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## Articles

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>An Analysis of the Effects of Multimedia Teaching on Student Achievement</td>
<td>Ramazan Bulut</td>
</tr>
<tr>
<td>23</td>
<td>A Qualitative Case Study of Multicultural Education in Turkey: Definitions of Multiculturalism and Multicultural Education</td>
<td>Yahya Han Erbaş</td>
</tr>
<tr>
<td>44</td>
<td>A Metaphoric Study on Classroom Teacher Candidates’ Perception of Nuclear Power Plants in a Socio-Scientific Issues-based Environmental Education Class</td>
<td>Hamdi Karakaş</td>
</tr>
<tr>
<td>61</td>
<td>Examining the Print Script Letters Shapes Taught in Primary Schools in Turkey</td>
<td>Özgür Babayiğer</td>
</tr>
<tr>
<td>76</td>
<td>High School Teachers’ Perception of Institutional Trust</td>
<td>Mustafa Erdem, Tufan Aytaç</td>
</tr>
<tr>
<td>88</td>
<td>The Effect of Interactive Book Reading Activities on Children’s Print and Phonemic Awareness Skills</td>
<td>Şenay Özen Altıkgayak</td>
</tr>
<tr>
<td>100</td>
<td>A Descriptive Content Analysis of the Studies on Mathematics Education in International Classroom Teaching Education Symposium (USOS)</td>
<td>Sedat Turgut</td>
</tr>
<tr>
<td>116</td>
<td>Understanding the Polygon with the Eyes of Blinds</td>
<td>Tuğba Horzum, Ahmet Arkan</td>
</tr>
<tr>
<td>135</td>
<td>A Phenomenological Study of Practicum Experience: Preservice Teachers’ Fears</td>
<td>Zehra Keser Ozmantar</td>
</tr>
<tr>
<td>151</td>
<td>The Effect of Chemistry Activities Applied in a Science Camp on Secondary School Students</td>
<td>Kader Birinci Konur</td>
</tr>
<tr>
<td>167</td>
<td>The Relationship between Solution-Focused School Leadership and Organizational Cynicism, Organizational Commitment and Teachers’ Job Satisfaction</td>
<td>Güven Özdem, Şenol Sezer</td>
</tr>
<tr>
<td>184</td>
<td>The Relationship between University Students’ Epistemological Beliefs and Teaching/Learning Conceptions</td>
<td>Mehmet Behzat Turan</td>
</tr>
</tbody>
</table>
An Analysis of The Effects of Multimedia Teaching on Student Achievement

Ramazan Bulut

Abstract

Multimedia settings can be defined as digital settings in which elements with visual, audio or visual-audio characteristics that appeal to individuals’ auditory and visual senses are presented in a combined way. Such settings are employed in numerous fields including movies, advertisements, tourism, commerce and education. The aim of the study is to analyse the effects of social studies education based on multimedia setting on students’ academic achievement. The study was designed using the explanatory sequential design which is part of the mixed method. The major finding of the study is that social studies teaching based on the multimedia setting had much more positive effects on student achievement than traditional teaching, but this effects was not statistically significant. The qualitative findings suggested that the reason for it is related to crowded classroom size, high levels of students’ academical readiness and noise in the classrooms. It is possible to conclude that teaching based on multimedia setting has much more positive effects on academic achievement in contrast to traditional teaching and it makes topics to be learned much more understandable and learning environment much more fun.

Key words: Multimedia learning, academic achievement, social studies.

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Ramazan Bulut, This study is based on a PhD thesis by Ramazan Bulut.

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INTRODUCTION

As a result of technological advances many distinct equipment that can be employed in the teaching and learning environment has evolved. It is stated that technology has a function of developing several materials and tools with the goal of making life much easier, raising the life standards and controlling the environment. Such tools are considered to be an integral part of life and change over time (Ersoy, 2013). Similarly, those tools and equipment used for educational purposes change in parallel to the advances in technology. The common educational materials and tools used in the past periods include books, notebooks, pen and pencils and blackboards. Today in addition to these traditional educational materials the following ones are also employed when they are available: radio, television, overhead, computers, Internet, CDs, DVDs, interactive board, e-books and e-journals. As stated above the changes in the use of educational tools are closely related to the technological advances.

Another effect of technological advances on education is that educational programs have been modified to keep up with these changes and developments. In Turkey one of the examples of such an effect is about the educational program for the course of social studies. In 2005 the Ministry of National Education began to implement a new educational program for the course of social studies. The gains, learning and teaching process and measurement process covered in the program were all modified and updated. The philosophical basis of the new program is the constructivist approach instead of traditional one. Adopting the constructivist approach made it possible to have a student-centered teaching and learning process instead of one based on a teacher-centered teaching and learning process. The program emphasized the fact that teaching and learning environment should be enriched through activities which reinforce active student involvement. For such activities the Ministry recommends the use of some multimedia materials including atlas, sphere, picture, photo, animation, simulation which stimulate student senses (MONE, 2010).

Stimulating more than one sense of students in the teaching and learning process increase both the productivity of learning process and the permanency of the learning. Research suggests that learning occurs with senses varying rates: 83% by seeing, 11% by hearing, 3,5% by smelling, 1,5% by touching and 1% by tasting (Çilentı, 1988). Therefore, one of the most significant sense for learning is seeing. Another research argues that individuals can remember 90% of what they both do and tell, 70% of what they tell, 50% of what they see and hear, 30% of what they see, 20% of what they hear and 10% of what they read (Yalın, 2015). In other words, learning which is defined as the long lasting behavioral change as a result of individuals’ experience (Driscoll, 2012) can be much more productive and long lasting if students actively involve in the learning process and if their senses of seeing and hearing are stimulated. Stimulating more than one sense of students is possible through the use of multimedia environment in the learning process.

Multimedia settings can be defined as digital settings in which elements with visual, audio or visual-audio characteristics that appeal to individuals’ auditory and visual senses are presented in a combined way. It is also defined as an environment which emerges from the combination of visual and auditory materials including videos, movies and animations (Akkoyunlu and Yılmaz, 2005). Therefore, multimedia environment is made up of those materials which mobilize more than one sense of the students.

Mayer (2002) who developed the cognitive theory of learning in multimedia settings stated that instead of using only verbal images using both verbal and visual have much more positive effects on learning. Mayer (2009) terms learning which occurs as a result of using both words and visuals as multimedia learning. Mayer’s theory (2009) is based on the following three theories: Dual Coding Theory, Limited Capacity Theory and Active Memory Theory. Figure 1 below presents the components of the cognitive theory of learning in multimedia settings.
Figure 1 Cognitive Theory of Multimedia Learning

Figure 1 shows that in multimedia teaching the pictures and words covered are taken to sensory memory through senses. For instance, pictures are perceived by eyes and words are again perceived by eyes if these are given in written form and perceived by ears if they are given through verbal form. The words and pictures in sensory memory are transferred to short-term memory to be processed. Short-term memory retains them for a short period and processed. It has two major components. The first one covers voices and visual images in pictures which are not processed. There is a relationship between voices and images which is represented with arrows which refers to the fact that voice can be transformed into a visual image and a visual image can be transformed into voice (Mayer, 2009). For instance, ears perceive the sound meaning of, for instance, the word “tree” and the related image occurs in the mind or any image transforms into sound. There are verbal and visual models on the right side of working memory which transform pictures into visual model and words into verbal model (Clark and Mayer, 2016). Following these processes visual and verbal models are related and combined. Next to the working memory there is long-term memory which stores information for a long period of time. Here information is retained much longer in contrast to working memory. In order to be processed information in the long-term memory should be relocated to the working memory (Mayer, 2009). In the initial period the rate of forgetting about information is higher, but later it becomes lower. Repeating information and transferring it to the long-term memory may decrease the rate of forgetting about information (Senemoğlu, 2013).

Multimedia settings have been commonly used in many different fields, including education. Multimedia settings facilitate learning and make learning activities much more meaningful, long lasting and attractive (Eryaman, 2006, 2007; Yaşar and Gültekin, 2012). Research suggests that 92% of the participants considered multimedia learning setting fun and entertaining (Arkün, 2007). There are numerous studies indicating that multimedia teaching has positive effects on student attitudes (Beydoğan and Hayran, 2015; İnan, 2015; Özüpekçe, 2015; Yeşiltaş, 2010). Akın (2015) analysed the effects of the multimedia teaching on Turkish language courses and concluded that it has much more positive and desired effects on student attitudes in contrast to traditional teaching approach based on textbooks. The other studies dealt with the effects of multimedia teaching on student attitudes found no significant effects (Akbulut, 2013; Bulut and Yazıcı, 2017; Balkan, 2013; Bayturan, 2011; Çener, 2011).

The studies which analysed the effects of multimedia learning on student achievement have found similar results like those which examined the effects of multimedia learning on student attitudes. Some studies concluded that multimedia learning has significant effects on student achievement (Sezgin, 2009; Taşçı and Soran, 2008; Yılmaz, 2012; Yünkül and Oğuz-Er, 2014). For instance, Sezgin (2009) analysed the effects of multimedia setting and computer setting on student achievement.

1 Figure was adopted from the website “http://slideplayer.com/slide/9878856/” (URL-1)
achievement and permanent learning. The findings of the study indicated that the experiment group which received multimedia teaching had significantly much more higher scores on achievement and permanent learning in contrast to the control group. In addition, nearly all students reported that they liked multimedia teaching. However, there are other studies which concluded that multimedia teaching has no desired effects on student achievement (Altunışık, 2001; Bayırtepe and Tüzün, 2007; Yarar, 2010). In short research on the effects of multimedia learning on student achievement produced different findings. This study analysed the effects of the multimedia setting on student achievement, contributing to the ongoing discussions on the topic. The findings of the study is thought to assist the activities to raise student achievement.

**Purpose of the Study**

The aim of the study is to analyse the effects of social studies education based on multimedia setting on students’ academic achievement. In parallel to this aim the study attempts to answer the following research questions:

- Is there any statistically significant difference between the experiment and control groups in terms of their pre-test scores?
- Is there any statistically significant difference between the experiment and control groups in terms of post-test scores?
- Is there any statistically significant difference between the pre-test and post-test scores of the experiment group?
- Is there any statistically significant difference between the pre-test and post-test scores of the control group?
- What are the student views about social studies course based on multimedia teaching approach?

