the three themes obtained from the qualitative data of 24 graduate theses examined are presented in the form of comments and direct quotations under the title of research questions. Page numbers of theses are also given in direct quotations.

1. Findings Regarding Applications practiced to gain values education and problems encountered

In line with the first question of the study, the theses were examined and two themes were determined; the practices of teachers in teaching values education and the problems encountered in these practices. Regarding the first theme, it was observed that in the acquisition of values education, firstly drama (15), then a case study (11) and storytelling (10) about values education were practiced. Besides these, it was determined that educational games about the value to be gained (9), art activities such as music, painting, film and theater (9), project work (7), billboard preparation (7), narration (6), discussion (6), writing an essay about the subject (5), travel-observation activities (5), family visits (4), role modeling (4), Science and nature activities (3), feeding a living being (3), animation with puppets (3), poster preparation (3), presenting examples from daily life (3), empathy activities (3), brainstorming (3), choosing the model student of the month (3), reading poetry about values (2), examining social experiments (2) and reading books (2) applications were practiced. Some quotations from the thesis examined regarding these findings are presented below.

“Animating events or concepts we encounter in daily life in the classroom, that is, drama, will enable students to realize the importance of values” (T7, p.72). “Sometimes I can have difficulties when internalizing and teaching values. In such situations, we give examples from daily life and do drama” (T8, p.206). “I use all methods such as case study, discussion, brainstorming, narration. I mostly use the case study method” (T15, p.92). “I make the students perceive the value based on something they are curious about during the lesson or the case study that happened at that moment” (T20, p.60). “... We read story books. We have resource books, we plan activities” (T9, p.90).

When the theme of the problems encountered in practice has been examined, it was determined that families do not contribute to the process in the first place (14). The problems following come after this problem; having a low number of variety of activities and materials in the values education program (13), crowded classes (10), presence of negative examples presented by mass media such as social media, television series, television programs, YouTube phenomena, internet, etc.(10), the concepts being abstract (10), unsuitability of the physical environment (9), incompatibility of family values and universal values (9), insufficient teaching hours (9), insufficient in-service teacher training (8), the families not being conscious (8),teacher's being a wrong role model (6), priority to teaching over education (5), self-centered preschool students (4), behavioral differences among teachers (3) and unclear course outcomes (3) . Some quotations from the thesis examined regarding these findings are presented below.
“While teacher-student communication at school is within the framework of respect and love, the families’ ignoring this and doing what they know, not obeying the rules, disregarding them and not repeating the classroom activities at home cause disruption of values and the emergence of inconsistent behaviors (T3, p67).” 

“In my opinion, if I answer by considering the environment I am in, I can easily say that our biggest deficiency stems from the families (T14, p.72).”

“Timeless, improper, unconscious consumption of mass media, social media, TV programs, besides their misuse, the fact that they make programs that corrupt our values causes serious damage on values (T8, p.203).”

2. Findings regarding the values that should be acquired by students according to teachers and the factors effective in gaining these values

In line with the second question of the research, the theses were examined and 2 themes were determined, namely, what values should be gained according to the teacher's opinions and the factors that are effective in gaining these values. In the first theme, for the values that should be given to students according to teachers, it was determined that first comes respect (14), in the second place it's honesty (13), and in the third place it is responsibility (12) and love (12). Helping each other (11), tolerance (10), justice (9), empathy (8), patriotism (7), sharing (7), self-confidence (7), patience (6), conscience (3), cooperation (2) and equality (2) follow these values respectively. Among the theses examined regarding these findings, the value of respect takes the first place in the theses coded T3, T10, T15 and T20 and the quotations regarding this value are as follows:

“First of all, respect must be gained. Respect is essential for the development of a children's sense of self-confidence, for getting along well with their friends, and most importantly, for them to become characterful people in their future life (T3, p.56).” “First of all, we need to teach to be respectful at the ages of secondary school...” (T10, p.72).”

Honesty value came out as the second most important value that should be gained to students also in the thesis coded T11. The opinion of a teacher on this subject is as follows: “Personally, my most important value is not lying, honesty: I attach great importance to it...” (p.52). When codes in order of priority in teaching values in theses with T8 and T11, T16 and T17 codes were examined, it was found that responsibility and love values ranked third. Some opinions about these values are expressed as follows: “... A sense of responsibility should be given. Individuals who are aware of their responsibilities do their duties properly. Value of responsibility should be given. There is no information or school for a student who does not know what and why...” (T19, p.58).”

“Since people live together, I put the value of responsibility and sensitivity first...” (T20, p.44).”

When the second theme of the factors that are effective in providing values education is examined, it was determined that in the first place, it is the family’s necessity to be the right role model (5). This factor is followed by these; the teacher's being the right role model (3), family consistency (3), school culture (3), social media, television, etc. mass media (3), consciousness level of the family (2), family-teacher cooperation (2), universities, municipalities, health institutions, non-governmental organizations etc., private and public institutions (2), the support of the guidance service (1). Some of the opinions expressed by the teachers regarding these factors are given below.

“... I think the most important factor is family. After, it is an important factor that students fall into the exam rush brought by the system.... and... The family factor is particularly effective(T19, p.56).” “I try to set an example to teach the values education outcomes, not as if to explain the subject of a lesson, but to teach the subjects of values education with my behavior when necessary....” (T1, p.44).” “Since there are violent elements in the computer games, I observe that the child resorts to violence to get something. Likewise,
the presence of elements of violence on TV also makes it difficult for the child to learn values (T3, p.71).”

3. Findings of teachers' opinions about the problems that values education can solve and the behavioral changes observed in students after values education practices

In line with the third question of the research, the theses were examined and two themes were obtained: the problems that values education can solve and the behavioral changes observed in the students after the applications.

Regarding the first theme, it was determined that the teachers think that values education can bring a solution to the problem of injustice (5) the most. After that they indicated that it would be a solution to physical and psychological violence (4), lying (4), disrespect (3), lack of love for homeland, nation and flag (3), impatience (3), communication problems (3), failure (3), being judgmental (2) and not being able to express oneself (2). Some quotations regarding the views of teachers in theses where the problems that values education can solve are presented below:

“First of all, I believe that values education will solve the problems of violence, fighting, failure and discipline in schools… (T5, p.77).” “I think that violence can be solved with an effective values education. The student should use it in social activities in their spare time. Sports areas should be created to spend their energy. I think that violence can be solved if these values education is started to be given to the students at all hands; on the street, in the family, in the media (T1, 108).” “I think it can contribute to the solution of the problems such as violence, disrespect, inability and inequality that are increasing in our society (T2, p.29).”

When the opinions of teachers in the second theme regarding the behavioral changes observed in students after the values education applications are examined, it was found that respectively the behaviors of being respectful (7), sharing (6) and helping each other (5) were positively changed. These behavior changes are followed by those; being responsible (4), being self-confident (4), paying attention to cleanliness (3), finding solutions to problems (3), being patient (3), being tolerant (3), empathizing (3), showing love to all living things (3), not lying (3), less violent tendency (3) and fairness (2). Some quotations obtained from the views in the theses examined regarding these findings are as follows:

“Students are more respectful to each other and to adults after values education (T10, p.67).” “We also see that feelings of cooperation develop….. At school, we have students who are helpful to disabled students, share what they have with the others, have a habit of reading books, participate in artistic activities and respect diversity (T10, 71).” “After our practices for values education, I can say that there are some changes in students and I could observe them. For example, students who share their food with the ones who don’t have food, students who give their notebooks to others who couldn’t write the text on the board, students who confess their fault a result of misbehavior in the classroom, not lying etc. (T5, p.64).”

CONCLUSION, DISCUSSION AND SUGGESTIONS

3 themes were created from the qualitative data of 24 postgraduate theses examined; Applications practiced to gain values education and problems encountered, The values that should be gained by the students according to the teachers and the factors effective in gaining these values, The problems that the values education can deliver solution and the behavioral changes observed in the students after the values education practices.

In the studies in which the opinions were taken in values education, it was found that mostly the opinions of the teachers were taken. However, it is thought that taking the opinions of the
academic staff in higher education institutions, especially in teacher training institutions, on this issue will be beneficial in developing the programs. Therefore, first it is recommended to evaluate the existing situation also from the point of view of the student and the lecturer, in order to improve the curriculum of the education faculties further. Also, considering the subjects of the postgraduate studies examined, it was determined that a limited number of studies were conducted on the views on teaching materials used and produced in values education. Thus, it is recommended to conduct more studies in which opinions are taken in order to improve the teaching materials and technologies used in values education.

According to the synthesis obtained as a result of the research, teachers stated that in values education practices, primarily drama was used and then case study and storytelling. It was stated that the least common practice was reading poems and books on values. It was determined that the least common activity was reading poems and books about values. Also in different studies where teachers' opinions about the application of values education were taken, it was determined that drama method is used in the first place in gaining values and that its use is effective in gaining values, embodies the learning process and provides a fun learning environment (Akıtürk and Bağçeli Kahraman, 2019; Akpınar and Özdaş, 2013; Balcı and Yanpar Yelken, 2013; Can Aran and Demirel, 2013; Çelik and Buluç, 2018; Gür et al., 2015; Kaya and Antep, 2018; Kaya, Günyüz and Aydınum, 2016; Kilç, 2017; Meydan and Bahçe, 2010; Uzun and Köse, 2017). However, it should not be forgotten that teaching oral and written works at schools in addition to drama is important in cultural transfer. Especially literary texts are beneficial in terms of value explanation, value analysis, making a moral judgment and cultural transfer (Özdemir and İdi Tulumcu, 2017). On the other hand students can be gained values by making use of activities such as fairy tales, proverbs, folk songs and poems. It was stated that fairy tales are important in terms of the transmission, teaching and adoption of our traditions, national and sentimental values from generation to generation (Kahramanoğlu, 2019). For these reasons, it is recommended to examine the reflections of the poems of national and universal poets on the values education, and to read the books that include the life stories / achievements of the thinkers in value acquisition practices.

When the results regarding the problems encountered in values education applications are examined; it was observed that the fact that families do not contribute to the process is in the first place. The low number and variety of activities and materials in the values education program, crowded classes, negative examples presented by mass media, etc. problems follow this problem. In parallel with these findings, similar results have emerged in many studies in which problems encountered in values education practices were determined (Ağgül Yalçın & Yalçın, 2018; Çelikkaya & Filoğlu, 2014; Ergin & Karataş, 2016; Erkuş & Yazar, 2013; Gömleksiz & Kılınç, 2015; Kurtulmuş, Tösten, & Gundaş, 2014; Thornberg and Oğuz, 2013; Zurawsky, 2003). Based on the problem of the low number and variety of activities and materials, it is recommended to carry out studies to increase the effectiveness and variety of materials related to values education, and to evaluate and improve the results. At the same time, it is thought that giving regular seminars on values education to families and implementing practices that can involve the family may minimize the problem of family not contributing to the process.

According to teachers, it was determined that in the ranking of values that should be gained to students, the first place is respect, the second is honesty, and the third is responsibility and love. These values are followed by those values respectively; solidarity, tolerance, justice, empathy, patriotism, sharing, self-confidence, patience, conscience, solidarity and equality. In different studies about the values that should be gained according to teachers, especially the values of respect, responsibility and love were focused on. In different studies about the values that should be gained according to teachers, especially the values of respect, responsibility and love were focused on Gömleksiz and Kılınç, 2015; Gür et al., 2015; Ogelman & Erten Sarıkaya, 2015; Oğuz, 2012; Yiğittir & Öcal, 2011). When these values are examined in an international context, it is observed that common values such as freedom, honesty, reliability and responsibility are included; however the values such as self-control, compassion, conscience and character education are less included (Bilici, 2018; Brady, 2008; Klaus...
However, in the postgraduate theses examined, teachers did not include the value of self-control among the values that should be gained. In fact, the self-control value includes many values such as controlling thoughts, emotions and behaviors, awareness and empathy. For this reason, it is recommended to make practices that provide self-control value and evaluate their results. It was seen that the family should be the right role model in the first place in the results of the factors that are effective in providing values education. This factor is followed by these factors: teacher's being the right model, the family's being consistent, school culture and mass media etc. In a study conducted by Özmen, Er, and Gürgil (2012), teachers stated that the approach of being a role model in the teaching of values is the most important and they use that. In a qualitative study conducted by Akpınar and Özdəş (2013), it was concluded that the school and the media, as well as the family, are an important factor in value education. Anderson et al. (2003) indicated that violent programs on various television and social media increased the tendency towards violent behavior among young people. In a study conducted by Yörük, Koçyiğit, and Turan (2015), TV series and computer games were grouped as violent and non-violent, and the drawings of secondary school students about TV series and computer games were analyzed within this framework. At the end of the analysis, it was determined that knives, guns, bullets, blood, dead and injured people were drawn in the pictures involving violence. Considering that factors such as social media, television series, television programs, YouTube phenomena, internet create serious problems in gaining values, it is recommended to increase the supervision of social media and mass media, and especially to organize and develop the contents of programs, series and cartoons in accordance with values education. For this, it is recommended to include an applied course in which participation can be provided to the curriculum, apart from the theoretical course, and where evaluations can be made by watching cartoons, short films and theaters. In addition, taking into consideration the positive results (Albayrak & Kartal, 2020; Coşkunserçe, 2020; Fariyatul Fayhuni and Bandono, 2017; Karakuş, 2015; Kutlucan, Çakır and Ünal, 2019; Menendez-Ferreira et al., 2019; Rathore and Mishra, 2016; Yürük & Atıl, 2017), of the use of digital stories, animations, cartoons and video blogs on values education, it is recommended to frequently include such controlled practices.

As a result of the research, the teachers stated that they were of the opinion that values education could bring solution to injustice the most and then violence, lying and disrespect. At the same time, they expressed that they think that students' behaviors of being respectful, sharing and helping each other change positively with the values education provided in schools. Also in an experimental study conducted by Dereli İman (2014) in which the effects of the values education program on the psycho-social development of children were tested, it was determined that students who received values education developed the skills of controlling their anger behaviors, adapting to changes and self-control etc. In the two studies conducted by Dilmaç (2007), Tahiroğlu, Yıldırım and Çetin (2010), it was found that as a result of the practices of values education, it was concluded that the students’ sensitivity towards the environment increased, their aggression tendency decreased and human values such as responsibility, respect, tolerance and honesty were gained. With the help of results and as the teachers mentioned, it is seen that the values education applications are effective to set aright students’ habits and gaining the target values. With addition to these applications, it is advice to diversify values in terms of self-control and self-regulation, to review gains and prepare more effective instructional designs in between student-parents-teachers triangle with the help of guidance service.

**REFERENCES**


Hayta Önal, Ş. *The Effect of responsibility programme on to nineth class high school students*, Unpublished Master’s Thesis, Uludağ University, Institute of Social Science, Bursa.


Izgar, G. *The effect to democratic manners and behaviors of values education programme which is applied on 8. grades students at the primary school*. Unpublished Doctoral Thesis Necmettin Erbakan University, Institute of Educational Science, Konya.


Kılıç, Z. (2017). The effect of the activities based on creative drama on 60 - 66 months children for gaining them values. Unpublished Master’s Thesis, Recep Tayyip Erdoğan University, Institute of Social Sciences, Rize.


Theses Examined in Meta Synthesis Study


Erkuş, S. (2012). The Evaluate The Opinions Of Pre-School Education Teachers About The Values Education In Pre-School Education. Unpublished Master’s Thesis, Dicle University, Institute of Education Science, Diyarbakır. (T3)


Karaca, A.S. (2020). The Examination Of Values Education Applied To Pra 4-6 Age Quran Course Students In Terms Of Tutorial Views. Unpublished Master’s Thesis, Necmettin Erbakan University Institute of Social Sciences, Konya. (T23)


Kinaci, M.K. (2018). The Views Of Pre-Service Social Studies Teachers On Values Education And Values Included In Social Studies Curriculum. Unpublished Master’s Thesis, Firat University, Institute of Educational Sciences, Elazığ. (T7)


An Analysis of Teachers’ Views Toward the Teaching of Text Type and Structure

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Abstract

It is important to supply students with skills about text type and structure in educational environments. To have such skills gives the student many advantages in the process of comprehending, and evaluating any text. This study aims to bring out the opinions of Turkish language teachers and elementary school teachers about teaching text type and structure. In this study, a descriptive research design was employed and the participants consisted of 55 Turkish language teachers and elementary school teachers. Content analysis was utilized for data analysis. In this study, to check reliability and validity, the statements of participants were transfered directly, participant confirmation and the percent of agreement (approximately % 0.81) between two researchers were used. It was found that Turkish language teachers and elementary school teachers generally adopted a different teaching approach, and used the text-based, production and conversion, information transfer, and audience-centred activities. The participants stated that there are different problems in Turkish textbooks concerning the teaching. It is suggested that studies should be carried out to solve the problems that teachers have stated in the teaching of text type and structure.

Keywords: Textlinguistic, Writing Training, Text Type and Structure.

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INTRODUCTION

Reading, which is a process of meaning, is guided by the text format in addition to the reader's life experiences, prior knowledge, motivation, and intellectual accumulation. Especially, text format; in other words, the text type and structure expect the reader to carry out specific responsibilities.

The reader prefers a comprehension position in line with the expectations of the text. In this process, the primary determinant of the reader's comprehension position is text type and structure. Many field experts also agree that type and structure of the text drive or stipulate the reader's reception pattern, and require a specific reading style (Applebee et al., 2002, p. 1326; Dilidüzgün, Çetinkaya-Edizer, Ak-Başoğlu & Karagöz, 2019; Knapp & Watkins, 2005, p. 29; Özdemir, 2007, p. 53; Wellek & Warren, 1982, p. 317). For example; an informative text expects from assertions, advocated thoughts, discussed cases or situations to be continuously associated with the real world, to be examined in various ways, to be controlled by objective data, and to be questioned by logical inferences. However, a fictional text expects the reader to prop up temporarily information—even if in a short time-related to real-world and to accept that the narratives are fictional. What is essential in such passages is the internal consistency of what happens in fiction and the balance in the way they are jointed. Thence, in a fictional passage, "internal logic independent from the external world" in the imaginary universe becomes more critical than logical inferences.

The text structure is rhetorical patterns that reflect universal cognitive processes (Carey, 1995). Balci (2018, p. 199) points out that the passageual structure is formed as a consequence of a cognitive method and developed through the function of the passage. Whatever text is organized in the form of "introduction, body, and conclusion" aims to be transferred or shared in this order. Nevertheless, in the field of text linguistics, this structure is the topic of examination in "microstructure, macrostructure, and superstructure". Günay (2017, p. 71-72) states that these three structures (microstructure, macrostructure, and superstructure) will be mentioned in the text analysis in terms of linguistic and passageal theories. In the microstructure related to the inter-sentence arrangement, situations such as relations, repetition, cataphora, anaphora, elliptical structure, tense, inter-sentence relations, passage qualifier, implications are considered. The macrostructure focuses on differently sized units of passageal matter. The main parts of the passage (paragraph, chapter, fascicle, volume), the various components of the passage (plot, narrative vocabulary, narrator, point of view, setting) and consistency are the macrostructure's subject of examination. In other words, any kind of study related to the holistic assessment or summarization of the passage is the subject of this dimension—the superstructure deals with the main components of all texts. Text types and genres are examined in this structure. When an interpretation beyond the text conpassage is intended, the superstructure is referred.

Text types can also be classified or arranged in a variety of ways as daily, formal, entertaining, informative, instructional, literary, fiction, real-life genres, thought-knowledge-based genres (Adalı, 2011, p. 240; Knapp & Watkins, 2005, p. 29; Özdemir, 2007, p. 37-44). Nonetheless, it is difficult to say of a definite consensus on the classification of text types in the literature when the studies in the field of text linguistics are examined (İşeri, 2007). Particularly nowadays, transitions and fusions between genres are more common. Therefore, the classification of genres is not very healthy, and some classifications can be made only based on the most basic and obvious features (Adalı, 2011, p. 240).

In the most general form, passages can be categorized into three categories: narrative, informative and poetry. Informative passages are created to inform the reader of any topic, change or strengthen his/her thoughts or convictions (Aktas & Gundüz, 2001, p. 135). Such texts contain different discursive structures such as comparison, deduction, argument and evidence, and various abstract and logical relationships. Narrative passages are structured based on basic components such as setting, narrator, character, and plot. The familiarity of the regulated forms for children makes the texts easier to understand. (Akyol, 2006, p. 141; Anthony & Raphael, 2004, p. 315; Best & O'Reilly, 2007,
In the current Turkish Curriculum, it is seen that the text types are categorized in three groups as narrative, informative, poetry and different gains and explanations are presented about the text type and structure (MoNE, 2018):

T.2.3.16. Recognize text types.
Given short information about prose and poetry by supporting with examples
T.3.3.20. Distinguish text types.
General short information is given by using examples of narrative, informative, and poetry.
T.6.3.22. Determine the story elements in the text.
Plot, setting, characters, narrator are emphasized.
T.7.1.12. Evaluate the content of what they listen/watch.
a) Identify the implicit meaning in media passages.
b) It is provided to examine the target audience and intention of the media passages.
T.8.3.20. Determines the story elements in the texts he/she read.
Plot, setting, characters, narrator are emphasized.

There is a close relationship between the text type and structure. In one aspect, the preferred text type is the primary determinant of the features that the passageual structure will have. According to Coşkun (2009, p. 252), the preferred text type determines the passage structure. The passage type directs the reader to constitute some expectations. Any topic can be told in different formats by the text type. For instance; the fact that a murder is committed in a news article is different from the way it is considered in a fictional story. Naturally, the expectation of the reader for both of the text types differently.

It is important to supply students with skills related to text type and structure in educational environments. To have such skills gives the student many advantages in the process of evaluating, comprehending, understanding, and interpreting any text. According to Dilidüzgün (2013, p. 51), to have knowledge about the superstructure categories specific to text types has a function that facilitates the process of reading, understanding, remembering and producing. Tankersley (2005, p. 108-109) states that readers who know the text type, structure and style can comprehend better what they read and make a prediction of what awaits them in the passage. Therefore, while analyzing the text, the reader does not waste his cognitive energy in vain.

Having information about the text type and structure provides the reader/student with the following opportunities during the reading process (Armbruster, 1984; Camp, 2006, p. 61; Çeçen, 2011, p. 133; Prior, 2006, p. 16; Williams, 2007, p. 202):

- It helps to comprehend familiar texts or texts arranged differently.
- It enables the understanding of passageual discourse and the production of a new discourse.
- It leads students in simplifying and rearranging passages that are more complex or unqualified.
• It assists the reader to focus on the passage much more.

• It facilitates the student to create a purpose to read more books.

• It helps to run through the passage to reveal the information needed.

• It enables the author's purpose to be noticed.

• It teaches how to use and determine the style, expression, and ways of developing thought in the process of producing passage.

This study aims to bring out the opinions of Turkish language teachers and elementary school teachers about teaching text type and structure. Thusly, the problems encountered in educational environments in the teaching text type and structure will be revealed, and possible solutions will be put forward. The problem of the study can be summarized as follows: "What are the opinions of Turkish language teachers and elementary school teachers about teaching text type and structure?" For this purpose, answers to the following questions were sought:

1. What activities do Turkish language teachers and elementary school teachers in teaching text type and structure?

2. What are the opinions of Turkish language teachers and elementary school teachers about Turkish textbooks on teaching the text type and structure?

3. What are the matters that Turkish language teachers and elementary school teachers have difficulty in teaching the text type and structure?

4. According to the Turkish language teachers and elementary school teachers, what are the text characteristics that attract the students' interest in the process of teaching the text type and structure?

5. According to Turkish language teachers and elementary school teachers, which elements do students have difficulty in understanding the text types and structure?

**METHOD**

In this section, research design, data collection and study group, analyzing of data, reliability and validity studies are presented.

**Research Design**

In this study, a descriptive research design was employed. “Descriptive research design is describe systematically and accurately the facts and characteristics of a given population or area of interest” (Isaac & Michael, 1995). In this study, descriptive research design was used as it was aimed to determine the opinions of Turkish language teachers and elementary school teachers, who constitute a certain group among all teachers, on text type and structure teaching.

**Data Collection and Study Group**

In qualitative research, the researcher himself/herself is a tool. Also, the main concern of such research is to obtain detailed and in-depth information on a less number of individuals and situations (Patton, 2014, p. 14). In this study, which was conducted with 55 Turkish language teachers and elementary school teachers, it was proposed to obtain in-depth and detailed information about the
teaching of text type and structure. In this regard, the study has a qualitative and descriptive qualification.

The study group consists of 55 Turkish language teachers and elementary school teachers.

Table 1. Demographics information on the study group

<table>
<thead>
<tr>
<th>Gender</th>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>30</td>
<td>54.5</td>
</tr>
<tr>
<td>Female</td>
<td>25</td>
<td>45.5</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>21</td>
<td>38.2</td>
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<tr>
<td>6-10</td>
<td>18</td>
<td>32.7</td>
</tr>
<tr>
<td>11-15</td>
<td>12</td>
<td>21.8</td>
</tr>
<tr>
<td>16+</td>
<td>4</td>
<td>7.3</td>
</tr>
<tr>
<td>Teaching Education Level</td>
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</tr>
<tr>
<td>Undergraduate</td>
<td>47</td>
<td>85.5</td>
</tr>
<tr>
<td>Master’s Degree</td>
<td>6</td>
<td>10.9</td>
</tr>
<tr>
<td>Master’s Degree Without Thesis</td>
<td>2</td>
<td>3.6</td>
</tr>
</tbody>
</table>

Table 1 provides the demographics information about the Turkish language teachers and elementary school teachers in the study group. Accordingly, 55 Turkish language teachers and elementary school teachers (30 male and 25 female) participated in the study. In terms of teaching experience, there are 21 participants (1-5 years); 18 participants (6-10 years); 12 participants (11-15 years) and 4 participants (16+ years). Forty-seven of the participants were undergraduate, and six of them were master's degree; two of them received a master's degree without thesis.

Analyzing of Data

Content analysis was utilized for data analysis. Content analysis is a scientific approach that looks into social reality objectively and systematically by classifying, transforming, and inferring the message contained in verbal, written and other materials in terms of meaning and grammar or both (Tavşancıl & Aslan, 2001, p. 22). The following stages were taken to analyze the data:

In the beginning stage, interview forms were put down on paper, main and subcategories were acquired, starting from responses of Turkish language teachers and elementary school teachers. For example, two teachers responded; "With a question (what way would you follow if you had the chance to change the passage after a certain chapter?) we do creative thinking and good writing" (T10) and "Students find different titles. They talk about how to append if they were the author or poet of the passage" (T14). It comes into view that the teachers have carried out activities focusing on making changes in the passage regarding the text type and structure. Consequently, these tendencies of the two participants were evaluated under the main category of "production and conversion". A similar procedure was followed for other statements, and the process was continued.

The categories and subcategories obtained in the second stage were tabularized conveniently according to the aim of the study. The distribution of the determined categories and to which teacher it belongs is presented in the tables. The same subcategories are combined to convey the gathered data in the first analysis more simply and understandably. For instance; in the first analysis of the activities practiced by Turkish language teachers and elementary school teachers for teaching text type and structure, 34 subcategories were identified, and 31 subcategories were reached in this sub-aim with review and evaluation. The same itinerary was followed for other sub-aim. Likewise, sub-categories were trying to be structured in a way that was more simple, understandable and independent from subjective interpretations. For example; "using images" category is evaluated under "benefitting from visual materials."

In the third stage, the interview forms were examined again. New categories that were attained or excluded were mentioned in the tables. Hence, the findings received their final form. Besides, some teachers have stated that Turkish textbooks are sufficient in terms of teaching the text type and
structure. Teachers said not to confront any problem related to Turkish course books, and this was not shown in the table.

**Reliability and Validity**

Different ways have been used validity and reliability. The validity in qualitative research is closely related to the way that the researcher is as unbiased as possible and conveys the phenomenon researched. Criteria for validity are the detailed reporting of the collected data, explaining the way the researcher achieved the findings, being consistent in all stages of the research (data collection, analysis, interpretation), and explaining. These are important to assure internal and external validity (Yıldırım & Şimşek, 2018, p. 269-272). To provide the validity of this study, firstly, all stages were explained and reported in detail.

The strategies by LeCompte and Goetz (as cited in Yıldırım & Şimşek, 2018, p. 275-276) are used to secure the internal reliability in qualitative research, respectively: In the first strategy, the researcher shares the data with the reader without any comments. The second strategy allows different researchers to take part in the same research. In the third strategy, the collected data by observation are verified through interview. The fourth strategy is to include another researcher to help in the analysis of the collected data and verify the results obtained. The fifth and last strategy, data analysis based on a pre-established and circumstantial defined conceptual framework, is a factor that enriched internal reliability. Thusly, the researcher is expected to explain to the reader, if any, how he/she has formed such a conceptual framework and how he/she has analyzed the data upon this framework.

In this study, to ensure internal reliability, firstly, the statements cited in the interviews were shared with the reader just below the tables without any comment. Because clear descriptions and references are the raw data for qualitative research (Patton, 2014, p. 27). Then, participant confirmation was received. In this method, the researcher can tell the interviewee what he/she has ascertained as a summary and ask whether his/her perception reflects the data correctly (Yıldırım & Şimşek, 2018, p. 280). For this purpose, the summary of the interviews was shared with the participants, who provided their contact information at the interview stage, and their opinions about the analysis were taken. There was no objection to the analysis from any of the participants who gave feedback. The excerpts of participants’ confirmations can be presented in the following:

T12: I agree with analyzes you made in the interview we had about the text type and structure and the determinations obtained from these analyses.

T32: I agree with the determinations: 1) we comprehend the passage structure by asking the question. 2) There is no diversity in the activities, and the activities are really long. 3) Abstract thought, complicated language and passages those are not suited for the age.

T33: I agree with the determinations of the study. Especially in the teaching of text type and structure, students' lack of vocabulary creates great problems in understanding and analyzing the passage.

T34: You have briefly summarized my answers to the interview form regarding the passage type and structure. I affirm the accuracy of all the outlined information.

T37: I approve the inferences in the participant confirmation created in the study I participated in. I agree with these inferences.

One of the ways to control reliability in content analysis is to look at the correlation between two different researchers, which is called inter-rater reliability. In this way, documents are assigned to different researchers in a single period, and the correlation among them are analyzed. The percentage of agreement among the researchers is tested with the formula "Reliability Percentage=
Agreement/Agreement+Disagreement”. The percentage of agreement with this formula is expected to yield a result of more than 70% (Tavşancıl & Aslan, 2001, p. 80-81). At the final stage, five interview forms that were randomly chosen for testing reliability were re-analyzed by two different researchers and the agreement among them was examined. As a result, the correlation between the researchers was determined as 0.81 \[ \frac{36 \text{ (the number of agreements)}}{36 \text{ (the number of agreements)} + 8 \text{(the number of disagreements)}} \]. In this regard, it can be said that the study is reliable.

**RESULTS**

In this part, the collected data by analyzing the interviews with Turkish language teachers and elementary school teachers about teaching the text type and structure are presented.

**Table 2. Activities carried out by teachers in teaching the text type and structure**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Main Category</th>
<th>Subcategory</th>
<th>Distribution(n)</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strategy, Method and Technique</td>
<td>Questioning</td>
<td>18</td>
<td>T2, T6, T7, T9, T10, T12, T16, T18, T28, T31, T32, T33, T34, T37, T38, T40, T49, T52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Text type comparison</td>
<td>10</td>
<td>T3, T9, T20, T23, T24, T26, T43, T44, T48, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Implication</td>
<td>6</td>
<td>T16, T17, T18, T28, T31, T34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benefitting from visual materials</td>
<td>4</td>
<td>T7, T24, T31, T45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Giving clues</td>
<td>3</td>
<td>T2, T13, T18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taking notes</td>
<td>3</td>
<td>T3, T37, T40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estimating</td>
<td>3</td>
<td>T14, T41, T46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Summarization</td>
<td>2</td>
<td>T7, T10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Group evaluation</td>
<td>1</td>
<td>T37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Participatory argument</td>
<td>1</td>
<td>T27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concept map</td>
<td>1</td>
<td>T47</td>
</tr>
<tr>
<td></td>
<td><strong>Text-based</strong></td>
<td>Giving different sample passages</td>
<td>16</td>
<td>T3, T13, T16, T20, T23, T25, T26, T28, T29, T31, T37, T39, T45, T47, T50, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Various activities according to the text type (word choir, reading theatre, dramatization, and so forth.)</td>
<td>8</td>
<td>T4, T11, T12, T15, T38, T42, T46, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Finding a distinctive feature</td>
<td>6</td>
<td>T28, T37, T39, T46, T51, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To move from passageual traits</td>
<td>5</td>
<td>T5, T6, T9, T12, T13</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reviewing content</td>
<td>2</td>
<td>T18, T53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Style analyzing</td>
<td>1</td>
<td>T18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Analyzing parts of the text</td>
<td>1</td>
<td>T35</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repeated readings</td>
<td>1</td>
<td>T8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emphasizing keywords</td>
<td>1</td>
<td>T47</td>
</tr>
<tr>
<td></td>
<td><strong>Total: 52</strong></td>
<td><strong>Total: 41</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Production and Conversion</td>
<td>Generating a new passage</td>
<td>15</td>
<td>T1, T2, T9, T14, T17, T20, T21, T29, T34, T37, T40, T46, T50, T55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make modifications to the text (part, title and the like)</td>
<td>3</td>
<td>T10, T14, T26</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Place oneself in character's shoes</td>
<td>1</td>
<td>T7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Take on the role of the author</td>
<td>1</td>
<td>T14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Convert passage to a different text type</td>
<td>1</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td><strong>Information Transfer</strong></td>
<td>Defining the text type</td>
<td>10</td>
<td>T21, T24, T33, T37, T38, T40, T41, T48, T49, T51</td>
</tr>
<tr>
<td></td>
<td><strong>Total: 21</strong></td>
<td><strong>Total: 11</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Target audience-centered</td>
<td>Activating preliminary information</td>
<td>3</td>
<td>T41, T43, T48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Homework</td>
<td>2</td>
<td>T21, T36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Preliminary</td>
<td>2</td>
<td>T7, T8</td>
</tr>
<tr>
<td></td>
<td><strong>Total: 7</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows the activities carried out by Turkish language teachers and elementary school teachers for teaching the text type and structure. Findings reveal that the educational activities of teachers in the process of teaching the text type and structure are grouped in 5 categories as "strategy, method and technique", "text-based", "production and conversion", "information transfer", and "target audience-centered". Turkish language teachers and elementary school teachers use the most strategy, methods, and technique (n: 52) in teaching the text type and structure. This is followed by "text-based" (in: 41), "production and conversion" (n: 21), "information transfer" (n: 11) and "target audience-centered" (on: 7) activities. Among the teaching approaches, there are "questioning" (n: 18) ranked as the first and "text type comparison" (n: 10) ranked as the second. In text-based activities, "giving different sample passages" (n: 16) is ranked the first, "various activities according to the text type" (word choir, reading theatre, dramatization, and so forth.) (n: 8) is ranked the second; in production and conversion generating a new passage" (n: 15) is the first; "make modifications to the text (path, title...)" (n: 3) is ranked as the second. In the main category of information transfer, "defining the text type" (n: 10) and "do test" (n: 1); in target audience-centred, the categories of "activating preliminary information" (n: 3), "homework" (n: 2) and "preliminary" (n: 2) were discovered. The same assessments maybe got for all other subcategories.

Turkish language teachers’ and elementary school teachers’ opinions about the activities they conducted for teaching the text type and structure can be presented as follows:

T2: Regarding the text structure (characters, plot, setting), we also ask students to describe and write an event appropriate for their level and about their own lives. To do so, we tell them to express the plot according to chronological order and logic flow, and before that, they need to remark characters, setting.

T12: By asking questions to determine the text type, I make them think about what type of text it might be. For example; "Do you think that this passage is about an event, or does it give us information?" Then, while guiding them with new questions together with the child's answers, to find them the answer and to create an infrastructure for the text type.

T28: I start to study with the implication method of detecting the text types we read. I am trying to ask questions and receive answers from the students of the finding distinctive features method. Then try to make comprehension by reading sample paragraphs.

T37: I ask highlighting questions with distinctive characteristics that appropriate for the text type. If the passage is a letter, I speak about how it starts, whether the thoughts are personal, why the date was written, how it finishes. After the features of the passage are adumbrated with questions, I explain the features and read notes. I desire them to bring different passages to the class that fit the passage structure. We read the passage in the class and evaluate whether it is appropriate for the passage structure.