**METHOD**

**Design of the Study**

The study employed a mixed method. It is defined as a research method in which both quantitative and qualitative data are collected in a manner that both approaches are combined to analyse the topic at hand (Creswell & Garrett, 2008). Given that it combines quantitative and qualitative approaches it minimizes the disadvantages of using just one of them in the research (Johnson & Onwuegbuzie, 2004).

There are many designs under the mixed method. Researchers choose the best design in accordance with the aims of the study (Teddlie & Tashakkori, 2015). In the current study the explanatory sequential design was employed. This design includes a sequential use of the methods. At the first step the quantitative method is used. Following the identification of the quantitative results a decision is made over which of them should be further analysed through the qualitative method. At this point some of the unexpected, interesting result are focused. At the second step the qualitative method is employed. At the final step the results collected from both methods are interpreted and summarized. Then a discussion is made regarding how qualitative findings account for quantitative ones (Creswell & Plano Clark, 2014).
Participants

The participants of the study are fifth grade students attending Hoca Ahmet Yesevi Secondary School in Afyon Karahisar province. In the interviews with school personnel about the socio-economical status of the students it was reported that the students were successful and most of them came from higher socio-economical families. In addition, their parents were reported to have higher levels of education and were conscious about their children’s education. The participants for the quantitative part of the study were chosen through conventional sampling technique. This technique makes it possible for the researcher to find participants among those who are easily accessible (Aziz, 2013). There were two groups of the participants, the experiment and control groups. The experiment group was the students of 5/A and the control group was the students of 5/E. The pre-test was administered to 42 experiment subjects and to 39 control subjects. For the qualitative part of the study the participants were chosen through the maximum sampling technique. It was employed to increase the possibility of including students with different views (Yıldırım and Şimşek, 2013).

The Scale Data Collection Tools

The data were collected through the “achievement test on let’s know our region unit”. The test was developed based on the major topics and gains covered by the unit. Each topic and each desired output were represented by an item in the test. On the other hand, more significant ones were represented by two or more items. During the development of draft test form the following item pools were employed URL:6; MEB, 2014a, 2014b, 2014c; MONE General Directorate of Measurement, Evaluation and Examinations [ÖDSGM], 2016; URL:9; Özensoy and Aynacı, 2016a, 2016b, 2016c; URL: 10; URL: 11). The draft test was reviewed by field specialists in terms of content, language and developmental level of the participants. Based on the feedbacks from the specialists five items were excluded. The draft test consisted of 69 items. It was then reviewed by three social studies teachers who suggested that the number of items should be reduced. Finally, six more items were also excluded from the test and it covered 63 items under two sections.

In a pilot study the test was administered to the fifth grade students attending three different public secondary schools (Hoca Ahmet Yesevi secondary school, Kocatepe secondary school and 100. Yıl Hisarbank secondary school) which served the children from different socio-economical status. It was administered to 168 students. The data obtained were analysed in terms of validity and reliability. In the item analysis the focus was on which items should be included in the test considering difficulty level, discrimination power and item-total correlation coefficients (Can, 2013; Erkuş, 2014; Özçelik, 2010).

Based on the findings of the pilot study the test contained 52 items. However, social studies teachers suggested that the test should contain 30-35 items due to content and developmental characteristics of the students. Therefore, some items were excluded to have a test of 33 items. The test has a difficulty level of intermediate. All items have an acceptable level of discrimination which t-test results indicated.

The KR-21 reliability coefficient of the test was found to be 0.94. Its Kuder-Richardson (KR-20) reliability coefficient was found to be 0.95 and it was equal to the Cronbach's Alpha reliability coefficient. It is reported that the answers to the items are two (i.e., true-false) the KR-20 reliability coefficient of the scale and its Cronbach's Alpha coefficient are the same (DeVellis, 2014). On the other hand, it is stated that when the coefficient value is near to 0 the reliability of the scale is low, while when it is near to 1 the scale has higher reliability (Özçelik, 2010). Tekindal (2009) reported that a good cognitive measurement tool should have an alpha coefficient between 0.80 and 0.90. Therefore, it can be stated that the test developed in the study is a reliable measurement tool.
Interview Form

In order to reveal the student views about the multimedia teaching a survey interview with open-ended items was carried out. It is reported that this kind of interview is not so much different from the structured interviews in terms of content and methodology. The survey interviews include a series of items and the participants are asked to answer them in their way using their subjective views (Yıldırım and Şimşek, 2013).

The items were developed following the review of related studies (Akbulut, 2013; Baysan, 2015; Daşdemir, 2012; Gürer, 2013; Kan, 2012; Kunduz, 2013; İbili, 2013; Yarar, 2010). Then a draft item form was developed. It was reviewed by four specialists (two in educational sciences, one computer education and technology education, and one in Turkish language education and social studies education) in terms of content and the wording of the items. The draft interview form was administered to the participants of the pilot study to determine whether or not the writing of items and their meanings were proper for the participants’ cognitive level. Based on the reviews of the specialists and the findings of the pilot study the items were revised to finalize the interview form. The interview form was consisted of four items.

Data Collection Process

Before the implementation daily course outlines developed based on multimedia teaching approach were reviewed by the specialists. Then the course outlines were used in the pilot study for three weeks. Based on the findings of the pilot study the course outlines were revised and modified. Then the six-week experiment was initiated. The pre-test was administered to both groups nearly one month before the implementation. Following the implementation the post-test was administered to the participants of the study. The quantitative data were first analysed. It was followed by the analysis of the qualitative data gathered from the structured interviews in which four items were asked to the participants.

Materials Used in the Experiment and Control Groups

In the experiment group the course was delivered in accordance with the principles of the multimedia teaching approach. In order to develop daily course outlines the related research was reviewed. More specifically, audio-visual materials (animations, videos, maps, photographs, pictures, etc.) were taken from different educational platforms such as the Educational Communication Network (ECN), Vitamin and Morpa Kampüs and from other websites. Some of these audio-visual materials were recorded to use them later in the learning and teaching process and the others were used online during the class hour.

In the control group traditional materials such social studies textbook, guides and study sheets were employed. The same unit was taught in both groups. In addition, the study sheets were also the same.

Data Analysis

The quantitative data obtained from the pre-test and post-test were analysed through the following ways;

- Given that the distribution of the pre-test scores of the experiment and control groups was found to be normal, these scores were analysed using t-test.
In order to identify whether or not the pre- and post-test scores of the experiment and control groups significantly differ their scores were analysed. Given that these scores normally distributed t-test was employed.

In order to identify whether or not the pre- and post-test scores of the experiment group significantly differ t-test was used.

The qualitative data were analysed through content analysis, which was completed following four steps. The first step is coding. The data were read for many times before coding. The next step was to develop themes. Codes were classified to produce themes. Then the data were placed into tables. The last step was the interpretation of the data (Yıldırım and Şimşek, 2013). In order to increase the interbal consistency of the analyses a co-observer was informed about the procedures and the data coded were analysed by the co-observer. The coder agreement was calculated using the following formula: “[agreement / (agreement + disagreement) x100]” (Miles and Huberman, 1994; cited in Yapıcıoğlu, 2016: 76). The coding reliability coefficient was found to be 93%.

**FINDINGS**

This section presents a discussion of the quantitative and qualitative findings.

**Quantitative Findings**

As mentioned above the first research question was “Is there any statistically significant difference between the experiment and control groups in terms of their pre-test scores?” Table 1 presents the results of t-test which was used to determine whether or not there was a statistically significant difference between the pre-test scores of the groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>42</td>
<td>14,76</td>
<td>5,22</td>
<td>79</td>
<td>1,069</td>
<td>,288</td>
</tr>
<tr>
<td>Control group</td>
<td>39</td>
<td>16,03</td>
<td>5,42</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows that the pre-test scores of the experiment group (X_{Exp}=14,76) is lower than those of the control group (X_{Con}=16,03). However, it is found that this difference is not statistically significant \( t_{(79)} = 1.07, p>0.05 \).

As stated earlier the second research question was “Is there any statistically significant difference between the experiment and control groups in terms of their post-test scores?” Table 2 presents the results of t-test which was used to determine whether or not there was a statistically significant difference between the post-test scores of the groups.

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>X</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experiment</td>
<td>42</td>
<td>5,60</td>
<td>5,68</td>
<td>79</td>
<td>-,961</td>
<td>,339</td>
</tr>
<tr>
<td>Control group</td>
<td>39</td>
<td>4,49</td>
<td>4,59</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 2 the results of t-test indicate that the post-test score of the experiment group is 5,60, while that of the control group is 4,49. Therefore, it is higher for the experiment group. However, this difference is found not to be statistically significant \( t_{(79)} = -,96, p>0.05 \). In other words,
multi-media based social studies teaching has much more positive effects on student achievement in contrast to traditional teaching, but this effect is not statistically significant.

The third research question of the study is given as follows: “Is there any statistically significant difference between the pre-test and post-test scores of the experiment group and control group?” In order to determine it t-test was employed and the results of t-test are given in Tables 3 and 4.

**Table 3. Results of t-test on the pre- and post-test scores of the experiment group**

<table>
<thead>
<tr>
<th>Experiment group</th>
<th>N</th>
<th>X̄</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>Pre-Test</td>
<td>42</td>
<td>14.76</td>
<td>5.22</td>
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<td>41</td>
<td>-6.386</td>
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<td>Post-Test</td>
<td>42</td>
<td>20.36</td>
<td>6.48</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can observed in Table 3 there is a statistically significant difference between the pre-test score of the experiment group ($X_{pre}=14.76$) and the post-test score of the experiment group ($X_{post}=20.36$) [$t_{(41)} = -6.39$, $p<0.05$].