T49: First, I read the given passage. Then reading is carried out by students. The student asks questions about the text type and structure. The correct answers are rewarded according to the answers. Incorrect answers are corrected by the teacher. Information about the passage is transferred, and the student gives an answer about the passage.
Table 3. Problems in Turkish course books on teaching text type and structure

<table>
<thead>
<tr>
<th>Rank</th>
<th>Main Category</th>
<th>Subcategory</th>
<th>Distribution(n)</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Activity and Question</td>
<td>Lack of variety</td>
<td>11</td>
<td>T3, T15, T20, T28, T29, T31, T32, T33, T35, T37, T48, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quantitative and qualitative insufficiency</td>
<td>11</td>
<td>T15, T17, T21, T24, T29, T33, T34, T39, T41, T46, T47</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excessive details</td>
<td>2</td>
<td>T6, T44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uninteresting examples</td>
<td>2</td>
<td>T35, T38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Not leading to inquiry</td>
<td>1</td>
<td>T27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Information transfer only</td>
<td>1</td>
<td>T12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Virtually no information on the text type</td>
<td>1</td>
<td>T18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disconnection from daily living</td>
<td>1</td>
<td>T46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More themes</td>
<td>1</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Superficiality</td>
<td>1</td>
<td>T48</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inability to develop metacognitive skills</td>
<td>1</td>
<td>T53</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Text</td>
<td>Lack of qualification</td>
<td>6</td>
<td>T23, T25, T29, T34, T37, T38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long texts</td>
<td>5</td>
<td>T12, T29, T31, T39, T42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of type variety</td>
<td>4</td>
<td>T10, T37, T49, T50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unknown words</td>
<td>3</td>
<td>T13, T39, T43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abbreviated passages</td>
<td>3</td>
<td>T10, T37, T51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Careless, superficial and same topics</td>
<td>2</td>
<td>T10, T25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>More variety in text types</td>
<td>2</td>
<td>T4, T29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Far from actuality</td>
<td>2</td>
<td>T1, T7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Too much passage</td>
<td>1</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moral anxiety only</td>
<td>1</td>
<td>T25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Target Audience</td>
<td>Ignoring student level</td>
<td>10</td>
<td>T1, T15, T11, T23, T26, T27, T31, T39, T41, T43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Failure to address the student's interests</td>
<td>4</td>
<td>T1, T7, T41, T30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total: 14</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows the problems that Turkish language teachers and elementary school teachers see in the Turkish course books regarding teaching the text type and structure. Teachers state that there are three categories of problems connected to Turkish course books: "activity and questions", "text" and "target audience". The data acquired shows that the most of the problems related to teaching text type and structure belong to the category of "activity and question" (n: 33), followed by "text" (n: 29) and "target audience" (n: 14) categories in terms of distribution. The most important problems related to the activities and questions were "lack of variety" (n: 11), "quantitative and qualitative insufficiency" (n: 11); the first three problems with the text are "lack of qualification" (n: 6), "long texts" (n: 6), "lack of type variety" (n: 4); and the first problem of the target audience are the "ignoring student-level" (n: 10). The same assessments may be obtained for all other subcategories.

The following examples exemplify the problems conveyed by the participants regarding the Turkish course books in teaching the text type and structure:

T17: Especially the 6th-grade Turkish course books are inadequate in every aspect. Texts in the course books can be utilized, but the activities are inadequate. Even there is not any text type related to activities.

T39: I think that the text type and structure are not suitable for student's levels. Particularly, I think that the number of words that the students do not know is too much in the texts and the texts are long according to the students' grade level. In addition, I believe that the activities aimed at comprehending the passage are not sufficient, and there should be more examples of this activity.
T51: Texts in course books are generally good, but sometimes they do not adequately reflect the features of the text type in abbreviated text.

Table 4. The problems encountered in teaching text type and structure

<table>
<thead>
<tr>
<th>Rank</th>
<th>Main Category</th>
<th>Subcategory</th>
<th>Distribution(n)</th>
<th>Participant</th>
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<tbody>
<tr>
<td></td>
<td>Text Characteristics</td>
<td>Close text types</td>
<td>15</td>
<td>T2, T12, T18, T26, T28, T31, T36, T39, T43, T47, T48, T50, T51, T52, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abstract concepts</td>
<td>7</td>
<td>T1, T5, T6, T16, T25, T44, T49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Complicated language</td>
<td>7</td>
<td>T11, T15, T19, T32, T33, T34, T42</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abstract thought</td>
<td>6</td>
<td>T18, T32, T39, T40, T44, T54</td>
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<tr>
<td></td>
<td></td>
<td>Figurative language</td>
<td>2</td>
<td>T6, T16</td>
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<td></td>
<td></td>
<td>Long sentence structure</td>
<td>2</td>
<td>T8, T23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intensity of unknown words</td>
<td>2</td>
<td>T8, T9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terminological expressions</td>
<td>2</td>
<td>T16, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intense thought</td>
<td>1</td>
<td>T15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requires high-level thinking skills</td>
<td>1</td>
<td>T2</td>
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<tr>
<td></td>
<td></td>
<td>Lack of passageual integrity</td>
<td>1</td>
<td>T10</td>
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<tr>
<td></td>
<td></td>
<td>Inverted sentence structure</td>
<td>1</td>
<td>T23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The complex structure of texts</td>
<td>1</td>
<td>T25</td>
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<td>Total: 48</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Originating from Student</td>
<td>The absence of reading culture</td>
<td>11</td>
<td>T5, T7, T14, T24, T27, T29, T35, T37, T46, T49, T55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insufficiency of vocabulary</td>
<td>7</td>
<td>T5, T27, T30, T33, T34, T49, T52</td>
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<td></td>
<td></td>
<td>Indifference</td>
<td>6</td>
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<td>Lack of interpretation power</td>
<td>5</td>
<td>T28, T34, T39, T41, T46</td>
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<td></td>
<td>Inability to show passageal differences</td>
<td>2</td>
<td>T4, T22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of motivation</td>
<td>1</td>
<td>T31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unfamiliar texts</td>
<td>1</td>
<td>T38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of social media</td>
<td>1</td>
<td>T46</td>
</tr>
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<td></td>
<td>Total: 34</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>Passageual content</td>
<td>Non-interesting</td>
<td>7</td>
<td>T9, T17, T19, T26, T30, T32, T33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard to understand</td>
<td>3</td>
<td>T1, T11, T41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Foreign place and character names</td>
<td>2</td>
<td>T2, T44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflection of information from different disciplines in content</td>
<td>1</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>Total: 13</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>External Factors</td>
<td>Exam anxiety</td>
<td>2</td>
<td>T44, T46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Insufficient course duration</td>
<td>2</td>
<td>T17, T20, T5, T8,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incompatibility of content and curriculum targets</td>
<td>2</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Condensed curriculum</td>
<td>1</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classroom environment</td>
<td>1</td>
<td>T8</td>
</tr>
<tr>
<td></td>
<td>Total: 8</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transmissibility</td>
<td>The inability to implement that learned</td>
<td>5</td>
<td>T5, T20, T23, T33, T40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disconnection from daily living</td>
<td>3</td>
<td>T5, T13, T25</td>
</tr>
<tr>
<td></td>
<td>Total: 8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 shows the problems Turkish language teachers and elementary school teachers faced in the process of comprehending the text type and structure. The collected data show that Turkish language teachers and elementary school teachers meet most of the problems related to "text characteristics" (n: 48) in teaching the text type and structure. This is continued by "originating from student" (n: 34), "passageual content" (n: 13), "external factors" (n: 8) and "transmissibility" (n: 8). The first three of the problems related to the text characteristics are "close text types" (n: 15), "abstract concepts" (n: 7) and "complicated language" (n: 7). In the originating from student category, "the absence of reading culture" (n: 11) is the first, "insufficiency of vocabulary" (n: 7) is ranked as the second and "indifference" (n: 6) is ranked as the third. In the passageual content category, "non-interest" (n: 7), "hard to understand" (n: 3); in external factors "exam anxiety" (n: 2), "insufficient course duration" (n: 2), "incompatibility of content and curriculum targets" (n: 2); in the transferability category, "the inability to implement that learned" (n: 5) and "disconnection from daily living" (n: 3).
are at the forefront in terms of distribution. The same assessments may be obtained for all other subcategories.

The following examples can be given to the views expressed by Turkish language teachers and elementary school teachers about the problems they encounter in the process of comprehending the text type and structure:

T2: The common features of text types create serious problems in understanding the text types. For example, novel and story have the same nature and structure; personalization and speech of non-human beings in fairy tales and fables; verse writing of poetry and fables; objective and subjective judgments in articles and essays. The fact that an author conveys the effects and images that he/she has noticed about the places he/she has seen to the reader brings to mind the travel writing as well as the memoir.

T10: Some texts have been abbreviated from long chapters and given to children in a summary that cannot be united. They have difficulty completing them.

T18: Students confuse the features of similar text type. For example; they confuse the style of the interview with the essay.

T26: In particular, a small number of distinguishing factors in the think pieces may have difficulty in determining the text type. For instance; the student can call an interview where question sentences are few as an essay.

T44: Our students are trying to overcome the problem of inability to comprehend the thought article by memorization method because of exam anxiety. 8th-grade students prepare for the exam by memorizing the differences between the text types but lose the difference between the topics.

T49: Students have difficulty in an understanding message, transition and connection expressions, and theme components. The cause for this is that they do not know clearly what these components mean.

Tablo 5. Text characteristics that attract students’ interest

<table>
<thead>
<tr>
<th>Rank</th>
<th>Main Category</th>
<th>Subcategory</th>
<th>Distribution(n)</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Text Content</td>
<td>Noticeability</td>
<td>6</td>
<td>T16, T21, T38, T42, T43, T45</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brief and concise</td>
<td>6</td>
<td>T2, T33, T35, T42, T49, T55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Setting imagination in motion</td>
<td>6</td>
<td>T17, T22, T26, T38, T53, T55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Creating curiosity and excitement</td>
<td>5</td>
<td>T12, T17, T34, T43, T48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Including events</td>
<td>5</td>
<td>T9, T13, T20, T48, T55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distinctive passageal traits</td>
<td>4</td>
<td>T27, T28, T39, T49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Entertaining</td>
<td>4</td>
<td>T1, T23, T29, T53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extraordinary elements</td>
<td>4</td>
<td>T2, T49, T50, T53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harmony elements (rhythm, and the like)</td>
<td>3</td>
<td>T14, T30, T54</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Escapist style</td>
<td>2</td>
<td>T6, T7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identification characters</td>
<td>2</td>
<td>T7, T18</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Few characters</td>
<td>1</td>
<td>T49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Few dialogues</td>
<td>1</td>
<td>T8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Addressing emotions</td>
<td>1</td>
<td>T49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Humour element</td>
<td>1</td>
<td>T25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Up-to-date information</td>
<td>1</td>
<td>T5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pellucidity</td>
<td>1</td>
<td>T40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fictiveness</td>
<td>1</td>
<td>T50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Happy ending</td>
<td>1</td>
<td>T53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Explicit Characterization</td>
<td>1</td>
<td>T11</td>
<td></td>
</tr>
</tbody>
</table>

Total: 56
Table 5 shows the text characteristics interest the students in teaching the text type and structure according to the opinions of Turkish language teachers and elementary school teachers. The collected data show that the text characteristics catching the attention of students have been grouped into three main categories: "text content" (n: 56), "appropriateness for the reader" (n: 17) and "type-specific" (n: 5). In the passage content dimension "noticeability" (n: 6), "brief and concise" (n: 6), "setting imagination in motion" (n: 6), "creating curiosity and excitement" (n: 5), "including events" (n: 5), "distinctive passageual traits" (n: 4), "entertaining" (n: 4), "extraordinary elements" (n: 4), in category appropriateness for the reader "age level" (n: 12), "interest and need" (n: 2), "reflecting the child's world" (n: 2), "familiarity" (n: 1), and in the type-specific category "type-specific reading style" (n: 3), "encouraging active participation" (n: 2) are the text characteristics drawing attention of the students. The same assessments may be obtained for all other subcategories.

The following examples can be given to the opinions of Turkish language teachers and elementary school teachers about the text characteristics interest the students in the process of teaching the text type and structure:

T3: They are especially interested in poetry. Because its reading style is different from the prose.

T4: The students are more interested in the text, which is connected with curiosity and excitement and fictional texts. Like a fairy tale, story, fable. I think they get more attention because they are a reflection of the students' own fictional universe.

T7: Stories, novels, and fairy tales attract further attention. Even the most indifferent student can attend the lesson when you heroize him/her – put himself/herself character's shoes- or ask a question as "what would you do?" about text?

T53: Students are mostly interested in fairy tale and legend passages. The reason may be that he/she dreams, entertains and enriches his/her imaginary world through fantastic elements. Perhaps the most important thing is that fairy stories have a happy ending.

T55: I see that students are more interested in stories and fairy tales. Because these text types address to students' daily or imaginary world.

Table 6. The passageual components that students have difficulty in understanding

<table>
<thead>
<tr>
<th>Rank</th>
<th>Main Category</th>
<th>Subcategory</th>
<th>Distribution(n)</th>
<th>Participant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Interpretive components</td>
<td>Main idea</td>
<td>22</td>
<td>T1, T2, T4, T9, T11, T13, T14, T16, T17, T19, T21, T23, T25, T26, T29, T34, T39, T41, T42, T48, T51, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Purpose of the text</td>
<td>14</td>
<td>T1, T3, T4, T11, T13, T16, T17, T20, T37, T38, T39, T46, T47, T55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Theme</td>
<td>12</td>
<td>T2, T11, T28, T34, T37, T39, T44, T46, T47, T48, T49, T50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Massage</td>
<td>9</td>
<td>T14, T16, T31, T37, T39, T43, T46, T47, T49</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Main emotion</td>
<td>4</td>
<td>T13, T26, T37, T54</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary thought</td>
<td>4</td>
<td>T14, T16, T39, T41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cause and effect</td>
<td>3</td>
<td>T35, T37, T54</td>
</tr>
</tbody>
</table>
Table 6 shows the passagual components that students have difficulty in comprehending during the teaching of the text type and structure according to the opinions of Turkish language teachers and elementary school teachers. The passagual components that students have difficulty in understanding are grouped into three main categories: "interpretive components", "main components", and "grammatical components". The data acquired show that students have difficulty in inferring the most interpretive components (n: 76). This is followed by the main components (n: 22) and grammatical elements (n: 16), respectively. The students have difficulty in understanding the "main idea" (n: 22), "purpose of the text" (n: 14), "theme" (n: 12), "message" (n: 9) and "main emotion" (n: 4) which are interpretive components according to the distribution. They have difficulty in understanding "plot" (n: 9), "narrator" (n: 5), "topic" (n: 3) and grammatical components of the "transition and connection expressions" (n: 16). The same assessments may be obtained for all other subcategories.

The following statements can be conveyed for the opinions of Turkish language teachers and elementary school teachers about the passagual components that the students have difficulty in understanding during the process of teaching the text type and structure:

T9: My students experience no difficulty in identifying the title, setting, event, narrator, cause and effect. However, they always have trouble in determining the main idea.

T14: Students have difficulty in finding, grasping the message and transition and connection of expressions. Because the student does not have thought as "what does the author want to convey to me?" when he/she is reading or listening to the passage. Although we constantly ask, he/she often says the main idea and often summarizes it.

T40: Transition and connection expressions. Because they do not know which transition and connection expressions to use after the sentence.

T47: Grades 5 and 6 have difficulty in all except the narrator, plot, setting, title. In the upper classes, the purpose of the passage, theme and message can force students a bit.

T48: They find it hard to find the theme and the main idea, and they confuse both. They determine the main idea instead of the theme, and the theme instead of the main idea.
T55: Our students frequently have difficulty in finding the purpose of the text. Because sometimes they cannot compose the whole writing in one element.

**DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

The aim of this study, 55 Turkish language teachers and elementary school teachers participated, is to analyze the teaching of the text type and structure. The data acquired show that Turkish language teachers and elementary school teachers utilize 11 different strategies, methods, and techniques in the teaching of the text type structure. When the literature is reviewed, there are many strategies suitable for the text type that the reader can utilize in the process of comprehending or evaluating the passage. Dilidüzgün et al. (2019) mentions the metacognitive strategies (asking questions, taking notes, marking, predicting, summarizing and associating them with passages, flexible, creative, associating with visual passages, selective reading) that can be used in text types. In general, Turkish language teachers and elementary school teachers benefit from many of these strategies. However, the teachers have not made any reference to marking, flexible, and elective reading strategies. In this regard, it can be said that Turkish language teachers and elementary school teachers try to approach the text as a whole instead of focusing on the important points of the texts they utilize in the course.

While selecting text in Turkish course books, text type diversity is an important matter besides the number of texts. In the literature, different opinions are suggested about the genre diversity of the passages to be selected in Turkish course books. Instead of increasing the number of types, some researchers draw attention to the importance of teaching any type of pupil very well. Some defend that different passage types should be included as much as possible and that the number of passages should be increased (Çoşkun & Taş, 2008; Okur, 2010; Solak & Yaylı, 2009). Of course, the student's frequent reading of a text type will help his/her become competent. Nevertheless, another point to be considered here is the success of the selected passage in reflecting the text characteristics (Özbay & Çeçen, 2012, p.75).

In Turkish course books, it is seen that the participants exemplify two similar opinions about diversity in terms of distribution. It was put forward by the participants that "lack of type variety" (n: 4) and "more variety in text types" (n: 2) in Turkish course books. Nevertheless, the idea lackness of text type variety is more in terms of distribution. This data is consistent with the results of different studies in the literature. In a study conducted by İşeri (2007, p. 11), it was seen that the texts that would reach the curriculum's goals related to the text types and contain the text type characteristics are not included in the course books enough.

In another study, conducted by Konuk (2018, p. 434), it was stated that informative texts were more intensive in the course books (39.4%) when compared with other text types, and it was difficult to notice a balance in terms of text types distribution. For this reason, the text type diversity in Turkish course books should be assisted with qualified and useful text types. A balance should be achieved among the passage types. Likewise, in many studies examining Turkish course books, it has been revealed that there is variability in the distribution of passage types and some passage types take an important place (Temizyürek & Delican, 2016).

The text selected for Turkish course books should be included in the course books as a whole to jog the student's memory in all facets. Nevertheless, for some text types, this is not possible. When adapting the texts to the course books in their abbreviated form, it should be paid attention to protect semantic integrity (Okur, 2010, p.119). The problems that Turkish language teachers and elementary school teachers participating in the study have seen in Turkish course books in terms of teaching the text type and structure are "long texts" (n: 5) and "abbreviated passages" (n: 3). Hence, the course duration and semantic integrity should be considered together in the choice of passage. Parallel to this, the protection of passageual and structural features should be paid attention in abbreviated passages.
Teachers stated that the texts awakened students' interest in the following characteristics: noticeability, brief and concise, setting imagination in motion, creating curiosity and excitement, appropriateness for age level, catering interest and needs and having distinctive passageual traits. These findings are supported by different studies conducted in the literature. In a study led by Aslan and Doğu (2015) with secondary school students, passages that have enjoyable, entertaining, remarkable, excited, arousing curiosity, appropriateness for their level, structured with best-known words, having adventurous events, including emotional and imaginary elements, full of adventure attracted their attention. The Turkish language teachers who participated in the study indicated that qualifications such as "age level" (n: 12), "extraordinary elements" (n: 4), catering "interest and needs" (n: 2), "reflecting the child's world" (n: 2) and "fictiveness" (n: 1) awakened student's attention. It can be said that these passageual features are supported by the findings of different studies.

Tavşanlı (2018) found out that in a study in which primary school students preferred the text type the preferred in their written expressions and writing topics, a large proportion of students moved from their own lives in writing activities. In some cases, they found that the passage they created was ornamented with extraordinary events. Thus, it can be precipitate that students are more interested in passages enriched with fiction and reflecting their lives. This result can be handled as a criterion for the selection of passage, especially in course books. The chosen texts should be based on the child's life and enriched with the elements as fiction, extraordinariness, the excitement that interest him/her.

Many different studies based on both teacher opinions and content analysis, there has been brought out that Turkish course books have many problems and deficiencies (Epçaçan & Okçu, 2010; Öztürk & Razgathoğlu, 2013; Şen, 2020). Field experts point out that the activities in Turkish course books are not eligible (Çevik & Güneş, 2017). In addition, in different studies, it was found that Turkish course books have problems in terms of the text type. In a study conducted by Ari (2011), it was revealed that Turkish course books do not overlap with the curriculum in terms of text type, there are problems in terms of terminological in the presentment for the text types, and there are imbalance and inconsistency between text types and writing tasks. In a study conducted by Temizkan (2016), it was found that the activities linked to the text structure do not match up with the curriculum. On the other side, although gains related to macrostructure prioritizes in the course books, reading activities in the student workbooks mostly include activities related to microstructure.

In this study, findings that match up with the opinions and results presented above. Turkish language teachers and elementary school teachers stated that the course books have problems of activity and question (n: 33), text (n: 29) and ignore the target audience (n: 14) in terms of teaching text type and structure. Lack of diversity, quantitative and qualitative insufficiency, excessive details, and including uninteresting examples are the main problems identified in terms of activities and questions.

Nowadays, it was seen that writers or poets integrate and produce different text types. In daily life, a person encounters the texts do not belong to an exact category in terms of text type. In particular, it is clear that some texts go beyond conceptual definitions or typical characteristics. In this respect, it is almost impossible to distinguish text types with precise lines. This causes to occur some difficulties in teaching the text type and structure. Turkish language teachers and elementary school teachers who participated in the study stated that the transitivity between passage types [close text types (n: 15)] is an important problem in teaching the text type and structure. Therefore, it is perceived to student that classifications are "artificial" and "arbitrary" and it is difficult to speak of a definite classification. It should be remarked to the text producers (the writer or the poet) to benefit easily from the potentiality of different text types and that there is a dialogue between the texts. Moreover, this opinion should be concretized by giving examples from several texts.
It is seen that the students do not have any problems while identifying information-based components (n: 22) in general. However, it was found that they could not distinguish the components based on interpretation (theme, message, and the purpose of the passage...) (n: 76). It can be reasoned that the students' interpretation skills are not sufficient. Because the concepts connected to text type and structure are abstract, students have difficulty in distinguishing some of them from each other. They often confuse the theme with the topic, the summary with the plot. Participants stated that the students had difficulty in detecting the main idea (n: 22). In a survey conducted by Çetinkaya et al. (2013) with 233 fifth-grade students, the results obtained were consistent with the other studies in the literature. It was found out that the students who participated in the study had difficulty in detecting the main idea. It was brought out that the students confused the main idea with the topic, read the text over and over to detecting the main idea, and regard the teacher as the fundament source in bringing out the main idea. Also, one of the main problems in revealing the main idea is based on the difficulty level of the passage.

The plot (n: 9) is one of the other passageual elements that students have difficulty in understanding. The inability of students to comprehend this component causes to reduce their writings' quality. In many studies, it was brought out that students could not use the plot component adequately and competently (Kaynaş, 2014; Kiiliç, 2014; Kureci & Özen, 2017; Yasul, 2014; Yaylacik, 2014). This problem was also expressed by the participating teachers. Thus, it can be said that not filling the conceptual gaps in the process of teaching text type and structure causes deficiencies in students' writings. To fill these deficiencies, awareness should be raised on the passageual components with different enriched activities and practices, especially applications for filling conceptual gaps. In the beginning, to eliminate conceptual complexity, texts not having typical transitivity and having distinctive characteristics can be used.

One of the problems encountered in the process of comprehending the text type and structure in Turkish course books is the disconnection of them from daily living. The inability to apply what is learned (n: 5) and disconnection from daily living (n: 3) [transferability (n: 8)] are among the primary problems in this respect. Different studies had put forth regarding this problem. In a study conducted by Şen and Turhan (2013), it was determined that the activities linked to daily living in Turkish course books were deficient in terms of quality and quantity and these activities were structured in a way disconnected from daily living. Ören et al. (2017) compared the text types used to measure reading skills in PISA with the text types in the Turkish curriculums. Granting to the data obtained, it was determined that the texts in the curriculums are less encountered less in daily life and do not include the text types in information communication technologies. Thus, to overcome this deficiency, it can be said that the text types referred to in the curriculum and taken into the course books should be updated and the passages related to daily life should be included.

The inverted sentence structure (n: 1), the long sentence structure (n: 2), the intensity of unknown words (n: 2) are some of the problems Turkish language teachers and elementary school teachers face in the process of comprehending the text type and structure. In a survey conducted by İskender and Yiğit (2015) with a group of middle school students [20 students (4 boys, 16 girls)], the participants also mentioned the length of the text and sentences, the overturned and mixed sentences and the intensity of unknown words among the reasons make the passage difficult to understand. Thus, there may be an overlap between the results talked in the study conducted with students and the results of this study based on teacher views.

REFERENCES


Arı, G. (2011). Türkçe (6, 7, 8. sınıf) ders kitaplarındaki okuma ve dinleme/izleme metinleri ile yazma görevleri arasındaki tür uyumu [The genre consistency between the reading and listening/viewing texts and writing tasks in Turkish (6th, 7th, and 8th grades) course books]. *Turkish Studies, 6*(3), 489-511.


Instructor Views on Technology Use and Coding Training

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Abstract

With the inclusion of the Information Technology and Software course in elementary and middle school curricula in Turkey, the Ministry of National Education has started to offer Technology Use and Coding courses. In this study, opinions of 12 instructors who taught Technology Use and Coding courses were consulted. The study aimed to determine the level of comprehension of the trainees through the evaluation of in-service training. The study was conducted as a case study, one of the qualitative research designs, and the data were collected using a semi-structured interview form. The data were analyzed using the MaxQDA 2020 software. As a result, it was determined that the trainees who attended the courses voluntarily were more willing to learn. The trainees who voluntarily attended these courses stated that they preferred these courses due to the popularity of coding training. While the duration of the course was found to be sufficient, it was determined that offering the courses after work hours caused a decrease in the motivation of the trainees. Inconvenience of training centers, lack of educational materials and insufficient number of instructors were stated as problems encountered in courses. It was observed that the attendees of the course liked the algorithm and block-based coding subjects, and that the instructors did not give enough importance to the subject of coding without computers.

Keywords: In-Service Training, Algorithm, Coding Without Computers, Block-Based Coding, Robotic Coding

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INTRODUCTION

When we look at the list of the largest companies today, it is seen that the majority of the top ten companies are those that produce technology and software. This reveals the importance of digital technologies and software in the development of countries and their economies and shows that countries investing in this field will have a voice in the world in the future. Countries that produce technology will survive unlike those that are consumers. Countries have begun to integrate software, programming, and robotic coding into their curricula to invest in their future. In the United States of America, coding has been included in the curriculum in 24 states at the middle school level (Öymen, 2014). England started to provide coding education to students between the ages of 5-16 in elementary and middle schools in 2014 (European Schoolnet, 2015). The European Union (EU) declared 2013 as the year of software drawing the attention of the member countries to coding education, and in 2014, it was integrated into the curriculum of K-12 schools in 16 member countries (European Schoolnet, 2015). In the education reform implemented in Finland between 2012 and 2014, informatics competency of students was included in 1st – 2nd grades, and coding and programming was included starting from the 3rd grade, (Kwon & Schroderus, 2017). Coding education in China started in 2017, and artificial intelligence subjects were included in curricula of elementary and middle school levels in 2019 (Chunying, 2019). South Korea is trying to make software courses a part of the curriculum in elementary, middle, and high school levels with the education reform initiated in 2015 (Kwon & Schroderus, 2017).

Coding, which many countries try to integrate into their education systems around the world, is a tool for students to adopt a problem-solving approach with the thinking techniques they have acquired in programming rather than being expert programmers (Seğmen, 2017), and plays a fundamental role in the development of technology literacy (Lau & Yuen, 2011). Coding, which is the heart of digital technologies, is the act of writing codes and creating programs, and the ability to understand the world and its structures (Dufva & Dufva (2016). Programming is one way of thinking and turning thoughts into a product (Sayginer & Tüzün, 2017).

Programming skills are not only related to informatics, but also support the skills such as creativity, collaboration, awareness and critical thinking that individuals should have in the 21st century (Howard, 2002), and provides problem solving and engineering skills that emerge with the combination of science, mathematics and technology (Gura,2012). PISA (Program for International Student Assessment) exams, which are implemented in 70 countries around the world, are conducted in three areas, namely reading skills, mathematical literacy and science literacy, and it is considered to add a fourth area that is algorithmic thinking (computational thinking) skills, which are the basis of programming and coding, in 2021 (PISA, 2021).

The increasing importance of coding and software in Turkey as well as around world have also increased the demand for trained manpower in this field. Efforts are made in Turkey as well as around the world to make students like coding and get them started in this process at an earlier age (Karabakan & Sun, 2013). In 2017, the Turkish Ministry of National Education (MoNE) published the 2023 Vision Document which includes strategies to be implemented for the next five years. This document emphasizes the importance of digital learning materials that teachers need to develop, and states that it is planned to include 3D design, electronics and coding in the learning processes of IT production in order to improve the information production skills of teachers and students (MEB, 2017). For this purpose, MoNE included the Information Technologies and Software Course in middle schools as a mandatory course in 5th and 6th grades and as an elective course in 7th and 8th grades in 2018 and published the education program. In primary schools, the Information Technologies and Software course was included in the curriculum for 1st – 4th grades starting in the 2018-2019 academic year (Gökbulut, 2019).

While basic computer programming education is usually provided in vocational high schools, vocational schools, and engineering departments in Turkey, it has become more common with its
inclusion in high school and elementary school curricula (Seğmen, 2017). Programming education at the elementary and middle school level is provided by information technology teachers (Mazman, 2013). With the inclusion of Information Technologies and Software course in the curricula of 1st – 4th grades, these courses are planned to be taught by classroom teachers, not by information technologies teachers. Teachers need professional support to follow new technologies and integrate them into their classrooms (Top, Baser, Akkus, Akayoglu, & Gurer, 2020; Williams, 2017) because the levels of Information Communication Technologies (ICT) education that teachers receive during their university years are quite low (Gudmundsdottir & Hatlevik, 2018; Türker & Pala, 2018). Even if the education they received during their university years is sufficient, considering the rapid changes in information technologies, teachers should be given the opportunity to improve themselves through in-service training for information communication technologies and coding (Türker & Pala, 2018). Planning ICT activities and dedicating extra time on solving possible technical problems increase teachers' workload and at the same time, teachers need both technological and administrative support when using technological devices and platforms (Top, Baser, Akkus, Akayoglu, & Gurer, 2020). Training on basic computer use were offered to teachers by the Ministry of National Education, and courses such as coding and programming were planned for IT teachers or vocational teachers working in technical schools. In the last few years, MoNE has started to provide in-service training on "Basic Coding and Technology Use" to teachers working in elementary, middle, and high schools (Gökbulut, 2019). Although teachers attend these courses, their competence levels in providing coding training to students vary. Teachers' negative beliefs and attitudes towards technology can negatively affect technology integration into classroom environments (Top, Baser, Akkus, Akayoglu, & Gurer, 2020). There is a bi-directional relationship between teachers' use of technology and their pedagogical beliefs (Tondeur, Van Braak, Ertmer & Ottenbreit-Leftwich, 2017). Although coding is offered to elementary school teachers in China, it was observed that teachers were not sufficient in providing this education to students (LaLonde, 2019). The technology-based courses provided may not always be sufficient to achieve technology integration (Top, Baser, Akkus, Akayoglu, & Gurer, 2020). Therefore, it is very important to train teachers who will teach computational thinking to students (Göncü, Çetin, & Ercan, 2018). While most of the teachers participating in coding training consider themselves incompetent in providing coding education, very few consider themselves competent at a basic level (Türker & Pala, 2018).

Robotic coding, which started worldwide in 2013-2014, has started in Turkey in 2018 for elementary and middle school teachers through a Ministry-based standard education program provided by the General Directorate of Teacher Training and Education as in-service training. Today, while the competency levels of teachers in ICT vary, to what extent coding training, which requires a higher level of knowledge and readiness, achieves its purpose is questionable. At this point, the opinions of the instructors who provide coding training are very important. For this reason, revealing the levels of coding training, which were opened and have been offered by the ministry for several years, the difficulties encountered in teaching the courses, and to what extent these courses achieve the goals will contribute to the literature.

In this study, answers to the following questions were sought by obtaining the views of Information Technologies instructors on the level of education received by the teachers who attended the Technology Use and Coding courses offered by the Ministry of National Education.

- What are the opinions of instructors on the Technology Use and Coding Training?
- What are the opinions of instructors on the content of the Technology Use and Coding Training?

**METHOD**

In this qualitative study, a "case study" approach was used to reveal the status of the Technology Use and Coding course that elementary and middle school teachers attended. Case studies
are in-depth studies that are concerned with individuals, events and processes as a whole, using multiple data collection sources (interviews, observations, documents, reports) over a period of time (Creswell & Plano Clark, 2007; Yıldırım & Şimşek, 2011; Yin, 1984). In this study, the aim is not to make a generalization on the sample, but to investigate the existing situation in depth.

Participants

12 Information Technologies instructors working in different regions and schools in Turkey and teaching Technology Use and Coding courses to teachers participated in this study. A purposeful sampling method was used in the study. Purposeful sampling is a method that allows for in-depth study of situations that are thought to have rich information (Patton, 1987). By using the maximum variation method together with the purposeful sampling, the diversity of the participants in the study was maximized (Yıldırım & Şimşek, 2011). In maximizing the diversity, 12 instructors who teach Technology Use and Coding were selected from different regions and different schools of Turkey to participate in the study. The purpose here is to reveal the situations that may arise from regional and school differences. One of the teachers participating in the study works at a high school, nine work at a middle school, one in the Science and Art Center, and one works as an instructor in the Fatih Project at the Provincial Directorate of National Education. Instructors participating in the study were coded as I1, I2, I3… I12 and their demographic information is given in Figure 1.

As shown in Figure 1, 9 of the instructors are male and 3 are female. When their years of experience is examined, it is seen that there is one teacher who’s been a teacher for 1-5 years, 3 teachers between 6-10 years, 4 teachers between 11-15 years and 4 teachers over 16 years. In terms of the level of education, it is seen that the number of teachers with a master’s degree is 4 and the number of teachers with an undergraduate degree is 8.

Data Collection Tools

The data were collected through interviews. Interview is a very powerful method in revealing individuals’ opinions, experiences, and feelings, and is a method based on speech which is the most
common form of communication (Yıldırım & Şimşek, 2011). With an interview form, the researcher can make comparisons with the scope of the research by asking the questions prepared prior to the interview, by having the freedom to ask additional questions in order to get more detailed information, and by analyzing the data faster (Büyüköztürk, Çakmak, Akgün, Karadeniz & Demirel, 2012; Türnüklü, 2000; Yıldırım & Şimşek, 2011). In the study, the interview method was preferred to determine the opinions, experiences, and feelings of the instructors who teach the in-service training on robotic coding. A semi-structured interview form was prepared before the interviews were held. While preparing the interview form and the questions, alternative probe questions should be included and questions that are leading following a logical sequence should be avoided (Yıldırım & Şimşek, 2011).

During the preparation of the interview questions, the content of the course was reviewed, and the questions were prepared with an Information Technologies instructor teaching the Technology Use and Coding course. Expert opinion of an academician working in the field of educational sciences was consulted regarding the academic appropriateness of the prepared questions. The questions were redesigned in line with the expert opinion. The questions were reviewed by a Turkish Language and Literature teacher working at a high school in terms of Turkish grammar compatibility. In developing the questions, close-ended, Yes/No questions were avoided and instead open-ended questions that would reflect the honest opinions of the participants were used. In addition, as the teachers were responding to the questions, alternative questions were created in order for them to better understand the questions according to the flow of the interview, and probe questions to obtain in-depth responses were developed. With these questions, a pilot study was conducted with an Information Technologies instructor who teach the Technology Usage and Coding Course, estimated time calculations were made and a consensus was reached that the questions could be understood. The questions developed are listed below.

1- What are the opinions of the instructors on the Technology Use and Coding Training?
   a- What are the differences in attitudes towards training among the trainees (on an official assignment or voluntary basis)?
   b- What do you think the reasons are for trainees to attend these courses?
   c- Is the duration of the training sufficient? Why?
   d- Was the planned start time for the training appropriate for you? Why?
   e- What are the factors that affect the motivation of the attendees?
   f- Was the learning environment and material support of the training sufficient? Why?

2- What are the opinions of instructors on the content of the Technology Use and Coding Training?
   a- What are the comprehension levels of teachers attending the course in terms of the in-service training content?
   b- Did they comprehend the logic of algorithm development? Can they provide training on this content in their schools? Why?
   c- Did they comprehend the coding without computers education? Can they provide training on this content in their schools? Why?
   d- Did they comprehend block-based coding education? Can they provide training on this content in their schools? Why?
   e- Can they develop projects with coding content? Why?
f- Can they help their students to acquire problem-solving, questioning, and higher-level thinking skills? Why?

**Data Collection Process**

Data in the study were collected between February 24 and March 13, 2020 using a semi-structured interview form. During the data collection phase, the data were obtained by interviewing 6 teachers in their schools and by talking to the other 6 teachers on the phone. Both face-to-face and phone interviews were recorded using the recording feature of mobile phones. The shortest interview was 14.47 minute-long and the longest interview was 34.40 minutes. The average duration of the interviews was calculated as 20.93 minutes. Before the interview, the instructors were informed about the purpose of the interview and their consent were obtained. Participants were selected on a voluntary basis, and potential concerns were addressed by giving the information that their names will not be used and kept confidential, except for some demographic characteristics (such as gender, seniority). The participants were informed that the interviews will be recorded. The questions used in the study were asked separately. The participants were given as much time as needed to respond to the questions.

**Data Sources and Analysis**

In qualitative research, the preparation and organization of data consist of coding, developing themes by creating links between codes, interpreting, and presenting the findings as a discussion (Creswell, 2013). The codes generated from the organized data usually consist of a word or short expressions that symbolically summarize some of the language-based or visual data, that attract attention, and capture the essence (Saldana, 2016). After the theme and codes are created, the data are interpreted. In interpreting the data, direct quotations from the participants are frequently used, cause-effect relationships are established, and themes are made more meaningful (Yıldırım & Şimşek, 2011).

In the study, a descriptive analysis was completed by transforming the audio recordings of the Basic Coding and Technology Use course instructors into written texts. The data were processed according to the thematic framework and arranged in a meaningful and logical manner. The data deemed insignificant were not included in the study. In defining the data, attention has been paid to make it readable and understandable. Codes were created according to the determined themes, and interpretations were made in accordance with the purpose of the study. The data were analyzed using the MaxQDA 2020 qualitative data analysis program.

**Ensuring Validity and Reliability**

In research, it is very important to represent the facts correctly, to be consistent, objective, impartial, and to ensure validity and reliability (Yıldırım & Şimşek, 2011). The steps taken to ensure validity and reliability in the study are given in Table 1.

**Table 1. Validity and Reliability Methods**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Methods Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Validity</td>
<td>Credibility</td>
</tr>
<tr>
<td></td>
<td>Expert review</td>
</tr>
<tr>
<td></td>
<td>Member check</td>
</tr>
<tr>
<td></td>
<td>Transferability</td>
</tr>
<tr>
<td></td>
<td>Detailed description</td>
</tr>
<tr>
<td></td>
<td>Purposeful sampling</td>
</tr>
<tr>
<td>Reliability</td>
<td>Consistency</td>
</tr>
<tr>
<td></td>
<td>Consistency review</td>
</tr>
<tr>
<td></td>
<td>Confirmability</td>
</tr>
<tr>
<td></td>
<td>Confirmation review</td>
</tr>
</tbody>
</table>

As a result of the interviews conducted in the study, a framework was developed, and the decision was made on the themes. The data were coded separately by two people, one academician
and one coding instructor to determine the themes. Afterwards, the codes of consensus and the codes of disagreement were identified, and the appropriateness rate was determined. In identifying the rate, Miles&Huberman’s (1994) reliability formula was used (Reliability formula: Consensus/ (Consensus+Disagreement) x 100). The result of the calculation showed a rate that is over 90%. If the rate is above 90%, it is at an acceptable level to ensure reliability (Saban, 2008). According to this result, it was seen that similar results were obtained in the analysis of the researchers, and it can be said that the study is reliable.

One of the most important criteria in research is the credibility of the study results (Başkale, 2016). For validity and credibility of the study, the complete study and the data obtained were sent to an academician working in the field of educational sciences to get an expert review. Findings in the dimension of credibility were sent to the instructors who participated in the study for member checking and confirmation was obtained on how much their responses in the interview overlapped with the findings. In order to ensure validity in the dimension of transferability, direct quotations in which participants’ expressions are reflected are included in the findings section. Using purposeful sampling method in terms of transferability, teachers, who work as instructors in the Technology Use and Coding Courses, from different regions and schools in Turkey were included in the study. In qualitative studies, audio recordings to transcribe the opinions of the participants in writing increases the reliability. Use of the data source by more than one researcher in obtaining a complete and accurate recording of the data will increase the reliability of the results (Büyüköztürk et al., 2012). In the reliability dimension of the study conducted, interviews were recorded digitally. These recordings in digital environment are kept for confirmation review.

**FINDINGS**

In the study, the findings obtained by analyzing the opinions of the teachers who are the instructors in the Technology Usage and Coding course opened within the scope of the MEB in-service training activities are presented.

*What are the opinions of instructors of the Technology Use and Coding Training?*

MAX Maps codes under the In-Service Evaluation theme of information technology teachers who are instructors in the Technology Usage and Coding Course organized within the scope of MEB in-service training activities are given in Figure 2.

![Figure 2. MAX Maps codes of the In-Service Evaluation theme](image-url)
Seven codes were created under the In-Service Evaluation theme. These codes included the selection of participants, reasons for training preference, training duration, time of the training, management attitude, lack of material and number of instructors. Information on the participants from which these codes were obtained is given in Table 2.

Table 2. Codes related to the In-Service Evaluation theme

<table>
<thead>
<tr>
<th>Codes</th>
<th>Participant Code (n=12)</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant selection</td>
<td>I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, I11, I12</td>
<td>12</td>
<td>100.0</td>
</tr>
<tr>
<td>Reason for training preference</td>
<td>I1, I2, I3, I4, I7, I12</td>
<td>6</td>
<td>50.0</td>
</tr>
<tr>
<td>Training duration</td>
<td>I1, I3, I5, I6, I7, I8, I10, I11</td>
<td>8</td>
<td>66.6</td>
</tr>
<tr>
<td>Training time</td>
<td>I1, I2, I3, I4, I5, I6, I7, I8, I9, I10, I11, I12</td>
<td>12</td>
<td>100.0</td>
</tr>
<tr>
<td>Attitude of management</td>
<td>I1, I2</td>
<td>2</td>
<td>1.6</td>
</tr>
<tr>
<td>Material support</td>
<td>I2, I3, I4, I5, I6, I7, I9, I11, I12</td>
<td>9</td>
<td>75.0</td>
</tr>
<tr>
<td>Number of instructors</td>
<td>I5</td>
<td>1</td>
<td>0.8</td>
</tr>
</tbody>
</table>

According to Table 2, all the instructors expressed similar opinions about the attitudes of the trainees based on the way they were enrolled in the in-service course. Attendees who were required to attend the training were unwilling to attend while those who volunteered were quite eager towards the training. Instructors shared their opinions on those who voluntarily attended the training: I4 stated “…they want to start a course in their school, that’s why their attitude was good,” I5 stated, “…those who attended voluntarily were curious and making efforts but those who were required to attend were not that engaged,” while I9 shared, “…my lessons with the teachers who voluntarily attended were very enjoyable and productive.” In terms of those who were required to attend the training, the instructors shared: I5, “…there were those who were in the mood to get it over with and sign the attendance sheet. However, after the training, there were some who changed their minds about the training. There were those who did not have this change as well.” I6 shared, “…there were many who were told to attend; in general, they viewed it as something merely to endure. There were complaints such as, how will this training benefit us? I can’t understand this,” while I9 shared, “…It was not enjoyable, and I don’t think it was beneficial either. The teachers were complaining by saying ‘it’s late, when will we go home?’ Most of them wasted their time.”

In terms of the reasons why trainees preferred the Technology Use and Coding training, the instructors shared that they preferred it out of curiosity and that it’s a popular subject, and that teachers who are new in the profession were more willing compared to the senior teachers. I3 stated, “…they attend because coding is popular on social media platforms. However, when they encounter difficult subjects, they don’t want to come.” I12 shared, “…while some attend the training for personal development, others attend to teach their kids about coding” while I7 stated, “…young teachers are more willing to attend the courses. Teachers who are close to retiring are more reluctant.”

66.66% of the instructors stated that the 30-hour course duration was sufficient for Technology Use and Coding Training. In relation to this, I8 stated “…if the training is provided thoroughly, 30 hours is sufficient,” while I10 stated, “…the duration of training was appropriate. For example, if it were a 10-day training, it would be boring. The training provided by public education centers is very long, but in-service trainings are appropriate.”

The instructors participating in the study stated that the Technology Use and Coding trainings were held during the week after school hours of the teacher. Almost all the instructors stated that the time of the courses were not suitable and that the trainees attended the training with a low motivation. In relation to this aspect, I2 stated that “…teachers are tired after work hours which decreases motivation,” while I3 stated “…when they come to class, they are tired, and as the course is after work hours, they do not find the opportunity to practice.” I4 shared, “…such courses should be offered when there’s no school.” I6 stated, “…when they are tired at the end of the day and their spouses and kids are waiting for them at home or when they have other daily commitments to attend to, it is difficult for them to focus on the lesson. And thus, their motivation is low, and they have difficulty in
understanding.” I7 shared, “…I think the reason why teachers are not willing is that the courses are offered after work hours. If these courses are offered during seminar periods, it would be better. Teachers that are tired are unwilling to engage.”

Two instructors who participated in the study stated that school administrators created problems for teachers regarding their attendance to the training. One of these instructors, I2, shared their opinion by saying, “…some of the trainees can’t attend the training because their school principals cause problems. Attendance to these trainings should not be left to the initiative of the school principal.”

75% of the instructors participating in the study shared their views on the learning environment of the Technology Use and Coding training and the lack of materials. In this regard, I6 said “… Necessary material support should be provided during these trainings. For example, training with Microbit is required. However, if the school or the instructor does not have the materials, then there may be a problem.”

Another point emphasized in the study is that the Technology Usage and Coding Training is an applied course, that one instructor is not sufficient during the trainings, and the fact that while one instructor explains the subject and the other instructor makes the trainees practice will affect the quality of the education positively. In relation to this, I5 shared their opinion by saying, “…when there is more than one instructor in the training, it’s more beneficial. Then, the trainees can receive one-on-one attention.”

**What are the comprehension levels of the participants in the Technology Usage and Coding Training?**

The MAX Maps codes developed under the Training Content theme about the comprehension levels of teachers on the educational are provided in Figure 3.

![MAX Maps codes related to the Training Content theme](image-url)
As shown in Figure 3, there are five codes under the training content theme which are algorithm, coding without computers, block-based coding, project development and high-level thinking skills. These codes are presented in Table 3 with the sub-codes of participant codes.

Table 3. Codes related to the training content theme

<table>
<thead>
<tr>
<th>Codes</th>
<th>Participant codes (n=12)</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithm</td>
<td>Sufficient</td>
<td>I3, I4, I6, I5, I7, I11, I12</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Insufficient</td>
<td>I8, I9</td>
<td>2</td>
</tr>
<tr>
<td>Coding without computers</td>
<td>Sufficient</td>
<td>I3, I7, I8, I10, I11, I12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Insufficient</td>
<td>I2, I3, I5, I8</td>
<td>4</td>
</tr>
<tr>
<td>Block-based coding</td>
<td>Sufficient</td>
<td>I1, I4, I5, I6, I7, I8, I9, I10, I11, I12</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Insufficient</td>
<td>I2, I3</td>
<td>2</td>
</tr>
<tr>
<td>Project development</td>
<td>Can develop</td>
<td>I1, I2, I3, I4, I5, I6, I8, I10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Can’t develop</td>
<td>I7, I9, I11</td>
<td>3</td>
</tr>
<tr>
<td>High-level thinking skills</td>
<td>Can be acquired</td>
<td>I1, I2, I4, I5, I7, I8, I10, I11, I12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Can’t be acquired</td>
<td>I3, I6</td>
<td>2</td>
</tr>
</tbody>
</table>

58% of the course instructors stated that the trainees have comprehended the subject of algorithm and that they are at a level to provide these trainings in their schools. One of the instructors, I4 stated, “…If the teachers attending the course can improve themselves more, it would be beneficial for them. However, if they stop using what they learn, they can’t educate others. It’s similar to learning a foreign language where if it is not practiced for six months, the person will forget all the information.” Other instructors shared their opinions as well: I5 stated, “…they can teach because the foundation is algorithm. The foundation of their disciplines is based on algorithm as well,” while I7 shared, “…algorithm is very important for the student. We are using algorithm in our daily lives, so teachers can teach it.” I9 said, “…this overlaps with subjects such as problem solving, establishing logic in their fields. They can easily teach algorithm,” and similarly I11 expressed their opinion: “…of course they can teach. Particularly in math and science courses there is algorithm. I saw it clearly in classroom teachers particularly. The teacher does not know what algorithm is but in training, they understand that algorithm is in every aspect in life.” 16.6% of the course instructors stated that the trainees who attended the training did not grasp the algorithm content and could not provide these trainings in their schools. I8 stated, “…they get stuck in algorithm. They say they are having difficulties and they can’t make the time for it,” while I9 shared, “…half of the attendees were not interested and I don’t think they can understand and teach algorithm.”

50% of the instructors who provided in-service training stated that the teachers who attended the training grasped the subject of coding without computers, and that they could teach it in their schools. As a justification for this, I8 shared, “…they can teach it when they are provided with the logic of coding without computers and multiple practice activities,” while I11 stated, “…there was an activity related to bees and honey. We developed an activity for children using colored print outs. We explained the content by having them do coding activities such as ‘take the flowers numbered one and two, turn right, then turn left.’”

25% of the instructors who provided in-service training stated that the teachers who attended the course did not grasp the subject of coding without computers, and that they could not provide coding without computers training in their schools. They expanded on this by saying, “…they can’t teach it because there is no such outcome in their curriculum (I2)” whole I5 stated, “… it is not possible at the secondary level education but it is possible at the elementary level education,” and I12 shared, “…I don’t teach these in my trainings. I don’t think teachers can do it efficiently as their research and computer skills are low.” Approximately 20% of the instructors stated that the coding without computers is included in the course curriculum, but they do not offer it during the training. They explained the reasons for this as “…we did not cover coding without computers; it is totally up to the teacher (I1),” or as I6 stated, “…I don’t cover coding without computers in their training. I believe it is completely related to personal interest.”
83% of the instructors indicated that the teachers who attended the training have grasped the block-based coding content and that they are at a level where they can teach in their schools. I4 stated, “…block-coding is easy to learn and teach,” I5 shared, “…this training is easy in terms of interface and use,” while I10 expressed that teachers “…like block-based coding and they are eager to learn.”

66.6% of the instructors stated that teachers who attended the training could develop projects related to coding. I1 stated, “…we introduced the fundamental topics and opened the door for them. If they continue to improve themselves, they can develop new projects,” while I3 shared, “…if they make the time and integrate it to the courses they teach, they can develop projects.”

25% of the instructors stated that teachers who attended the course cannot produce projects with coding content. I7 expanded on it by saying, “…I don’t think they can teach it at an advanced level” and I12 stated, “…I have never met a teacher who said ‘I took this course for a certain period of time and I developed this.’”

74.7% of the instructors stated that the teachers who attended the course had reached a level where they could help their students gain high-level thinking skills. I1 shared, “…we don’t provide training for a single field. We also provide its equivalent in life. STEM education should be integrated in this training,” while I5 stated, “…these characteristics are integrated into their own courses.” I6 shared, ‘…if they can use the coding information in their own disciplines, then they can teach high-level thinking skills,” and I7 stated, “…problem solving is not only related to coding. Better examples should be found related to problem-solving phases. They can have children engage in such activities.” I8 expressed that, “…regardless of the coding content, courses are taught in a way that help students gain these skills,” while I11 said, “…children can find solutions to problems through high-level thinking after they learn algorithm and by doing some analysis and some synthesis.”

24% of the instructors who provide in-service training stated that the trainees cannot help their students gain high-level thinking skills with the training they received. They explained the reasons by saying, “…I don’t think they can teach high-level thinking skills by only using coding (I6)” and “…they can do some parts of problem-solving. However, it is difficult to grasp high-level skills (I7).”

**RESULT, DISCUSSION, AND SUGGESTIONS**

In the study, the opinions of the instructors of the Technology Use and Coding Training organized by the Ministry of National Education were consulted on in-service training and the content of the training. In the analysis of the data obtained, two main themes emerged: Service Evaluation and Training Content.

*What are the opinions of the instructors on the Technology Usage and Coding Training?*

In the analysis of the data obtained from the instructors whose opinions were consulted about the general in-service training, codes related to the selection of the participants, the reasons for attending the training, training duration, time of the training, attitudes of management, material support and the number of instructors were obtained.

In the Ministry of National Education, teachers attend in-service training by applying themselves. In some cases, teachers are required by MoNE to attend in-service training without being asked for their preference. According to the findings obtained in the study, some of the trainees in the Technology Usage and Coding training attended voluntarily while some were required to attend. It was observed that the trainees, who were required to the coding training, were generally resistant to the training, and viewed it as something merely to endure. It was observed that the trainees who attended the in-service training voluntarily showed a more enthusiastic, open, and positive attitude towards learning. Attitudes can cause emotions that affect behavior (Marzano et al., 1988). Sometimes, personnel for whom the training is not relevant are sent to in-service trainings which
causes significant problems in the perceptions and attitudes of the trainees about self-improvement (MEB, 2010). Professional development programs designed to provide teachers with various knowledge, skills, experiences, and thoughts are expected to positively change teachers' attitudes and beliefs (Guskey, 2002; Yaman & Tekin, 2010). If the trainees do not develop positive attitudes towards in-service training, the training will also be negatively affected (Yaman & Tekin, 2010). Teachers who attend the trainings involuntarily have an attitude that is closed to learning which negatively affects the learning environment as well as their own learning (Durmuşoğlu, 2020). For a training to be effective and successful, people who will participate in the training must develop a positive attitude towards the training (Sütay, 2019). When the trainees are included in-service training involuntarily, they may exhibit more negative attitudes and behaviors than those who attend the course voluntarily. For this reason, including voluntary people in in-service trainings as much as possible, and avoiding requirement people may contribute to the quality of in-service trainings.

The instructors stated that the reason why trainees preferred to attend the training was because of the popularity of Technology Use and Coding. In addition, young teachers with less seniority among the trainees are more eager to attend training than those with more professional seniority. Coding education, which is very popular in Turkey as well as in the entire world, has become a subject that interests not only students but also teachers. The reason why young teachers are more enthusiastic in their training may be due to their early encounters with technology.

The instructors stated that the 30-hour training period determined for the Technology Use and Coding in-service training was sufficient, and it could be boring if it was longer. Gültepe (2018) states that the duration of coding training is insufficient. Regarding the time of the in-service trainings, the instructors stated that the training are held after school hours. They stated that the trainees were unwilling and tired and their motivation was low in the training held after school hours. It can be said that teachers who attend classes at school and participate in in-service training activities with the fatigue of the day have low motivation towards learning. In terms of the negative attitudes of teachers, organizing in-service training during seminar periods or summer holiday periods may increase motivation towards learning.

As another problem experienced in Technology Use and Coding training, the instructors stated that there were school administrators who created difficulties for teachers participating in the trainings. By offering in-service training for school administrators, administrators can be informed about the content and applications of in-service trainings which may cause them to have a positive attitude (Özer, 2004). It is very important for school administrators to actively participate in trainings, to plan trainings for them and to set an example for teachers (Bümen, Alev, Çakar, Gonca, & Veli, 2012). The support, encouragement, and exemplary behaviors received from school administrators can increase the motivation and desire to learn of the teacher who will participate in in-service training. Then, the teacher, who knows that the school administrator encourages them rather than preventing from attending the training, can make an effort to contribute to the development of students, colleagues and the school with the knowledge, skills and experiences they acquire in-service training.

Instructors identified the learning environments not being suitable and the lack of materials as the problems encountered in the Technology Use and Coding training. Problems arising from lack of equipment and learning environments are experienced in in-service training organized (Gökbulut, 2006; Usta & Güntepe, 2019). Learning environments should be arranged and necessary materials should be prepared prior to the trainings. Lack of materials and equipment, especially in applied trainings, may cause inefficiency of the courses organized.

Another finding of the study is that the number of instructors in Technology Use and Coding training is insufficient. In applied trainings, while one of the instructors explains the subject, the other instructor can have trainees practice which would contribute to better comprehension of the topics. The number of instructors is determined by forming groups based on the number of students in applied workshops and vocational courses in vocational high schools. Especially in in-service trainings, which
are applied, the number of instructors can be determined according to the number of trainees and one trainer can teach the content while the other instructor has trainees engage in practice.

**What are the comprehension levels of the participants in the Technology Use and Coding Training?**

In the analysis of the data obtained from the instructors on whether the content of the Technology Use and Coding training was comprehended, codes related to the selection of the participants, the reasons for attending the training, training duration, time of the training, attitudes of management and material support were developed.

58% of the course instructors stated that the trainees who attended the course understood the subject of algorithm and that they could provide these trainings in their schools, while 16.6% stated that the trainees who attended the course did not understand the subject of algorithm and that they could not offer these trainings in their schools. In order for students to have a good programming logic, teachers should fully compose the algorithm logic in their students (Usta & Güntepe, 2019). The student or any individual's comprehension of the logic of the algorithm contributes to the development of problem-solving, logical thinking, viewing from different angles and questioning skills (Saygıner & Tüzün, 2017). If students cannot develop the algorithm logic, they may experience difficulties in programming education (Usta & Güntepe, 2019). Therefore, it is very important for teachers who will teach algorithm logic to students to understand algorithm logic in achieving the purpose of coding education.

50% of the instructors who provided in-service training stated that the teachers who attended the course comprehended the subject of coding without computers and could provide this training in their schools. 25% of the instructors stated that the teachers who attended the course did not understand the subject of coding without computers and that they could not teach it in their schools. Some of the instructors who stated this view have the opinion that the coding without computers training is suitable for elementary school level, while it is not appropriate for middle school level. Some instructors stated that they never explained the subject of coding without computers during the course and this is related to personal interest. Providing activities on coding without computers as an introduction causes students to increase their motivation to learn coding and contribute to their acquisition of necessary knowledge and skills (Akçay, Karahan, & Türk, 2019). Lack of sufficient content, information, and examples of coding causes students to perceive coding as just moving the game character and limits what they can do (Türker & Pala, 2018). Therefore, giving enough importance to the subject of coding without computers, which is included in the Technology Use and Coding training curriculum, is very important for students studying in schools that do not have computer laboratories and necessary equipment.

Another finding of the study is that the teachers who attended the training understood the block-based coding very easily and practiced it very fondly. Block-based coding provides great convenience especially in teaching abstract concepts (Saygıner & Tüzün, 2017). In order to make programming education common in educational institutions, programming tools that are easy to learn and have visual features should be used in learning environments (Usta & Güntepe, 2019). Block-based coding is presented step by step in visual environments and provides instant feedback (Saygıner & Tüzün, 2018). At the same time, by drawing the attention of students, and contributing to the development of skills such as concretization, algorithm logic, visual intelligence, problem solving, creative thinking, analytical thinking (Usta & Güntepe, 2019), it encourages students to become productive and creative individuals (Saygıner & Tüzün, 2017). It can be said that block-based coding causes both students and teachers to like and easily comprehend coding.

66.6% of the in-service training instructors stated that teachers who attended the training could develop projects related to coding. 25% of the instructors who provided in-service training stated that teachers who attended the training could not develop projects with coding content. Some of the basic
cognitive skills such as problem-solving and analytical thinking required for programming (Holvikivi, 2010) may be developed in some of the trainees and less developed in others. Programming is a challenging education for inexperienced learners of any age (Çınar, Doğan, & Tüzün, 2019). For this reason, while the instructors participating in the study thought that some of the trainees could develop projects related to coding, others might have thought that they would not be able to produce projects with coding content.

74.7% of the in-service training instructors stated that the teachers who attended the training had reached a level where they could help their students gain high-level thinking skills. They stated that coding trainings are not designed for a single field, they address different disciplines, and that trainings can be organized by integrating them with STEM (Science, Technology, Engineering and Math) education. It is seen that 18 countries in Europe include coding training in the primary education curriculum to "support logical thinking skills" and "to support problem solving skills" (Saygün & Tüzün, 2018). It has been determined that these trainings also contribute to the development of metacognitive skills such as visual intelligence, problem-solving, creativity, computational and analytical thinking collaboration (Akçay, Karahan & Türk, 2019; Sayın & Seferoğlu, 2016; Usta & Güntepe, 2019; Yılmaz, 2017 ). With robotics and coding trainings, people practice problem solving skills, and contribute to the development of fine motor skills and hand-eye coordination (Çınar, Doğan, & Tüzün, 2019). Coding can be very effective in providing individuals with STEM education that includes interdisciplinary collaboration and 21st century skills.

This study is a qualitative study limited to the opinions of the instructors who participated in the study. Qualitative and quantitative studies can be conducted with the opinions of the trainees who are trained in this field and the students who receive coding training in schools. Many countries around the world have integrated or are working to integrate coding training into their educational curricula. Studies in which the training contents or training programs provided by countries on coding are compared can be conducted. Studies conducted show that coding training includes skills that 21st century learners should have such as visual intelligence, problem-solving, creativity, computational and analytical thinking, and collaboration. Studies can be conducted to reveal the relationships between coding training and 21st century skills.

REFERENCES


Sütay, E. İ. (2019). Devlet okullarında görev yapan eğitim yöneticilerinin hizmet içi eğitim etkinliklerine ilişkin tutumlarının incelenmesi (İstanbul ili Sultangazi ilçesi örneği). (Yayımlandırmamış yüksek lisans tezi), İstanbul Kültür Üniversitesi, Lisansüstü Eğitim


Intervention for Social Anxiety among University Students with a Solution-Focused Group Counseling Program

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Abstract
The aim of the research is to investigate the effect of a solution-focused group counseling program on reducing social anxiety of university students. The study group consists of 30 (16 female, 14 male) students who volunteered among 224 students who continue their education at Afyon Kocatepe University in the 2019-2020 academic year. The research had a 2x3 mixed pattern with experiment and control groups and pretest, posttest and follow-up measures. The Liebowitz Social Anxiety Scale (LSAS) was used as data collection tool. University students in the experimental group attended a 6-session solution-focused group counseling program about reducing social anxiety, while the control group did not participate in any study. After completing experimental processes, both groups underwent posttest and then follow-up measures at the end of 3 months. Data were analyzed with the two-way analysis of variance technique for mixed patterns. Results revealed that the solution-focused group counseling program was effective in reducing the social anxiety of university students and the efficacy continued during follow-up at the end of three months.

Keywords: Solution-Focused Group Counseling, Social Anxiety, Program, University, Student

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INTRODUCTION

In order for the social beings of humans to maintain an adjusted, balanced and regular life during their whole lives, it is undoubtedly very important not to break social bonds with other people and to maintain relationships. In the youth period, abandoning their original social groups and beginning university life is a habitual life cycle. However, during this period, young people may encounter significant difficulties in terms of adjustment (Deci & Ryan, 2004). Facing many personal and academic difficulties during this process, young people may experience emotional distress during their experiences and this may make the adjustment process even more difficult (Bolsoni-Silva & Loureiro, 2014; Mustafa, Hamdan-Mansour, Hijazeen, Abed, Abdallah, El-Haiaj & Omari, 2014; Wintre & Yaffe, 2000). In addition to these difficulties encountered during university life, young people with less interaction may feel inadequate and remain distant from their social environment (Ateş & Gençdoğan, 2017; Elemo, 2019). This worrying situation for young people is qualified as social anxiety and is defined as “individuals avoiding one or more social situations due to experiencing pronounced forms of fear or anxiety in relation to exposure to possible investigation or negative assessment by others” (American Psychiatric Association, 2013). In other words, it is defined as the tendency of individuals to fear or avoid situations that they think are examined or evaluated by others (Rapee, 1995).

There is a need for increased studies investigating treatment and therapy approaches related to social anxiety problems among young people. In the relevant literature, there are studies investigating efficacy based on psychological counselling approaches to overcome this problem and meta-analyses reviewing these studies. Studies aimed at reducing social anxiety in the literature are generally in the form of group counseling. It has been observed that these studies are based on cognitive-behavioral approach (Aydın, Sütçü Tekinsav & Sorias, 2010; Abeditehrani, Dijk, Toghchi & Arntz, 2020; Fogarty, Hevey & McCarthy, 2019; Mercan, 2007; Tillfors, Andersson, Ekselius, Furmark, Lewenhaupt, Karlsson & Carlbring, 2011), behavioral counseling approach (Beidel, Turner & Morris, 2000) and reality theory (Palancı, 2014). A meta-analysis completed in 2013 revealed that cognitive behavioral psychological counseling, exposure and social skills, supported self-help, unsupported self-help and psychodynamic psychological counseling were effective to cope with social anxiety; however, individual cognitive behavioral psychological counseling was more effective (Mayo-Wilson, Dias, Mavranezouli, Kew, Clark, Ades & Pilling, 2014). Another meta-analysis study stated that exposure, cognitive restructuring techniques and social skills education and a combination of these techniques were effective; however, studies based on cognitive behavioral approaches had higher effect magnitude. This result indicates that the cognitive behavioral approach was effective on social anxiety (Gil, Carrillo & Meca, 2001). In line with this knowledge, it appears that studies about coping with social anxiety problems have focused on cognitive approaches. In terms of coping with social anxiety problems, it appears there are studies based on solution-focused approaches, especially in the international literature (Baijesh, 2015; Elemo, 2019; Esmail, Alireza, Khadije, Esmail & Shima, 2019; George, 2008; Mahdiyar, Dadfarnia, Hadianfard & Rahimi, 2019). However, in the Turkish literature, it can be said that research based on a solution-focused psychological counseling approach to reducing social anxiety is quite inadequate. It is notable as an approach with efficacy in a short duration for this common problem among young people. In this context, the effectiveness of the solution-focused counseling approach as an alternative to other counseling approaches in dealing with social anxiety can also be tested.

Solution-focused counseling approach developed by Steve de Shazer and his team is accepted among counseling approaches in the whole world developed in the last fifty years in America. It is based on rules like “if it isn’t broken, don’t fix it”, “apply functional solution paths” and “don’t insist on trying dysfunctional solution paths, try different solutions”. People focus on solution paths instead of problems and assist in producing targets and solutions as experts in their own lives. Solution-focused counseling is a collaborative process that takes place between 4 and 6 sessions and puts the client at the center. The techniques and basic components of this approach are miracle question, exceptions, scaling questions, praise, homework, emphasizing strong aspects, searching for solutions...
and determining targets (De Shazer, 1985; De Shazer & Berg, 1997; De Jong & Berg, 1998; Doğan, 1999; Kim & Franklin, 2009; Simon & Berg, 1997; Sklare, 1997). In the context of these techniques based on the solution-focused approach, it is significant how the solution-focused approach provides a new dimension as an alternative to other problem-focused approaches for university students coping with social anxiety. It is thought that there is a need for solution-oriented studies and programs that can be used functionally in the field of psychological counseling to intervene in the social anxiety of university students. Additionally, the need for university students to integrate their daily life activities with society in more regular, adjusted and balanced fashion makes this topic important. For these reasons, in this study, it is tried to find answers to the questions about to what extent the program based on the solution-focused group counseling approach will contribute to reducing the social anxiety of university students. Within this target framework, the answer to the following hypothesis was researched:

Hypothesis: When university students in the solution-focused group counseling group and control group are compared, there will be a significant reduction in posttest social anxiety scale points compared to pretest points and this reduction will continue during follow-up measures performed 3 months after the sessions end.

MATERIALS AND METHODS

Research Pattern

This research is a quasi-experimental study using 2 x 3 split-plot factorial (mixed) pattern. The first factor in this pattern is the independent process groups of the experiment and control groups, while the second factor represents the dependent variable of repeated measures at different times of the pretest, posttest and follow-up measurements (Büyüköztürk, 2011). Due to field studies, it is difficult to provide real experimental design conditions, especially to assign randomly to groups. Therefore, quasi-experimental design offers greater flexibility for many applied researches. Quasi-experimental designs involve the manipulation of one or more independent variables as in real experimental designs. Random assignment of study participants is not included. It is as useful as possible in applied research due to both creativity in the use of patterns and appropriate use of statistical processes and controls (Heppener, Wampold, & Kivlighan, 2008). Therefore, quasi-experimental design was preferred in the framework of this research.

Study Group

The study group was selected from volunteer university students who received low scores by completing the "Liebowitz Social Anxiety Scale-Turkish Form (LSAS)" scale tool at Afyon Kocatepe University. The research was completed with a total of 30 university students with 15 in the experiment group and 15 in the control group. The study groups consist of 8 female, 7 male and 15 students.

Data Collection Tools

With the aim of gathering data in the research, “Liebowitz Sosyal Anxiety Scale” was used.

Liebowitz Social Anxiety Scale-Turkish Form (LSAS): Liebowitz Social Anxiety Scale (LSAS) was developed by Heimberg, Horner, Juster, Safren, Brown, Schneier and Liebowitz (1999). This scale, adapted to Turkish by Soykan, Devrimci, Özgüven and Gençöz (2003), was prepared to determine the levels of fear and/or avoidance of individuals in performance situations with social interaction. The scale comprises 24 items with Likert-type responses from 1-4. Inter-assessor reliability of the scale was 0.96, test-repeat test reliability was 0.97 and internal consistency (Cronbach alpha coefficient) was 0.98 (Soykan, Devrimci, Özgüven & Gençöz, 2003).
Procedure

Ethics committee permission was obtained from Afyon Kocatepe University Social and Humanities Scientific Research and Publication Ethics Committee (Date of Decision: 06.02.2020; Meeting: 01; Number of Documents: E.6467). Then the LSAS was applied to 224 volunteer university students attending University with the aim of determining participants. Then, the 224 university students were ranked from lowest to highest for LSAS points. Thirty university studies with high social anxiety points who agreed to participate in the study voluntarily as a result of preliminary interviews provided written consent and were randomly placed in experiment and control groups with the lottery method.

Before beginning sessions, the experiment and control groups had LSAS pretest applied. The independent group t test was performed to determine whether the experiment and control groups were equivalent and there was no significance for the difference between the pretest mean points for social anxiety ($t = 1.05$, $p > .05$) in the groups. In line with this, it may be stated that the experiment and control groups had equivalent social anxiety levels before the implementation. The independent group t test results for pretest social anxiety points of university students in the experiment and control groups are given in Table 1.

Table 1. Independent Group T test Results related to LSAS pretest points

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Ss</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>15</td>
<td>109.33</td>
<td>15.74</td>
<td>1.05</td>
<td>.301</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>104.20</td>
<td>10.39</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ss: Standard deviation, t: t test

Later the experimental group underwent 6 sessions of a solution-focused group counseling program lasting 120 minutes each week. There was no implementation for the control group. After completing sessions, participants in both groups were presented with the LSAS posttest. Three months after the posttest administration, later the same experiment and control groups had the follow-up test applied.

Solution-Focused Group Counseling Program

The general aim of this program was to allow university students to reduce social anxiety with a solution-focused perspective and live in a more-adjusted way. During development of the program, the domestic and international literature was investigated (Ateş & Gençdoğan, 2017; Baijesh, 2015; De Shazer, 1985; Doğan, 1999; Elemo, 2019; Mahdiyar, Dadfarnia, Hadianfard & Rahimi, 2019; Baygül, 2015; Sarı & Günaydın, 2015). This program focuses on small changes and exceptions and includes solution-focused techniques for clients to discover their strong aspects, and assist in searching for solutions and determining targets; to use scaling questions and coping techniques; to ask the miracle question and ensure a positive view of the future; to do homework; to compliment clients; and to encourage clients; in addition to activities like directed dream studies, finding positive stories, discussion and role-play. After the preparation and development stage of the solution-focused group counseling program, pilot applications were completed with a 10-person group to create the program framework. During the pilot study, inadequacies related to the program were identified and revisions were made and the program was made appropriate for the study group. During implementation, care was taken to complete group sessions on the determined date and durations.