**Table 4. Results of t-test on the pre- and post-test scores of the control group**

<table>
<thead>
<tr>
<th>Control Group</th>
<th>N</th>
<th>X̄</th>
<th>S</th>
<th>sd</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Test</td>
<td>39</td>
<td>16.03</td>
<td>5.42</td>
<td></td>
<td>38</td>
<td>-6.101</td>
</tr>
<tr>
<td>Post-Test</td>
<td>39</td>
<td>20.51</td>
<td>5.24</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4 indicates that there is a statistically significant difference between the pre-test score of the experiment group ($X_{inten}=16.03$) and the post-test score of the control group ($X_{post}=20.51$) [$t_{(38)} = -6.10$, $p<0.05$].

**Qualitative Findings**

This section presents the qualitative findings of the study. In the interview the participants were first asked to answer the following question: “How did animation, photographs, pictures and maps used in the course affect your learning of the topics? Give some examples.” The themes and codes appeared in relation to this item and their frequency is given in Table 5.

**Table 5. Student views on multimedia based teaching on learning of topics**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Views</td>
<td>Efficient, Productive and Attractive Learning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Better understanding/learning</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Concrete/Visualization</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Academic achievement</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Facilitation</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Long-lasting learning</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>69</td>
</tr>
<tr>
<td>Desire to Learn</td>
<td>Motivation increase</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>85</td>
</tr>
<tr>
<td>Negative views</td>
<td>Insufficient</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>No effect</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>88</td>
</tr>
</tbody>
</table>
As can be seen in Table 5 the majority of the students (37 students) reported that multimedia based teaching positively affected their learning. Such positive student views were divided into two themes of “efficient, productive and attractive learning” and “desire to learn”.

Of these two themes the former one, “efficient, productive and attractive learning”, has much more higher frequency. The positive effect of the multimedia teaching on student achievement partly occurs due to the fact it causes efficient, productive and attractive learning. This theme covers five codes ranking from the highest and lowest frequency as follows: academic achievement (26), better understanding/learning (23), concrete learning/visualization of learning (12), facilitating learning (6) and long-lasting learning (2).

As can also seen in Table 5 the code with the highest frequency is “academic achievement. This finding suggests that the multimedia teaching positively produce student achievement. The direct quotations related to this code are given as follows:

S16: “I think it increased my achievement. Because I understood better there were visuals in the course.”

S3: “I affected positively my achievement. Now it is much higher.”

S39: “I increased my achievement. Now I do not make errors.”

S24: “I think it positively affected my achievement. Because I learned much more.”

These quotations also suggest that the multimedia teaching positively produce student achievement.

The second most frequent code under the theme of “efficient, productive and attractive learning” is “better understanding/learning”. The direct quotations related to this code are given as follows:

S5: “It affected well my learning. I understood better all topics due to the use of animations, photographs, etc.”

S30: “Good. I understood better the topic. Teacher asked questions about the photographs. The course was good and nice.”

S24: “It affected my understanding well. The reason for better understanding was the use of animations, maps and pictures in the course.”

S8: “I understood everything better and began to like all.”

S31: “Courses were fun and we all understood the topics better.”

S14: “I understood better the topics.”

S27: “In this way I understood the topic better.”

S38: “It well affected my understanding of the topic. Now I better know the topics.”

The direct quotations above clearly indicate that multimedia teaching makes the topics much easier to learn and understand.

The third most frequent code under the theme of “efficient, productive and attractive learning” is “concrete learning/visualization”. The direct quotations related to this code are given as follows:
S10: “Photographs and maps make it easier for me to learn. Thus, they had positive effects on my learning. For example, I could not see how it was before, I saw it through the photographs and learned well.

S16: “We used to read the textbook, but I did not understand it very well. However, now I could well understand it due to the use of animations, pictures and other visuals.”

S17: “Yes, I think that it positively affected my learning. Because of the visuals I understand the materials much better.”

S11: Before we did not see any maps and animations in social studies courses. But in this course our teacher used animations which made it possible for us to learn the content.

S12: “I think that it positively affected my learning. Learning the materials through visuals is much easier.”

S6: “It positively affected my learning. Because just reading the textbook does not help my learning and understanding.”

S24: “It positively affected my learning. Animations, maps and pictures made it easier for me to understand the content better.”

S4: “It positively affected my learning; because when I look at pictures and photos I understand better the issue.”

The direct quotations above clearly indicate that multimedia teaching and multimedia learning environment make the topics much more concrete and visual and therefore, make them much easier to learn and understand.

The third most frequent code under the theme of “efficient, productive and attractive learning” is “long-lasting learning”. The direct quotations related to this code are given as follows:

S5: “It had positive effects on my learning. Because when pictures, animations and photographs made my learning long-lasting.”

S20: “Yes, it reinforced the learning about the topics.”

The direct quotations above clearly indicate that multimedia teaching makes learning much more long-lasting.

As can be seen in Table 5 another theme under the positive views is “desire to learn”. Therefore, it is safe to argue that one of the factors affecting student achievement is “desire to learn”. This theme covers only one code, “motivation increase”. The frequency of this code is sixteen. The direct quotations related to this code are given as follows:

S3: “I liked social studies course and in the course I felt that I desired to learn the topics.”

S19: “My desire to learn the topics improved.”

S1: “It was fun so I did better.”

S10: “I think it affected my learning. It really affected my learning and my interest.”

S8: “I understood everything better and begin to like.”
The direct quotations above clearly indicate that multimedia teaching improved students’ motivation to learn.

Table 5 also shows that there are some students (3 students) who had negative views about the multimedia teaching used in social studies courses. The direct quotations below exemplify such negative views about the multimedia teaching.

S13: “Our teacher showed us the plains, but in the examination I could not give the correct answer to the item about it.”

S25: “It does not affect much.”

S23: “I don’t think that it affected.”

Another question asked to the participants in the interviews is given as follows: “What are the problems you observed during the six-week implementation?” The themes and codes appeared in relation to this item and their frequency is given in Table 6.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Code</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom Management</td>
<td>Noise + (not being able to listen to course)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Not having chance to answer</td>
<td>4</td>
</tr>
</tbody>
</table>

Eleven participants of the study reported that they did not experience any problem during the implementation. The others reported that there were some problems related to the experimental procedure. As can be seen in Table 6 the views of the students who experienced problems during the implementation are mostly related to “classroom management”. The theme of “classroom management” includes two codes: noise and not having chance to answer.

Of these two codes the code of “noise” has much higher frequency (30). Therefore, the participants reported that during the implementation undesired noise occurred in the class. The related quotations are given as follows:

S11: “My friends shout during the class. We might understand better the topics if they talked less and was respectful.”

S22: “I could not understand what teacher said due to the noise in the classroom.”

S10: ”The problem was that my friends talked too much.”

S8: “My friends shouted and talked too much. They did not allow me to listen to the course.”

S12: “My friends’ talking too much.”

S27: “Talking too much during the class…”

S3: “My friends talked too much, so the course was taught a bit slow.”

S35: “My friends talked too much and did not allow me to listen to the course.”

The quotations above indicate that during the course based on multimedia teaching undesired noise occurred in the classroom. Some students reported that they cannot manage to listen to the course due to the noise.
Another code under the theme of classroom management is not having chance to answer. In other words, for students not having chance to answer is a problem. The related quotation is given as follows:

\[ S24: \text{“Some problems occurred due to the noise by the students. They did not allow me for having a chance to make comments.”} \]

In the interviews the next item was “what do you suggest to increase student involvement in social studies courses?” The themes and codes appeared in relation to this item and their frequency is given in Table 7.

Table 7. Student suggestions about raising student involvement

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>About Learning Environment</td>
<td>Having a chance to say something</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>No noise</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Less crowded classes</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>19</td>
</tr>
<tr>
<td>About Students</td>
<td>Listening to the course</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Studying</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>8</td>
</tr>
<tr>
<td>About teacher</td>
<td>Rewards</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Fun topics</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>29</td>
</tr>
</tbody>
</table>

As can be seen in Table 7 the participants suggested several ways to increase the student involvement in social studies course. The content analysis showed three themes: about learning environment (19), about students (8) and about teachers (2).

Given that the most frequently stated theme is about learning environment it can be stated that for them in order to increase student involvement learning environment should be modified. This theme involves three codes of which the code of having a chance to say something has the highest frequency. The related quotations on this code are given as follows:

\[ S39: \text{“Having a chance to say something.”} \]

\[ S30: \text{“Having a chance to say something should be given to all students.”} \]

\[ S12: \text{“I want every student should have a chance to say something in the course.”} \]

These quotations indicate that for the participants having a chance to say something is one of the factors to improve student involvement.

Another suggestion to improve student involvement was given as a learning environment where there is no undesired noise. The related quotations on this code are given as follows:

\[ S7: \text{“We would participate more if there was no noise in the classroom.”} \]

\[ S16: \text{“Social studies courses should be taught in a classroom with no undesired noise and with less.”} \]
S19: “My friends should not talk too much…”

S22: “Classroom should be silent…”

These quotations indicate that for the participants a learning environment with undesired noise is one of the factors to improve student involvement.

Another suggestion to improve student involvement was given as the classrooms with less students. The related quotations on this code are given as follows:

S3: “If the class size is much less, the courses will be much more productive.”

S10: “There might be less students in the classrooms. Then the placement of chairs can be rearranged.”

S20: “I would like to have classroom with less students.”

S16: “Social studies courses should be taught in a classroom with no undesired noise and with less..”

These quotations indicate that for the participants a classroom with less students is one of the factors to improve student involvement.

As can be seen in Table 7 the participants developed some suggestions to improve the student involvement which are about themselves. This theme involves two codes: “listening to the course” (6) and “studying” (2). The related quotations on these two codes are given as follows:

S1: “Listening to the course in a productive way.”

S31: “Students should listen to the courses.”

S37: “We should listen to the courses.”

S25: “Always studying.”

These quotations indicate that for the participants listening to the course and studying are among the factors to improve student involvement.

As can be seen in Table 7 the participants also suggested those ways to improve student involvement which are about teachers. This theme has two codes: “rewards” and “fun topics”. The related quotations on these two codes are given as follows:

S4: “Teacher should reward us…”

S6: “Topics of the social studies course should be entertaining…”

These quotations indicate that for the participants rewards and those topics having fun are among the factors to improve student involvement.