The content summary of the solution-focused group counseling program developed in the context of this research is given in Table 2.
Solution-Focused Group Counseling Program

Table 2. Content Of Solution-Focused Counseling Program

<table>
<thead>
<tr>
<th>Session</th>
<th>Number of participants</th>
<th>Duration</th>
<th>Aim</th>
<th>Solution-focused techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st session</td>
<td>15</td>
<td>120 minutes</td>
<td>Opening, group formation, ensuring solution-focused approach and awareness of coping sources</td>
<td>Variation Technique Before Session, Power Sources, Encouragement, Exceptions</td>
</tr>
<tr>
<td>2nd session</td>
<td>15</td>
<td>120 minutes</td>
<td>Ensuring clear determination of achievable aims</td>
<td>Miracle Question Technique</td>
</tr>
<tr>
<td>3rd session</td>
<td>15</td>
<td>120 minutes</td>
<td>Ensuring awareness of power sources and times without problems</td>
<td>Exceptions/Rare Situations Technique, Coping Questions Technique, Imagination Questions Technique</td>
</tr>
<tr>
<td>4th session</td>
<td>15</td>
<td>120 minutes</td>
<td>Ensuring awareness of methods used when coping with problems and times when successfully used</td>
<td>Exceptions/Rare Situations Technique, Coping Questions Technique</td>
</tr>
<tr>
<td>5th session</td>
<td>15</td>
<td>120 minutes</td>
<td>Ensuring an idea about what life will be like when problems are solved in the future</td>
<td>Scaling Questions Technique, Future-Focused Questions Technique, Crystal Ball Technique, Exceptions/Rare Situations Technique, Coping Questions Technique</td>
</tr>
<tr>
<td>6th session</td>
<td>15</td>
<td>120 minutes</td>
<td>Ensuring an assessment of the group process and ending this process</td>
<td>Exception, encouragement</td>
</tr>
</tbody>
</table>

Analysis of Data

Firstly, the distribution graph of data and the Shapiro-Wilks normality test were used to determine whether there were parametric values in the experiment and control groups in the research. Both groups were identified to show normal distribution. Analysis of data in line with this used the two-factor variance analysis technique for mixed patterns. Analysis of data was completed in a computer environment with the SPSS program and analyses assessed significance level at .05 (Büyüköztürk, 2011).

FINDINGS

Before testing the trial in the research, firstly the mean and standard deviations were calculated for points obtained on the LSAS by the experiment and control groups of university students before the implementation, after the implementation and 3 months after the implementation ended. The values are presented in Table 3.

Table 3. Mean and Standard Deviation of LSAS Pretest, Posttest and Follow-up Test Points for Experiment and Control Groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>Pretest Mean</th>
<th>Standard deviation</th>
<th>Posttest Mean</th>
<th>Standard deviation</th>
<th>Follow-up test Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental Group</td>
<td>15</td>
<td>109.33</td>
<td>15.74</td>
<td>62.53</td>
<td>6.09</td>
<td>61.80</td>
<td>5.64</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>104.20</td>
<td>10.39</td>
<td>104.93</td>
<td>10.91</td>
<td>101.66</td>
<td>12.95</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>106.76</td>
<td>13.36</td>
<td>83.73</td>
<td>23.24</td>
<td>81.73</td>
<td>22.52</td>
</tr>
</tbody>
</table>
As observed in Table 3, participants in the experimental group were observed to have lower mean points on the LSAS posttest ($\bar{X}=62.53$) and 3-month follow-up test ($\bar{X}=61.80$) compared to the pretest ($\bar{X}=109.33$).

In terms of testing the trial in the research, the two-factor variance analysis technique for split-plot patterns was used to analyze whether the difference between mean points on the pretest, posttest and follow-up tests were significant or not. The obtained findings are presented in Table 4. The analysis results on Table 4 did not abide by the Mauchly sphericity assumption ($p<0.05$), so analysis results obtained with the Greenhouse-Geisser correction are presented.

Table 4. Variance Analysis Results for Mean LSAS Pretest, Posttest and Follow-up Test Points for Experiment and Control Groups

<table>
<thead>
<tr>
<th>Source of variance</th>
<th>Total squares</th>
<th>Degree of freedom</th>
<th>Mean squares</th>
<th>F</th>
<th>p</th>
<th>$\eta_p^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group</td>
<td>14873.87</td>
<td>29</td>
<td>14873.87</td>
<td>61.29</td>
<td>.000</td>
<td>.686</td>
</tr>
<tr>
<td>Error</td>
<td>6794.57</td>
<td>1</td>
<td>242.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement (Pre-Post- follow-up)</td>
<td>11612.02</td>
<td>1.507</td>
<td>7707.94</td>
<td>102.45</td>
<td>.000</td>
<td>.785</td>
</tr>
<tr>
<td>Group * Measurement</td>
<td>10727.08</td>
<td>1.507</td>
<td>7120.53</td>
<td>94.64</td>
<td>.000</td>
<td>.772</td>
</tr>
<tr>
<td>Error</td>
<td>3173.55</td>
<td>42.182</td>
<td>75.23</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\eta_p^2$: partial eta square, $p < .05$

As seen in Table 4, the results of variance analysis of the points obtained on the LSAS determined the group effect caused significant difference ($F(1,28)= 61.29$, $p<.05$). Stated differently, without differentiating between pretest, posttest and follow-up measures in experimental and control groups, there was a significant level of difference identified in the mean points on the LSAS. Without differentiating the groups, the basic effect of measurement on the difference between mean points obtained from the pretest, posttest and follow-up test completed at different times appears to be significant ($F(1.507,42.182)= 102.45$, $p<.05$). Additionally, when investigating whether the variation between mean pretest, posttest and follow-up test LSAS points were different or not in the experiment and control groups, the group*measure common effect was identified to be significant ($F(1.507,42.182)= 94.64$, $p<.05$). The significant common effect shows the implemented program was effective in reducing the social anxiety of participants in the experiment group. Additionally, the effect of intervention and time was investigated with Wilks’ lambda value and the analysis results are given in Table 5.

Table 5. Liebowitz Social Anxiety Scale (LSAS) repeated measurements Anova results according to Wilks Lamda Statistics

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ $\lambda$</th>
<th>F</th>
<th>Degree of freedom</th>
<th>P</th>
<th>$\eta_p^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement</td>
<td>.176</td>
<td>63.26</td>
<td>2</td>
<td>.000</td>
<td>.82</td>
</tr>
<tr>
<td>Measurement * Groups</td>
<td>.178</td>
<td>62.51</td>
<td>2</td>
<td>.000</td>
<td>.82</td>
</tr>
</tbody>
</table>

Not: Wilks’ $\lambda$: Wilks Lambda Statistics, F: F-test, $\eta_p^2$: partial eta square

As seen in Table 5, when the analysis results are investigated, the LSAS for time had Wilks’ $\lambda=.176$, $F(2,27) = 63.26$; $p<.001$ and appeared to show significant variation. Similarly, the measure*group interaction effect appeared to be similar (Wilks’ $\lambda=.178$, $F(2,27) = 62.51$; $p<.01$). In line with the results, mean values of measures differed between themselves as well as differing between groups. With the aim of determining the source of the difference, the Bonferroni corrected multiple comparison test was performed. The obtained results are presented in Table 6.
Table 6. Two-way Comparison (Bonferroni Correction) Test Results for LSAS Pretest, Posttest and Follow-up Test Points for Experiment and Control Groups

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<tbody>
<tr>
<td>Experimental Group</td>
<td>Pretest</td>
<td>Posttest</td>
<td>46.800*</td>
<td>4.120</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>Follow-up test</td>
<td>47.533*</td>
<td>4.128</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Follow-up test</td>
<td>Posttest</td>
<td>-.733</td>
<td>.636</td>
<td>.805</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pretest</td>
<td>Posttest</td>
<td>-.733</td>
<td>.714</td>
<td>.965</td>
</tr>
<tr>
<td></td>
<td>Pretest</td>
<td>Follow-up test</td>
<td>2.533</td>
<td>2.023</td>
<td>.693</td>
</tr>
<tr>
<td></td>
<td>Follow-up test</td>
<td>Posttest</td>
<td>-3.267</td>
<td>2.514</td>
<td>.644</td>
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</table>

As seen in Table 6, when the analysis results are investigated, the difference in pretest and posttest LSAS points and the difference between the pretest and follow-up test points for the solution-focused group counseling program were higher compared to the control group. Differentiation was not observed between the posttest and follow-up measures in both groups. Results are presented in Figure 1.

![Figure 1](image)

Figure 1. Variation related to Mean LSAS Pretest, Posttest and Follow-up Test Points for Experiment and Control Groups

As seen on Figure 1, the pretests generally had points in relative proximity, while there was a sharp fall on the posttest for the solution-focused group counseling group. Finally, the solution-focused group counseling program can be said to be effective to reduce social anxiety of university students compared to the control group.

DISCUSSION

In this study to reduce the social anxiety of university students, the solution-focused group counseling program was more effective on the Liebowitz Social Anxiety Scale (LSAS) compared to a control group. This efficacy was concluded to continue during follow-up measures completed three months after the sessions ended. This result may be interpreted as showing the solution-focused group counseling program developed in this study was effective to reduce the social anxiety of university students.

This study was conducted to examine the effect of solution-focused group counseling on the social anxiety of university students. At the end of the sessions, the students evaluated this counseling process very positively. They also stated that they reduced their anxiety and fear in social situations compared to the past. The result obtained from this study is consistent with the results on social anxiety disorders based on other psychological counseling approaches other than solution-focused
group counseling (Beidel, Turner & Morris, 2000; Stangier, Heidenreich, Peitz, Lauterbach & Clark, 2003; Nedim-Bal & Öner, 2014; Palanci, 2004; Mörtberg, Karlsson, Fyring & Sundin, 2006; Zaboski, Joyce-Beaulieu, Kranzler, McNama, Gayle & MacInnes, 2019). In this context, it can be stated that the participation of the clients in the counseling process has a positive effect on social anxiety.

As a result of literature review related to social anxiety issues in Turkey, of studies examining the effectiveness of group counseling based on solution-oriented approaches to solutions it was found to be inadequate. This study result supports the result of the study conducted by Ateş and Gençdoğan (2017). It is emphasized by De Shazer (1985) and De Shazer and Berg (1997) that solution-oriented counseling is a powerful therapeutic approach that emphasizes the resources people have and how these resources can be applied to a positive change process. In this context, with solution-oriented counseling, individuals will be able to create ways to achieve positive adaptation by using their resources when they encounter negative conditions. In addition, the result obtained from this study supports the results of psychological counseling with a solution-oriented group conducted abroad to reduce social anxiety (Baijesh, 2015; Elemo, 2019; Esmail, Alireza, Khadije, Esmail & Shima, 2019; George, 2008; Mahdihyar, Dadfarnia, Hadanfard & Rahimi, 2019). In this context, the sessions being based on the solution-focused counseling approach, focusing more on solutions to the participants’ problems, and emphasizing their strong and positive aspects more than their weak points are thought to be effective on the results obtained in this research. In addition to these, it is seen that there are studies in the literature that have determined that psychological counseling with a solution-focused group is effective in dealing with various problems in life (Ateş, 2015; Ateş, 2016; Baratian, Salimi, Moghim, Shakarami, & Davarniya, 2016; Javid, Ahmadi, Mirzai & Atghaie, 2019; Mohseni Takalu, Hosseini & Khankeh, 2017; Roeden, Maaskant & Curfs, 2013; Rose & Ishak, 2019; Sağar, 2020; Sari & Günaydın, 2016). Accordingly, the solution-focused group counseling program may have assisted university students in undergoing significant experiences and variations in terms of reducing social anxiety and discovering coping strategies. By developing resilience to social anxiety, it may have enabled them to organize their daily lives and to explore their power sources in more depth. Their own reorganization and taking action may have contributed to assessments of themselves with a positive perspective and reduced social anxiety.

In conclusion, in this study to reduce the social anxiety of university students, the solution-focused counseling program was revealed to be more effective compared to a control group. However, limiting aspects of the research are that it was completed only with university students, is not longitudinal and only compared with a control group. Additionally, just as group dynamics may have been effective on the program, they may be considered a limiting aspect. Programs to reduce social anxiety based on other psychological counseling approaches may be developed and compared with this solution-focused group counseling program to reduce social anxiety.

REFERENCES


Creating Learning Environments in Preschool Classrooms: Perspectives of Pre-service Preschool Teachers

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Abstract

The aim of the research is to determine pre-service preschool teachers’ views on creating learning environments in preschool classrooms. Qualitative research methods were used in the research. The study group was composed of 35 pre-service preschool teachers. In this study, a semi-structured interview form was chosen as data collection tool. The data of the research was evaluated using content analysis. As a result of the research, pre-service preschool teachers stated that some physical and educational features should be taken into account while creating the learning environment. Pre-service preschool teachers also state that learning centers are the most important elements in the preschool learning environment. Pre-service preschool teachers consider the existence of learning centers to be important in preschool classroom. Also, pre-service preschool teachers stated that there are points to be considered while creating learning centers. In conclusion, pre-service preschool teachers have sufficient information about creating an effective learning environment.

Keywords: Learning Environment, Learning Centers, Early Childhood Education, Pre-service Teachers’ View

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INTRODUCTION

The pre-school period is a very critical for the development of children. In this critical period; the physical, socio-emotional, cognitive and language developments of children are shaped by the quality of their environment and learning experiences. Therefore, preschool education is based on meeting the children's educational needs with rich stimulating environmental opportunities which were suitable for their developmental levels.

A developmentally appropriate learning environment that meets children's developmental needs and capacities has positive effects on children's development (Maxwell, 2007; Sanoff, 1995; Stankovic & Stojic, 2007). In order to reach a quality education level, it is necessary to ensure the healthy growth of children with rich learning experiences and to support their development in all areas (MoNE, 2013). The concept of quality in preschool education services is determined depending on the quality in learning activities, the quality of interactions with teachers, peers, and materials (Pianta et al., 2005; Thomason & La Paro, 2009), physical environment qualities, group size, balance of child-teacher ratio and teacher qualifications (Howes et al., 2008; Thomason & La Paro, 2009; OECD, 2006).

Physical environment and resources, including the features and conditions of space, furniture, tools and materials, have a significant impact in supporting children's development. According to a research study examining the effects of physical environment on children, it is seen that the physical design and layout of preschool education environments have an impact on children's learning, behavior and creativity (Dearing et al., 2009). In addition, in an intercultural study on the quality of preschool education environments, the quality of learning conditions offered to children in preschool education varies depending on the physical conditions of the school (Sheridan, Giota, Han & Kwon, 2009).

A well-organized learning environment in preschool education causes more time for classroom interactions (OECD, 2006; UNESCO, 2005) and supports the development of children positively (Burchinal et al., 2000; Howes et al., 2008; Mashburn et al., 2008; Peisner-Feinberg et al., 2001; Sabol, Soliday Hong, Pianta & Burchinal; 2013). In this context, good arrange of the learning environment will be important for the development of children because the children are developing by being influenced by the environment.

When preschool education program in Turkey is examined; the program aims to ensuring children grow up healthy through rich learning experiences. The program has been developed in order to ensure that children's development reaches the highest level in the fields of motor, socio-emotional, language and cognitive development. Also, enabling children to be ready for primary school by gaining self-care skills is one of the other important goals of the program (MoNE, 2013). In general, it is aimed to support the multidimensional development of children in preschool education. In addition to this, the learning environment should also support children's development in order for children to reach these developmental goals specified in the program. Considering the developmental goals in all area included in MoNE 2013 Preschool Education Program; it will be important to create a learning environment that will enable the child to develop skills such as fine and gross motor skills, creative thinking skills, ability for empathy, attention skills, remembering skills, scientific thinking skills.

It is important to create a physical environment that meets the educational needs of children in preschool educational institutions in order to support the child's development in all area. A well-designed physical environment in education will support children's active learning experiences and develop creative problem-solving skills (Moore, 1987). In this context, a physically careful and attentive planned physical environment in education gains importance in terms of achieving the goals in the program. Especially in preschool learning environments, learning centers, which will be created in the classroom environment, have a particular importance in achieving the goals set in the program.
Learning centers are defined as areas that are separated by various materials (cabinets/shelves, panels, carpets of different colors, floorings or tapes attached to the floor, etc.). These centers contain different and various materials selected in accordance with the objectives of program and children can work individually or as a group in these centers (Beaty, 2013; Diffily, Donaldson & Sassman, 2001; MoNE, 2013; Pool & Carter, 2011; Prevost, 2003). In the simplest terms, learning centers can be considered as places in classroom where learning activities and experiences take place (Sanoff, 1995).

The physical environment created through learning centers in preschool classroom helps meet children’s educational needs by working individually or as a group. Especially considering the significant impact of the learning environment on the socio-emotional, physical and cognitive development of children (Bekman, 1982; Burchinal & Cryer, 2003; Ceglowski & Bacigalupa, 2002; Feyman, 2006; Kağıcibaşı, Sunar & Bekman, 1988; Yalçın, 2011); learning centers are an important issue in creating a learning environment. In this regard, it is seen that many studies have been carried out regarding the opinions of teachers, who have an important role in the creation and use of learning environment, about the organization and use of the learning centers (Ayşu & Aral, 2016; Çakır, 2011; Durmuşoğlu, 2008; Erşan, 2011; Ögelman, 2014; Ögelman & Karakuzu, 2016; Özyürek & Aydoğan, 2011; Parla'yıldız & Aydın, 2004; Tu, 2006; Uluataş & Demiriz, 2006; Öncü Celebi, 2015, 2017; Yoleri & Tetik, 2018). When all these study findings are examined, it is seen that teacher has an important role in creating an effective learning environment. It was observed that the related researches were generally carried out with teachers and that there was no study about this issue with pre-service teachers. Accordingly, it is aimed in this study to determine the opinions of pre-service preschool teachers, who are future preschool teachers, about creating a learning environment. As the teacher of the future, revealing the opinions of them on this subject is important in terms of revealing the competence of the pre-service teachers on this subject. For this reason, the aim of this research is to determine the pre-service teachers' opinions about creating a learning environment in preschool classroom. Within the framework of this main purpose, seeks to answer the following research questions:

1. What are the characteristics that the learning environment should have in preschool education in terms of preservice preschool teachers’?

2. What is the importance of learning centers?

3. What are the points to consider when planning learning centers?

4. What are the aims of using learning centers?

**METHOD**

**Research Design**

In the research, qualitative research design was preferred in order to find out what pre-service preschool teachers' opinions about creating a learning environment. Hereby, instead of generalizing the results to a wider population, the qualitative research design provides a more detailed examination of the perspectives of a selected sample group on the subject of the study. In addition, the qualitative research design provides the researcher flexibility in the process of recognizing and interpreting the participants' understanding (Patton, 2014).

**Study Group**

The study group of the research consists of 35 pre-service preschool teachers (n=33 women, n=2 men). In the study group, all participants are senior students studying in pre-school education program of a public university in Turkey. Participants were preferred to be senior students in order to have a longer-term experience in undergraduate education and teaching practice.
Research Instruments and Procedures

The data were collected by using qualitative data collection methods because of the need to obtain in-depth information about the research topic. In this research, semi-structured interview questions were used as data collection tool. Semi-structured interview was preferred because it is a convenient way to obtain data to reveal different perspectives of the participants on a particular subject.

The following steps were following while preparing the semi-structured interview form to be used as the data collection tool in this study: Firstly, following the literature review, semi-structured interview questions were prepared by the researcher. Secondly, the semi-structured interview questions shared with 2 experts in the field in order to ensure reliability. Thirdly interview form was organized according to the feedback received from the experts. Fourthly this interview form was first tested through pilot interviews with 2 preschool teachers. Finally, in line with the feedback obtained from the pilot interviews, the interview form was finalized and the data of the research started to be collected. The interview form consists of 6 open-ended questions.

Before starting interviews with participants, participants were informed about the research subject, objectives, and their rights in the research process. Following this notification, the participant's confirmation about voluntarily participated in this interview was obtained. Then, six open-ended questions designed to determine the opinions of the participants about creating a learning environment in preschool classroom are presented. The duration of the interviews ranged between 15 minutes and 25 minutes. At the end of each interview, the voice recordings were transcribed using MS Word software by the researcher on a daily basis. Data collection process was completed between 22 October 2020 and 5 November 2020.

Data Analysis

The data obtained from the interviews were analyzed through the content analysis method. Accordingly, data are analyzed in four phases: Firstly, at the end of each interview, the interview records transcriptions written daily by the researcher were combined. Secondly, the interview transcript obtained were carefully read and broad categories were created (Wellington, 2000). Thirdly, the interview transcript was read again and it was checked whether there were any parts that were not included in the categories and then the main themes of the research were listed. In the last step, sub-themes were created by evaluating the data under each theme within itself. At the end of the data analysis, the data were reported under five sub-themes under two main themes, and important parts of the participants' views were cited to support the findings. Pseudonyms as P1 (participant 1), P2 (participant 1) etc. are used in these citations.

FINDINGS

The themes and sub-themes resulting from the content analysis applied to the data obtained from the interviews with participants are given in Figure 2. The findings obtained in this study consisted of the main themes of Characteristics of Learning Environment and Learning Centers under the category of learning environment. In this context, the theme of the characteristics of the learning environment includes physical and educational features sub-themes. The theme of the learning centers covers importance of learning centers, planning of learning centers and using of learning centers sub-themes. The planning of learning centers sub-theme consists of general conditions, art center, block center, dramatic play center, book center, science center and music center sub-themes.
Figure 1: Themes and sub-themes based on content analysis

Characteristics of Learning Environment Theme

Participants considered that the learning environment must have certain features in order to support the child's all-round development in the educational environment. While participants stated the features that the learning environment should have, they mentioned some of the physical and educational features of the learning environment.

**Physical features.** Participants think that the learning environment should primarily contain concrete materials of diversity and richness that address children's senses (seeing, hearing, touching, etc.). Participants expressed these opinions such as: "The learning environment should be equipped with rich and diverse materials that support the creativity, curiosity and all areas of development of the child." (P5), "There should be a variety of sufficient materials in the learning centers. These materials should be of a variety that can stimulate all the senses of children." (P8), "There should be materials to support children's imagination and creativity." (P10), "There should be concrete materials to improve children's learning. In addition, different materials that will support children's creativity should be offered to the child." (P11) and "It is important that existence of material in the classroom environment, as children use their senses in the learning process during this period. Various and rich materials for different senses such as seeing and touching should be present in the classroom.” (P23).

In addition, participants emphasized that these materials in the learning environment should be appropriate for the age and development level of children and that these materials should be safe for the health of the children. Participants expressed that such as: "The materials in the learning centers should be appropriate for the age and development levels of the children. It should be suitable and safe for child health.” (P3) and “Materials that are appropriate for children's development levels and ages should be available.” (P12).

According to participants’ opinions, materials should be placed in a learning environment in an easily accessible way for children. With the following views, participant stated that children could be encouraged to make free and independent choices in the learning environment: “Learning environment should include learning centers. All learning centers should be included to support the development of the child. A slippery floor should not be preferred in learning environment. The materials should be diverse and rich to suit the level of children's development and should be placed in a learning environment so that children can access it independently. Thus, children can work independently without the need for adult assistance.” (P1) and “The classroom environment should be
designed so that the child can easily reach all learning centers. This situation enables the child to act independently in the classroom environment.” (P18).

Moreover, participants think that the learning environment should be of adequate size, clean, tidy and have appropriate qualifications in terms of features such as temperature, light, sound and ventilation. Participants expressed these opinions such as: “Learning environment should be in a way to attract the attention of preschool children; it should be bright, spacious and airy. The classroom should be sufficiently wide. In addition, the classroom should be safe for children. There should be large boards where children can hang up their activities.” (P5), “It is important to design the learning environment by considering the physical characteristics of the children. Stimulants such as temperature, light and sound should be taken into consideration.” (P4), “The learning environment should consist of rich materials, but it should not be too crowded and mixed. It should be tidy. There should not be more stimulants and confusion in the environment.” (P9), “The environment should be suitable for both individually and collaboratively work. The environment should be arranged accordingly. The furniture like as table, chair etc. must be suitable for the physical structures of the children.” (P13) and “The class should be very clean and tidy. Everything should be in place.” (P24).

There are also examples of opinions of participants that it is important that classroom furniture (table, chair, etc.) is suitable for children's physical properties and can be moved when necessary. Participants’ opinion examples on this subject are as follows: “Furniture should be suitable for the physical structure of the child. The furniture like chair and table in the classroom environment must be movable. There should be different kinds of furniture suitable for group and individual works.” (P8), “The physical environment of the classroom should be comfortable, safe and adaptable to changes.” (P14) and “The learning environment should be designed to support comfortable movement.” (P21).

Additionally, with the following views, participants stated that there should be various learning centers in the learning environment in order to diversify children's learning experiences: “All learning centers should be located in a classroom setting. Materials in learning centers should be appropriate and safe for children's health.” (P2), “In the classroom setting, there should be learning centers separated from each other by using tools such as cabinets and floor bands.” (P6) and “In the learning environment, there should be learning centers first. These learning centers should have a diverse and sufficient number of materials.” (P30).

Finally, with the following views, participants pointed out that the learning environment should be created in an integrated manner with technology: “There must be materials to support children's imagination and creativity. Learning of children should be extended by using technological tools.” (P25) and “There must be an interactive whiteboard to provide children with a variety of visual and audio materials.” (P31).

**Educational features.** Participants think that the learning environment in preschool education should have a quality that meets the individual differences, interests and needs of children. Participants expressed opinions such as: “The learning environment should be designed in accordance with the individual differences and needs of children.” (P22), “The learning environment must respond to the children's interests and needs.” (P26), “The individual differences of the child should be taken into consideration while creating a learning environment.” (P29), “The learning environment must be in a way to attract children's interest and attention.” (P32), “The learning environment must have the quality to stimulate the child's interest and curiosity.” (P34) and “The learning environment should be appropriate for the children's interests, needs and development levels.” (P35).

Participants consider that the preschool learning environment should meet the individual differences, interests and needs of children. One of the participants expresses this as “Learning environment should be designed in accordance with the individual differences and needs of the child” (P12), many other participants expressed their opinions like as: “It must meet the interests and needs
of the child” (P7), “When the learning environment planned, the individual differences of the child should be taken into consideration” (P16), “It must be in a way to attract children's attention and attention” (P20), “It must have the quality to stimulate the child's interest and curiosity” (P27), “It should be appropriate for the interests, needs and development levels of the children” (P28) and “It should address the differences of children. It should be appropriate for their development.” (P33).

In addition, participants emphasized that the learning environment should inspire curiosity in the child, present concrete learning experiences and support all areas of development of the child. Participants expressed opinions such as: “It must be of a quality to support the child's development. It should be arouse curiosity and keep her curiosity alive.” (P1), “It should provide learning opportunities to support children's creativity, curiosity and development.” (P6) and “The child's interest and curiosity play a very important role in active learning, so the learning environment should stimulate the child's sense of curiosity.” (P23).

Participants defined an effective learning environment as an environment where children can express themselves comfortably and freely. With the following views, participants stated that the learning environment must enable children to participate actively in the learning process: “An environment where children can feel comfortable should be provided, so that children should be able to express their thoughts easily.” (P15), “The learning environment should be an environment where the child can be free. Because the child will be more creative, more independent and more productive in a free environment.” (P22) and “The child should be actively learned by trying and observing. So, we have to design active learning processes in learning environment.” (P26).

Finally, with the following views, participants emphasized the importance of creating an effective learning environment by including both individual and group activities in different types of activities in line with educational goals: “The learning environment should help children get skills such as communication, cooperation and sharing. For this, it is necessary to include group activities in learning process as well as individual activities.” (P17) and “The learning environment should be sufficient physically for group and individual activities. The child should be able to work comfortably in environment both in the group and on his own. The environment should be arranged accordingly for this.” (P29).

Learning Centers Theme

Participants stated that there should be various learning centers in the learning environment in order to diversify children learning experiences. When these statements of them about learning centers are examined, it is seen that participants have various ideas about the importance, planning and using of learning centers.

The importance of learning centers. Participants think that learning centers offer different life experiences to children and support all development areas of children. Their opinions are as follows that learning centers support children development: “Learning centers are important for the development of the child in various developmental area and to provide them with a suitable environment.” (P19), “Children can find opportunities for their development through different experiences in learning centres.” (P21), “Learning centers support all development areas of children by helping children to gain different experience, to establish natural relationships with peer in smaller groups, to solve problems they encounter during play, to take decisions and responsibilities, and to express themselves.” (P25) and “Learning centers and the variety of materials in these centers support the all-round development of children. For this reason, it is important to establish different learning centers in the classroom environment.” (P32).

Participants stated that children also had the opportunity to develop various skills and abilities in line with their interests and needs in learning centers. In this regard, with the following views, participants think that learning centers that allow children to discover and express themselves in
different ways and it is also important for teachers to create new opportunities to develop children interests and potentials: “Learning centers is important for the development and increase of children’s interests.” (P3) and “Learning centers allows the child to discover himself and his interests. In addition, it is ensured that they have knowledge about different fields such as books, music and science.” (P13).

Participants emphasized that the interests and potentials of children can be discovered in the activities in learning centers. In addition, it was observed that they think that learning centers are important in terms of activating the curiosity in the child and enabling them to obtain information from different sources. Participants expressed opinions such as: “Learning centers enable children to discover themselves in different environments. In addition, as teachers, we enable us to see the direction of children’s interests and thus support their development in this direction.” (P9), “Learning centers are areas that support children’s curiosity, interest and development. The child can find different information and activities to support his development in each center.” (P20), “Learning centers play an important role in meeting children's curiosity.” (P24) and “During this period, children need rich stimulants as they develop rapidly. These stimulants are mostly found in learning centers. This means that learning centers are environments where important activities that support the development of the child and arouse curiosity.” (P28).

Participants think that knowledge is embodied in learning experiences realized with the use of materials in learning centers and therefore consider learning centers are important. In addition to being a place where knowledge is embodied, learning centers are effective in creating an active learning environment that provides children with the opportunity to learn by doing and experiencing. Participants expressed that such as: “Children need to learn some concepts at an early age. The best way to embody these concepts is to use learning centers. For example, when talking with children about our body, the teacher can use the body model in the science center. So, the children can see this visually. Thus, embodied learning can be achieved.” (P19), “Learning centers support children to learn by doing and experiencing by providing a comfortable working environment.” (P27) and “Learning centers help us create an active learning environment based on the theory of multiple intelligences. Different learning centers reveal different interests and abilities.” (P30).

Participants think that different groups of children have the opportunity to work together in learning centers. Thus, with the following views, participants express that children's social skills such as initiating and maintaining communication, helping, sharing, waiting their turn and cooperation will be supported: “Learning centers enable the child to do both individual and group work. Thus, learning centers supports communication skills of children.” (P2), “Learning centers provide an environment where children with individual differences can come together and express themselves. Thus, children’s' communication skills improve and they learn by socializing.” (P11) and “In learning centers, children learn to playing cooperatively with peers, helping each other, sharing, and waiting their turn. Thus, learning centers ensure the development of children's social skills.” (P18).

Finally, with the following views, it was observed that participants stated that the development of scientific thinking, problem solving and creative thinking skills in children could be supported through learning centers: “Learning centers develop children's creativity.” (P14), “Learning centers enable children to develop different perspectives.” (P17), “Learning centers allows children to play in the field they want by improving their creativity. Thanks to the learning centers, children develop their creativity by turning to the centers as desired.” (P31) and “Learning centers are important because the children have fun while playing games in these areas, on the other hand, they develop their imagination by constructing something with the tools and equipment in these centers, their thinking skills are developed and they learn by doing and living.” (P34).

Planning of learning centers. Participants stated that some general points should be considered in the planning of learning centers. In addition, participants think that in learning centers
(art center, block center, dramatic game center, book center, science center and music center) some special conditions should be considered depending on the characteristics of the learning centers.

**General conditions.** Participants stated that learning centers should be planned in a way that meets the interests and needs of children in accordance with their development levels. Also, participants considered planning and reorganizing learning centers in accordance with the educational objectives as significant. Although it is seen that participants emphasize that learning centers should have a remarkable design, they think that learning centers should have a sufficient variety of materials that will stimulate children's curiosity and creativity. Participants stated that while planning the learning centers, taking the necessary safety precautions, being sure to make a point of being clean, hygienic and tidy, and ensuring that the furniture is suitable for the physical characteristics of the children are also should be taken into consideration. Finally, participants stated that physical conditions of the classroom should be taken into consideration when determining the number of learning centers to be established in the classroom. Participants stated that the requirements of the activities such as noisy or quiet, and wet or dry should be taken into account when determining the locations of learning centers. It is seen that participants also stated that the learning centers created in the classroom environment should be separated from each other with various materials. Participants expressed that such as: “I organize the learning centers according to the interests and needs of the children. In this process, I also make a planning by considering the developmental characteristics of the children. Especially when choosing materials to be located in centers.” (P7), “The arrangement of a learning center should base on the needs of the students and the gains to be addressed in the program. Again, as changing developmental needs of children, various arrangements must be made in the learning centers. Some materials can be added, some materials can be removed.” (P10), “I would plan the learning centers arrestingly for children. In addition, I would pay attention that the materials in the center are of a quality that will stimulate children's creativity and sense of curiosity.” (P12), “It is important that the furniture or materials in the learning center are suitable for children. Safe areas should be planned. Learning centers and materials must be in a certain order and must be clean.” (P15), “I make sure that the furniture in the learning centers is suitable for the physical characteristics of the children. The materials should be placed in the centers at the eye level of the children. Thus, they can easily access the materials themselves. In addition, the height of the cabinets that separate the learning centers from each other must be suitable for the physical characteristics of the children. Thus, the child can easily observe the activities in other learning centers.” (P16), “I decide how many learning centers will be established in the classroom, taking into account the physical characteristics of the classroom. Then, considering the developmental needs of the children, after deciding which centers I should make an arrangement, I would make an arrangement in the classroom environment according to the characteristics of the activities to be held in the centers.” (P33) and “I try to separate each learning center from each other using various materials. I try to make sure that each learning center has its own boundaries.” (P35).

**Art center.** Participants stated that different and various art materials and activities should be presented at the art center. While emphasizing that art materials are safe for the health of the child, participants stated that there should be an exhibition area in this area besides various visual materials. In terms of size, it was stated that it would be appropriate to work both individually and collaboratively. Participants expressed opinions such as: “In the art center, different and various materials should be presented to children to stimulate their creativity.” (P7), “I would make sure that the paint materials used do not contain parabens. I would choose art materials that do not contain carcinogenic substances. I would also pay attention to the issue of cleaning of art center.” (P12), “I would pay attention that there have tables that allow children to do group and individual activities.” (P20) and “There should be areas where children can exhibit their studies” (P21).

**Block center.** Participants emphasized that the block center should have a large area, and it was stated that blocks of different sizes, shapes, and colors should be present in this center. At the same time, with the following views, participants stated that it should be established in a place away from learning centers that require silence to work: “First of all, block center should be included blocks
of different sizes and colors, and paying attention to be a large area.” (P23) and “It should be a large area and be created away from learning centers that require silence to work. There should be blocks of different size, shape, and color.” (P27)

**Dramatic play center.** Participants stated that the dramatic play center should be established in a comfortable and wide area in the classroom and emphasized that puppets, costumes and accessories should be in this center in order to enrich children's play experiences. One of the participants expresses this as “In this learning center, it is important to have the variety and sufficient material available for children to develop their games. For example, dolls of different skin colors, accessories such as women and men's dress-up clothes, and puppets. In addition, the center should be planned in a wide area and made more comfortable with furniture such as pillows and armchairs.” (P33).

**Book center.** According to participants, the book center should be planned comfortably and interestingly in a brighter area of the classroom. In this center, it should be picture books, newspaper, magazine suitable for their ages and away from learning centers such as the block center where noisy activities are performed. Participants expressed opinions such as: “The book center should have illustrated fairy tales and story books suitable for the ages of the children. In addition, different magazines and newspapers can be contained.” (P8) and “The books in the center should be suitable for the age group of children and should be an area where they can work quietly and comfortably. For this reason, it should be created in a bright part of the classroom and away from the learning centers where include noisy activities.” (P17).

**Science center.** With the following views, participants stated that science center should be planning as a center where children can feel themselves as scientists, with costumes and materials, various information sources (brochures, illustrated atlas, etc.) and models (human body, etc.): “There should be experiment tools, various science books, journals that will not harm the child.” (P1), “All kinds of materials that help the child to examine, observe and experiment should be included.” (P5) and “It should be in the form of a small laboratory with materials that help them to conduct experiments and research. In addition, I try to make the children feel like scientists by wearing costumes such as white coats.” (P16).

**Music center.** With the following views, participants think that the music center should be established as a center with different and various musical instruments and various visual stimulants (notation pictures, etc.), away from the centers where silent studies will be done: “I would organize it as a center with music instruments that can attract children's attention. I would establish in a place away from the learning centers where include noisy activities.” (P9) and “There should be a center where there are various music books and note books as well as musical instruments.” (P28).

**Use of learning centers.** Participants stated that learning centers should be used effectively in order to meet the individual needs of children, to support their development and to reach the gains included in the education program. In addition, participants stated that learning centers can be used especially in concept instruction. Finally, it is seen that participants emphasized that learning centers should be updated at regular intervals to keep the centers alive. Participants expressed opinions such as: “I would actively use these centers during playtime to meet the individual needs of children.” (P4), “I would organize the learning centers according to the outcomes of program. I would use the learning centers to support the development of children individually or with their peers.” (P10) and “In learning centers, I would not present all of the materials to the child at once. As time progressed, I would refresh the materials by add and subtract. Thus, I would keep the children's interest in the centers alive.” (P18).

**CONCLUSION AND DISCUSSION**

In this study, the views of pre-service preschool teachers about creating a learning environment were examined. The pre-service preschool teachers defined the learning environment as
an environment have some physical and educational qualities. In addition, all of them stated that the most important element that creates the learning environment in the preschool classroom is learning centers.

When the opinions of the participants on creating a learning environment are examined, it is seen that they emphasize that the learning environment should primarily contain diverse and rich materials. Literature indicates that pre-school education programs draw attention to this situation. It is stated that the pre-school education programs should be offer diverse and rich materials that supply different vital experiences to children in the learning environment (Beaty, 2013; Diffily et al., 2001, MoNE, 2013). At the same time, it is seen that the participants stated that the materials should be placed in the learning environment in a way that children can easily reach in the study. In the relevant literature, it is stated that the learning environment should be a flexible and reliable area that allows children to move freely (Demiriz, Karadağ & Ulutaş, 2003). In addition, according to the participants, the learning environment should be adequate size, clean, tidy and have appropriate qualifications in terms of features such as temperature, light, sound and ventilation. Similar to this finding of the study, Aksoy (2009) emphasizes that the learning environment should be clean and to have a suitable temperature, sufficient light and ventilation. In addition to this, a well-organized learning environment positively affects children's development and enables children to learn better and develop positive behaviors (Abbas & Othman, 2011; Maxwell & Chmielewski, 2008, Riedler & Eryaman, 2016).

When the opinions of the participants on the educational features of the learning environment should have a quality that meets the individual differences, interests and needs of children. Literature demonstrates that the learning environment should arouse the curiosity of children, make them active and provide opportunities for them to express themselves. In the pre-school education program, it is stated that a well-organized learning environment should be designed according to the needs of children in order to increase their development opportunities (MoNE, 2013). In order to create a conducive environment for teaching and learning, the physical properties of the classroom should be used effectively and a learning environment that activates the child's learning process should be created (Shaari & Ahmad, 2016). The learning environment should be created in a way that meets the educational needs of children and provides opportunities for effective learning (MoNE, 2013). Considering that especially preschool children are curious, questioning and researcher, educational environments that will support their development in this direction should be created (Beaty, 1988). The learning environment should support multi-directional thinking and ensure that children benefit from education at the highest level (Özdemir, Bacanlı & Sözer; 2007; MoNE, 2013).

Another prominent view expressed by the participants is that there should be various learning centers in the learning environment in order to diversify the learning experiences of children. The preschool education program shows that the learning environment should be organized to include learning centers in order to support children's development (MoNE, 2013). In addition, in the pre-school education program, learning centers are expressed as necessary areas for the education program to be planned and implemented in accordance with its purpose (MoNE, 2013). As a matter of fact, the learning centers provide children with experiences of making choices, working with others, engaging in hands-on activities and active learning (Sanoff, 1995). The studies in the literature show that the learning centers support children's language development by enabling them to interact with others. Also, children can develop their reading and writing skills by using the materials in the learning centers symbolically. In addition, while children are using the learning centers, they have the opportunity to exhibit skills such as queuing and sharing in order to develop appropriate social relationships with each other, and thus the use of learning centers supports children to establish games in a collaborative way. Children have the opportunity to develop their skills in activities they enjoy and find meaningful, and their creativity is supported through open-ended activities they experience in learning centers (Isbell, 1995; Isbell & Exelby, 2001; Isbell & Isbell, 2003). In this sense, learning centers not only provide children with opportunities to explore, try and construct their own knowledge, but also provide children with freedom of movement, socialization, choice, responsibility and problem-solving opportunities (Bottini & Grossman, 2012).
In addition, according to the participants, learning centers should be organized in accordance with the objectives in the educational program. Learning centers should be planned in a way that is interesting, attractive and stimulates creativity. Also, the participants stated that the physical conditions of the classroom should be taken into account when determining the number of learning centers to be established in the classroom, and when determining the locations of learning centers, they stated that the requirements of the activities such as noisy or quiet, and wet or dry should be taken into account. Moreover, it is seen that they also stated that the learning centers created in the classroom environment should be separated from each other by various materials. When the relevant literature on the planning of learning centers is examined, it is seen that the opinions expressed by the participants are among the things that should be considered. Literature indicates that while organizing learning centers, some characteristic features of the activities in learning center (such as noisy/quiet, and wet/dry) should be taken into consideration (MoNE, 2013; Sanoff, 1995). In addition, while organizing learning centers, the physical characteristics of the classroom and the number of children should be taken into account, and should be arranged according to the individual needs and interests of the children (Çakır, 2011; MoNE, 2013; Null & Sima, 2000; Ömeroğlu-Turan & Turan, 1998). The flexibility principle should be considered when creating learning centers to enable children to create appropriate interactions and develop new learning experiences in line with their changing interests (Çakır, 2011; Diffily et al., 2001; Knopf & Welsh, 2010; MoNE, 2013; Poyraz & Dere, 2001). Learning centers should be updated as adding new materials, removing some materials, and replacing some of them in accordance with the objectives of educational program (Diffily et al., 2001; Lundgren, 1998; MoNE, 2013; Moyer, 2001; Stephens, 1996; West 2011). Thus, children's interest in learning centers can be kept alive.

As a result, when the opinions of the participants about creating a learning environment are examined, it is seen that all of them expressed their opinions about creating a learning environment in the interior. Considering the opinions expressed about creating an indoor learning environment, it can be thought that the participants have sufficient knowledge about creating an effective learning environment. However, it is a striking finding that the participants did not present an opinion on the creation and use of the outdoor space, which has an important place in pre-school education. Outdoor spaces in pre-school education institutions are an important issue that should be handled as an extension of indoor space. The participants' only expressing their opinions about creating a learning environment in the interior may be due to their insufficient knowledge about outdoor use.

REFERENCES


Use of 3D Printers for Teacher Training and Sample Activities*

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Abstract

The aim of this study was to determine the effects of 3D (3-dimensional) printing activities on pre-service teachers’ self-efficacy in technological pedagogical content knowledge (TPCK) and their views of 3D printing activities. The study sample consisted of 39 students of science education, classroom teaching and preschool teaching departments of the faculty of education. An exploratory sequential mixed method design was used. In the quantitative part, a one group pre-test post-test design was used, and data were analysed using statistical methods. In the qualitative part, phenomenology was used, and data were analysed using content analysis. Results showed that 3D printing activities improved participants’ self-efficacy in TPCK. Participants stated that 3D printers helped them develop skills in many areas and that 3D printer teaching materials contributed to both learning and teaching. The majority of participants had positive views on the effect of 3D objects on learning. They stated that 3D objects turned abstract concepts into concrete visual representations, facilitated learning, made lessons enjoyable, provided learning retention, encouraged them to learn more about their fields, increased their interest, and helped them develop creative thinking and design skills, and thus, create different content-specific educational materials.

Keywords: 3D Printers, Technological Pedagogical Content Knowledge, Teacher Training, Mixed Research Design

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INTRODUCTION

Today, technology is widely used in learning environments. It has, therefore, been an important topic of discussion to develop technology-based processes in teaching design and to help students develop technology skills (Yanpar-Yelken, Sancar-Tokmak, Özgelen & İncikabı, 2013) because technology-based learning environments actively engage students in the learning process and provide them with the opportunity to develop thinking, interpretation, and self-expression skills (Baki, 2002; Ersoy, 2003). Software provide permanent and efficient learning by helping students turn abstract concepts into concrete visual representations and imagining them in their minds (Eryigit, 2010). It is, therefore, of paramount significance to provide teachers with the opportunity to learn how to combine technology and pedagogical content knowledge and put it into practice and use tools and materials to solve problems pertaining to the use of technology in learning environments. Graduate pre-service teachers should therefore not only have content knowledge or know how to teach but also integrate content knowledge with technology. Teachers should be able to use technology to teach and evaluate a topic of their own areas of interest. In other words, they should have adequate technological pedagogical content knowledge. Therefore, universities should provide students with such training that makes sure that they can develop appropriate teaching skills and acquire TPCK to be able to design technology-integrated classroom activities.

Technology is in every aspect of our life and also widely used in learning environments. The concept of TPCK has emerged with the premise that pedagogy and field components should also involve technology (Doğru & Aydın, 2017). TPCK, which is an expanded version of pedagogical content knowledge, is defined as teachers’ ability to integrate technology into pedagogical strategies and their awareness of the effects of technological materials and presentations on students' comprehension of content (Graham, Burgoyne, Cantrell, Smith, St. Clair & Harris, 2009). In other words, TPCK refers to teachers’ or pre-service teachers’ ability to integrate technology with pedagogical content knowledge and put it into practice in their teaching. Teachers with TPCK can integrate appropriate educational technologies into their pedagogy knowledge to provide effective learning environments (Doğru & Aydın, 2017). Research generally focuses on teachers’ TPCK levels and self-efficacy (Archambault & Crippen, 2009; Bilici & Güler, 2016; Jang & Tsai, 2013; Jordan, 2011; Karadeniz & Vatanarturan, 2015; Karataş, 2014; Lee & Tsai, 2010; Özbek, 2014; Şad, Açıkgül & Delican, 2015; Timur & İmer-Çetin, 2014) and pre-service teachers’ self-confidence in TPCK (Sancar-Tokmak, Yavuz-Konokman & Yanpar-Yelken, 2013; Sarikaya, Kaya, Akdağ, Ay & Doğan, 2012; Savas, Öztürk & Tüzün, 2010) and development of TPCK levels (Akkaya, 2009; Canbazolu-Bilici, 2012; Niess, 2005; Timur, 2011). Most of these studies investigate whether teachers’ and pre-service teachers’ self-efficacy and self-confidence in TPCK differ by major, branch, age, experience, gender etc. Most studies on 3D printers are conducted in the fields of engineering (Golub, Guo, Jung & Zhang, 2016), robotics (Hamidi, Young, Sideris, Ardeshiri, Leung, Rezaï & Whitmer, 2017), special education (Buehler, Kane & Hurst, 2014), anatomy education (Vaccarezza & Papa, 2015), earth science (Horowitz & Schultz, 2014), design (Greenhalgh & Greenhalgh, 2016), science education (Byun, Jo & Cho, 2015), STEM education (Taylor, 2016; Nichols, Schuster & Ball, 2016), mathematics and geometry education (Huleihil, 2017). Since 3D printers are new to the field of education, there is only a small number of studies on this topic. The vast majority of those studies focus on higher education while only a handful of them are concerned with primary and secondary education (Karaduman, 2018).

There are very few studies investigating the effects of 3D printers on pre-service teachers’ TPCK. The aim of this study was, therefore, to determine the effects of 3D printing activities on pre-service teachers’ self-efficacy in TPCK and their views of 3D printing activities. We believe that this study will contribute to the literature and pave the way for further research.
METHOD

This study employed an explanatory sequential mixed methods design and involved two stages; (1) quantitative data collection and analysis, and (2) qualitative data collection and analysis. “Qualitative data are collected to better understand, investigate, and enrich the quantitative data” (Creswell & Plano Clark, 2015, p. 79). In the quantitative part, a one group pretest-posttest design was used. In the qualitative part, phenomenology was used.

PROCEDURE

1. Opening an elective course “3D design and modeling” in the departments of science, classroom education and preschool education and organizing a 3D printer workshop in the faculty of education.

2. Training the “3D design and modeling” course instructors on 3D printers and then performing activities with participants (students who took the course)

3. Training participants on Microsoft 3D builder for 3D object design and introduction to 3D printers

4. Training participants on 3D design and modeling during the first five weeks of the 14-week curriculum to ensure that they are equipped with the skills to perform 3D activities. The training involved converting 2D designs to 3D models, software programs and interfaces for 3D object design, the 3D printing process, and use of 3D printer apparatus and printing methods.

5. Figure 1 presents the 5-week training process in detail.

6. Allowing participants for the remaining eight weeks to develop content-specific or unique materials that they believe might promote their students’ learning. Figure 2 shows some of the learning objects (materials) designed by participants on 3D Builder.
Figure 2. Learning object designs

7. Allowing participants to present their 3D learning objects as a group or individually every week.

Participants

The study sample consisted of 39 third-year students (11 men and 28 women) of the primary school, preschool, and science teaching departments of the faculty of education.

Data Collection Tools

TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE SELF-EFFICACY SCALE

The technological pedagogical content knowledge self-efficacy scale (TPACK-SeS) was used as pretest-posttest to determine participants’ self-efficacy in TPCK. TPACK-SeS was developed by Graham et al. (2009) and adapted to Turkish language by Timur and Taşar (2011). It consists of four subscales: technological pedagogical content knowledge (TPCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological knowledge (TK) (Timur & Taşar, 2011). TPCK (Cronbach’s alpha α = .89) consists of eight items on internet and digital technology usage in science classes to detect misconceptions, to collect data, and to conduct research. TPK (α = .87) consists of seven items on self-efficacy in classroom management and effective communication during digital technology-based teaching. TCK (α = .89) consists of five items on self-efficacy in using digital technology in the field. TK (α = .86) consists of 11 items on self-efficacy in using digital technology. TPACK-SeS has a Cronbach’s alpha of .92.

INTERVIEW FORM

The researchers developed an interview form to determine participants’ views of 3D printing activities. The form consisted of seven open-ended questions designed to probe participants’ views of the contribution of 3D printing activities to skill development and contribution of 3D materials to
teaching and learning. Three academics were consulted for content and face validity. The questions were revised, and the form was finalized based on their feedback. The form questions are as follows:

1. What skills do you think 3D printer design and modeling activities helped you develop?
2. In what way do you think 3D printer design and modeling activities helped you acquire TPCK?
3. What kind of problems (challenges) did you have to deal with when using 3D printers?
4. In what way do you think 3D learning objects (course materials) contributed to your learning?
5. What kind of problems (challenges) did you have to deal with when building 3D learning objects (course materials)?
6. In what way do you think using 3D printers in learning environments can contribute to learning?
7. For what purpose would you consider using 3D printers in your professional life?

Data Analysis

Within the scope of the research, interviews were conducted with 27 volunteer preservice teachers.

Quantitative data was tested for normality using the Shapiro-Wilks test and then analysed using either parametric or nonparametric tests, depending on whether they were normally distributed. Qualitative data were analysed using content analysis. Interview data were transcribed and prepared for analysis. The researchers assessed the interview data independently and coded as short, simple, and clear symbols. After coding, they identified common points and then developed themes. They identified the parts on which they agreed and disagreed during coding and discussed and revised the codes on which they disagreed in order to reach a consensus. Participants were assigned pseudonyms (Yeliz, Kader, Mehmet etc.) in order to assure anonymity. An expert was consulted to determine whether the themes were representative of the codes for reliability. The expert matched the codes with the themes. The researchers compared the expert matching with theirs and discussed the themes on which they disagreed in order to reach a consensus. Direct quotations were used to ensure internal validity. The entire research process (from the development of the data collection tool to implementation and analysis) was elaborated, and all results were presented and compared to those of previous studies in order to ensure external validity. It was made sure that the research questions were open-ended and consistent with the research stages in order to ensure internal reliability. The research steps were described in detail to increase external reliability.

RESULTS

TPACK-SeS RESULTS

Descriptive statistics were used for quantitative data analysis. Quantitative data was tested for normality and then analysed using either parametric or nonparametric tests, depending on whether they were normally distributed. Table 1 shows the analysis results.
Participants’ TPCK, TCK and TPK pretest-posttest scores were normally distributed, and therefore, analysed using dependent groups t-test, which is a parametric test. Their TK pretest-posttest scores were non-normally distributed, and therefore, analyzed using the Wilcoxon signed ranks test, which is a nonparametric test (S-W=.099 df=38 p >0.05).

The main research question was “Do 3D printer design and modeling activities have an effect on pre-service teachers’ self-efficacy in TPCK?” Dependent groups t-test was used to analyse participants’ TPACK-SeS pretest-posttest scores. Table 2 shows the results.

Table 2: T-test results for participants’ TPACK-SeS pretest-posttest scores

<table>
<thead>
<tr>
<th>Measure (TPACK-SeS)</th>
<th>N</th>
<th>x̄</th>
<th>S</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>39</td>
<td>3.31</td>
<td>.52</td>
<td>38</td>
<td>-2.852</td>
<td>.007</td>
</tr>
<tr>
<td>Posttest</td>
<td>39</td>
<td>3.61</td>
<td>.62</td>
<td>38</td>
<td>-2.852</td>
<td>.007</td>
</tr>
</tbody>
</table>

Table 3 shows the standard deviations, means and dependent groups t-test results of the participants’ TPCK, TCK, and TPK pretest-posttest subscale scores.

Table 3: T-test results for participants’ TPCK, TCK, and TPK pre test-post test subscale scores

<table>
<thead>
<tr>
<th>Subscales</th>
<th>Measure (TPACK-SeS)</th>
<th>N</th>
<th>x̄</th>
<th>S</th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPCK</td>
<td>Pre-test</td>
<td>39</td>
<td>3.29</td>
<td>.61</td>
<td>38</td>
<td>-2.828</td>
<td>.007</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>39</td>
<td>3.61</td>
<td>.71</td>
<td>38</td>
<td>-2.568</td>
<td>.014</td>
</tr>
<tr>
<td>TCK</td>
<td>Pre-test</td>
<td>39</td>
<td>3.34</td>
<td>.79</td>
<td>38</td>
<td>-2.411</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>39</td>
<td>2.78</td>
<td>.18</td>
<td>38</td>
<td>-2.411</td>
<td>.021</td>
</tr>
<tr>
<td>TPK</td>
<td>Pre-test</td>
<td>39</td>
<td>3.26</td>
<td>.15</td>
<td>38</td>
<td>-2.411</td>
<td>.021</td>
</tr>
</tbody>
</table>

Participants had significantly higher mean TPCK, TCK and TPK post-test subscale scores than mean pre-test scores (X_{TPCKPre} = 3.29 and X_{TPCKPost} = 3.61; X_{TCKPre} = 3.34 and X_{TCKPost} = 3.71; X_{TPKPre} = 2.78 and X_{TPKPost} = 3.26), indicating that 3D printer design and modeling activities improved participants’ self-efficacy in TPCK [t_{TPCK}(38) = -2.828, p_{TPCK} < .05], TCK [t_{TCK}(38) = -2.568, p_{TCK} < .05], and TPK [t_{TPK}(38) = -2.411, p_{TPK} < .05].

The Wilcoxon signed rank test was used to analyze participants' TK subscale pre-test and post-test scores. Table 4 shows the results.

Table 4: Wilcoxon signed rank test results for Participants’ TK subscale pretest-posttest scores

<table>
<thead>
<tr>
<th>Pretest-Posttest</th>
<th>N</th>
<th>Mean Rank</th>
<th>Rank Sum</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative ranks</td>
<td>13</td>
<td>20.35</td>
<td>264.50</td>
<td>-1.754</td>
<td>.079</td>
</tr>
<tr>
<td>Positive ranks</td>
<td>26</td>
<td>19.83</td>
<td>515.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference total</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There was no statistically significant difference in participants’ TK scores between pre-test and post-test, indicating that 3D printer design and modeling activities had no effect on participants’ self-efficacy in TK (z=-1.754 and p>.05).
Participants’ views of the effect of 3D printer design and modeling activities on skill development were analysed using qualitative methods. Table 5 shows the interviews results.

Table 5: Participants’ views of contribution of 3D printer design and modelling activities to skill development

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills</td>
<td>Designing</td>
<td>Yeliz, İsmail, Gizem, Derya, Mehmet, Melek, Gökay, Deniz, Erdem, Aylin, Funda, Gökhan, Elif</td>
</tr>
<tr>
<td></td>
<td>Using software</td>
<td>Nuray, Özge, Esra, Derya, Gökay, Ezgi, Eda, Şeyma</td>
</tr>
<tr>
<td></td>
<td>Developing materials</td>
<td>Özge, İsmail, Eda, Kader, Gamze, Zerrin, Mehmet</td>
</tr>
<tr>
<td></td>
<td>Multidimensional thinking</td>
<td>Nuray, Özge, Esra, Erhan, Derya, Melih</td>
</tr>
<tr>
<td></td>
<td>Using technology</td>
<td>Yeliz, Mustafa, Fatih, Şeyma, Melih, Hasan</td>
</tr>
<tr>
<td></td>
<td>Creative thinking</td>
<td>Gizem, Erhan</td>
</tr>
</tbody>
</table>

Participants’ views of the effects of 3D printer design and modeling activities on skill development were grouped under the theme of “skills” which consisted of the codes of “designing,” “using software,” “developing materials,” “multidimensional thinking,” “using technology,” and “creative thinking.” The following are direct quotations from participants:

(Ismail): As a pre-service teacher, I think that 3D printers have helped me acquire the knowledge and skills that I need to develop materials and design and produce different kinds of toys.

Designing, Developing materials

(Nuray): First of all, they have expanded our current understanding of things. Even fiddling with a simple cube turned it into objects of different dimensions, which was a nice thing to see. Besides, they’ve helped us to use the software [3D Builder] better.

Using software

(Gizem): They’ve made me think more creatively and showed that we can make different things out of simple shapes. This lesson taught us how to make course materials that can help us explain topics during lessons. We designed tangrams to teach topics of our own major and designed materials to teach numbers, which is very good for us.

Creative thinking

Participants’ views of the contribution of 3D printer design and modeling activities to their TPCK were analysed using qualitative methods. Table 6 shows the interviews results.
Table 6. Participants’ views of contribution of 3D printer design and modeling activities to TPCK

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Effective use of technology</td>
<td>Erdem, Yeliz, Nuray, Özge, Ismail, Gizem, Esra, Gamze, Zerrin, Mehmet, Gökay, Ezgi, Elif, Eda, Funda, Deniz, Şeyma</td>
</tr>
<tr>
<td></td>
<td>Developing content-specific materials</td>
<td>Yeliz, Gizem, Kader, Gökhan, Fatih</td>
</tr>
<tr>
<td></td>
<td>A full grasp of content</td>
<td>Mehmet, Hasan, Gökhan</td>
</tr>
<tr>
<td></td>
<td>Attracting students’ attention</td>
<td>Melih, Erhan</td>
</tr>
<tr>
<td></td>
<td>Turning abstract objects into concrete ones</td>
<td>Yeliz, Gizem</td>
</tr>
<tr>
<td></td>
<td>Increasing permanence</td>
<td>Gizem</td>
</tr>
<tr>
<td></td>
<td>Making classes productive</td>
<td>Melih</td>
</tr>
<tr>
<td></td>
<td>Enjoyable classes</td>
<td>Gizem</td>
</tr>
<tr>
<td>Negative</td>
<td>No contribution</td>
<td>Melek, Mustafa, Aylin, Derya</td>
</tr>
</tbody>
</table>

Participants’ views of the contribution of 3D printer design and modeling activities to their TPCK were grouped under the themes of “positive” and “negative.” The theme of “positive” consisted of the codes of “effective use of technology,” “developing content-specific materials,” “making classes productive,” “attracting students’ attention,” “turning abstract objects into concrete ones,” “a full grasp of content,” “enjoyable classes,” and “increasing permanence” while the theme of “negative” consisted of the code of “no contribution.” The following are direct quotations from participants:

(Ozge): I had no idea about 3D printers before that class. But in that class, I learned what 3D design, and software programs like 3D Builder, and Zaxe were and how to use them. We learned how to 3D print using the software Zaxe during and after the classroom activities.

*Effective use of technology*

(Gökhan): I learned how to develop content-specific materials and turn abstract objects into concrete ones.

*Developing content-specific materials, Turning abstract objects into concrete ones*

(Melek): I can’t say it did much. I mean, it was only two hours a week and so it was nothing more than rudimentary.

*No contribution*

**PARTICIPANTS’ VIEWS OF CHALLENGES OF 3D PRINTERS**

Participants’ views of the challenges of 3D printers were analysed using qualitative methods. Table 7 shows the interviews results.

Table 7: Participants’ views of challenges of 3D printers

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges</td>
<td>No software know-how</td>
<td>Özge, Gizem, Esra, Kader, Gamze, Gökhan, Mehmet, Gökay, Ezgi, Elif, Eda, Funda, Deniz, Şeyma,</td>
</tr>
<tr>
<td></td>
<td>Designing</td>
<td>Yeliz, Özge, Gizem, Esra, Zerrin, Deniz, Erdem, Hasan</td>
</tr>
<tr>
<td></td>
<td>Time-consuming</td>
<td>Zerrin, Derya, Elif, Fatih, Funda, Hasan</td>
</tr>
<tr>
<td></td>
<td>No 3D printer know-how</td>
<td>Ismail, Gamze, Gökhan, Melih</td>
</tr>
<tr>
<td></td>
<td>Inability to think in three dimensions</td>
<td>Nuray, Melek, Mustafa</td>
</tr>
<tr>
<td></td>
<td>No challenge</td>
<td>Erhan, Aylin</td>
</tr>
<tr>
<td></td>
<td>Inability to supply</td>
<td>Özge</td>
</tr>
</tbody>
</table>
Participants’ views of the challenges of 3D printers were grouped under the theme of “challenges” which consisted of the codes of “time-consuming,” “inability to supply,” “designing,” “no 3D printer know-how,” “no software knowledge,” “inability to think in three dimensions,” and “no challenge.” The following are direct quotations from participants:

(Deniz): The greatest challenge for me is that I can’t design. I believe I’ll get better as I learn more.

 Diseining

(Zerrin): It’s just that we can’t design what we have in mind, and it takes too much time to design things. Besides, the printers take too much time to print.

 Time-consuming

(Erhan): There was no challenge whatsoever.

No challenge

PARTICIPANTS’ VIEWS OF CONTRIBUTION OF 3D LEARNING OBJECTS TO LEARNING

Participants’ views of the contribution of 3D learning objects to learning were analysed using qualitative methods. Table 8 shows the interviews results.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Developing different materials</td>
<td>Özge, Gamze, Zerrin, Ezgi, Mustafa, Funda, Seyma, Melih, Aylin</td>
</tr>
<tr>
<td>Enhancing creativity</td>
<td></td>
<td>Deniz, Derya, Nuray, Mehmet</td>
</tr>
<tr>
<td>Facilitating learning</td>
<td></td>
<td>Aylin, Melek, Gizem</td>
</tr>
<tr>
<td>Attracting students’ attention to course content</td>
<td>Ismail, Esra, Kader</td>
<td></td>
</tr>
<tr>
<td>Engaging students in learning</td>
<td></td>
<td>Yeliz, Kader, Elif</td>
</tr>
<tr>
<td>Improving design skills</td>
<td></td>
<td>Nuray, Erhan, Derya</td>
</tr>
<tr>
<td>Providing permanence</td>
<td></td>
<td>Fatih, Erdem</td>
</tr>
<tr>
<td>Transforming the abstract into concrete</td>
<td></td>
<td>Özge, Yeliz</td>
</tr>
<tr>
<td>Making lessons enjoyable</td>
<td></td>
<td>Fatih, Seyma</td>
</tr>
<tr>
<td>Negative</td>
<td>No contribution</td>
<td>Gökhan, Gökay, Elif, Hasan</td>
</tr>
</tbody>
</table>

Participants’ views of the contribution of 3D learning objects (course materials) to learning were grouped under the themes of “positive” and “negative.” The theme of “positive” consisted of the codes of “transforming the abstract into concrete,” “improving design skills,” “making lessons enjoyable,” “attracting students’ attention to course content,” “engaging students in learning,” “a full grasp of content,” “developing different materials,” “enhancing creativity,” “providing permanence,” and “facilitating learning” while the theme of “negative” consisted of the code of “no contribution.” The following are direct quotations from participants:

(Yeliz): 3D printing and turning what I had in mind into something tangible got me more engaged in learning.

Engaging students in learning, Transforming the abstract into concrete

(Erdem): It provided learning retention because it was based on learning by doing.

Providing permanence
(Ezgi): I learned about other teaching materials because I did some research on topics and materials.

Developing different materials

PARTICIPANTS’ VIEWS OF CHALLENGES OF DEVELOPING 3D LEARNING OBJECTS

Participants’ views of the challenges of developing 3D learning objects (course materials) were analysed using qualitative methods. Table 9 shows the interviews results.

Table 9: Participants’ views of challenges of developing 3D learning objects

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Subcodes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenges of Developing</td>
<td>Designing objects</td>
<td>Zerrin, Kader, Mehmet, Mustafa,</td>
<td>Erdem, Aylin, Yeliz, Gamze, Melek,</td>
</tr>
<tr>
<td>Objects</td>
<td></td>
<td>Hasan, Nuray, Esra, Ezgi, Fatih,</td>
<td>Derya, Gökay, Seyma</td>
</tr>
<tr>
<td>Dimension-size adjustment</td>
<td></td>
<td>Nuray, Yeliz, Esra, Gamze, Ezgi,</td>
<td>Fatih, Erdem</td>
</tr>
<tr>
<td>Union</td>
<td></td>
<td>Kader, Mehmet, Mustafa, Fatih,</td>
<td>Aylin</td>
</tr>
<tr>
<td>Extrusion</td>
<td></td>
<td>Yeliz, Melek, Hasan</td>
<td></td>
</tr>
<tr>
<td>Intersection</td>
<td></td>
<td>Yeliz, Seyma</td>
<td></td>
</tr>
<tr>
<td>Subtraction</td>
<td></td>
<td>Gökay</td>
<td></td>
</tr>
<tr>
<td>Rotation</td>
<td></td>
<td>Zerrin</td>
<td></td>
</tr>
<tr>
<td>Using software</td>
<td></td>
<td>İsmail, Gökhan, Eda, Deniz</td>
<td></td>
</tr>
<tr>
<td>Multidimensional thinking</td>
<td></td>
<td>Nuray, Melih</td>
<td></td>
</tr>
<tr>
<td>Creativity</td>
<td></td>
<td>Gizem, Funda</td>
<td></td>
</tr>
<tr>
<td>Power outages</td>
<td></td>
<td>Özge, İsmail</td>
<td></td>
</tr>
<tr>
<td>Internet connection problems</td>
<td></td>
<td>Elif</td>
<td></td>
</tr>
<tr>
<td>No challenge</td>
<td></td>
<td>Erhan</td>
<td></td>
</tr>
<tr>
<td>Using printer apparatus</td>
<td></td>
<td>Özge</td>
<td></td>
</tr>
</tbody>
</table>

Participants’ views of the challenges of developing 3D learning objects (course materials) were grouped under the theme of “challenges of developing objects” consisting of the codes of “Internet connection problems,” “creativity,” “using software,” “power outages,” “multidimensional thinking,” “no challenge,” “using printer apparatus,” and “designing objects.” The code of “designing objects” consisted of the subcodes of “rotation,” “union,” “subtraction,” “intersection,” “extrusion,” and “dimension-size adjustment.” The following are direct quotations from participants:

(Yeliz): First of all, I had a hard time using 3D Builder to design because it was the first time I had ever used it. I had difficulty intersecting and extruding and doing size adjustments, but I got the hang of it.

Using software, Designing objects, Dimension-size adjustment, Intersection, Extrusion

(Nuray): As I’ve said it before, we had a hard time thinking in three dimensions and doing size adjustments on the software.

Multidimensional thinking, Designing objects, Dimension-size adjustment

(Elif): It was a bit frustrating that the Internet in the lab kept cutting out.

Internet connection problems
PARTICIPANTS’ VIEWS OF CONTRIBUTION OF USING 3D PRINTERS TO LEARNING

Participants’ views of the contribution of using 3D printers in learning environments to learning were analysed using qualitative methods. Table 10 shows the interviews results.

Table 10: Participants’ views of contribution of using 3D printers in learning environments to learning

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Helping to develop different materials</td>
<td>Gizem, Mehmet, Melek, Eda, Deniz, Hasan, Ismail, Esra, Erdem, Melih</td>
</tr>
<tr>
<td></td>
<td>Improving design skills</td>
<td>Aylin, Derya, Özge, Yeliz, Gizem</td>
</tr>
<tr>
<td></td>
<td>Helping to prepare materials easily</td>
<td>Gizem, Erhan, Gökay, Elif</td>
</tr>
<tr>
<td></td>
<td>Improving creativity</td>
<td>Yeliz, Ezgi, Özge, Derya</td>
</tr>
<tr>
<td></td>
<td>Increasing interest</td>
<td>Fatih, Nuray, Gizem, Yeliz</td>
</tr>
<tr>
<td></td>
<td>Attracting attention</td>
<td>Nuray, Gizem, Şeyma</td>
</tr>
<tr>
<td></td>
<td>Providing learning retention</td>
<td>Nuray, Kader, Hasan</td>
</tr>
<tr>
<td></td>
<td>Transforming the abstract into concrete</td>
<td>Yeliz, Hasan, Aylin</td>
</tr>
<tr>
<td></td>
<td>Helping to develop educational materials</td>
<td>Fatih, Zerrin</td>
</tr>
<tr>
<td></td>
<td>Facilitating learning</td>
<td>Seyma, Gizem</td>
</tr>
<tr>
<td></td>
<td>Promoting participation</td>
<td>Kader</td>
</tr>
<tr>
<td></td>
<td>Arousing curiosity</td>
<td>Yeliz</td>
</tr>
<tr>
<td>Negative</td>
<td>Useless</td>
<td>Mustafa, Funda, Gökhan</td>
</tr>
<tr>
<td></td>
<td>Hard to use</td>
<td>Ezgi, Eda, Gamze</td>
</tr>
</tbody>
</table>

Participants’ views of the contribution of using 3D printers in learning environments to learning were grouped under the themes of “positive” and “negative.” The theme of “positive” consisted of the codes of “helping to prepare materials easily,” “helping to develop educational materials,” “helping to develop different materials,” “facilitating learning,” “improving creativity,” “providing learning retention,” “improving design skills,” “attracting attention,” “promoting participation,” “increasing interest,” “transforming the abstract into concrete” and “arousing curiosity,” while the theme of “negative” consisted of the codes of “hard to use” and “useless.” The following are direct quotations from participants:

(Erhan): It helps us develop sound materials easily.

Helping to prepare materials easily

(Melek): It helps us develop different materials and use them in class.

Helping to develop different materials

(Mustafa): A 3D printer is not lot like a factory, and it’s costly and time-consuming and so it’s useless.

Useless

PARTICIPANTS’ VIEWS OF USING 3D PRINTERS IN THEIR PROFESSIONAL LIVES

Participants’ views of using 3D printers in their professional lives were analysed using qualitative methods. Table 11 shows the interviews results.
Table 11: Participants’ views of using 3D printers in their professional lives

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intended Use</td>
<td>I do not think I will ever use them</td>
<td>Gizem, Gökhan, Ezgi, Mustafa, Elif, Eda, Funda</td>
</tr>
<tr>
<td></td>
<td>Supplying materials</td>
<td>Fatih, Şeyma, Deniz, Erdem, Hasan, Aylin</td>
</tr>
<tr>
<td></td>
<td>Designing and developing materials</td>
<td>Ismail, Kader, Erhan, Gamze, Mehmet</td>
</tr>
<tr>
<td></td>
<td>Enriching learning environments</td>
<td>Nuray, Melek, Gökay</td>
</tr>
<tr>
<td></td>
<td>Transforming the abstract into concrete</td>
<td>Yeliz, Özge, Melih</td>
</tr>
<tr>
<td></td>
<td>Ensuring learning retention</td>
<td>Nuray, Zerrin, Özge</td>
</tr>
<tr>
<td></td>
<td>Transforming the abstract into concrete</td>
<td>Yeliz, Özge, Melih</td>
</tr>
<tr>
<td></td>
<td>Improving creativity</td>
<td>Yeliz, Esra</td>
</tr>
<tr>
<td></td>
<td>Using technology</td>
<td>Esra</td>
</tr>
<tr>
<td></td>
<td>Engineering skills</td>
<td>Derya</td>
</tr>
<tr>
<td></td>
<td>Providing learning by doing</td>
<td>Özge</td>
</tr>
<tr>
<td></td>
<td>Arousing curiosity</td>
<td>Yeliz</td>
</tr>
<tr>
<td></td>
<td>Attracting attention</td>
<td>Nuray</td>
</tr>
<tr>
<td></td>
<td>Promoting active engagement</td>
<td>Özge</td>
</tr>
<tr>
<td></td>
<td>Multidimensional thinking skills</td>
<td>Derya</td>
</tr>
<tr>
<td></td>
<td>Taking learning to the next level</td>
<td>Yeliz</td>
</tr>
<tr>
<td></td>
<td>Making classes enjoyable</td>
<td>Zerrin</td>
</tr>
</tbody>
</table>

Participants’ views of using 3D printers in their professional lives were grouped under the theme of “intended use” consisting of the codes of “using technology,” “designing and developing materials,” “I do not think I will ever use them,” “enriching learning environments,” “arousing curiosity,” “promoting active engagement,” “multidimensional thinking skills,” and “taking learning to the next level,” “supplying materials,” “engineering skills,” “providing learning by doing,” “making classes enjoyable,” “improving creativity,” “transforming the abstract into concrete” and “ensuring learning retention.” The following are direct quotations from participants:

(Zerrin): I can use these objects to make learning outcomes more efficient and to provide both fun and permanent learning.