In the interviews the participants also asked to answer the following item: “How do you want to be taught about other topics in social studies courses? Why?” The themes and codes appeared in relation to this item and their frequency is given in Table 8.
Table 8. Student views about how they would like to learn the other social studies topics

<table>
<thead>
<tr>
<th>Themes</th>
<th>Codes</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>Views about Learning Environment</td>
<td>Multimedia setting</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>A silent learning setting</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>27</td>
</tr>
<tr>
<td>Views about Teaching Process</td>
<td>Through fun</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Through playing games</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Through using study sheets</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Through rewards</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

As can be seen in Table 8 the participant views about how they would like to learn about the other topics in social studies courses are grouped under two themes: learning environment and teaching process. The latter has much higher frequency. The codes contained under this theme are given as follows: multimedia teaching (24) and a silent learning environment (3). These views suggest that the participants also wanted to have a multimedia-based learning environment to learn about other social studies topics. The related quotation on this code is given as follows:

S10: “I would like to learn the others with photographs, pictures, maps and animations. Because courses are much more interesting in this way.”

S16: “I would like to learn the others with photographs, pictures, maps and animations. Because I could understand the content better in this way.”

S6: “I would like to learn the others with photographs, pictures and animations.”

S12: “I would like to learn the others with videos and animations.”

S13: “I would like to learn the others in this way.”

S23: “Like that, because it is very nice.”

These quotations indicate that the participants would like to learn the other topics in social studies courses through the multimedia teaching in which animations, pictures, photographs and maps are used.

Another code under the theme of learning environment is “a silent learning environment”. This code indicates that the participants would like to learn the topics in a learning environment with no undesired noise. The related quotation on this code is given as follows:

S22: “I would like to learn the topics in a silent and peaceful classroom environment.”

S28: “I would like to learn the topics in a silent and entertaining classroom environment.”

As can be seen in Table 8 the participant views about how they would like to learn about the other topics in social studies courses are also about the teaching process. Under this theme there are four codes: through fun, through playing games, through study sheets and through rewards.

The related quotations on the code of through fun are given as follows:

S7: “I wish it was fun. Because we might both have fun and learn the materials.”
S11: “I wish it was fun, included animations and much more exciting.”

S38: “I wish it was fun and was taught through animations.”

These quotations suggest that the participants would like learn the content through fun. The direct quotations about other codes, namely through playing games, through study sheets and through rewards, are given as follows:

S5: “I would like to learn the unit through watching videos and working with study sheets.”

S34: “I would like to learn the unit through fun, pleasure and playing games, etc.”

S4: “I would like to learn the unit through rewards. Under such a condition both me and my peers would listen to teacher with much more motivation.”

**DISCUSSIONS AND CONCLUSION**

The pre-test scores of the participants from the achievement test on the unit of let’s know our regions are found not to significantly differ in that that of the experiment group was $x=14.76$ and that of the control group was $x=16.03$. Therefore, both groups had a similar level of academical achievement.

Following the six-week implementation the test was again administered to both groups as post-test. The post-test scores of both groups significantly increased. Therefore, it is safe to argue that the methods used in both groups were influential in improving student learning. There are some findings suggesting that the traditional teaching method employed in the control group has significant effects on student achievement (Baysan, 2015; Küslü, 2015). There are also other findings indicating that the multimedia teaching method employed in the experiment group has significant effects on student achievement (Çoruk and Çakır, 2017; Leow and Neo, 2014; Lui, Olmanson, Horton and Toprac, 2011; Saad, Dandashi, Aljaam and Saleh, 2015; Saran and Seferoğlu, 2010; Singh, 2013). The views of the participants in the experiment group also support this result. More than half of the participants reported that the multimedia teaching improved their achievement in social studies course and made it possible for them to better understand the content. Some of the participants stated that the animations, pictures, photographs and maps used in the multimedia teaching facilitated learning of the content, made the topics concrete and learning long-lasting. Two out of three students in the experiment group, on the other hand, reported that the multimedia teaching did not affect their learning, hence their achievement. It may be resulted from different learning styles. Given that the multimedia teaching is not always time and cost effective, personal differences cannot be taken into consideration. These factors may be considered to be disadvantages of the multimedia teaching.

It is also found that although the post-test scores of the experiment group was higher than those of the control group, this difference is not statistically significant. This finding is consistent with some previous findings, but there are also some other previous findings which are inconsistent with it. Altunışık (2001) found that the multimedia teaching in the social studies courses did not make a significant difference in the achievement of the experiment subjects. Yarar (2010) concluded that there was no significant difference between the achievement scores of the experiment group in which the multimedia teaching was employed and those of the control group. Bayırtepe and Tüzün (2007) found that there was no significant difference between the achievement scores of the experiment group in which the multimedia based software was employed and those of the control group.

The reason for not having a significant difference between the achievement scores of the experiment group and those of the control group in the study may be that the achievement levels of both groups were already high. In accordance with the principle of individual differences that is used in the multimedia teaching designs the multimedia teaching has much more positive effects for those with less knowledge in contrast to those with higher levels of knowledge (Mayer, 1999). As stated
earlier the school administrators reported that the children attending the schools had a good academical background. Similar observations were expressed by the teachers working at the schools. It was also reported that the students were successful and most of them came from higher socio-economical families. In addition, their parents were reported to have higher levels of education and were conscious about their children’s education. Therefore, it can be stated that the multimedia teaching did not produce the desired level of achievement in the social studies courses due to the fact that the participants were successful learners. As stated earlier Mayer (2009) argued that the multimedia teaching has much more positive effects for those with less knowledge in contrast to those with higher levels of knowledge. Because those children with lower levels of achievement need more of the use of visual and verbal materials together. In other words, the multimedia learning environments contribute to learning of the material in an easier way for such students.

On the other hand, it can be argued that the multimedia teaching did not produce the desired level of achievement in the social studies courses due to the fact that the classrooms were very crowded. Some of the students participated in the study reported that the classroom was crowded and more than half of them stated that the classroom was noise so that they could not understand what teacher said in the course. Some others stated that they could have a chance to discuss the topic with the teacher and therefore, could not participate in the class discussions. Some students suggested that in order to improve student involvement there should be a silent learning environment and others argued that the classroom size should be lower. Işık (2011) argued that the size for classrooms should be between 20-30 students. It is reported that classroom management will be much easier in such classes and different teaching methods can be employed. The other advantage of such a classroom size is that teacher could be familiar with the students. However, if the classroom size is higher than 30 students, such classrooms are “crowded”. In such classrooms classroom management can be a problem. In addition, it is difficult for teacher to be familiar with students. Tabancalı (2008) argued that crowded classrooms may limit the benefits of the teaching methods and techniques in addition to the problems related to classroom management. Çınar, Temel, Beden and Göçgen (2004) found that crowded classrooms have negative effects on student achievement, attendance and result in time consuming. In short, it is possible to state that the multimedia teaching did not produce the desired level of achievement in the social studies courses due to the fact that the classrooms were very crowded.

However, it should be noted that if the implementation will be done on a different group of participants, the effects of the multimedia teaching will be differ. In some studies it is found that the multimedia teaching had significant effects on student achievement (Mayer, 2002; Mayer, 1997; Mayer and Moreno, 2002a; Taççi and Soran, 2008). Beydoğan and Hayran (2015) dealt with the effects of the multimedia teaching on the teaching of some social studies concepts. It is concluded that the academical achievement of the experiment subjects was much higher than that of the control subjects. Sezgin (2009) also concluded that the multimedia teaching significantly improved student achievement in contrast to computer-based teaching. It was also found that the learning of the students taught through the multimedia teaching was long-lasting. Bülbul (2009) analysed the effects of simulations on student achievement and found that this technique significantly improved student achievement. The reason for positive effects of simulations on student achievement was stated to be the fact that it made students active participants of the learning process. Toros (2015) analysed the effects of the multimedia teaching on student achievement. It was concluded that the academical achievement score of the experiment subjects was higher than that of the control subjects. In addition, the multimedia teaching was found to be very effective to avoid misconceptions about climate, weather, geography, map and scale. Another study also found that the experiment subjects taught through the multimedia teaching were much more successful than the control subjects (Küslü, 2015). Singh (2013) analysed the effects of multimedia teaching on geography teaching and learning and found that multimedia teaching is much more influential on geography teaching and learning in contrast to traditional teaching approach. The reason for it is that traditional methods make students passive recipients of the knowledge and that traditional methods do not address multi sense of students. On the other hand, the multimedia teaching addresses more than one sense of students making it much easier to learn the content and it makes topics concrete and learning long-lasting. It
also makes students active participants of the learning process. All these characteristics of the multimedia teaching have positive effects on student achievement.

Based on the findings of the study the following suggestions are developed:

✓ Given that the implementation was carried out in a crowded classroom, the course could not be delivered using full student-centered approach. It is thought that the effects of the multimedia teaching were limited due to this factor. It is predicted that the effects of the multimedia teaching will be much more when it is used in the classrooms with less students. A similar study can be repeated in the classrooms with less students.

✓ One of the major findings of the study is that the multimedia teaching makes it possible for students to learn the content through fun. Although the quantitative findings do not much support it, the qualitative results suggest that the multimedia teaching positively affects student learning. Therefore, it can be stated that the multimedia teaching should be used in the learning and teaching process.

✓ The findings of the study suggest that the multimedia teaching facilitates learning, makes the topics concrete and produces long-lasting learning. In order to improve long-lasting learning it can be suggested that the multimedia teaching should be supplemented with the tests on comprehension, repetition and interactive techniques.

✓ The participants of the study had higher levels of academic achievement. However, it is stated that multimedia setting are much more influential on the students with lower levels of academic achievement which is in consisten with the individual differences principle of multimedia teaching (Mayer, 2009). Therefore, future studies may be carried out on the participants who have lower, intermediate and higher levels of academic achievement to have much clearer understanding of the effects of multimedia teaching on student achievement. Such studies may be designed using the embedded theory or explanatory sequential design techniques.

✓ The reasons for not having desired results in student achievement when the multimedia teaching is used should be analysed to describe the required characteristics of the approach.