**Ensuring learning retention, Making classes enjoyable**

(Deniz): I can use it when I don’t have enough material because I sometimes have a hard time finding stuff online, so, I think the software is useful.

**Supplying materials**

(Özge): As a pre-service teacher, I think that I will use that software instead of classical methods. Instead of teaching on paper, designing together with students and getting them to turn something abstract into something concrete and getting them to learn by living promote active engagement and ensure learning retention.

**Transforming the abstract into concrete, Promoting active engagement**

DISCUSSION AND CONCLUSION

Participants’ TPACK-SeS pretest-posttest scale and subscale scores show that 3D printing activities improved their self-efficacy in TPCK, TCK, and TPK, but not in TK. This improvement might be because participants learned how to use 3D printing to design 3D content-specific learning objects to use in learning environments. Lower TK scores might be due to lack of experience. These results are also confirmed by the qualitative data. In the interviews, the majority of participants stated that 3D printing activities helped them acquire TPCK. They stated that the activities taught them how to use technology effectively and helped them have a grasp of content and develop content-specific materials which turned abstract objects into concrete ones, attracted students’ attention, made the lessons enjoyable and efficient, and promoted learning retention. As for the challenges of 3D printers,
participants stated that they had never used such software before and therefore had a hard time getting the hang of the 3D printer and its apparatus at first because they knew nothing about it. Previous studies have reported similar results. Taştı, Avcı Yücel and Yalçınalp (2015) reported that students had positive attitudes towards 3D printing because they believed that it facilitated learning and provided learning retention by turning the abstract into concrete. Jo (2016) reported that 3D printing achieved learning retention by supporting students’ learning and teaching activities and boosting their concentration. Cano (2015) argues that 3D printers make schools and classes enjoyable and interesting and trigger students' curiosity, creativity, and passion for learning. Karaduman (2018) found that 3D printers and models helped pre-service teachers to develop technology skills, turn abstract concepts into concrete visual representations, and attract students’ attention, and thus, ensure learning retention.

3D printing activities helped participants develop different skills. Most participants stated that the activities improved their creativity and taught them how to use a new software program and design and develop materials and think multi-dimensionally. These results are consistent with the quantitative data. Participants' TPACK-SeS posttest scores showed that 3D printing activities helped them acquire TCK. Previous studies have reported similar results. Chien (2017) argues that 3D printing is an effective technology that can be used to design innovative and versatile materials in learning environments. Güleryüz, Dilber ve Erdoğan (2019) found that 3D printers facilitated learning and improved pre-service teachers’ ability to think creatively and in three-dimensions. Computers and new technology provide creative learning environments that improve academic performance (Potter, and Johnston, 2006). According to Karaduman (2018), 3D printing is a revolutionary technology that integrates the third dimension into the learning-teaching process and encourages students to design and develop materials that promote learning and activate the sense of touch, and thus, facilitate learning.

Participants faced various problems associated with 3D printers. They stated that 3D printing required three-dimensional thinking and took too long and was therefore time-consuming, that 3D printers were too expensive for utilization in a classroom environment, and that they had a hard time designing because they did not know how to use the 3D Builder. However, some participants stated that they had no difficulty using the 3D printers. Previous studies have reported similar results. Although 3D printers offer time and cost advantages, they are still too slow and too expensive to be useful to households (Berman, 2012; Demir Kuzu, Çağı, Tuğtekin, Demir, İslamoğlu & Kuzu, 2016). Jo (2016) argues that not only material development and dissemination, but also design, cost, and production limitations should be taken into account in 3D technology. Gibson, Rosen and Stucker (2010) also maintain that possible changes in the 3D printing process greatly slow down and hinder production.

The majority of participants had positive views on the effect of 3D objects on learning. They stated that 3D objects turned abstract concepts into concrete visual representations, facilitated learning, made lessons enjoyable, provided learning retention, encouraged them to learn more about their fields, increased their interest, and helped them develop creative thinking and design skills, and thus, create different content-specific educational materials. These results are consistent with the quantitative data. Participants’ TPACK-SeS posttest scores showed that 3D printing activities improved their self-efficacy in TPK. However, some participants stated that the activities had no effect on their self-efficacy in TPK, which has been reported by some previous studies. Research shows that 3D printers have positive effects on learning. For example, 3D printers can help students enjoy learning, apply what they learn in real-life situations, and develop creative thinking skills (Eisenberg, 2013). Taştı et al. (2015), state that 3D modeling software is effective and easy to use. Participants also stated that 3D learning objects promoted learning by turning abstract concepts into concrete visual representations.

Participants stated that they had a hard time using the software because they lacked multidimensional and creative thinking skills that were necessary to design and create 3D learning objects. They also stated that they were challenged by Internet connection problems and by their own inability to use 3D printer apparatus. Power outages were another challenge because they disrupted the
3D printing process and made participants start it all over again. Research also shows that students and teachers (Maloy, Kommers, Malinowski and LaRoche, 2017) and pre-service teachers (Karaduman, 2018; Taşti et al., 2015) faced challenges in using 3D modeling software such as creating models due to lack of knowledge or finding models online due to limited number.

Participants reported that 3D printers helped them prepare different educational materials easily. They stated that 3D printing can attract students' attention and arouse their curiosity because it allows them to turn abstract concepts into concrete visual representations, promotes learning, provides learning retention, and helps students develop creative thinking and design skills. Some participants, on the other hand, stated that they found 3D printers hard to use and useless. Some studies support our results. Lütolf (2013) argues that cheap 3D printers allow students and teachers to quickly design and produce educational materials, which increases educational opportunities. (Karaduman, 2018) also maintains that 3D printing is an ideal technology to produce materials that are not easily accessible and available.

Participants stated that they would like to use 3D printers in their professional lives to teach their students how to use a new technology, to attract their attention and arouse their curiosity, to help them develop multidimensional and creative thinking and engineering skills, to enrich learning environments, to make classes enjoyable, to promote active engagement, to provide learning by doing and learning retention, to perform high-level learning, and to design and use concrete materials. However, some participants stated that they would not like to use 3D printers in their professional lives, which might be due to the challenges that they faced during the 3D printing process. Previous studies have reported similar results. Schelly, Anzalone, Wijnen, and Pearce (2015) investigated the advantages of the use of open-source technologies in teaching environments. To that end, they provided students with training on how to 3D print by using open-source technologies and found that students immediately put that new knowledge into practice in their own classes. Özsoy and Duman (2017) state that 3D printers help students develop three-dimensional and analytical thinking and design skills.

RECOMMENDATIONS

The following are recommendations based on the results: Teachers and pre-service teachers should be provided with trainings to raise their awareness of 3D printers and their use in learning environments. Education faculty students should be offered trainings to provide them with the opportunity to develop language proficiency and digital literacy skills necessary to use 3D software. Moreover, future experimental studies should recruit teachers and students at all levels of education in order to investigate the effects of 3D printing technologies on teaching-learning processes. It is recommended that future studies recruit more participants and involve more activities to provide more precise information on the contribution of 3D printing technologies and 3D learning objects to teaching-learning processes.

REFERENCES


Savaş, M., Öztürk, N., & Tüzün, Y. Ö. (2010). Fen bilgisi öğretmen adaylarının fen eğitiminde teknoloji kullanım ile ilgili görüşleri ile ilişkili olan faktörlerin belirlenmesi. [Determination of factors related to science teacher candidates' views on technology usage in science education].


Seventh Graders’ Learning Strategies and Achievement Goal Orientations as Predictors of Their Achievement in Social Studies*

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Koray Kasapoglu
Afyon Kocatepe University

Abstract

It is aimed to examine the relationships among seventh-graders’ achievement goal orientations and learning strategies and achievement in Social Studies. In this quantitative study with a correlational design, the data were collected from 440 seventh-grade students studying in nine public middle schools selected by convenience sampling. As data collection tools, Learning Strategies for Social Studies Scale (Didin & Kasapoğlu, 2017), Social Studies-Oriented Achievement Goals Scale (Gezer & Şahin, 2016) and Personal Information Form were used. Seventh-graders’ achievement in Social Studies was determined based on end-of-term grades. The data were analyzed by descriptive and inferential statistics. The results of the hierarchical regression analysis depicted that seventh-graders’ learning strategies for Social Studies positively predicted their achievement in Social Studies, after controlling for gender. After adjustment for both their gender and learning strategies for Social Studies, the task-approach as one of the Social Studies-oriented achievement goals positively predicted their achievement in Social Studies.

Keywords: Social Studies, Achievement Goal Orientations, Learning Strategies, Academic Achievement

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**INTRODUCTION**

Individuals face with many problems in the society they live in. They need to be prepared to deal with these problems. Social Studies is one of the basic courses required for individuals to have knowledge and responsibility about the problems in society, to understand interpersonal relations and to understand national characteristics (Şahin, 1994). These goals of Social Studies require students to think, understand, question and find solutions to problems, and seek ways to make what they learn more lasting (Akınoğlu & Bakır, 2003). In order to make students learn effectively and lastingly in Social Studies, learning strategies are needed (Çelikkaya & Kuş, 2010). Weinstein and Mayer (1986) characterize learning strategies as a process in which the learner does not passively accept the stimuli offered by the teacher, but instead as a process in which the student is active. Learning strategies are generally classified as attention, rehearsal, elaboration, organization and metacognition strategies, although they are named differently in the literature. Attention strategies help understanding information and distinguishing important information from unimportant one (Senemoğlu, 2015). Rehearsal means that the student tries to actively remember, read or name information (Weinstein & Hume, 1998). In its simplest form, organization strategies generally focus on organizing new information for easier recall (Weinstein & Hume, 1998). With elaboration strategies, new knowledge is made meaningful by comparing it with old one (Weinstein & Mayer, 1986). While cognitive strategies are utilized to organize learning and solve problems, metacognitive strategies are used to plan, oversee, assess, manage and understand these strategies (Aleven & Koedinger, 2002).

In addition to the learning strategies, the motivation of the students, the goals they set and the behaviours they display in line with these goals are effective in being successful. In order to explain the underlying causes of students’ behaviours while learning, the achievement goal orientation theory has been introduced by Nicholls (1984). Achievement goal orientations create a framework that explains the reasons of the ways that influence individuals’ academic achievement and how they perceive their abilities and act according to them (Dweck & Leggett, 1988). The concept of achievement goal orientation, which determines the cognitive, affective and behavioural responses of students to their performance, emphasizes the measurement and assessment of their beliefs and performances that affect students’ achievement (Schunk, 2000). The different needs of students lead to different orientations of achievement including learning goals and motivations (Gümüş, 2018). The achievement goal orientation models developed with the aim of investigating the goals that students adopt and the skills they demonstrate have changed over time (Elliot et al., 2011): In the 1970s and 80s, achievement goal orientations were named as a dichotomous model consisting of mastery and performance. In the 1990s and 2000s, a trichotomous model was created by dividing achievement goal orientations into three as mastery, performance approach and performance avoidance. Then, the 2x2 model was created as mastery approach, mastery avoidance, performance approach, and performance avoidance. In the early 2010s, the 2x2 model was converted into a 3x2 model consisting of six orientations: task-approach, self-approach, other approach, task-avoidance, self-avoidance, and other avoidance.

Gezer and Şahin (2016) named the 3x2 achievement goal orientations model developed by Elliot et al. (2011) as task-approach, task-avoidance, self-approach, self-avoidance, other-approach and other-avoidance. The achievement goals of individuals with these orientations are as follows (Gezer & Şahin, 2016):

1. Task-Approach: It is important to answer most of the exam questions correctly and in the best way. They benefit from the opportunities that guarantee achievement. One of the most important goals is to get higher grades than previous ones.

2. Other-Approach: To be successful is to get higher grades than classmates. It is important to look more successful than classmates and to be perceived as successful by classmates. For individuals with this orientation, it is important that the grades they get from the exams are not too high, but higher than the grades of their classmates.
3. Self-Approach: Students learn subjects broadly and comprehensively. The most important goal of the students is to learn new knowledge. The important thing in this framework is to constantly improve knowledge and learn everything that can be learned. They try to understand the topics mentioned in the best way. They are always interested in topics that lead them to think.

4. Task-Avoidance: Students with this orientation refrain from answering questions incorrectly, having many wrong answers, getting lower grades than previous ones and all factors that prevent them from being successful.

5. Other-Avoidance: Students with this orientation are reluctant to perform poorer than their classmates, to answer the teacher’s question incorrectly, to be humiliated when answering a question in the classroom, to look like an unsuccessful student, and to get a lower grade than their classmates.

6. Self-Avoidance: Students with this orientation avoid not learning the subjects incompletely, the possibility of learning mistakenly, forgetting what they have learned over time, making mistakes when solving questions and the lack of learning all the subjects that need to be learned.

As these achievement goal orientations can be related to the reasons behind students’ success and their different aspects, they might contribute to the definition of academic achievement. Academic achievement is the result of an assessment made during or at the end of an instructional process. Academic achievement is defined as the students’ proficiency levels regarding the learning objectives stated in the curriculum (Öztekin, 2012). School scores are often taken into account in determining achievement (Aydıner, 2004). In his experimental study, Dursunlar (2018) took into account the Social Studies grade averages and the achievement test results of the seventh-grade students in order to determine their achievement in Social Studies.

There have been studies in the literature examining the relationship of academic achievement with either learning strategies or achievement goal orientations. Examining the related literature shows that there are studies reporting significant relationships between learning strategies and academic achievement (Celikkaya & Kuş, 2010; Liu, 2009; Liu et al., 2008). Learning strategies were found to significantly predict academic achievement (Shawer, 2016) and mediate the relationship between motivation and academic achievement (McClintic-Gilbert et al., 2013) and between motivation and feelings of success (Magen-Nagar & Cohen, 2017). Mostly, the impact of learning strategies on academic achievement was studied (Dikbaş & Kaf Hasırço, 2008; Kayan Fadilemula, 2011; Tunçer & Güven, 2007; Washburn et al., 2016; Yıldız, 2003; Yorulmaz, 2001). It is also seen that there are studies revealing significant relationships between achievement goal orientations and academic achievement (Akin, 2006; Buluş, 2011; Coutinho, 2007; Jiang et al., 2014; Skaalvik, 2018; Üzbe, 2013). Besides, achievement goal orientations were found to significantly predict feelings of success (Pekrun et al., 2009) and academic achievement (Chan et al., 2012; Richey et al., 2018). However, there is no study investigating the relationship between these three variables namely, learning strategies, achievement goal orientations and academic achievement. In addition, it has been determined that the studies conducted with the 3x2 achievement goal orientations model used in this research are limited and focused more on mastery approach, performance approach and performance avoidance orientations. It is anticipated that this study will fill the literature gap in terms of the achievement goal orientations model used. It is expected that the results of the research will contribute to the determination of the students’ achievement goal orientations and learning strategies, the structuring of the Social Studies curriculum and instructional materials (e.g. textbooks) according to the determined achievement goal orientations and learning strategies, and to the achievement of the students in Social Studies.
Purpose of the Study

In this study, it was aimed to determine (a) learning strategies used by seventh-grade students in Social Studies, (b) Social Studies-oriented achievement goals of seventh-grade students, (c) seventh-grade students’ achievement in Social Studies, (d) the relationships among learning strategies for Social Studies, Social Studies-oriented achievement goals, and achievement in Social Studies, (e) whether learning strategies for Social Studies predict achievement in Social Studies after controlling for gender, (f) whether Social Studies-oriented achievement goals predict achievement in Social Studies after controlling for gender and learning strategies for Social Studies. Within this scope, answers were sought to the following research questions:

1. What are the learning strategies used by seventh-grade students in Social Studies?
2. What are the Social Studies-oriented achievement goals of seventh-grade students?
3. What is the level of seventh-grade students’ achievement in Social Studies?
4. What is the relationship between seventh-grade students’ learning strategies for Social Studies and their achievement in Social Studies?
5. What is the relationship between seventh-grade students’ Social Studies-oriented achievement goals and their achievement in Social Studies?
6. What is the relationship between seventh-grade students’ learning strategies for Social Studies and Social Studies-oriented achievement goals?
7. How well is seventh-grade students’ achievement in Social Studies predicted by their learning strategies for Social Studies, after controlling for their gender?
8. How well is seventh-grade students’ achievement in Social Studies predicted by their Social Studies-oriented achievement goals, after controlling for their gender and learning strategies for Social Studies?

METHOD

Research Design

This quantitative research has a correlational design. The correlational research design detecting relationships among variables aims “either to explain important human behaviours or to predict likely outcomes” (Fraenkel et al., 2012, p. 362). In this research, the correlational research design was used since it aimed to examine the relationships among seventh-grade students’ learning strategies for Social Studies, Social Studies-oriented achievement goals, and achievement in Social Studies and whether their achievement in Social Studies was significantly predicted by their Social Studies-oriented achievement goals, after controlling for their gender and learning strategies for Social Studies.

Population and Sample

The accessible population of the research comprises the seventh-grade students studying in Afyonkarahisar. The data were collected from nine different public middle schools in the central district of Afyonkarahisar determined by convenience sampling in the spring semester of the 2017-2018 academic year. As underlined by Fraenkel et al. (2012), a convenience sample is a group of individuals that is convenient to the researcher. This method was preferred to select the public middle
schools that could be accessed easily. The sample consisted of 440 seventh-grade students voluntarily participating in the research. The characteristics of the sample are displayed in Table 1.

### Table 1. Characteristics of the Participant Seventh-Grade Students

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>227</td>
<td>53.3</td>
</tr>
<tr>
<td>Male</td>
<td>199</td>
<td>46.7</td>
</tr>
<tr>
<td><strong>Mother’s status of employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>87</td>
<td>20.6</td>
</tr>
<tr>
<td>Unemployed</td>
<td>288</td>
<td>68.1</td>
</tr>
<tr>
<td>Self-employed</td>
<td>45</td>
<td>10.6</td>
</tr>
<tr>
<td>Retired</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Father’s status of employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>286</td>
<td>69.1</td>
</tr>
<tr>
<td>Unemployed</td>
<td>8</td>
<td>1.9</td>
</tr>
<tr>
<td>Self-employed</td>
<td>96</td>
<td>23.2</td>
</tr>
<tr>
<td>Retired</td>
<td>24</td>
<td>5.8</td>
</tr>
<tr>
<td><strong>Mother’s level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>11</td>
<td>2.6</td>
</tr>
<tr>
<td>Elementary school</td>
<td>166</td>
<td>39.1</td>
</tr>
<tr>
<td>Middle school</td>
<td>132</td>
<td>31.1</td>
</tr>
<tr>
<td>High school</td>
<td>75</td>
<td>17.6</td>
</tr>
<tr>
<td>University</td>
<td>30</td>
<td>7.1</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>8</td>
<td>1.9</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Father’s level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>3</td>
<td>0.7</td>
</tr>
<tr>
<td>Elementary school</td>
<td>89</td>
<td>21.1</td>
</tr>
<tr>
<td>Middle school</td>
<td>114</td>
<td>27.1</td>
</tr>
<tr>
<td>High school</td>
<td>134</td>
<td>31.8</td>
</tr>
<tr>
<td>University</td>
<td>50</td>
<td>11.9</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>25</td>
<td>5.9</td>
</tr>
<tr>
<td>Doctoral degree</td>
<td>6</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Note: *N* for each item may vary due to missing responses.

According to Table 1, 53.3% of the participant seventh-grade students are female and 46.7% are male. While 68.1% of the students’ mothers are not working, 92.3% of the students’ fathers are working. While the mothers of 39.1% of the students are elementary school graduates, the mothers of 9.7% are at least university graduates. While the fathers of 31.8% of the students graduate from a high school, the fathers of 0.7% are illiterate.

### Data Collection Tools

In the research, Learning Strategies for Social Studies Scale (Didin & Kasapoğlu, 2017), Social Studies-Oriented Achievement Goals Scale (Gezer & Şahin, 2016) were utilized. In addition to this, in order to collect information about the characteristics of seventh-grade students, the Personal Information Form the researchers developed was utilized.

### Learning Strategies for Social Studies Scale

In order to determine seventh-grade students’ learning strategies for Social Studies, the “Learning Strategies for Social Studies Scale” (Didin & Kasapoğlu, 2017) which consists of 20 items and one factor explaining 52.21% of the total variance was used. The reliability coefficient for one-factor structure of the scale was calculated as 0.95 (Didin & Kasapoğlu, 2017). Didin and Kasapoğlu (2017) conducted exploratory factor analysis during the scale development phase.

In this study, the data collected in the second half of the 2017-2018 academic year were subjected to confirmatory factor analysis with LISREL 8.71 (Jöreskog & Sörbom, 1993) to confirm the single-factor structure of the scale. The data entries of the 426 subjects were checked and no errors were detected. Missing value analysis was performed to determine the missing values. It was suggested that the sample size should be at least 200 in order to perform the confirmatory factor analysis (Kline, 2016). In this research, the sample size is larger than 200 (*n* = 426). The confirmatory
factor analysis assumptions, i.e. absence of multivariate outliers, univariate and multivariate normality and absence of multicollinearity were checked. Univariate normality was checked by observing skewness and kurtosis values. Skewness and kurtosis value of zero displays a perfect normal distribution (Tabachnick & Fidell, 2007). Skewness values greater than 3 and kurtosis values greater than 10 indicate that data are not normally distributed (Kline, 2016). Skewness values between ±2 and kurtosis values between ±4 showed that the univariate normality assumption was met. Multivariate normality was checked by running Mardia’s test (Mardia, 1970). The multivariate kurtosis value of 40.78 (p<.05) not more than the critical value of 440, which was calculated for multivariate normality according to the formula developed by Raykov and Marcoulides (2008 cited in Ursavaş, 2015), indicated that the multivariate normality could be assumed (Ursavaş, 2015). There was no multicollinearity between the scale items because the correlation coefficients ranging from .20 and .56 did not exceed .90 (Pallant, 2011). In confirmatory factor analysis, the chi-square/degree of freedom ratio, GFI, CFI, RMSEA, SRMR, AGFI and NNFI values are examined (Çokluk et al., 2014). The goodness of fit values for the modified model are X²/df = 2.47; RMSEA = 0.059; GFI = 0.91; AGFI = 0.89; SRMR = 0.043; NNFI and CFI = 0.98. It can be suggested that the model is acceptable according to the following cut-off criteria: X²/df ≤ 3 (Kline, 2016); RMSEA ≤ .08 (Jöreskog & Sörbom, 1993); SRMR ≤ .05 (Brown, 2006); GFI ≥ .90, AGFI ≥ .90, NNFI ≥ .95, CFI ≥ .95 (Sümer, 2000). t values greater than 1.96 shows that the scale items significantly load on the factor. Since t values are greater than 2.58, they are significant at the 0.01 level (Jöreskog & Sörbom, 1993). As a result, it can be stated that confirmatory factor analysis supports exploratory factor analysis. Accordingly, “Learning Strategies for Social Studies Scale” consists of 20 items and one dimension. The Cronbach alpha value of the overall scale was 0.92. According to Field (2009), this value indicates that the scale has a high-level internal consistency.

Social Studies-Oriented Achievement Goals Scale

To determine the Social Studies-oriented achievement goals of seventh-grade students, the “Social Studies-Oriented Achievement Goals Scale” (Gezer & Şahin, 2016) was used after getting permission. It consists of 29 items and six factors (task-approach, self-approach, other-approach, task-avoidance, self-avoidance, other-avoidance) explaining 50.82% of the total variance. The reliability coefficients for each factor are as follows: .73, .63, .71, .55, .73, and .70 (Gezer & Şahin, 2016). Gezer and Şahin (2016) conducted exploratory factor analysis during the scale development phase as suggested by the literature (Çokluk et al., 2014; Tabachnick & Fidell, 2007) and confirmatory factor analysis during the scale validation phase as mentioned in the literature (Jöreskog & Sörbom, 1993; Kline, 2016).

In this study, confirmatory factor analysis was done to confirm the six-factor structure. Before conducting confirmatory factor analysis, its assumptions were checked. Univariate normality was examined through skewness and kurtosis values. Skewness values greater than 3 and kurtosis values greater than 10 indicate that data are not normally distributed (Kline, 2016). Skewness values lower than 3 and kurtosis values lower than 10 indicated that the univariate normality was assumed. Multivariate normality was checked through Mardia’s test (Mardia, 1970). The multivariate kurtosis value of 61.91 (p<.05) lower than the critical value of 899, which was calculated for multivariate normality according to the formula developed by Raykov and Marcoulides (2008 cited in Ursavaş, 2015), indicated that the assumption of multivariate normality could be satisfied (Ursavaş, 2015). No multicollinearity was found between the scale items because the correlation coefficients ranging from .11 and .65 did not exceed .90 (Pallant, 2011). In confirmatory factor analysis, chi-square/degree of freedom ratio, GFI, RMSEA, SRMR, AGFI and NNFI values are examined (Çokluk et al., 2014). The fit indices for the modified model are as follows: X²/df = 2.10; RMSEA = 0.051; GFI = .89; AGFI = 0.87; SRMR = 0.048; NNFI and CFI = 0.98. It can be suggested that the model is acceptable according to the following cut-off criteria: X²/df ≤ 3 (Kline, 2016); RMSEA ≤ .08 (Jöreskog & Sörbom, 1993); SRMR ≤ .05 (Brown, 2006); GFI ≥ .90, AGFI ≥ .90, NNFI ≥ .95, CFI ≥ .95 (Sümer, 2000). t values greater than 1.96 show that the scale items significantly load on the relevant factors. t values are statistically significant at 0.01 level since they are greater than 2.58 (Jöreskog & Sörbom,
Confirmatory factor analysis confirmed the six-factor structure of the 29-item “Social Studies-Oriented Achievement Goals Scale”. The Cronbach alpha values for all factors (self-approach, task-approach, other-approach, task-avoidance, other-avoidance and self-avoidance) were 0.83, 0.82, 0.75, 0.77, 0.76 and 0.77, respectively. According to Field (2009), these values indicate that there is an internal consistency among the items loading on the factors.

**Data Collection**

Permission for data collection was obtained from Afyon Kocatepe University Scientific Research and Publication Ethics Committee and Afyonkarahisar Provincial Directorate of National Education. The scales were administered to 440 volunteer seventh-grade students in 20-25 minutes. Before the scale administration, the students were informed of the purpose of the research and how to fill out the scales. Data were screened to check for incorrect entry, missing values and extreme cases, and no misentry was detected. Little’s MCAR test (Little, 1988) was run to analyze missing values, and the MCAR test result (.477) was found to be nonsignificant (p>.05). In other words, missing values were found to be completely at random. Three cases (391st, 395th, and 397th) were removed from the data file because these cases included 65.3% of missing values. Outliers were examined through Mahalonobis Distance values for each case. There were 11 cases, which had Mahalonobis Distance values greater than the critical value. These cases were deleted from the data file. Hence, the data from the remaining 426 seventh-grade students were subjected to further analyses.

**Data Analysis**

Means and standard deviations as descriptive statistics used for summarizing, organizing and simplifying data (Gravetter & Wallnau, 2007) were calculated in order to determine seventh-grade students’ learning strategies for Social Studies, Social Studies-oriented achievement goals and achievement in Social Studies. The relationships among these three variables were determined through Pearson correlation analysis. Pearson correlation analysis is done to “measure the degree and direction of linear relationship between two variables” (Gravetter & Wallnau, 2007, p. 511). Since gender affects achievement in Social Studies (Dania, 2014), hierarchical regression analysis was performed to determine (1) how well learning strategies for Social Studies predict achievement in Social Studies after controlling for gender and (2) how well Social Studies-oriented achievement goals predict achievement in Social Studies after controlling for gender and learning strategies for Social Studies. Hierarchical regression is a multiple regression method in which the researcher determines the entry order of the predictors based on earlier research (Field, 2009). The assumptions of the hierarchical regression analysis (sample size, normality, homoscedasticity, independence of errors, linearity, and absence of multicollinearity and outliers) (Tabachnick & Fidell, 2007) were checked and satisfied. The assumption of sample size was met because the data were collected from a sample of 440 seventh-grade students, size of that should be 114 at minimum according to the formula of 50+8m. The histogram and normal P-P plot of residuals displayed that the assumption of normally distributed errors was satisfied. As the scatterplot of the dependent variable and residuals did not show a significant pattern, the homoscedasticity was assumed. The Durbin-Watson test was run for the assumption of independence of errors that was met due to the value of d (1.59) which should be between 1.5 and 2.5. The linearity assumption was checked through the scatterplots which displayed linear relationships between the dependent variable and each independent variable. In order to diagnose the absence of multicollinearity, correlations among predictors were checked from the correlation matrix. The correlations between predictors did not exceed the critical value of .90, tolerance values (1.00, .99, .37, .39, .69, .39, .46, .47) were higher than .20, and the variance inflation factor (VIF) values (1.00, 1.00, 2.71, 2.58, 1.45, 2.56, 2.16, 2.11) did not exceed 10. Cook’s distance and leverage values were examined, and it was seen that there were no serious outliers (p<.001).
**FINDINGS**

**Seventh-Grade Students’ Learning Strategies for Social Studies**

Seventh-grade students’ learning strategies for Social Studies are shown in Table 1.

Table 1. Seventh-Grade Students’ Learning Strategies for Social Studies

<table>
<thead>
<tr>
<th>Item</th>
<th>Learning Strategies for Social Studies</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>“I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying Social Studies.”</td>
<td>5.28</td>
<td>1.76</td>
</tr>
<tr>
<td>14</td>
<td>“I try to apply ideas from Social Studies readings in other class activities such as lecture and discussion.”</td>
<td>5.26</td>
<td>1.78</td>
</tr>
<tr>
<td>18</td>
<td>“When studying for Social Studies, I try to determine which concepts I don’t understand well.”</td>
<td>5.18</td>
<td>1.90</td>
</tr>
<tr>
<td>8</td>
<td>“When I become confused about something I’m reading for Social Studies, I go back and try to figure it out.”</td>
<td>5.17</td>
<td>1.86</td>
</tr>
<tr>
<td>20</td>
<td>“If I get confused taking notes in Social Studies, I make sure I sort it out afterwards.”</td>
<td>5.17</td>
<td>1.83</td>
</tr>
<tr>
<td>12</td>
<td>“I try to understand the material in Social Studies by making connections between the readings and the concepts from the lectures.”</td>
<td>5.01</td>
<td>1.76</td>
</tr>
<tr>
<td>5</td>
<td>“When I study for Social Studies, I go through the readings and my class notes and try to find the most important ideas.”</td>
<td>4.90</td>
<td>1.86</td>
</tr>
<tr>
<td>6</td>
<td>“When reading for Social Studies, I try to relate the material to what I already know.”</td>
<td>4.85</td>
<td>1.83</td>
</tr>
<tr>
<td>1</td>
<td>“When I study for Social Studies, I pull together information from different sources, such as lectures, readings, and discussions.”</td>
<td>4.80</td>
<td>1.82</td>
</tr>
<tr>
<td>19</td>
<td>“When I study for Social Studies, I set goals for myself in order to direct my activities in each study period.”</td>
<td>4.79</td>
<td>1.82</td>
</tr>
<tr>
<td>16</td>
<td>“I try to change the way I study Social Studies in order to fit the course requirements and instructor’s teaching style.”</td>
<td>4.74</td>
<td>1.85</td>
</tr>
<tr>
<td>3</td>
<td>“When reading for Social Studies, I make up questions to help focus my reading.”</td>
<td>4.72</td>
<td>1.93</td>
</tr>
<tr>
<td>15</td>
<td>“I ask myself questions to make sure I understand the material I have been studying in Social Studies.”</td>
<td>4.70</td>
<td>1.94</td>
</tr>
<tr>
<td>13</td>
<td>“Before I study new course material in Social Studies thoroughly, I often skim it to see how it is organized.”</td>
<td>4.68</td>
<td>1.86</td>
</tr>
<tr>
<td>4</td>
<td>“I try to relate ideas in Social Studies to those in other courses whenever possible.”</td>
<td>4.65</td>
<td>1.98</td>
</tr>
<tr>
<td>10</td>
<td>“When I study for Social Studies, I go over my class notes and make an outline of important concepts.”</td>
<td>4.57</td>
<td>1.96</td>
</tr>
<tr>
<td>11</td>
<td>“If course materials in Social Studies are difficult to understand, I change the way I read the material.”</td>
<td>4.56</td>
<td>2.01</td>
</tr>
<tr>
<td>9</td>
<td>“When I study for Social Studies, I write brief summaries of the main ideas from the readings and the concepts from the lectures.”</td>
<td>4.50</td>
<td>1.97</td>
</tr>
<tr>
<td>2</td>
<td>“When I study the readings for Social Studies, I outline the material to help me organize my thoughts.”</td>
<td>4.46</td>
<td>1.94</td>
</tr>
<tr>
<td>7</td>
<td>“I make simple charts, diagrams, or tables to help me organize course material in Social Studies.”</td>
<td>4.14</td>
<td>1.99</td>
</tr>
</tbody>
</table>

“...” (M = 5.28, SD = 1.76), “...” (M = 5.26, SD = 1.78), “...” (M = 5.18, SD = 1.90) are the Social Studies learning strategies that reflect seventh-grade students most. It can be said that seventh-grade students mostly use metacognition strategies. The Social Studies learning strategies that reflect seventh-grade students least, on the other hand, are “...” (M = 4.50, SD = 1.97), “...” (M = 4.46, SD = 1.94), “...” (M = 4.14, SD = 1.99). It can be said that organization strategies are used the least.
Seventh-Grade Students’ Social Studies-Oriented Achievement Goals

Seventh-grade students’ Social Studies-oriented achievement goals are shown in Table 2.

Table 2. Seventh-Grade Students’ Social Studies-Oriented Achievement Goals

<table>
<thead>
<tr>
<th>Social Studies-Oriented Achievement Goals</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-Approach</td>
<td>4.13</td>
<td>.881</td>
</tr>
<tr>
<td>Task-Avoidance</td>
<td>4.05</td>
<td>.861</td>
</tr>
<tr>
<td>Self-Approach</td>
<td>3.91</td>
<td>.825</td>
</tr>
<tr>
<td>Other-Avoidance</td>
<td>3.82</td>
<td>.907</td>
</tr>
<tr>
<td>Self-Avoidance</td>
<td>3.73</td>
<td>.919</td>
</tr>
<tr>
<td>Other-Approach</td>
<td>3.54</td>
<td>.967</td>
</tr>
</tbody>
</table>

As seen in Table 2, the Social Studies-oriented achievement goals of seventh-grade students are task-approach ($M = 4.13; SD = .88$), task-avoidance ($M = 4.05; SD = .86$), self-approach ($M = 3.91; SD = .82$), other-avoidance ($M = 3.82; SD = .90$), self-avoidance ($M = 3.73; SD = .91$), and other-approach ($M = 3.54; SD = .96$), respectively. Based on this table, it can be inferred that seventh-grade students’ Social Studies-oriented achievement goals are task-approach at most, while other-approach at least.

Seventh-Grade Students’ Achievement in Social Studies

The grades (over 100 points) seventh-grade students earned in Social Studies in the first semester of the 2017-18 academic year were accepted as their achievement in Social Studies. Descriptive statistics related to the end-of-term report grades of 424 students in Social Studies accessed via e-school system were calculated. It can be suggested that 424 seventh-grade students earned high end-of-term grades from Social Studies ($M = 76, SD = 18.04, mode = 95, median = 80$). Since the end-of-term scores seventh-grade students gain in Social Studies show a negatively-skewed distribution, it is suggested that the Social Studies teachers might give high scores to the participant seventh-grade students or ask easy questions in the exams.

Relationships between Seventh-Grade Students’ Learning Strategies for Social Studies, Social Studies-Oriented Achievement Goals and Achievement in Social Studies

The relationships between seventh-grade students’ learning strategies for Social Studies, Social Studies-oriented achievement goals and achievement in Social Studies were determined by computing Pearson’s correlation coefficients. The coefficients in Table 3 are interpreted according to the following criteria (Büyüköztürk, 2016): Pearson correlation coefficient of .70-1.00 indicates high; Pearson correlation coefficient of .30-.70 medium; Pearson correlation coefficient of .00-.30 low level of relationship.

Table 3. Pearson Correlation Analysis Results

<table>
<thead>
<tr>
<th></th>
<th>Sap</th>
<th>TAp</th>
<th>OAp</th>
<th>TAv</th>
<th>OAv</th>
<th>SAab</th>
<th>LS</th>
<th>AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sap</td>
<td>1</td>
<td>.72**</td>
<td>.43**</td>
<td>.66**</td>
<td>.50**</td>
<td>.52**</td>
<td>.62**</td>
<td>.30**</td>
</tr>
<tr>
<td>TAp</td>
<td></td>
<td>1</td>
<td>.39**</td>
<td>.41**</td>
<td>.51**</td>
<td>.49**</td>
<td>.51**</td>
<td>.39**</td>
</tr>
<tr>
<td>OAp</td>
<td></td>
<td></td>
<td>1</td>
<td>.41**</td>
<td>.51**</td>
<td>.49**</td>
<td>.59**</td>
<td>.48**</td>
</tr>
<tr>
<td>TAv</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>.62**</td>
<td>.59**</td>
<td>.67**</td>
<td>.48**</td>
</tr>
<tr>
<td>OAv</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>.67**</td>
<td>.67**</td>
<td>1</td>
</tr>
<tr>
<td>SAab</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>.67**</td>
<td>.48**</td>
</tr>
<tr>
<td>LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>.32**</td>
</tr>
<tr>
<td>AS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Moderate-level positive relationships were determined between seventh-grade students’ learning strategies for Social Studies and Social Studies-oriented achievement goals [self-approach ($r = .62$, $p < .01$), task-approach ($r = .52$, $p < .01$), task-avoidance ($r = .52$, $p < .01$), self-avoidance ($r = .48$, $p < .01$), other-avoidance ($r = .40$, $p < .01$), other-approach ($r = .35$, $p < .01$)]. A low-level positive relationship has been found between seventh-grade students’ learning strategies for Social Studies and their achievement in Social Studies ($r = .23$, $p < .01$). Moderate and positive relationships were found between seventh-grade students’ achievement in Social Studies and self-approach ($r = .30$, $p < .01$), task-approach ($r = .39$, $p < .01$), and task-avoidance ($r = .32$, $p < .01$). Low-level positive relationships were found between seventh-grade students’ achievement in Social Studies and other-avoidance ($r = .13$, $p < .01$) and self-avoidance ($r = .18$, $p < .01$). Seventh-grade students’ achievement in Social Studies is not significantly correlated with the other-approach ($r = .06$, $p > .01$). As a result, significant positive relationships were found between Social Studies-oriented achievement goals (except the other-approach) and achievement in Social Studies.

**Learning Strategies for Social Studies and Social Studies-Oriented Achievement Goals as Predictors of Seventh-Grade Students’ Achievements in Social Studies**

How well seventh-grade students’ achievement in Social Studies is predicted by learning strategies for Social Studies after controlling for gender and how well seventh-grade students’ achievement in Social Studies is predicted by Social Studies-oriented achievement goals after controlling for gender and learning strategies for Social Studies are determined by the hierarchical regression analysis, results of which are displayed in Table 4.

<table>
<thead>
<tr>
<th>Variables</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Partial $r^2$</th>
<th>$\Delta R^2$</th>
<th>$\Delta F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>5.29</td>
<td>1.74</td>
<td>.14</td>
<td>3.04*</td>
<td>.14</td>
<td>.02</td>
<td>9.25*</td>
</tr>
<tr>
<td>Model 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning strategies</td>
<td>3.35</td>
<td>.70</td>
<td>.22</td>
<td>4.73*</td>
<td>.22</td>
<td>.04</td>
<td>22.39*</td>
</tr>
<tr>
<td>Model 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-approach</td>
<td>1.64</td>
<td>1.61</td>
<td>.074</td>
<td>1.01</td>
<td>.05</td>
<td>.11</td>
<td>9.67*</td>
</tr>
<tr>
<td>Task-approach</td>
<td>6.31</td>
<td>1.48</td>
<td>.30</td>
<td>4.26*</td>
<td>.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other-approach</td>
<td>-1.86</td>
<td>1.00</td>
<td>-.09</td>
<td>-1.85</td>
<td>-.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task-avoidance</td>
<td>2.95</td>
<td>1.51</td>
<td>.13</td>
<td>1.94</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other-avoidance</td>
<td>-2.26</td>
<td>1.31</td>
<td>-.11</td>
<td>-1.72</td>
<td>-.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-avoidance</td>
<td>.38</td>
<td>1.28</td>
<td>.01</td>
<td>.30</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

In the first stage, it was found that gender significantly predicted achievement in Social Studies and explained 2% of variance ($AR^2 = .02$, $AF = 9.25$; $p < .05$). From the $\beta$ value (.14) in Table 4, it is understood that girls are more successful in Social Studies. In the second stage of the analysis, learning strategies for Social Studies were added to the model, and after controlling for gender, it was found that learning strategies positively predicted achievement in Social Studies ($AR^2 = .04$, $AF = 22.39$; $p < .05$) and explained 4% of the variance. In the last stage of the analysis, Social Studies-oriented achievement goals were added to the model. Accordingly, it was found that Social studies-oriented achievement goals explained 11% of the variance ($AR^2 = .11$, $AF = 9.67$; $p < .05$) after controlling for gender and learning strategies for Social Studies and that only the task-approach was a positive predictor of achievement in Social Studies after adjusting for gender and learning strategies ($\beta = .30$). According to these findings, when gender and learning strategies for Social Studies held constant, the more seventh-grade students aim to get higher exam scores in Social Studies, the more their achievement in Social Studies increases.

**DISCUSSION, CONCLUSION, AND RECOMMENDATIONS**

This study aimed to determine seventh-grade students’ learning strategies for Social Studies, Social Studies-oriented achievement goals and achievement in Social Studies. In addition, it was
aimed to explore the relationships among learning strategies for Social Studies, Social Studies-oriented achievement goals, and achievement in Social Studies, whether learning strategies for Social Studies predict achievement in Social Studies after controlling for gender and whether Social Studies-oriented achievement goals predict achievement in Social Studies after controlling for gender and learning strategies for Social Studies.

The Social Studies learning strategies that reflect seventh-grade students most are “I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying Social Studies.”, “I try to apply ideas from Social Studies readings in other class activities such as lecture and discussion.” and “When studying for Social Studies, I try to determine which concepts I don’t understand well.” On the other hand, “When I study for Social Studies, I write brief summaries of the main ideas from the readings and the concepts from the lectures.”, “When I study the readings for Social Studies, I outline the material to help me organize my thoughts.” and “I make simple charts, diagrams, or tables to help me organize course material in Social Studies.” are the Social Studies learning strategies that reflect seventh-grade students least. Based on these findings, it can be said that learning strategies that reflect seventh-grade students most are metacognitive self-regulation strategies, while learning strategies that reflect least are organization strategies (Kayhan Fadlelmula, 2011). In parallel with this finding, Çelikkaya and Kuş (2010) stated that seventh-grade students are very eager in Social Studies to “re-read the course material that they do not understand, pay attention to something written in bold while studying, listen to the course carefully, mark sentences that they do not understand with “? *, !”, revise the notes they take after the course, and review the topics covered at school”. The participant seventh-grade students might be mastery-oriented rather than performance-oriented. Mastery-oriented students were found to use cognitive and metacognitive strategies (Sücuoğlu & Gökdag Baltaoğlu, 2020). Mastery goal orientation was found to positively predict the use of deep and/or metacognitive learning strategies (Guo & Leung, 2021; Somuncuoğlu & Yıldırım, 1999) and be correlated with the use of self-regulated learning strategies (Kayhan Fadlelmula et al., 2015; Ozkal, 2013). According to Sağ and Şit (2020), middle school students using attention and rehearsal strategies rather than metacognitive ones are stated to be performance-oriented. Organization strategies suggest that it is necessary to devote a certain amount of time to learning. Considering that these strategies are the learning strategies that reflect the seventh-grade students least, it can be suggested that students spend little time learning Social Studies. In this, students’ prejudices about Social Studies, the effect of which was investigated on the achievement in Social Studies, may be effective (Çelik & Katılmış, 2010). Since students perceive Social Studies as easy or difficult, they may not be interested in this course and may not be studying enough. Supporting this possibility, Çakmak et al. (2008) concluded that primary and secondary school students attach less importance to Turkish and Social Studies than to Mathematics and Science. However, organization strategies that reflect the participant seventh-grade students least can be associated with some competencies in the Social Studies curriculum. Organization strategies can be considered related to mathematical competence in the Social Studies curriculum updated in 2018 that includes the ability to use tables and graphics (Ministry of National Education [MoNE], 2018a: 5). As a matter of fact, Pala and Başbüyük (2019) found that the sixth, seventh and eighth grade students’ skills of reading maps, graphics and tables in Social Studies were predicted by their mathematical competencies. The very low level of graphic design skills of seventh-grade students has been associated with the lack of proper use of learner-centered strategies (Oruç et al., 2016). These strategies might have not been taught or used properly in the classrooms of the participant seventh-grade students. The graphic organizers used in Social Studies, however, facilitate the learning of seventh-grade students (Dönmey et al., 2007). For instance, it is stated that use of mind maps as graphic organizers improves reading comprehension of students (Nopita et al., 2021).

It was found that seventh-graders’ Social Studies-oriented achievement goals are task-approach, task-avoidance, self-approach, other-avoidance, self-avoidance and other-approach, respectively. According to these findings, it is determined that seventh-grade students’ Social Studies-oriented achievement goals are the task-approach at most and the other-approach at least. This finding can be regarded as expected in the Turkish education system, where test anxiety is felt at an early age,
and success means getting high marks, and students have extrinsic motivation, place emphasis on
competition and adopt a performance-approach orientation (Üztemur, 2020). It can be suggested that
seventh-grade students with a higher orientation toward task-approach aim to get high exam scores in
Social Studies (Gezer & Şahin, 2016). It was stated that students adopt a test-based approach of
learning Social Studies, they have test anxiety, and learning Social Studies is not among the main
goals of the students anymore (Açıkalın & Gönenç, 2017). Çoban et al. (2017) concluded that students
perceive Social Studies as an easy course, memorize the topics they consider important and fail to
internalize it. The fact that seventh-grade students with a lower orientation toward other-approach can
be explained by the fact that they do not care much about scoring higher and being more successful
than their classmates in Social Studies exams (Gezer & Şahin, 2016). The participant seventh-grade
students may not compare themselves with their peers, do not see their peers as competitors, or ignore
scoring higher in order not to be socially isolated; because, as Köse (2015) suggests, these students in
adolescence who have a sense of belonging in a group of friends feel valued.

End-of-term grades seventh-grade students earn in Social Studies ($M = 76, SD = 18.04$) can be
considered as high. Considering that students have task-approach at most, this result can be regarded
as expected; however, it should be interpreted carefully. How achievement is assessed can also be
effective in this result. Even though the process- and product-oriented, individually-sensitive and
versatile assessment (MoNE, 2018a) are underlined in the Social Studies curriculum updated in 2018,
Memişoğlu (2012) found that Social Studies teachers frequently used matching, short-answer and
multiple-choice tests and performance tasks, but never used interview and observation forms, written
exams, attitude scales, portfolios, self-, peer- and group-evaluation forms. On the other hand, it has
been suggested that multiple-choice tests that allow students to make choices restrict them (Schleicher,
2017). High end-of-term grades of seventh-grade students in Social Studies may not mean that they
are successful. Social Studies teachers may give seventh-grade students high scores or ask easy
questions in exams. Şanlı and Pınar (2017) found that Social Studies teachers mostly administered
multiple-choice and true-false tests to their seventh-grade students, most of the questions they asked
were at the levels of remembering and understanding, and they measured the factual and conceptual
knowledge.

As a result of this research, a positive and low-level significant relation was found between
seventh-grade students’ learning strategies and their achievement in Social Studies. As seventh-grade
students use learning strategies, their achievement in Social Studies increases. Supporting this finding,
Çelikkaya and Kuş (2010) also found that learning strategies for Social Studies and academic
achievement are positively correlated. Erden and Demirel (1991) found that learning strategies of fifth
grade students are correlated with their academic achievement, and that they learn quickly and
lastingly as they use learning strategies. Yorulmaz (2001) concluded that the “learning to learn”
strategies used by seventh-grade students in Social Studies positively affect their academic
achievement.

It has been determined that moderate and positive relationships are found between seventh-grade
students’ learning strategies and Social Studies-oriented achievement goals. In other words, students
use the learning strategies that will make them accomplish their goals according to their
achievement goal orientation more. Supporting this finding, Paulino et al. (2016) found significant
relationships between self-efficacy expectations, task value, achievement goal orientations and
motivational regulation strategies, and Won et al. (2018) between learning orientations, sense of
belonging to school, metacognitive strategies, and time management strategies.

The relationships between seventh-grade students’ achievement in Social Studies and Social
Studies-oriented achievement goals (except other-approach) were found to be positively significant. It
is determined that achievement in Social Studies will increase as it is aimed to learn new knowledge in
Social Studies, to understand the issues that lead to thinking ideally, to answer most of the exam
questions correctly, and to avoid answering exam questions incorrectly, failing while friends succeed,
and failing to learn (Gezer & Şahin, 2016). Zhou et al. (2019), despite no statistically significant
cluster differences in academic achievement, found out that students clustered under high-mastery-approach-low-performance-avoidance get consistently high exam scores whereas those clustered under performance-avoidance-dominant earn the lowest scores. Diseth and Kobbeltvedt (2010) reached the conclusion that academic achievement was positively linked to performance-approach goal and mastery goal, but negatively associated with performance-avoidance goal. Correspondingly, Tuominen et al. (2020) concluded that the sixth- and seventh-grade Finnish students who are mastery-oriented manifest the most positive outcomes in academic achievement and well-being. As indicated by Świątkowski and Dompierní (2020), the impact of achievement goal orientations on achievement depends on the self-regulatory focus orientations namely, promotion and prevention. The participant seventh-grade students might be promotion-oriented. In other words, they might show sensitivity to the presence or absence of desired outcomes of their actions and consider obtaining a positive result (Świątkowski & Dompierní, 2020). That seventh-grade students’ achievement in Social Studies is not related to the other-approach can be clarified by the fact that seventh-grade students have the lowest orientation toward other-approach. In other words, aiming to get higher grades and to be more successful than others in Social Studies class (Gezer & Şahin, 2016) neither increases nor decreases achievement of seventh-grade students in Social Studies. Finding out that the relationship between being socially accepted by peers and achievement is significant and positive; Wentzel et al. (2021) highlighted the significant role of peers in supporting students to accomplish achievement goals, though. In fact, as stated by King and Mendoza (2020), one’s achievement goals can be influenced by his/her classmates’. For instance, both approach and avoidance goals (except for mastery-avoidance ones) are found to be contagious (King & Mendoza, 2020).

It was also observed that seventh graders’ genders positively predicted their Social Studies achievement. Holding gender constant, learning strategies positively predicted their achievement in Social Studies. After adjustment for both their gender and learning strategies for Social Studies, the task-approach as one of the Social Studies-oriented achievement goals positively predicted their achievement in Social Studies. In this study, it was concluded that gender predicted achievement in Social Studies. Supporting this finding, it was found that the academic achievement of the seventh- and eighth-graders is related to their gender, and the fact that girls are more successful than boys is explained by many psychological, physical and social factors (Adatepe, 2014). For example, it has been argued that girls are more successful as a result of undertaking the responsibility given to them at an early age in their classes. Girls might perceive Social Studies as stereotypically compatible with their gender and be more motivated in verbal subjects such as Social Studies as inferred from the results of a study by Wirthwein et al. (2020). Aydıner (2004) also determined that girls aged between 13 and 16 are more successful than boys. In this study, it was found that seventh-grade students who use learning strategies will be more successful in Social Studies holding their gender constant. The findings that the teaching of learning strategies (Tuçer & Güven, 2007) and their use (Dikbaş & Kaf Hasirci, 2008) increase academic achievement coincide with the results of this research. In this study, after controlling for gender and learning strategies for Social Studies, it is determined that the seventh-grade students with task-approach orientation will be more successful in Social Studies. It is determined that seventh-grade students who aim to get high scores from the exams will be more successful in Social Studies when their gender and learning strategies are held constant. Correspondingly, the related literature (Lüftenegger et al., 2016; Stoebert et al., 2015) also indicates that the task-approach directly and positively predicts achievement as well. The achievement goal orientation of students affects their academic achievement (Berber & Eker, 2018). The fact that the task-approach is a positive predictor of Social Studies achievement after controlling for gender and learning strategies does not comply with the learner-centred approach adopted in the education system of Turkey. Since the learning to learn competence is essential to the learner-centred approach, the self-approach is expected to predict Social Studies achievement, after adjusting for gender and learning strategies. But the reason for this result may be central examinations. Çetin and Ünsal (2019) found that teachers determined examination-oriented goals, content, methods and techniques, and administered multiple-choice tests due to central exams. It has been stated in the “2023 Education Vision” published by the Ministry of National Education that it aims to reduce the pressure of national
transition examinations, to diversify the measurement and assessment techniques, and to develop both a process- and product-oriented approach (MoNE, 2018b).

Depending on the findings, the following recommendations were made for practice and further research: Social Studies teachers can encourage seventh-grade students to use organization strategies (such as making simple charts, diagrams, or tables to organize the course material) more. A more particular space can be left for organization strategies in Social Studies textbooks. According to Tay (2005), learning strategies should be used in Social Studies textbooks. Out-of-school activities can be organized to ensure that seventh-grade students can use what they have learned in Social Studies in daily life. Social Studies teachers can teach seventh-grade students learning strategies to increase their achievement in Social Studies. Pre- and in-service Social Studies teachers can be supported through trainings on teaching of learning strategies. It was stated by Özer (2002) that teachers in primary schools are not prepared enough to teach learning strategies, they mention a few about learning strategies, and that they are willing to participate in in-service trainings. Seventh-grade students can be encouraged to adopt the self-approach. The reasons behind of seventh-graders’ learning strategies and achievement goal orientations in Social Studies can be investigated. The predictive power of learning strategies and achievement goal orientations in achievement might be investigated for different courses and grade levels. Social Studies teachers’ perceptions about achievement goal orientations can be studied using the qualitative research method. Self-efficacy levels of Social Studies teachers for teaching of learning strategies for Social Studies can also be investigated. The effects of central exams on learning strategies used in Social Studies and achievement goal orientations can be investigated in depth.

REFERENCES


Ministry of National Education. (2018a). *Social studies curriculum (Elementary and middle school grades 4, 5, 6 and 7).* Board of Education.


Determination of Pre-service Science Teachers’ Conceptual Understandings about the “Solutions: Dissolving-Melting” with Predict-Observe-Explain Technique

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Abstract

In the study, the effect of Predict-Observe-Explain (POE) activities carried out within the scope of argumentation-supported learning method on the detection of the conceptual understandings of the pre-service science teachers about “Solutions: Dissolving-Melting” was examined. Based on this main purpose, a case study was applied in the study, one of the qualitative research methods. The study group of the research consists of 22 pre-service science teachers. According to the data obtained at the end of the study, it was observed that pre-service teachers structured non-scientific claims and justifications, and could not use their refutation skills adequately before applications. It was observed that pre-service teachers were more willing and competent in developing scientific arguments in POE activities.

Keywords: Argumentation-Supported Learning, Predict-Observe-Explain, Pre-Service Science Teacher, Solutions, Dissolving, Melting.

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INTRODUCTION

In order to develop an effective science teaching program, updating science programs in Turkey has begun recent years. The emphasis of the Ministry of National Education (MoNE) on the necessity of educating students as science literate individuals in the vision of the science course curriculum reveals the need for these updates (MoNE, 2017). Skills that increase the development of science literacy in an individual such as problem solving, creativity, and analytical thinking skills (MoNE, 2017) are also frequently used in the argumentation-based teaching approach (Burke, Greenbowe & Hand, 2005; Gött & Duggan, 2007). The Ministry of National Education has included learning-teaching environments where the student will be active and the teacher will be the guide and director at the center of lesson planning and applications in the science course curriculum. Such learning-teaching environments include all methods and techniques that fall into the research/inquiry-based learning strategy. In this learning strategy, learners engage in activities that are in an effort to recognize and understand the universe, are curious to explore their surroundings constantly, and can provide their reasons and/or necessary explanations in this discovery process (MoNE, 2013).

Argumentation is an integral part of science and therefore the necessity of its inclusion in science education has been revealed as a result of the findings of many studies (Jimenez-Aleixandre, 2007; Tippett, 2009; Zohar & Nemet, 2002; Berland & Reisier, 2011; Sampson & Clark, 2011, Erduran & Jimenez-Aleixandre, 2007). Scientific argumentation is a social practice in which members of a community make sense of facts such as studying, sharing, evaluating, criticizing, thinking and reviewing claims through discourse (Berland & Reisier, 2011).

In science classes, it is necessary to prevent the difficulties students experience at these stages and to benefit from appropriate teaching strategies to improve these skills. In this context, it is stated that using a wide variety of strategies in learning-teaching environments where argumentation-based learning method is handled can help to overcome these problems. These are; table of expressions, concept maps made up of student ideas, experiment report, competing theories - theories competing with cartoons, theories competing with a story, theories competing with opinions and proofs, structure an claim, predict - observe - explain (POE) and experiment design (Osborne, Erduran & Simon, 2004a).

The Predict-Observe-Explain technique was developed by White and Gunstone (1992), and was later used by Osborne, Erduran, and Simon (2004b) to improve argumentation skills. This technique involves introducing students to a scientific event (without showing the event) and asking students to discuss what they think will happen when the scientific event is initiated in small groups, and verifying the reasons. After this stage, the scientific case is shown and students are given opportunities to review and reconsider their initial arguments. They focus on the theory they support and develop with discussion, predict and evidence. Thus, the student's misconceptions are also detected. This technique can be used at the beginning of the subject in order to find out whether students have any misconceptions about this subject; in order to enable students to learn the subject and discuss it in the classroom during teaching of the subject; and at the end of the subject in order to make an assessment to reveal how much students have learned the subject and their existing misconceptions.

Importance of the Research

It is very important for science education to create curricula and course contents (theoretical and applications) for effective university level science courses (Physics, Chemistry and Biology learning areas), to increase the academic success of pre-service teachers, to make science concepts meaningful and to be able to be interpreted with daily life. The applied aspect of science education, which is important for both epistemological and educational reasons, helps to reflect the nature of science and to understand scientific concepts better. It also has a motivating effect on students (Zuzovsky & Tamir, 1999). In the 19th century, laboratory applications, which were used to expose...
students to concrete experience with objects and concepts, came to the fore with the concept of “learning by doing” within the framework of research-based approach by Dewey. This phenomenon, which has been defended, has preserved its place in the literature as applications performed to verify or revive the information learned from written sources such as teachers or course books. Laboratories were seen as the core of science learning processes in the science curriculum described as “new” in the 1960s, which emphasized scientific processes or the development of high-level cognitive skills (Shulman & Tamir, 1973). In this new laboratory approach, students establish hypotheses, collect and record data, interpret their findings, state their solutions, and generalize (Tamir, Doran & Chye, 1992).

There are many laboratory approaches used in laboratory environments today. However, when the relevant literature is examined, it is seen that the closed-ended laboratory approach is used more than other approaches, especially in university level laboratory applications of basic sciences such as physics, chemistry and biology (Güngör Seyhan & Okur, 2020). Constructivist learning theory and other modern learning theories suggest the use of student-centered laboratory environments where the teacher is a guide (Yılmaz & Şahin, 2011). In this context, it is very important to design the physical structure of science laboratories and the activities to be carried out in accordance with the structuring of knowledge (Ari & Bayram, 2011).

Thanks to the importance given to laboratory studies in recent years, laboratories, which were seen as places where educational activities in the form of proof and demonstration experiments were carried out; have been replaced by students as places that they find the science concepts more believable and understandable, and where they find learning effective and dynamic (Renner, Abraham & Birnie, 1985). Instead of transferring information to students with traditional methods, learning-teaching environments in which students are active, learn by doing, experiencing and discovering information themselves should be created (Güngör Seyhan & Okur, 2020).

In the study, Predict-Observe-Explain (POE) activities carried out within the scope of argumentation-supported learning were used as an alternative to the validation laboratory approach, which is a closed-ended experiment technique. In the study, it was aimed to determine the contribution of argumentation-supported learning to the conceptual understandings of pre-service science teachers on the subject of “Solutions: Dissolving-Melting” and to examine the effectiveness of the method in determining the current misconceptions of pre-service teachers.

**METHOD**

The research, in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to reveal perceptions and events in a realistic and holistic manner in the natural environment, is defined as qualitative research (Yıldırım & Şimşek, 2008, p.39). In this study, the misconceptions of pre-service science teachers about the “Solutions: Dissolving-Melting” were revealed by following a qualitative process. The study was conducted based on case study, one of the qualitative research methods (Bromley, 1986, p.1).

**Study Group**

The study group of the research consists of 22 pre-service science teachers (19-20 years old). The study group of the study was determined according to the purposeful sampling type, one of the non-random sampling techniques (Creswell, 2012).

**Data Collection Tools**

The data collection tools of the research consist of worksheets filled by pre-service science teachers during the POE activities. These worksheets include activity papers that contain a problem situation or basic problem statement for each science subject and instructions that allow the argumentation process to be followed. The content validity of the data collection tool was provided by the control of two educators (science educators and chemistry educators) who are experts in field.
education. The reliability was provided with a 95% consistency between the same researchers’ coding and categorizing the data.

**Data Analysis**

In the analysis of the worksheets distributed to pre-service teachers for argumentation-supported learning, many studies aimed at determining students’ understanding and misunderstanding about many basic science concepts in the literature were examined (Abraham, Grzybowski, Renner, & Marek, 1992; Balaydm & Altınok, 2018; Birinci-Konur & Ayas, 2010; Ayvacı & Durmuş, 2016). The pre-service teachers’ predictions and their claims; the reasons for supporting their claims; observations and data obtained during the experimental application process; in order to evaluate the scientific explanations and the level of their refutation, if any, the categories determined in the literature were used. The categories given in Table 1 were used in the analysis of the worksheets completed by the pre-service teachers in cooperation with their group mates. While creating the categories, the answers in all categories for the misconceptions of pre-service teachers regarding the levels of "making claims", "writing reasons", "collecting data", "making explanations" and "being able to refute" were examined and analyzed.

**Table 1. Categories Used for Scientific Claims in the Analysis of Worksheets**

<table>
<thead>
<tr>
<th>Levels of Claim</th>
<th>Categories used in the analysis of pre-service teachers’ responds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making Claim</td>
<td>Correct Claim (Completely and Partially Correct)</td>
</tr>
<tr>
<td></td>
<td>Wrong Claim</td>
</tr>
<tr>
<td></td>
<td>No Claim</td>
</tr>
<tr>
<td>Being able to write justification</td>
<td>Correct Justification (Completely and Partially Correct)</td>
</tr>
<tr>
<td>Collecting Data</td>
<td>Correct Data</td>
</tr>
<tr>
<td></td>
<td>Wrong Data</td>
</tr>
<tr>
<td></td>
<td>No Data</td>
</tr>
<tr>
<td>Being able to make explanation</td>
<td>Correct Explanation (Completely and Partially Correct)</td>
</tr>
<tr>
<td>Being able to refute</td>
<td>Correct Refutation (Completely and Partially Correct)</td>
</tr>
</tbody>
</table>

**Application Process**

In the study, argumentation-supported learning practices were carried out for pre-service science teachers’ conceptual learning about “Solutions: Dissolving-Melting”. The applications, including the argument structuring preparation activities of the pre-service teachers, lasted for 3 weeks in total. The two-week flow chart of the applications is shown in Figure 1.
Before starting the main applications for argumentation-supported learning, preliminary studies were carried out with the pre-service teachers to activate their argument skills in order to prepare for the applications. Preliminary studies conducted with pre-service teachers consist of the POE activities, which includes studies of "being able to write an argument-justification and then design an experiment" are examined. These pre-study activities started with a problem situation in which pre-service teachers would use their prior knowledge and predictions. Afterwards, they were allowed to design and carry out an experimental activity that they would observe, and consequently, their ability to record their observations was activated in this process. In the last stages of the pre-study activities, an environment was provided in which they compared their predictions and the results they obtained based on the data they obtained during their observations. During all these pre-activity stages, pre-service teachers worked as a group. During the pre-study, the conceptual learning of the relevant subject targeted within the scope of the study was started with the pre-service teachers who had information about the stages of an argument structuring process. The argumentation-supported learning applications for the relevant chemistry subject given to pre-service teachers were carried out for 2 weeks. For the “focus question” given in the first week, pre-service teachers were asked to form their arguments (making claims and providing justifications). They then designed an experiment and/or conducted a pre-study on an existing directed experiment so that they could support their claim and justification. In the second week, the planned experiments were carried out in the laboratory environment and they had the opportunity to test the arguments they created in the previous lesson, and after the experiments, they compared them and made their explanations (presenting scientific arguments and refuting).

**FINDINGS AND INTERPRETATION**

The findings and results obtained for the main purpose examined within the scope of the research are given below. During the “predict-observe-explain” activities about “Solutions: Dissolving-Melting”, the pre-service teachers were asked to fill in the worksheets distributed to them with their group friends. The worksheets start with a “focus question” that requires an experimental process. The claims given by the pre-service teachers in the worksheets were analyzed by content analysis and the findings obtained are presented in Table 2. The claims of the pre-service teachers were criticized based on the following scientific claims (https://www.fossweb.com-Solutions):

- When two matters are mixed, several types of interactions are possible. The simplest type of mixing can be seen when mixing two solids, such as salt and baking soda: The parts of the two matters mix together randomly, but there is no other interaction beyond random contact. Two types of particles coexist and are completely unaffected by close relationship
with each other. Peanuts and raisins or a mixture of oil and vinegar also exhibits such independent coexistence, just like the salt/baking powder mixture.

- Solutions are also mixtures. A solution consists of two (or more) matters that are equally distributed to each other at the particle level. In the case of sugar and water, the sugar particles are evenly distributed among the water particles. Dissolved matter is called "solute". In this case, sugar is the solute matter. The matter in which the soluble matter dissolves is called "solvent". Water is the most common solvent on this planet, as many different matters will dissolve in water to form a solution. Since the most common gas in the air, nitrogen gas is solvent; gases such as oxygen and carbon dioxide are soluble matters, "air" is an example of gas-gas solutions. In the brass sample, which is an example of solid-solid solutions, the solvent is copper and the solute substance is zinc.

- Although two matters (or more) are required for the dissolving process, students tend to focus only on the solid and compare this process to "melting". In fact, when a solid material is placed in a liquid and the solid disappears into the liquid, we call the solid dissolved, and the resulting mixture is called a solution. Students may not be able to make a clear conceptual distinction between melting and dissolving. Usually they say that a piece of sugar dipped in water "melts". Similarly, sugar thrown into tea "melts" according to them.

- When we heat a solid matter, the particles will move faster as energy is transferred to the particles. When enough energy is transferred, the intergranular spaces change according to their location before the energy is transferred. After this process, the solid is now a liquid. In other words, an "energy transfer" is needed for melting.

- Dissolving is a transformation involving a new structural relationship between particles of different matters. This transformation is the result of kinetic activities and gravitational forces between particles. Let's go back to the sugar-water example. Kinetic activities involve the solvent (water) particles impinging on the dissolved (sugar) crystals and physically binding the separate particles from the crystalline structure. If the gravitational force between the solute and solvent particles are sufficient, the dissolved particles will separate themselves from the crystal and move towards the sea of solvent.

In order to determine the claim levels of the pre-service teachers about the "Solutions: Dissolving-Melting", the focus question given in the following (Figure 2) was presented by the researchers and then they were asked to write their claims and justifications for the basic problem sentence.

Sometimes we witness solids turning into liquids; just like taking a small ice cube from the freezer and leaving it on the table for 5-10 minutes, then there is no ice left on the table. Because ice is now liquid. How do you think this happened?

For this situation, some people say that solids like ice dissolve and become liquid; others say that solids melt and become liquid. This is so confusing !!!!!

**Figure 2. Focus Question Regarding “Solutions: Dissolving-Melting”**

Following the claims and justifications put forward by the pre-service teachers with their group mates, the following questions were directed to all group members by the researchers. Pre-service teachers were provided with very quick answers to these questions and brainstormed with them:
What is dissolving and what makes it happen?
What is melting and what makes it happen?

The pre-service teachers were asked to write their answers to all these questions in the relevant places in the worksheets distributed to them. After brainstorming with the above two questions, the following questions were posed by the researchers to get the claims and justifications of the pre-service teachers:

- How are melting and dissolving alike? How are they different?
- How would you melt a substance?
- How would you dissolve a substance?

After all these questions posed by the researchers and the feedback from pre-service teachers, all group students were asked to carry out the experiment given in Figure 3 and write their observations in the relevant places on the worksheets.

```
Material         Hot water | Cold water | Hot air | Cold air
Candy coating    |
Chocolate        |
```

Which one melted?: Which is dissolved?
Under what conditions?: Under what conditions?:
What happens at the particle level while melting occurs?: As dissolving occurs, what happens at the particle level ?:

Figure 3. Experimental Applications Regarding “Solutions: Dissolving-Melting”

Following the claims and justifications put forward by the pre-service teachers with their group mates, the following questions were directed to all group members by the researchers:

In order for pre-service eachers to define "Dissolving", the researchers guided them with the following questions:
1. Do you think the colored coating has dissolved or melted?

2. Where did the color coating go?

3. Has anything dissolved?

4. Did the colored coating disappear at the same rate in both glasses of water?

5. What is left after the color coating has disappeared?

6. Do you think the chocolate has dissolved or has melted?

The researchers guided the pre-service teachers to define "Melting" with the following questions:

1. In which glasses do you think the candies / chocolates melted?

2. What happened to the chocolates in water after the colored coating disappeared?

With all these questions posed after the experimental process, it was aimed to determine the definitions of "melting" and "dissolving" in pre-service teachers. Following the guidance on definitions, the following questions were asked in order to "determine the difference between dissolving and melting":

1. Have the candies dissolved or melted?

2. What was needed to dissolve/melt the colored coating on the candies?

3. What was needed for the chocolate in the center to dissolve/melt?

4. Where did the colored coatings on the candies go?

With the answers given by the group members to all the questions above, the researchers obtained clues about pre-service teachers' preliminary knowledge about the "Solutions: Dissolving-Melting". Afterwards, pre-service teachers were asked to perform their experiments according to the experimental setup given in Figure 3. They were asked to write all their observations during the experiment process in the relevant places in the worksheets distributed to them. This stage is the process in which the students are questioned whether their pre-experimental predictions (their claims to researchers and other classmates) are compatible with their observations during the process and the data they have obtained. The group members were asked to write their final explanations and refutes about the compatibility of the data they obtained from their observations with their claims before the experimental process. At this stage, the feedbacks of the pre-service teachers gave clues about the changes in their argument levels (being able to explain at the scientific argument level and write refutation). After all these applications, pre-service teachers were given research homework:

- Write at least five examples of dissolving or dissolving substances outside the laboratory (kitchen could be a good place for this question!!).

- Candy coating is made from a mixture of candy, corn syrup and artificial coloring. Remember what happened to the coating when you put these candy coatings in water. Well, could all the items create a situation similar to a candy coating in water, write your predictions.