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A Qualitative Case Study of Multicultural Education in Turkey: Definitions of Multiculturalism and Multicultural Education

Yahya Han Erbaş
Canakkale Onsekiz Mart University

Abstract

The Republic of Turkey became more diverse than ever in its history. Multiculturalism and multicultural education, as part of Turkey’s globalization efforts, may be the most appropriate approach for the Turkish educational system to form a synthesis of cultures and to help diverse groups build an interactive dialog with others regardless of local, national, transnational or international status. This qualitative case study aimed to examine Turkish teachers’ and teacher candidates’ views on and perceptions of multiculturalism and multicultural education in the Turkish context. For this study, the researcher gathered data and investigated the perceptions and results of a stand-alone graduate course referred to as MULT-500 Multicultural Education and its effects on teachers’ and teacher candidates’ thoughts, beliefs, understandings, and perceptions. This course is offered at an institution located in the Marmara Region. When referring to this university, the pseudonym Alpha University was used. The data were collected from semi-structured interviews, written documents, focus group interview, classroom observation and fieldnotes. According to the findings, all study participants had an idea of what multiculturalism and multicultural education were before the course. During the course, they improved upon and enhanced their understandings and thoughts; however, they still need to extend their perspectives so as to more fully understand what those concepts mean.

Keywords: Multiculturalism, Multicultural education, Turkey, cultural pluralism, teacher education
INTRODUCTION

Today, nearly all societies include different cultures, ethnicities, religions and languages, and the differences associated with each of these needs to be explored in schools via a newly designed curriculum (Gorski, 2001; Maylor, Read, Mendick, Ross & Rollock, 2007). In modern countries, schools are an important part of socialization, and all schools need to be properly prepared to facilitate learning through the necessary components of institutional education – teachers, administrators and relevant course content – in order to address modern countries’ complex societal structures (Chisholm, 1994; Chou, 2007). When schools and all components necessary to education are properly prepared and readily available, students will be able to discover the diverse society in which they live. Even when a society is not particularly diverse in its makeup, the children of that society should still be exposed to multiculturalism through school such that they have the ability to become part of more diverse societies and to become global citizens. Learning about different cultures, lifestyles, ethnicities and all other forms of diversity allow students a more comprehensive view of the world than they previously held and a more appropriate lens through which to examine others (Terry & Irving, 2010).

Turkey’s population comprised of diverse ethnic groups has increased rapidly over the years, and integration regarding the backgrounds of these ethnic groups into the curriculum has become an increasingly important issue for the Turkish educational system. Recent growth of ethnic groups in Turkey, with regard to population, has demonstrated the need for increased awareness pertaining to future teachers’ abilities to teach issues regarding diversity in diverse classroom settings and teaching multiculturalism via teacher education programs (Aydin, 2013).

A Review of Literature

A considerable amount of literature has been published with regard to the goals or functions of multicultural education. For instance, Banks (1993) identifies two major goals of multicultural education; these include making any necessary adjustments to schools such that they provide a more supportive education environment as well as high-quality educational experiences for all students regardless of their ethnicities, racial groups and social classes, and providing similar educational opportunities for both genders. In addition, along a similar line, Bieger (1995) mentions that multicultural education is an opportunity for students to experience a variety of cultural influences within the educational system regardless of social class and gender differences.

It has been shown conclusively that multicultural education has gained increased importance since the last 50 years. According to Banks, Banks and McGee (2010), multicultural education was born as a result of the 1960s Civil Rights Movement; until now, many scholars have emphasized the importance of multicultural education and have defined it so as allow others to more clearly understand what multicultural education entails. Many researchers have agreed that multicultural education is important in its ability to represent the structure of a given society. There are additional definitions of multicultural education put forth by other well-known researchers as well. For example, Banks (1997) states that multicultural education serves as the attempt to try to analyze all education systems so as to avoid racism. Hourihan and Chapin (1976) define multicultural education as “making educational institutions congruent with the cultural backgrounds of the students and, perhaps more importantly, [giving] the students an appreciation and positive valuation of their own cultural heritage” (p. 24). Sleeter and Grant (1994) claim that multicultural education serves to educate the children who come from diverse backgrounds in order to help them adapt into education systems. Nieto (1999) defines multicultural education as the means by which educators can foster academic perfection for all students. Further, Gay (2004) refers to multicultural education as “integral to improving the academic success of students of color and preparing all youths for democratic citizenship in a pluralistic society” (p. 30).

In addition to understanding what multicultural education is, in terms of its functions and goals, it is important to take note of the sorts of misconceptions that exist regarding this type of education. First, it is important not to confuse multicultural education with ethnic studies. The focus of
ethnic studies is generally gathered around historical and social components of diverse groups; multicultural education, however, is interested in determining the best teaching methods to teach all components as they pertain to culture and cultural groups. Multicultural education does not suggest either protecting or destroying a particular ethnicity; it does not make use of any approaches intended to divide the people into separate groups by stressing ethnic loyalty over national adherence. Rather, it advocates the teaching of all components associated with cultural groups so as to build a nationwide or a global society. Multicultural education does not intend simply to criticize the political, educational or economic systems of a country; however, it does analyze these sociocultural factors, as this plays an important role in both determining and addressing social conditions and increasing students’ school achievements (Eryaman, 2007, 2009; Birkel, 2000).

Educating future teachers is an important part of improving awareness as it pertains to diversity; further, positive attitudes toward multiculturalism are important components of multicultural education (Chou, 2007). It has been suggested that teacher education programs in Turkey need to be revised such that they encourage teachers to become more sensitive to cultural differences (Coban, Karaman, & Dogan, 2010; Yavuz & Anil, 2010; Unlu & Orten, 2013; Tortop, 2014). Unlu and Orten (2013) investigated the perceptions of teacher candidates regarding multiculturalism and multicultural education. Their findings indicate that teacher candidates possess both true notion and false notion with regard to multiculturalism. Twenty-two teacher candidates out of 33 believe that multiculturalism has to do with cultural, language, religion, race and lifestyle differences and that these differences reflect individuals’ strengths; however, eleven of the teacher candidates in the study believe that multiculturalism, as a project, serves to divide their country into several parts based on ethnic differences. According to the researchers, eliminating the false information may be possible via the integration of the instructional components of multiculturalism into teacher education programs.

Demirsoy (2013), and Demircioğlu and Ozdemir (2014) completed their studies to determine pre-service teachers’ perceptions; to complete their work, the authors of the studies gathered data from Marmara and Ege Universities, located in western Turkey. Demirsoy (2013) analyzed the opinions of pre-service social studies teachers regarding multiculturalism; the author also assessed how these teacher candidates approached this multiculturalism. Demirsoy (2013) conducted interviews with twelve candidates and reported major findings in his studies. All teacher candidates in this study agree that teaching students about different cultures and offering equal-quality educational opportunities are important components of multicultural education. However, all pre-service teachers believe that neither their programs nor their associated curricula had prepared them to teach multiculturalism; instead, the pre-service teachers improved their perceptions regarding multiculturalism by way of the media. Additionally, half of the teachers in this study believe that they are not ready to teach in multicultural environments or to teach multiculturalism. The other half believes that they have only a slight amount of information regarding multicultural education. In addition, Demircioğlu and Ozdemir (2014) analyzed the perceptions of pedagogical formation students’ with regard to multicultural education. The authors take into account a number of variables (gender, age, specification and settlement) in order to analyze 156 pedagogical formation students’ thoughts. Their findings indicate that 156 participants have positive attitudes toward multicultural education regardless of their ages, genders, settlements and specifications. Based on these findings, regardless of gender, teacher candidates are willing to learn more about multicultural education.

Similarly, Coban and colleagues (2010) examined teacher candidates’ perceptions in terms of various demographic variables. Their findings are similar to those of the previously mentioned study: teacher candidates have positive attitudes toward multiculturalism. An interesting finding from this research indicates that female teacher candidates have more positive attitudes than male candidates with regard to people’s different political views. Additionally, the study has found that teacher candidates who grew up in urban areas have more positive attitudes than candidates who grew up in rural area with regard to different sexual preferences as a multicultural issue.

Problem and Purpose of the Study
Multicultural education has not yet found a valuable place among teacher education programs in Turkey, and universities remain skeptical about how to appropriately integrate multicultural education into the curriculum of teacher education programs (Demircioglu & Ozdemir, 2014; Tortop, 2014; Unlu & Orten, 2013). According to Aydin (2013), upon comparing Turkish teacher education programs to western countries’ programs, it becomes apparent that Turkish teacher education programs are not sufficient to address the needs of diverse students in current schools. After graduating from teacher education programs, teachers and teacher candidates need to fill this gap with their knowledge and skills with regard to how to teach diversity and how to adapt their curricula based on diverse students’ needs. Through their education, teachers and teacher candidates should learn how to integrate classroom content related to issues of diversity, provide equal educational opportunities to diverse populations, employ appropriate activities to increase academic achievement among diverse students, and increase students’ levels of understanding with regard to the importance of pluralism in society (Aydin, 2013).

In rare cases, a few university professors offer courses, as electives, related to the foundations of multicultural education and dimensions of multicultural education in teacher education programs in Turkey. In addition to a lack of integration of multiculturalism into teacher education programs, there are also serious gaps with regard to the examinations administered to indicate what teachers and teacher candidates have learned after taking a course related to multicultural education (Polat & Kilic, 2013). Based on the detailed research, an examination of teachers’ and teacher candidates’ initial perceptions and the outputs of these scarcely offered courses (i.e., the new perspectives or attitudes these target groups have developed after completing the course) is rarely conducted. Generally, researchers have preferred to make use of surveys and questionnaires in order to analyze teachers’ and teacher candidates’ perceptions, etc.

This study aimed to examine Turkish teachers’ and teacher candidates’ views on and perceptions of multiculturalism and multicultural education in the Turkish context. For this study, I gathered data and investigate the perceptions and results of a stand-alone graduate course referred to as MULT- 500 Multicultural Education (pseudonym) and its effects on teachers’ and teacher candidates’ thoughts, beliefs, understanding and perceptions. Through the research, I explored ideas, opinions and beliefs held by teachers and teacher candidates with regard to multiculturalism and multicultural education, and if and how multicultural education might be useful in the Turkish context.

Research Question

How do teachers and teacher candidates define multiculturalism and multicultural education before and after taking the graduate course in a public university in Turkey? In other words, what are their understandings of these concepts?

Conceptual Framework

In order to derive the conceptualization of teachers’ and teacher candidates’ perceptions, understandings, and beliefs regarding multiculturalism and multicultural education, Nieto’s (1994) “levels of multicultural understanding,” and Sleeter and Grant’s (2007) “goals of multicultural education” are used to frame this study.

Levels of Multicultural Understanding

Nieto (1994) developed four levels of multicultural understanding that serve to embrace all students in the classroom. According to the author, tolerance, acceptance, respect, and affirmation solidarity and critique are the levels of understanding associated with multiculturalism. While tolerance is the lowest level of multicultural understanding, affirmation solidarity and critique is the highest level.
Tolerance. Nieto (1994, 2004) claimed that tolerance is the first level of supporting pluralism; at this level, differences are endured. According to the author, “this level of support for multicultural education stands on shaky ground because what is tolerated today can too easily be rejected tomorrow” (p. 3). She claimed that if teachers were at this level, they would acknowledge students’ differences, but they would be unable to fully notice “why some students are more successful than others” (p. 4).

Acceptance. The second level of multicultural understanding is “acceptance.” According to Nieto (1994), the acceptance level of multicultural education “implies that differences are acknowledged and their importance is neither denied nor belittled” (p. 4). At this level, school administrators and teachers make students’ diverse backgrounds “visible” if they are allowed (Nieto, 2004).

Respect. The third level of multicultural education support is respect. At this level, teachers should hold differences in high esteem, and students’ diverse backgrounds do not serve exclusively as bridges to the mainstream culture of the class; rather, at this stage, teachers should support students and their education by understanding and relating to the students’ diverse backgrounds. This level requires more interaction among parents, teachers, and schools, and students’ experiences are used more frequently to enhance their schooling (Nieto, 1994; Nieto, 2004).

Affirmation, solidarity, and critique. According to Nieto (1994, 2004), this level of multicultural education provides the highest level of support for diversity. At this level, “conflict” is an important part of learning. In addition, at this level, multicultural education is concerned with “equity and social justice” (Nieto, 1994, p. 5). According to the author, students’ diverse backgrounds and families are “embraced and accepted as legitimate vehicles for learning” (Nieto, 1994, p. 5). Further, at this level of multicultural education, teachers are responsible for supporting students’ efforts to critique their own cultures and others’ cultures in order to understand the differences.

**Goals of multicultural education**

According to Sleeter and Grant (2007), goals of multicultural education have two major components, which are cultural pluralism and equal opportunity.

Cultural pluralism. According to Sleeter and Grant (2007), cultural pluralism entails “balancing diverse culture and identities within one nation, encouraging a ‘both-and’ stance toward difference and unity” (p. 152). The researchers claimed that the pluralist point of view allows people to be proud of their diverse backgrounds, and it advocates that diversities in society are not a problem that needs to be overcome. Global immigration of people increases each year and this has made countries more diverse than ever. The idea of cultural pluralism will prepare people “to work constructively with, communicate with, and respect diverse people of the world” (p. 154).

Equal opportunity. Sleeter and Grant (2007) claimed that equal educational opportunity should mean that,

Classrooms accommodate a wide enough spectrum of human diversity so that students do not find themselves disabled by factors such as teaching processes that ignore what they know, use of a language they do not understand, or adaption of teaching strategies that do not work well for them. Nor would students feel ostracized or unwelcome because of their color, religious affiliation, sexual orientation, or physical characteristics. Classrooms would enable all students to choose and strive for a personally fulfilling future, and develop self-respect, in a way that builds on their home culture and language. (p. 155).

According to the researchers, these two major components of multicultural education have the following goals: “(a) promoting and understanding cultural diversity, (b) promoting alternative choices
for people without negation of their own race, gender, disability, language, religion, sexual orientation, and social class background, (c) helping children to achieve academic success, and (d) promoting awareness of social issues involving unequal distribution of power and privilege that limits the opportunity of those not in the dominant group” (p. 178).

Methodology

An appropriate selection of research methods is essential to any research. This qualitative inquiry used qualitative case study model designed to examine beliefs, opinions and perceptions of teachers and teacher candidates with regard to multiculturalism and multicultural education, and to investigate the effects of obtaining knowledge regarding multiculturalism and multicultural education in a Turkish public university teacher education program. A qualitative case study model provided in-depth opportunity to gather data via events that occur within a bounded system as a natural setting for the study.

Participants

In the spring of 2016, nine teachers and teacher candidates were registered to the course. Previously, teachers in public and private schools, as well as teacher candidates who had already graduated from teacher programs but had not yet started working in schools, took this class to complete their elective requirements for their master’s degree in education. Further, previous students who took MULT-500 were often teachers with various years’ worth of teaching experience, of different ethnic and cultural backgrounds, and teacher candidates who came from culturally and ethnically diverse backgrounds. During the spring semester 2016, similar types of students – with their respective diverse backgrounds – enrolled in the course (Table 1).

I sought the necessary permission from the university and the instructor before meeting with the participants, and I explained the purposes of the study during the first day of the MULT-500 Multicultural Education course. After completing the necessary steps, I provided the Study Information Sheet to the students who volunteered to be a part of this study. Students who wanted to participate in the study signed and returned the Study Information Sheet during the first day of the course. All of the students who took the course (nine teachers and teacher candidates), as well as the course instructor, volunteered to participate in the study. In order to conceal the identities of the participants, pseudonyms were used instead of their original names.

<table>
<thead>
<tr>
<th>Table 1. Participants of the Study</th>
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<tbody>
<tr>
<td>Participants (pseudonyms)</td>
</tr>
<tr>
<td>Mete</td>
</tr>
<tr>
<td>Ayse</td>
</tr>
<tr>
<td>Fatma</td>
</tr>
<tr>
<td>Name</td>
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<tr>
<td>---------------</td>
</tr>
<tr>
<td>Harun</td>
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<tr>
<td>Zeliha</td>
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<td>Nalan</td>
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<tr>
<td>Olcay</td>
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<tr>
<td>Rana</td>
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<tr>
<td>Gokhan</td>
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<tr>
<td>Mehmet (the course instructor)</td>
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</tbody>
</table>

**Data Collection**

According to Creswell (2007), qualitative case studies generally require different types of data collection methods that lend themselves to more meaningful data. For this qualitative case study, data was collected from semi-structured interviews, participants’ written documents, classroom observation notes, transcriptions of audio and video recordings created via the discussions in class and focus group interview, and fieldnotes. Additionally, in class discussions, interviews and focus group interview were in Turkish; Turkish responses were translated into English.

**Data Analysis**

During coding and while finding emerging themes and categories, I mainly followed the following steps:

a) Coding the data and finding themes,

b) Collecting similar themes under a single category,

c) Determining how the results of the coding relate to the initial research questions.
The data analysis of a qualitative study must be systematic and verifiable (Kruger, 1994). Before beginning data analysis, demographic questions of interviews were analyzed and reported in order to indicate participants’ demographic structures and diverse backgrounds. All video records were saved on the computer and on a flash drive to protect them and allow for a backup of the data, which ensured that they are securely protected. Then, after the necessary tools, such as a headset, are procured, I listened to all of the responses multiple times so that they can be transcribed. As mentioned previously, the interviews, in class discussions and focus group interview were in Turkish.

I examined both significant comments made during the interviews, exams, records of in-class discussions, focus group interview and identified major ideas shared by the teachers and teacher candidates who were part of the study. Code mapping was used to divide data into categories. First, transcriptions were read multiple times, and data were coded such that they reflect major topics. According to Merriam (2009), coding is “assigning some sort of shorthand designation to various aspects of your data” (p. 173). Then, I determined the main themes in order to get a general view of what has been discussed. For this determination, I used QSR Nvivo to create word clouds.

When the QSR Nvivo program creates a word cloud from the generated codes, it distributes the more frequently generated codes to the center of the cloud and represents them using a larger font size, while the less frequently generated codes are displayed along the edges of the cloud. Thus, while the themes are created after the encoding process is complete, the names given to the themes related to the multiplicity of codes at the cloud’s center are similar to the names of these codes.

After emerging themes were identified, they were classified the responses. Additionally, all emerging themes from participants’ responses were categorized based on their similarities and differences. Finally, when responses were organized, they were organized with regard to their relationships to the research questions.

FINDINGS

The research question focused primarily on determining what the course instructor and nine participants believed multiculturalism and multicultural education, as concepts, meant; the question also aimed to determine whether and how these participants’ understandings of the concepts changed by the end of the course.

All class sessions were held during the 2016 spring semester. Further, the course instructor provided most of the course instruction, making the course instruction teacher-centered rather than being the result of class discussion among participants. There were, however, student presentations held near the end of the semester. Generally, the course instructor would ask students short-answer questions that would enable him to briefly hear their definitions or thoughts regarding the concepts being discussed. Because the instructor provided most of the instruction and did not allow for much discussion among class participants, it was sometimes difficult to gather satisfactory data with regard to participants’ thoughts and comments about the topics being discussed (fieldnotes).

In order to enrich the data and generate meaningful responses to the first research question, I employed multiple data sources (i.e., fieldnotes, reflective notes, and the first and final interviews). For the research question, I divided the findings into four categories: (1) the initial definitions of multiculturalism, (2) the initial definitions of multicultural education, (3) the final definitions of multiculturalism, and (4) the final definitions of multicultural education. I then created a data Table 2 to better articulate the findings associated with the initial research question.
Table 2. Overview of the Findings for the Research Question

<table>
<thead>
<tr>
<th>Research question</th>
<th>Pre-interview</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-definitions of multiculturalism</td>
<td>Pre-definitions of multicultural education</td>
<td>Definitions of multiculturalism</td>
</tr>
<tr>
<td>Acceptance</td>
<td>Equality of opportunity</td>
<td>Acceptance of differences</td>
</tr>
<tr>
<td>Respect</td>
<td>Integration of differences</td>
<td>Living together</td>
</tr>
<tr>
<td>Coexistence of sub-cultures</td>
<td>Theme(s)</td>
<td>Cultural pluralism</td>
</tr>
</tbody>
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<table>
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<tr>
<th>Post-interview</th>
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<tbody>
<tr>
<td>Post-definitions of multiculturalism</td>
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<tr>
<td>Cultural pluralism</td>
</tr>
<tr>
<td>Unity in diversity</td>
</tr>
<tr>
<td>Creating a mainstream culture</td>
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</table>

The Initial Definitions of Multiculturalism

Fieldnotes and the initial interviews served as the primary sources for answers to the first part of the research question, which examined the definition of multiculturalism.