The frequencies and percentages of all findings obtained from the pre-service teachers' POE activities are summarized in Table 2.
Table 2. Scientific Argument Levels of Pre-service Science Teachers about “Solutions: Dissolving-Melting”

<table>
<thead>
<tr>
<th>Argument Levels</th>
<th>Correct Claim</th>
<th>Wrong Claim (Misconception)</th>
<th>No Claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making claim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Partially Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>No Claim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being able to write justification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Partially Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>No Justification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collecting data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct Data</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Wrong Data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being able to make explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Partially Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>No Explanation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being able to refute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>Partially Correct</td>
<td>f %</td>
<td>f %</td>
<td>f %</td>
</tr>
<tr>
<td>No Refutation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The pre-service teachers were asked to write their claims and justifications for the focus question, “Some people say that ice-cold solids dissolve and become liquid, while others say that solids become liquid by melting. Which of these statements do you think is true?”. The answers given to all questions asked to pre-service teachers before the experimental procedures for the basic gain of “determining the basic difference between dissolving and melting” were analyzed according to Table 1. The pre-service teachers were first asked to give examples of what "melting" and "dissolving" and what melted or dissolved, and answered quickly. 68% of the pre-service teachers made wrong claims and 54% of these pre-service teachers gave the wrong reason, 14% could not present a justification. 32% of the pre-service teachers made partially correct claims and while 18% of these pre-service teachers could present the correct justification, 14% could not present a justification. The misconceptions of the pre-service teachers regarding their current understanding of "dissolving" and "melting" are as follows: "Dissolving is the observed changes in the states of matter"; "Dissolving is the chemical ionization of matter"; "Melting is not always required heat, for example, when we put an ice cube from the freezer on the table without heating it on the stove, it will melt"; "Melting is a chemical event according to the type of matter. Ice melts at room temperature and becomes water, but a piece of iron does not melt at room temperature, we melt it in very, very hot furnaces and iron is no longer iron"; "Heat is not always necessary in dissolving, it can only increase the dissolution rate". Sample answers from pre-service teachers those make a partially correct claim and can provide correct justification: “Actually, dissolving and melting seem to be alike. For example, when we put solid oil in a hot pan, it liquefies and the solid sugar disappears when it is put into a hot tea. They are the same as they both turn into liquid; but not quite, because we can see the melted butter but we can’t see the sugar"; "We put a butter in a hot pan to melt it or put it on a toasted bread and it will no longer be solid. We can use water this time to destroy another solid, for example, we can see the transition of a tablespoon of salt from solid to liquid by throwing it into water. In the case of oil, heat was required, but in the case of salt or detergent, water is needed, not heat ".
In applications, pre-service teachers expressed their current understanding of melting and dissolving processes before the POE activities. Afterwards, pre-service teachers were asked to perform their experimental processes according to the procedures. In this process, they observed what happened to the four sugar-coated pieces of chocolate in four different environments: hot and dry, cold and dry, hot water and cold water. They explained different results for the sugar coating and the chocolate in the center. Therefore, students produced definitions for melting and dissolving, based on their observations. The pre-service teachers carried out the experimental procedures as determined by the researchers and in sufficient times and recorded their expected observations. The pre-service teachers were asked to present scientific arguments based on their observations together with the questions posed during and after the experimental procedure. While 32% of the pre-service teachers provided partially correct explanations, none of these pre-service teachers wrote refutation. 68% of the pre-service teachers provided correct explanations and 18% of these pre-service teachers were able to refute correctly, 14% were able to refute partially correct category and 36% did not refute at all. As an example of partially correct explanations of the pre-service teachers regarding the definitions of "melting" and "dissolving" and "fundamental difference between melting and dissolving" after experimental applications; "Liquid is not required as a secondary matter for melting, but a liquid appeared later"; "A liquid may be required for dissolving and usually this is water"; "Generally, when we look around, we can say that solids always dissolve in water: for example, sugar or salt dissolves when we throw it into water." As an example of the sentences that the pre-service teachers produced correct definitions for "melting" and "dissolving" based on the data they obtained in their observations during the experimental process; "When a solid substance melts, its solid state goes into liquid. This change is caused by heating"; "When a solid is placed in water or other liquid, the gravitational force between the particles of the solid matter can be broken and the broken particles can move between the particles of the liquid"; "A solution of a matter consists of particles of the substance that are homogeneously mixed with the particles of the liquid in which it dissolves"; "In fact, melting is the transition from solid to liquid caused by heating. For example, in this experimental application, only the chocolate melted, the sugar coating dissolved"; "The kinetic energy of the particles in a melting matter increases because heat is given and the particles move away from each other as the matter passes from solid to liquid"; During dissolving, the particles of a solid are separated from each other and spread equally in the liquid. For example, only the sugar coating dissolved in this experiment.

The pre-service teachers carried out their experimental applications to support their claims and justifications for the focus question. They tried to write their scientific arguments with the observations they obtained during the experimental application process. At this stage, it was observed that pre-service teachers were able to refute. Also, at this stage, pre-service teachers reflected how their thoughts might have changed from their first ideas. They added their idea of what happens when the particles dissolve or melt. All people frequently encounter instances of both melting and dissolving during everyday events; a pool of liquid wax forms around the wick of a lighted candle; in winter, we see that the snow on the street sometimes turns into water; we observe that a piece of chocolate in the sun becomes sticky. These are all examples of matters that transfer from solid to liquid when energy is transferred to these solid matters. In some other changes, energy, namely heat, transfer is not required. It's like the solid detergent you pour into a bowl of water to wash the laundry disappears after a while. These solids disappear in the water, and sometimes the color and sometimes the odor remain as evidence that the solid is there. These two processes, melting and dissolving are fundamentally different. Melting requires heat; dissolving requires a second matter to interact.

The most striking finding after POE activities within the scope of the argumentation supported learning applications is that pre-service teachers usually construct non-scientific arguments before the activity, and after the activity, they change their wrong and or incomplete/inadequate arguments, form scientific arguments and realize their misconceptions and correct them. Furthermore, it was observed that while the pre-service teachers could not justify many of their arguments before the experiments they carried out during the activities, they were able to write completely or partially correct
explanations and refutes for their arguments in the light of the data they obtained based on their observations during the experimental procedures they were expected to do in practice.

RESULTS AND DISCUSSION

The reasons why chemistry is seen as a difficult field for students; it can be thought by both teachers and researchers that the way many chemical events occur is unfamiliar to learners and that the language used by chemistry is difficult to express these events. All these cause students to develop misconceptions about some chemical concepts (Ayaş & Demirbaş, 1997; Pardo & Partoles, 1995; Nakhleh, 1992; Zoller, 1990). Studies conducted to determine students’ pre-knowledge and misconceptions show that misconceptions are not specific to a particular age group and are carried by students from all groups and levels (Fensham, Gunstone & White, 1995; Gonzalez, 1997; Bar & Travis, 1991; Özmen, 2005). If there are misconceptions in the students' pre-knowledge, these may not only interpret new information, but also sometimes prevent the comprehension of new information and lead to new misconceptions, which can increase the formation of undesired learning products (Andersson, 1986; Griffiths & Preston, 1992).

This study showed that students have some misconceptions about “Solutions: Dissolving-Melting” issues. Within the scope of the study, it was determined that the pre-service teachers' information about the concepts of "melting and dissolving" is in accordance with scientific facts, as well as incompatible with scientific facts, and summarized in Table 3.

Table3. The Misconceptions of Pre-service Teachers on "Solutions: Dissolving-Melting"

<table>
<thead>
<tr>
<th>Identified misconceptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolving is the changes observed in the state of matters such as melting.</td>
</tr>
<tr>
<td>Dissolving is the chemical ionization of matter.</td>
</tr>
<tr>
<td>Melting is not always necessary, for example, when we put an ice cube from the freezer on the table without heating it on the stove, it melts.</td>
</tr>
<tr>
<td>Heat is not essential for both melting and dissolving.</td>
</tr>
<tr>
<td>Melting is a chemical process that changes according to the type of matter, ice melts at room temperature and becomes water, but a piece of iron does not melt at room temperature, we can melt it in very high temperature furnaces and iron is no longer iron.</td>
</tr>
<tr>
<td>Heat is not always required for dissolving; heat can only increase the dissolution rate.</td>
</tr>
</tbody>
</table>

“Melting and dissolving” are two of the basic processes discussed in chemistry education, but these two concepts are often confused (Prieto, Blanco & Rodriguez, 1989; Ebenezer & Gaskell, 1995; Ebenezer & Erickson, 1996; Goodwin, 2002; Pierré et al., 2008; Çalk et al., 2010; Smith & Nakleh, 2011). This confusion may be a result of how students view melting and dissolving processes on a microscopic level. It is very important to transfer the subjects taught under the name of daily life chemistry to daily life in chemistry education. These two commonly used concepts are misused interchangeably: for example, dissolving of sugar in tea or dissolving of salt in water. As Goodwin (2002) states, melting and dissolving are concepts that can’t be fully distinguished. There are many misunderstandings about melting and dissolving, such as: “Dissolved sugar starts melting, if sugar starts to dissolve in water, then it will take the characteristics of water, melting and dissolving are the same, lime cannot dissolve because it is very hard” (Slavy, 1991).

In this study, students’ misconceptions about dissolving and dissolving were determined and POE activities were carried out within the scope of argumentation-supported learning as an alternative method to various current methods used for the same purpose to overcome these misconceptions. The POE technique puts the student at the center and makes the lesson practice-oriented. In this technique, pre-service teachers are asked to make a prediction about the phenomenon, event or concept presented in the activities, to explain their predictions with their reasons, to observe the events and to eliminate the contradiction between their predictions and observations (Atasoy, 2004; Köše, Coştu & Keser, 2003; Keeratichamroen, Pantiapan, & Dahsah, 2007; Şahin & Çepni 2009). There are many studies
that reveal POE technique contributes greatly to students’ conceptual understanding success (Kearney & Treagust, 2000; Çimer & Çakır 2008; Aydın, Ekmekçi & Özkar, 2010). It can be said that with POE technique, students' motivation increased, they tested their current prior knowledge and had the opportunity to correct their wrong knowledge. They determined that the educational environments performed using the POE technique positively contributed to both the scientific process skills and the views on the nature of science (Bilen & Aydoğdu, 2012). It is emphasized that there is a mental conflict in students as a result of the succession of the prediction and observation stages in POE activities, and POE is an effective method in correcting misconceptions (McGregor & Hargrave, 2008). It is stated that revealing students' prior knowledge and teaching afterwards is an important factor in meaningful learning (Liew & Treagust, 1998). Meaningful learning takes place by establishing correct connections between newly learned concepts and previously learned concepts (Gil-Perez & Carrascosa-Alis, 1994). Studies have shown that the activities carried out with the POE technique contribute to meaningful learning and have a greater effect on eliminating misconceptions than traditional methods (McGregor & Hargrave, 2008; Rakkapao et al., 2013; White & Gunstone, 1992; Dumeş, 2014; Tetik, 2019; Yaman, 2012; Yıldırım, 2016; Altınok, 2017).

Concept teaching in learning-teaching environments has an important place in revealing students' misconceptions. Misunderstanding about a phenomenon/event or concept negatively affects the learning of other subjects. Therefore, it is important to diagnose and eliminate misconceptions in advance. In this context, educators should plan their learning-teaching environments by taking the prior knowledge of students into consideration and make arrangements to eliminate existing misconceptions beforehand. Considering from this point of view, one of the learning-teaching environments that can be used in the diagnosis and elimination of misconceptions in science education is the argumentation supported learning practices (POE activities) that we have discussed in the scope of the study.

REFERENCES


Student Perceptions of the Implications of a Financial Literacy Project Within a College Mathematics Course

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Abstract

The purpose of this study was to investigate how students perceived their engagement in an experiential learning project with a focus on financial literacy within general education mathematics courses (skills, knowledge, attitudes, and behaviors). Specifically, the researchers were looking to investigate whether the completion of a finance project within a general education mathematics course influences students' perception of and knowledge about personal finance concerning their lives and career paths. An aggregated analysis of survey responses using Qualtrics showed approximately half of students lacked knowledge of personal finance, the skills to interpret financial information, and expressed limited knowledge of loan repayment calculations. While over half of the participants would recommend this course to other students. There was no statistical significance in the correlation between students' assessments of their pre-and-post financial literacy knowledge and whether they recommend this course for future students. However, the majority of responders indicated that they have thought about future career and personal finance before completing the project.

Keywords: Student Loan Debt, Financial Literacy, Personal Finance, Experiential Learning, Finance Project.

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INTRODUCTION

The increase in the national student loan debt coupled with the actual and perceived decline in educational standards in American higher education was the focus of recent scholarly discussions (Baum, 2016; Goldrick-Rab, Anderson, & Kinsley, 2016; Williams, 2019). According to the Pew Research Center, student loan debt has reached 1.6 trillion U.S. dollars during the 2018-19 academic year. With the rising cost of tertiary education, and eventually the amount of student loan debt, institutions have an obligation to educate students about money management not only to pay back student loans but also to avoid various forms of financial distress after graduation (Williams, 2019). Additionally, institutions of higher education play a critical role in developing educated and financially-literate citizens (U.S. Financial Literacy and Education Commission, 2019).

The issue of financial literacy is not limited to American students and American institutions. Financial literacy has gained global recognition and is now considered an essential life skill (OECD, 2020, p. 15). According to the Organization for Economic Cooperation and Development, a 2018 study about financial literacy involving students (age 15) found that 16% were below the proficient level of financial literacy, 22% demonstrated a basic level of financial literacy, and only 12% successfully demonstrated the highest level of financial literacy (OECD, 2020, p. 30). This lack of financial literacy in middle and high school levels becomes evident once students reach college and have to navigate life’s financial issues on their own.

Undergraduate students seek financial independence but are unaware of how to do simple tasks such as balance a checkbook, pay bills, understand investment strategies, or how interest works on loans (Lin, Bumcrot, Ulicny, et al., 2019). The missions and visions of higher education institutions are to prepare students for life after college (U.S. Financial Literacy and Education Commission, 2019). To this end, educating students, or providing them with financial literacy training opportunities about money management can have life-long implications (Lin, Bumcrot, Ulicny, et al., 2019; U.S. National Strategy for Financial literacy, 2020). Ultimately, an impactful and life-long education begins with a positive learning experience that connects classroom knowledge to real-life events and decisions. In addition to preparing students for professional skills, higher education institutions can play a significant role in educating students about financial decision-making that would lead to productive participation in the economy, build wealth, and attain goals (U.S. Financial Literacy and Education Commission, 2019, p. 21).

This study will share the research, methods, findings, and recommendations based on survey data collected and analyzed from one private four-year university in the Midwestern United States. The data was collected based on existing instrumentation tested for both reliability and validity. The sample for this study consisted of undergraduate students who were enrolled in seven sections of Quantitative Reasoning in various modalities. Participants in this study reflected on their knowledge about financial literacy before and after completing a course summative finance project, which is a key assessment in their general education core. The finance project includes five assessments about the students’ abilities to apply mathematical concepts in life after college. Students were tasked with calculating annuity, filling out an expense worksheet, a food budget worksheet, a job and apartment worksheet, and a vehicle loan worksheet. The survey data was collected through the use of Qualtrics, and participation in the study was anonymous and optional.

Objective of the study

The purpose of this study was to investigate how students perceived their engagement in an experiential learning project with a focus on financial literacy (skills, knowledge, attitudes, and behaviors) through the analysis of their responses to the 19 Likert scale and open-ended survey questions. As part of this general objective, answers to the following research question were sought: To what extent do students believe that a project in a general education mathematics course adds value to their prior knowledge of financial literacy?
This research builds on prior studies about financial literacy initiatives for college students and the rising concerns about the national student loan debts in the United States. Data for this study was gathered using a survey which was created by the researchers and administered by the office of research and effectiveness at the university. The researchers gathered data from students enrolled in seven sections of a general education mathematics course and examined their perceptions of financial literacy after completing the finance project.

LITERATURE REVIEW

Educational Accessibility and Affordability

There is no doubt that education is one of the best vehicles for social and economic development and promoting upward mobility. Additionally, the relationship between education and socio-economic development has long been established (Ferguson, Macqueen & Reynolds, 2014; Joseph & Payne, 2011). To this end, a country’s social and economic development depends largely on its ability to educate and empower its citizens, and how well it arrives at equipping its labor force with superb skills (OECD, 2020). The view of education as a vehicle for change and enhancement of the human condition has been documented in government reports and scholarly discussions (Ferguson, Macqueen & Reynolds, 2014; Joseph & Payne, 2011; Joseph & Payne, 2011; OECD, 2020). There is also a universal consensus regarding the importance of a country's education system and its ability to compete in a globalized economy (Joseph & Payne, 2011; Menashy & Dryden-Peterson, 2015). Therefore, the importance of earning a college degree has economic implications individually and globally. For example, a report from the Social Security Administration stated that an individual with a bachelor's degree earns approximately $900,000 more in median lifetime earnings than high school graduates (SSA, 2015).

But while there is clear evidence for the role of education in promoting social mobility and economic development, access to education is hindered by the price tag and rise in tuition costs. According to the Pew Research Center, student loan debt has reached 1.6 trillion U.S. dollars during the 2018-19 academic year. The issue of educational affordability, access, and success has been a challenge, especially for poor and marginalized groups (Pew Research, 2019). Moreover, the racial divide, uneven distribution of wealth, and other cultural phenomena continue to impact access to all levels of education, despite recent provisions and investments in the human capital. Ideally, education should be a process by which members of society develop the skills and capabilities necessary for their successful social integration (Pfeffer, 2015). However, minority students, particularly African American students, accrue more debt than their White peers (PRC, 2019). With the rising cost of tertiary education, and eventually the amount of student loan debt, students and their parents are considering alternative pathways for accessing traditional college education and credentialing (Brown & Kurweil, 2017). To this end, institutions of higher learning have an obligation to educate students about money management not only to pay back student loans but also to avoid various forms of financial distresses that they may face after graduation. Additionally, institutions of higher education play a critical role in developing educated and financially-literate citizens (U.S. Financial Literacy and Education Commission, 2019). This is a skill that many students do not learn about in high school through their required mathematics credit courses as it is not a graduation requirement in many states.

Financial Literacy Defined

Financial literacy skills are one key aspect of independence and there have been many definitions of this term (Hogarth & Hilgert, 2002). Financial literacy has been defined as the awareness, knowledge, skill, attitude, and behavior necessary to plan and make sound financial decisions (money management, and ultimately achieve individual financial well-being) (OECD; 2006, Beverly & Burhalter, 2005; Hogarth & Hilgert, 2002). According to the U.S. National Strategy for Financial Literacy (2020),
Financial literacy describes the skills, knowledge, and tools that equip people to make individual financial decisions and actions to attain their goals; this may also be known as financial capability, especially when paired with access to financial products and services.

Financial education is the process by which people gain information, skills, confidence, and motivation to act, through various means, including classroom education, one-on-one counseling and coaching, technology-based interventions, and self-study.

A key desired outcome for financial education is sustained financial well-being, in which people can fully meet current and ongoing financial obligations, can feel secure in their financial future, and can make choices that allow enjoyment of life (p. 2).

There are a variety of factors that contribute to individuals' levels of financial literacy. Some of these items include parental socialization and the number of available resources (e.g., knowledge, attitudes, and personal characteristics) (Deacon and Firebaugh, 1981). According to Deacon and Firebaugh (1981), the Family Resource Management Theory Framework suggests young adults develop financial skills by interacting with parents throughout their lifespan; young adulthood serving as a critical period to develop a financial attitude and behavior outcomes (Shim, Xiao, Barber, & Lyons, 2009). Although a majority of financial literacy skills are taught by parents and/or guardians either informally or formally, many parents may not have the appropriate abilities to guide their young adults to become responsible economic consumers (Moschis, 1985; Jorgensen & Salvla, 2010; Lyons & Hunt, 2003). As an individual's level of financial knowledge increases, their attitudes and behaviors also tend to improve (Jorgensen & Salvla, 2010). Financial attitudes, or the psychological tendencies regarding financial management, may be positively influenced by parents with a higher income level, and an increase in positive life experiences (Jorgensen & Salvla, 2010).

College and Financial Literacy

The issue of financial literacy for college students has gained national and international attention in recent years (Lin, Bumcroft, Ulicny, et al., 2019; U.S. National Strategy for Financial literacy, 2020). This attention is due in part to the rising cost of higher education in the United States and the fact that income has not kept up with these costs. According to the National Center for Educational Statistics of the U.S. Department of Education, between 2007–08 and 2017–18, prices for undergraduate tuition, fees, room, and board at public institutions rose 31%, and prices at private nonprofit institutions rose 23% (NCES, 2019). The rising cost of college tuition and student loan debt is more troubling when considering a recent report by the Federal Reserve Board, which found that 20% of adults who attended college believe the cost of their education exceeded its financial benefits (Federal Reserve Board, 2018). Educating students about the long-term implications of student loan borrowing is critical to their personal and professional successes after college. Additionally, mastering financial knowledge and gaining financial skills in the classroom is critical to future decisions and citizenry life (OECD, 2020). For example, a school savings program or a money management college course has valuable outcomes for students, parents, and the community at large (U.S. National Strategy for Financial Literacy, 2020). This established link between early education initiatives and future financial decisions reiterates the importance of financial literacy for college students.

Recent Initiatives for Addressing Financial Literacy

Within elementary and secondary schools, many states have implemented financial literacy standards. For example, within the state of Ohio, Financial literacy standards were adopted in 2017 for kindergarten through twelfth grade and it is a high school graduation requirement. School districts within the state of Ohio may choose to create a separate financial literacy course or integrate these standards within other courses. Social Studies, Business Education, Marketing Education, and Family
and Consumer Sciences teachers are all licensed to teach financial literacy within the state of Ohio (ODE, 2017). Although there are resources for financial literacy in the K-12 school systems, there is no guarantee that these resources will accompany students as they move from high school into college.

Many universities offer loan exit counseling for students nearing graduation. This short program is often not enough to make an impact on student's financial literacy as they have already made financial decisions over the previous four or more years in college (U.S. Financial Literacy and Education Commission, 2019). Although research exists among elementary and secondary school levels, there are few higher education institutions with mandatory financial literacy courses. Those institutions that had implemented financial literacy courses showed students made improvements in budgeting, increased confidence in money management, retention, and graduation rates (U.S. Financial Literacy and Education Commission, 2019). To improve student financial literacy skills, some institutions have implemented financial courses that address quantitative reasoning or social sciences requirements, provided mentors or success coaches for students, or have integrated financial education into first-year orientation or wellness courses (U.S. Financial Literacy and Education Commission, 2019). In elementary and secondary schools, many teachers integrate financial literacy within their required math, social studies, and other courses all students take.

The U.S. Financial Literacy and Education Commission (2019) has recommended institutions of higher education require financial literacy courses or implement the concepts and skills within a financial literacy course within mandatory general education courses. When planning these courses and topics, higher education institutions should use national, institutional, and individual data to determine specific financial literacy needs of their students and identify students that may be in the ‘at risk’ population (U.S. Financial Literacy and Education Commission, 2019). Based on current studies and government reports, financial literacy is a concern for students, parents, and academic institutions. To this end, this study incorporated financial literacy topics into a required general education mathematics course and sought to assess its perceived value from a student perspective.

**RESEARCH METHODOLOGY**

To answer the research question, *To what extent do students believe that a project in a general education mathematics course adds value to their prior knowledge of financial literacy*, the researchers of this study created and distributed a survey questionnaire. The survey was created to measure the course and program outcomes that are specific to the general education core at the university. This structure and the nature of the Likert Scale questions within the survey instrument were guided by recommendations from the Organization for Economic Cooperation and Development (OECD, 2011). To assess the views and perceptions of college students concerning their financial literacy, OECD (2011) recommends incorporating Likert Scale and multiple-choice questions (p. 4). As universities set individual standards, using a questionnaire already created would not be an accurate depiction of this specific course (Brown & Kurweil, 2017). However, prior research has used similar approaches in assessing college students’ attitudes and behaviors concerning financial matters and money management decisions (Jorgenson, 2007). The questionnaire contained a total of 19 questions; 17 of which were Likert Scale in nature, the first four questions focused on students’ demographics, while the following 13 related to course learning outcomes (i.e. knowledge of personal finances installment buying, etc.). The last two questions were open-ended and asked whether students would recommend the project and course to future students. The researchers and staff members from the Institutional Research Office reviewed and edited the questions to ensure grammar, formatting, and phrasing were appropriate.

The total sample size for this research project was 160 possible participants. Participants in this survey were enrolled in MAT185 during the spring semester of 2020. These students were enrolled in online and seated courses. Of the total 160 participants who were contacted to complete the survey, 45 responses were recorded, thus providing a response rate of 28%. Response data were analyzed in Qualtrics and SPSS to produce the findings discussed in this report.
Participants

Participants for this study were recruited through convenient sampling, given that they were enrolled in undergraduate general education courses. Of the 42 who responded to gender identification, 12 (28.57%) identified as male, 28 (66.67%) identified as female, 1 (2.38%) identified as intersex, and 1 (2.38%) preferred not to answer. For race-ethnicity, 42 out of 45 responded to this question; 33 (78.57%) answered White, 7 (16.67%) answered Black or African American, 1 (2.38%) answered two or more and 1 (2.38%) preferred not to answer. As to academic standing, 32 (76.19%) answered freshman, 4 (9.52%) answered sophomore, 4 (9.52%) answered junior, and 2 (4.76%) answered senior. For the school of study, 43 out of 45 students responded, 9 (20.93%) in School of Arts and Sciences, 12 (27.91%) in School of Business, 19 (44.19%) in School of Criminal Justice and Social Sciences, and 3 (6.98%) selected undecided. Concerning learning modality, 42 out of 45 students responded; 35 (83.33%) were enrolled in face-to-face classrooms and 7 (16.67%) were enrolled in online courses.

Procedure

The researchers of this study were faculty members teaching in the undergraduate and graduate programs at a Private Midwestern university in the United States. Once approval to complete the study was granted by the office of the Institutional Review Board, the survey questionnaire was shared with the office of Institutional Research and Effectiveness for dissemination with the potential participants, which served to eliminate the direct interaction between the faculty and the participating students. The survey was initially distributed by email via Qualtrics. A reminder email was sent through Qualtrics to all unfinished respondents two weeks from the initial contact. Another reminder email was sent through Qualtrics to all the respondents who started the survey and had not yet completed it by the second week. Response data were analyzed in Qualtrics and SPSS to produce the findings discussed in this study. Participation in the study was voluntary and anonymous. Students were allowed to stop participating at any time.

Researchers analyzed quantitative survey data using SPSS to identify correlations and Qualtrics to generate visual representations of the data. Means were established on each of the items contained in the Likert Scale for the students’ responses. An analysis of variance test was conducted to determine whether students’ experiences within the finance project predict satisfaction and whether they recommend the course to future students.

For the qualitative data, researchers created a matrix that described summaries by themes related to the research questions. After summarizing data of student responses, the authors generated a list of propositions about the data (Miles, Huberman, & Saldana, 2014) and developed a coding scheme to test and confirm the initial set of propositions.

RESULTS

Data collected within the survey are identified below. Figures 1-10 illustrate students' assessments' of their prior knowledge of various financial literacy topics after completing the finance project. Although these assessments did not produce a statistically significant predictor of whether students would recommend the project to future students, the value-added from completing the project is well-noted in these figures. It should also be noted that the majority of the survey respondents (approximately 82%) were students enrolled in face-to-face sections of MAT185 Quantitative Reasoning. Additionally, only 33 of the 45 students who responded persisted in completing the questionnaire in its entirety.

Of the total 33 respondents for this question, 4 (12.12%) answered strongly agree, 11 (33.33%) answered somewhat agree, 2 (6.06%) answered neither agree nor disagree, 9 (27.27%) answered somewhat disagree and 7 (21.21%) answered strongly disagree. There was also a higher
percentage of online students who disagreed with this statement over students taking the class on campus (See Figure 1).

![Figure 1 Knowledge of Personal Finance](image)

Of the total 33 respondents for this question, 8 (24.24%) answered strongly agree, 11 (33.33%) answered somewhat agree, 3 (9.09%) answered neither agree nor disagree, 6 (18.18%) answered somewhat disagree and 5 (15.15%) answered strongly disagree. There were also more students in the online modality that chose to agree than disagree with this statement (See Figure 2).

![Figure 2 Knowledge of Interpreting Financial Information](image)

Of the total 33 respondents to this question, 7 (21.21%) answered strongly agree, 9 (27.27%) answered somewhat agree, 4 (12.12%) answered neither agree nor disagree, 8 (24.24%) answered somewhat disagree and 5 (15.15%) answered strongly disagree (See Figure 3).

![Figure 3 Knowledge of Performing Calculations for Loans](image)
Of the total 33 respondents to this question, 5 (15.15%) answered strongly agree, 10 (30.30%) answered somewhat agree, 4 (12.12%) answered neither agree nor disagree, 8 (24.24%) answered somewhat disagree and 6 (18.18%) answered strongly disagree (See Figure 4).

Figure 4 Knowledge of Performing Calculations for Savings Plans

Of the total 32 respondents to this question, 6 (18.75%) answered strongly agree, 12 (37.50%) answered somewhat agree, 3 (9.38%) answered neither agree nor disagree, 6 (18.75%) answered somewhat disagree and 5 (15.63%) answered strongly disagree (See Figure 5).

Figure 5 Knowledge of Installment Buying

Of the total 33 respondents to this question, 8 (24.24%) answered strongly agree, 10 (30.30%) answered somewhat agree, 4 (12.12%) answered neither agree nor disagree, 6 (18.18%) answered somewhat disagree and 5 (15.15%) answered strongly disagree (Figure 6).

Figure 6 Knowledge of Financial Investments.
Of the total 32 respondents to this question, 9 (28.13%) answered strongly agree, 7 (21.88%) answered somewhat agree, 2 (6.25%) answered neither agree nor disagree, 9 (28.13%) answered somewhat disagree and 5 (15.63%) answered strongly disagree (See Figure 7).

![Figure 7 Knowledge of Down Payments](image1)

Of the total 33 respondents to this question, 4 (12.12%) answered strongly agree, 6 (18.18%) answered somewhat agree, 2 (6.06%) answered neither agree nor disagree, 11 (33.33%) answered somewhat disagree and 10 (30.30%) answered strongly disagree (See Figure 8).

![Figure 8 Knowledge of Money Management](image2)

Of the total 33 respondents to this question, 3 (9.09%) answered strongly agree, 5 (15.15%) answered somewhat agree, 2 (6.06%) answered neither agree nor disagree, 11 (33.33%) answered somewhat disagree and 12 (36.36%) answered strongly disagree (See Figure 9).

![Figure 9 Knowledge of Spending Habits](image3)
Of the total 32 respondents to this question, 25 (78.13%) answered yes and 7 (21.88%) answered no (See Figure 10).

![Graph showing recommendation of class to future students]

**Figure 10 Recommendation of Class to Future Students**

**Positive Feedback**

Of the respondents who would recommend MAT185 to future students, one specific student stated within their survey,

"I already knew how to save money, but this project taught me what other things to save up for that weren't a house or a car. Things that we take for granted because our parents pay for them right now. How much I spend on weekly grocery shopping trips, how much I'll spend on house & car insurance, how different living prices are based on the area make sure you know what you are spending money on so you aren't homeless and in debt for the rest of your life."

The positives outweigh the negatives when it came to feedback on the course and the financial project. Some additional positive comments regarding takeaways students had that relate to their lives and/or career paths include: planning for the future with understanding loans (i.e. buying a home) (3 participants), cost of living, and money management/budgeting (6 participants), time management skills (1 participant), savings plans for financial stability (3 participants), understanding salaries for future jobs (2 participants).

**Negative Feedback**

From the survey feedback, 36.36% of respondents strongly disagreed that before completing the finance project, they had not given much thought to spending habits, resource allocation, and overall quality of life concerning their career paths. This shows that approximately 33-36% of the students completing their financial literacy project already have completed tasks similar to this in their previous math or high school courses. Specifically, a student stated within their survey, "I don't believe the finance project was beneficial. It may be for some people but me, it was repeating what I already have to do in my life. It helped but it didn't at the same time, didn't help us understand how to physically do it or made sure we understood it. was more focused on us getting math right and the right answer rather than understanding it." Other students stated they would not recommend the financial literacy project due to the following reasons: the material was too challenging or confusing (3 participants), or the course contained too many topics (1 participant).

**Analysis**

Reviewing each question, there was a larger difference among student responses from agreed to disagree related to interpersonal finance, installment buying, investments, money management, and spending. There were more students overall who agreed that their knowledge was limited before
completing the project in interpersonal financial information, loan calculation, savings plans, installment buying, investments, and down payments on homes. Additionally, more students expressed that they already knew about personal finance, money management, and spending. Overall, there is a consensus on the significance of completing the project and the majority of students recommended this course for future students which underscores the value-added of completing the financial literacy project with undergraduate college students.

To analyze this data further, SPSS was used to determine the significance of prior knowledge being a predictor of recommending the finance project to future students in MAT185. Results are represented within Tables 1 and 2 below. The items within the survey questionnaire were entered into SPSS as predictors (i.e. Personal finance, interpersonal finance, loan calculations, etc.) while the recommendation for the course for future students was entered as the outcome variable.

### Table 1 Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
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<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.055</td>
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<tr>
<td></td>
<td>Interpretation of Financial Data</td>
<td>.243</td>
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<td></td>
<td>Loan Repayment Calculation</td>
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<td></td>
<td>Savings Plans</td>
<td>-.936</td>
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<td></td>
<td>Installment Payments</td>
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<td></td>
<td>Financial Investments</td>
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<tr>
<td></td>
<td>Mortgage Down Payment</td>
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<td></td>
<td>Future Money Management</td>
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<tr>
<td></td>
<td>Spending Habits</td>
<td>-.633</td>
</tr>
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</table>

a. Dependent Variable: Recommend to Future Students

### Table 2 ANOVA Analysis of Variance

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<th>Model</th>
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<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
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</thead>
<tbody>
<tr>
<td>Regression</td>
<td>24,246</td>
<td>8</td>
<td>3.031</td>
<td>1.000</td>
<td>.461</td>
</tr>
<tr>
<td>Residual</td>
<td>72,724</td>
<td>24</td>
<td>3.030</td>
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<tr>
<td>Total</td>
<td>96,970</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Recommend to Future Students
b. Predictors: (Constant), Spending Habits, Interpretation of Financial Data, Financial Investments, Mortgage Down Payment, Installment Payments, Loan Repayment Calculations, Savings Plans, Future Money Management

Overall, there was no statistical significance in the correlation between students' assessments of their pre-and-post financial literacy knowledge and whether they recommend this course for future students, $F(8, 32) = 1.0, P = .461$. However, based on the results from Figure 8, 78.13% of responders indicated that they have thought about future careers and personal finance before completing the project.

**DISCUSSION AND CONCLUSION**

**Limitations and Recommendations**

One limitation identified in this study was the low response rate. As only 28% of students responded to the survey, the results may not be reflective of how all the students who took MAT185 in
the Spring of 2020. If further research is conducted, it is recommended that the survey is distributed as soon as the participants complete the finance project. For example, given the fact that the online term is only seven weeks, online participants completed the project 8 weeks earlier than their seated counterparts.

Another notable limitation was the self-reporting nature of the data, which suggests that some of the responses might have been subject to social desirability bias. Future research studies should consider measuring students’ responses to the survey questionnaire against other dependent variables such as the student’s overall score on the finance project or score on a summative assessment that is related to the project.

To further analyze the data, the researchers recommend that prior knowledge of financial literacy should be assessed before completing the finance project. Doing so will provide an accurate assessment of the impact of this activity on the student's overall knowledge. For future studies, it should be addressed whether students took a financial literacy-specific course in their high school education to determine whether or not this course prepared them for independent life after graduation.

Findings from this study echo those found in the literature and government reports in that college students face a multitude of complex financial decisions (OECD, 2020; ODE, 2017; U.S. Financial Literacy and Education Commission, 2019). To this end, academic institutions have a significant role in developing and building upon financial literacy skills by promoting research focused on money management and financial decisions (OECD, 2011). The approach varies from one institution to another, but general recommendations on how to assess student attitudes and behaviors toward personal finance is well demonstrated by OECD and other government entities (OECD, 2020; ODE, 2017). Overall, the findings from this study reiterate the need for further research and assessment of students' financial literacies, especially in light of the increase in the national student loan debt (Baum, 2016; Goldrick-Rab et al., 2016; Williams, 2019). Additionally, financial literacy has gained global attention and became a measurement of preparation for money management and preparation for life after graduation (OECD, 2020; US. Financial Literacy & Education Commission, 2019).

REFERENCES