Findings regarding multiculturalism, as defined in class. During the second week of class sessions, the course instructor and the participants sometimes tried to create a common definition for both multiculturalism and multicultural education. The findings related to the first part of the research question were generated via the fieldnotes made during this time.

When the course instructor asked students to draw on the readings and provide their own definitions of multiculturalism, only a couple students were able to come up with unique definitions. Based on the participants’ responses, the definitions of multicultural education were placed into three themes: (1) acceptance of differences, (2) living together, and (3) cultural pluralism. For instance, one participant defined the theme by saying; “I can describe it as a person who has more than one sub-culture or an environment where more than one sub-culture exists” (cultural pluralism) (Gokhan, fieldnotes, February 29, 2016). Then, the instructor asked another student for her definition of multiculturalism, and after the student hesitated and thought about it, she said that she would define the term in the same way that the prior student had. She described multiculturalism as “the presence of different social classes, including different ethnic structures and different cultures” (cultural pluralism) (Zeliha, fieldnotes, February 29, 2016). In defining the concept, another participant stated, “multiculturalism can be defined as a means of refusing to assimilate and instead supporting diversity” (acceptance of differences) (Harun, fieldnotes, February 29, 2016).
The results of my analysis of fieldnotes showed that the participants were mostly in agreement with regard to the following instructor-generated definitions of multiculturalism:

- Multiculturalism means that everyone lives according to his or her own sub-culture. *(Acceptance of differences and living together)*

- Multiculturalism is the acceptance of differences in the natural coexistence of subcultures. *(Acceptance of differences)*

- Multiculturalism is an opportunity to allow people of different religions, languages, races, and sects to live together. *(Acceptance of differences and cultural pluralism)*

- The idea of multiculturalism suggests that everyone can live or express his or her own culture as desired *(living together)*. (fieldnotes, February 29, 2016)

These definitions indicate that the study participants already had some ideas about diversity issues, differences, and multiculturalism. They knew that multiculturalism had to do with, for example, religion, language, racial differences, and the concepts of sub-cultures and mainstream cultures. Following are the results from the interviews, which are required for the detailed examination of the study participants’ understandings of the meaning of the concept of multicultural.

**Findings regarding multiculturalism, as defined in interviews.** Although the study participants came up with different definitions of multiculturalism during their first semi-structured interviews, was able to categorize the definitions as the following three themes: (1) coexistence of cultures, (2) acceptance, (3) and respect. Within these themes, the definitions gathered primarily around the first theme of multicultural understanding, which is “coexistence of sub-cultures.” Including the course instructor, five participants’ defined multiculturalism such that their definitions were placed in this group.

**Coexistence of sub-cultures.** I began by examining the course instructor’s definition of multiculturalism. In his first interview, the course instructor, Dr. Mehmet, mentioned that he had been teaching the course once a year since 2009, and he had around 15 years of experience teaching courses related to issues of diversity. During this teaching period, he said that he always thought about the definition of multiculturalism and multicultural education, and year-by-year, his definition evolved based on his teaching experiences at the university and social development that had taken place in Turkey and the world. Dr. Mehmet said that his initial understanding of multiculturalism was influenced by experiences he had in his family. He noted that these various experiences were fundamental elements in his formation of the definition of multiculturalism. This was largely due to a large gap in age between Dr. Mehmet and his eldest brother as well as the fact that he was the only person studying at the university on a very limited budget. In his definition, Dr. Mehmet focused primarily on how mainstream cultures can be shaped by sub-cultures. He thought that using communication-based tools and traveling around the world had served as means of increasing awareness regarding diversity and have helped to establish a multicultural society. He said:

Multiculturalism is a combination of different sub-cultures in societies. People whose subordinate identities are similar create a culture over time. A mainstream culture is formed from the composition of these sub-cultures. If these sub-cultures come together and build a diverse society, which is inevitable, then it becomes impossible to talk about just one culture existing in the world. The awareness of these different cultures has increased with the increased use of transportation facilities and technology, and the increase in migration. (Mehmet, first interview, March 7, 2016)

Adding to this definition, most of the other participants in this group focused on the coexistence of diverse communities within a society. For instance, one participant defined multiculturalism as “the coexistence of different ethnic groups” (Fatma, first interview, March 1,
2016). Coming from a different country that is home to many ethnicities shaped Fatma’s understanding of how diversity among ethnic identities constitutes a big part of multiculturalism. When Fatma was four years old, the Kosovo War was underway, and she said that this enabled her to become aware of, for the first time, concepts or terms related to other people’s ethnicities, which included Albanian, Turkish, and Serbian. She believed that such distinctions existed before the war began, but she was unaware of them. Fatma also stated that, during elementary school, secondary school, high school, and even in college, she became friends with classmates who came from every ethnic group in her country and who had very different religious backgrounds.

Another participant, Harun, offered a definition for the concept of multiculturalism that was very similar to the one that Fatma provided. The only difference is, while Fatma specifically mentioned different ethnic groups in her definition, Harun focused primarily on the “bir arada yaşama” (‘coexistence’) of different cultures without specifying what might define those cultures. Harun mentioned that the graduate program he had completed before beginning the current program had shaped his ideas about multiculturalism. He talked about his previous education in the language and literature department, which involved studying and debating many foreign authors’ works and the subjects about which they wrote. Harun said that since these books focus primarily on the existence of multilingual issues in society, multilingualism is, in his mind, central to the definition of multiculturalism. He also stated that he has often heard the terms “çokkültürlülük” (‘multiculturalism’) and “çokdillilik” (‘multilingualism’), but he said that he had never distinguished between these two terms. According to Harun, multiculturalism is the coexistence of “different cultures” (Harun, first interview, March 5, 2016).

Gokhan and Olcay both considered the concept of multiculturalism a little differently than the aforementioned participants. These participants suggested that differences in people’s characteristics account for multiculturalism within society. Gokhan, for example, defined multiculturalism as “the environment in which people who have more than one culture coexist” (Gokhan, first interview, March 7, 2016). Gokhan works in a military school where everyone looks the same thanks to the fact that they all wear the same uniform. Because of this, he did not initially consider people’s individual differences. Over time, however, he realized that the students at the school all had different socioeconomic status. It eventually occurred to Gokhan that, despite the level of equality that the school uniforms afforded the students, the students were different in terms of the regions from which they came, their socioeconomic status, their ethnic structures, and their sects. This led Gokhan to the idea that school is a multicultural environment.

In offering her definition, another participant said,

“Multiculturalism is the coexistence of people who have different characteristics within a society. It can be ethnicity, language, religion, skin color, eye color, anything that is different. Diversity is multiculturalism for me. (Olcay, first interview, March 9, 2016).

Olcay was the first person to specify people’s personal characteristics as a means of establishing diversity in society. Before taking the course, Olcay understood that she was an individual from the dominant culture in Turkey, but she also began thinking about multiculturalism and individual differences. During her interview, she talked about her experience with conflicts between two different students’ groups, one group of children from a community whose members are only slightly represented in Turkey and a group of other students whose members are well represented in the country. According to Olcay, very serious problems emerged as students did not want to approach the minority students and felt prejudice toward them. She said that she began to focus on these issues for the first time when she noticed that the students from the different groups refused to work on school activities together. She believed that spending time letting the students know that there is beauty in differences and that differences do not make people bad would prompt her students to begin to view differences via a more positive lens. While Gokhan’s and Olcay’s definitions seem similar to those of Fatma and Harun, they are more evolved perhaps in that they take into account the personalities of the people who make a society and that shape the multicultural environment.
One participant, Rana, came from an especially diverse family and had more diverse experiences throughout her life. She concluded that her diverse background helped her to come up with a more appropriate definition of multiculturalism. She defined it as the coexistence of different ways of thinking, different ethnic backgrounds, different socio-economic situations, and gender. My definitions might be affected by how my parents raised me. They have always taught me to respect differences and to love people simply because they are human beings. (Rana, first interview, March 10, 2016).

Rana said she always noticed that when she left the region of Turkey where she lived, people tended to behave differently toward her because of her ethnic background. She first experienced this when she was in the 5th grade and one of her friends said that she had a different sectarian background. Rana did not understand why her friend noted the difference between them, and this was because Rana’s family “never discussed the differences among people but taught respect” (Rana, first interview, March 10, 2016).

Acceptance. Some participants’ initial definitions of multiculturalism were grouped together within the acceptance theme. Two study participants suggested that respectfully accepting differences is the important element of internalizing the diversity in Turkey. For instance, one participant stated, “Multiculturalism is the respectful acceptance of the existence of various groups of people” (Zeliha, first interview, March 4, 2016). She said that she first became aware of people’s differences when she was in the 2nd grade. Having moved to a new city after the earthquake of 1999, Zeliha had the opportunity to get to know people who were very diverse culturally and who were from different socioeconomic backgrounds.

According to Zeliha, a family who emigrated from Iran to Turkey made the biggest impression on her. She was very surprised by their lifestyle and their clothing styles, which were unlike any she had seen before. Zeliha believed that the development of her view regarding multiculturalism has been greatly influenced by her education at a private university in Istanbul. She mentioned that having many friends from different countries, from east and west of Turkey, allowed her the opportunity to get together with people associated with different orientations and different cultures. Further, she stated that talking to these people and becoming familiar with them and their ways of life helped her to both recognize them for who they are and find commonalities among them. She mentioned that her 4-year university education helped her to assume an even more positive outlook with regard to people’s differences. Zeliha also said that she learned to become more tolerant of her family. Finally, she noted that she has not had any difficulty in accepting people’s differences because she grew up in an environment where no one was alienated.

Similarly, Nalan, another participant stated, “If culture is everything a person does, multiculturalism is the result of accepting and respecting all of these different people” (Nalan, first interview, March 3, 2016). She said that she really began to understand differences among people when she was a first grader and noticed that boys and girls were often separated because of gender. Nalan noted that her societal observations are central to her definition of multiculturalism. She believed that Turkey is a country where some ideas dominate other ideas. She believed that she might have enough information about the differences in Turkey. In addition to being aware of people’s differences, Nalan said that she spent a lot of time thinking about how differences should be integrated into life in general.

Respect. Under this theme, two students focused primarily on respecting differences in their definitions. One participant, Mete, defined it as “having respect for different cultures, being non-discriminatory, accepting all differences, and behaving equally with regard to all cultures”(Mete, first interview, March 9, 2016). Mete stated that, since his childhood, his family advised him to not discriminate against people. For example, when there were students from different ethnic and religious backgrounds in a classroom, they usually had only small groups of friends, but no one in Mete’s family discussed the differences. They were, however, discussed in friends’ homes because those
friends were aware of these distinctions. Mete believed that having his family to provide this sort of education helped to shape his understanding of multiculturalism.

In addition, another participant, Ayse, combined ideas about having respect and living together such that she was able to offer a more advanced definition of multiculturalism. She said, “Multiculturalism means to me to respect differences. People can be completely different with regard to their outer appearances, their spirits, etc., but people should be able to live together and respect one another regardless of their differences” (Ayse, first interview, March 10, 2016). Ayse stated that she found it unfortunate that she had learned about the existence of differences in Turkey thanks to bad experiences in elementary school. Especially in primary school, Ayse had a number of friends who came from the east part of Turkey, and they felt that their teachers behaved differently toward them than they did toward their peers; they believed that their teachers mostly ignored them. This caused other students to begin to ignore them, and Ayse eventually noticed this and saw that it was wrong. According to Ayse, one of the reasons behind why the students adopted these attitudes had to do with the teachers’ attitudes. Ayse stated that she grew up in a place where most of the people were the same and there were few differences.

The Initial Definitions of Multicultural Education

Based on the participants’ responses, the definitions of multicultural education were placed into two themes: (1) integration of differences and (2) equality of opportunity. The results indicate that, within these groups, the definitions of multicultural education were mostly aggregated within the theme of integration of differences.

Integration of differences. Ayse believed that teachers should be capable of integrating students’ diverse backgrounds into the education system. She said, “Multicultural education is the use of differences in education. It refers to the education of students by tending to these differences and paying more attention to them” (Ayse, first interview, March 10, 2016). Although another participant, Harun, stated that schools need to provide equal opportunities for all individuals within sub-cultures, he believed that the first role of the school must be to properly integrate those differences into the education system. He said, “The school environment must be organized accordingly such that multicultural education can take place. Multicultural education aims to recognize different cultures, respect them and integrate them” (Harun, first interview, March 5, 2016). According to Harun, this integration helps to create a mainstream culture that makes for a multicultural country where sub-cultures are represented on equal footing and there is no one sub-culture that dominates others.

Nalan also believed that integration of differences would positively affect students’ behaviors. When diverse groups begin to interact, and get to know one another, they are more likely to decrease their levels of prejudice. In her definition, Nalan said,

People who come from diverse backgrounds can be educated with others. I define multicultural education as cultural exchanges, interactions, and learning about the cultures of others. Students should not be educated on a single line; they should be educated in different directions. (Nalan, first interview, March 3, 2016)

Rana’s definition, however, was largely centered on the integration of students who come from different races, cultures and socio-economic classes. According to Rana, multicultural education can be defined as “introducing the characteristics of students to each other, integrating these characteristics into education, and offering opportunities for students from different races, cultures, and socio-economic environments” (Rana, first interview, March 10, 2016). According to Mete, eliminating inequity from all educational institutions might be the main purpose of multicultural education. He said,

Multicultural education aims to eliminate discrimination and support the understanding of the culture, to facilitate communication among different groups, to ensure that
individuals are self-confident, to live within a common culture, and to create a common culture by integrating these various cultures. (Mete, first interview, March 9, 2016)

This response indicates that a connection among all minor groups of people is important to the creation of a national-wide culture in Turkey.

Equality of opportunity. According to Dr. Mehmet, the main purpose of multicultural education is to design curriculum for all people in order to offer equal access to educational opportunities and their benefits. He said, “Multicultural education is an educational philosophy that supports understanding different cultures and providing justice and equal learning opportunities for all. I think it is an approach to better facilitate teaching activities” (Dr. Mehmet, first interview, March 7, 2016). Olcay and Gokhan provided definitions similar to that of Dr. Mehmet. They defined multicultural education as a means of providing equality for all students. Olcay stated, “Multicultural education is the education of individuals from different cultures in a society where many cultures coexist. In multicultural education, equal opportunities are provided for all cultures, and students are introduced to other cultures” (Olcay, first interview, March 9, 2016). In addition, Gokhan defined multicultural education as “[multicultural education is] an education that will enable students to benefit equally from all possibilities in an environment where people with more than one culture exist” (Gokhan, first interview, March 7, 2016). Although Fatma briefly made note of several aspects of multicultural education, such as having respect and reducing prejudice, she essentially focused on the equality of diversity in the classroom. According to Fatma, multicultural education is

[multicultural education is] an approach that tolerates differences in the education system and provides equal opportunities. Multicultural education should ensure that those who receive education establish and maintain a sense of respect for differences, discard their prejudices, accept those who are different, and recognize that these differences are not something people can choose. (Fatma, first interview, March 1, 2016)

Final Definitions of Multiculturalism

At the end of the course, I conducted another semi-structured interview with each participant to learn his or her final thoughts about multiculturalism and multicultural education. Though there may be some similarities between the participants’ initial definitions and their final definitions, some participants came up with slightly different definitions or expanded on their earlier definitions of multiculturalism. Based on these definitions, I created three themes: (1) tolerance, (2) cultural pluralism, and (3) creating a mainstream culture.

Unity in diversity. One participant, Fatma, defined multiculturalism as the “interactions of more than one culture and people from more than one culture living together peacefully” (Fatma, final interview, June 17, 2016). Unlike her earlier definition, Fatma’s final definition of multicultural understanding is rooted in unity. In addition, Fatma, referring only to the unity of differences in her first definition, refers to the importance of living in peace in her final definition. Another participant, Olcay, emphasized the importance of accepting differences as a normal thing. She defined the concept as “a place where one or more cultures live together and accept one another’s differences as normal human differences” (Olcay, final interview, July 9, 2016). As she did in her first definition, Olcay based her final definition on the concept of unity. In her first definition, however, Olcay suggested specific differences, but in her second definition, she generalized by referring to humanity as a whole.

To create a strong definition, one participant, Rana, named many possible sub-cultures when making reference to differences. According to Rana, multiculturalism is

The societal diversity that occurs when people from different races, religions, languages and cultural groups come together to live, work, trade, participate in political life and engage in cultural interaction. In other words, it is a society in which
individuals of different ages, sexual orientations, disabilities, social classes, ethnicities, religions, languages, and cultural characteristics live together. (Rana, final interview, June 23, 2016)

Rana was the only person who adhered to her first definition when providing her final definition. Both definitions suggest very similar understandings and are rooted in concepts such as respecting differences and living together.

Gokhan noted the importance of equality between two or more cultural groups, and he also made an important distinction between creating a monotype and creating a mainstream culture. Gokhan stated, “Multiculturalism refers to the positive, equal-gratification and glorification of cultural diversity. Advocates of multiculturalism should be opposed to the assimilation of different groups and of a monotype society” (Gokhan, final interview, August 15, 2016). It is obvious that Gokhan expanded on his understanding of multiculturalism and thus expanded on his earlier definition. In his first definition, he referred to the coexistence of different cultures, and his later definition referred to multiculturalism as the equality of differences and being against assimilation politics.

**Cultural pluralism.** The second theme in this section is cultural pluralism. Two participants defined multiculturalism such that their definitions were categorized into this theme. One participant, Mete, mentioned that multiculturalism should not serve as a means of dividing the country. According to Mete, multiculturalism involves “differences are not a sort of tension; it is the idea of considering all people in terms of cultural and moral richness such that our horizons are broadened and laws are formed via the pluralistic environment in which we live” (Mete, final interview, August 13, 2016). In his first interview, Mete’s definition mostly had to do with respect for differences. However, at the end of the course, he added some new notions and understandings to his definition of multiculturalism, and he made it accountable for a pluralistic society.

In her definition, another participant, Ayse, focused primarily on resistance to assimilation. According to Ayse, multiculturalism means that

Sub-cultures in society, such as those related to different ethnicities, languages, races, religions, economic levels, sexual orientations, are accepted and that society is sensitized to them. We can say that it is a state of being multicultural. It has emerged against assimilation policies. Our main goal is to give cultural diversity the opportunity to grow strong and to thrive. (Ayse, final interview, June 22, 2016)

Compared to her first definition, Ayse’s final definition could be considered more controversial in terms of the topics it addresses such as sexual orientation and religion. She expanded on her definition of multiculturalism such that it came to be more than simply having respect. In her final definition, she noted that assimilation policies would not be helpful to Turkey; rather, accepting differences would help to make the country more culturally rich.

**Creating a mainstream culture.** In the final theme, two participants defined multiculturalism related to creating a mainstream culture within society. One participant, Harun, wrote that people could create a multicultural society without interactions between social and cultural groups. According to Harun, “Even if sub-cultures (e.g., those related to race, gender, socio-economic status, age) do not communicate with each other, they can live together by creating a mainstream culture” (Harun, final interview, August 2, 2016). In his final definition, Harun thought that people should be gathered around a generally accepted mainstream culture regardless of their diverse backgrounds. According to the participant, communication is not necessary to create a common mainstream culture. His first definition noted primarily the importance of living together; however, he added to this the idea that, beyond living together, people should create a mainstream culture.

Another participant, Zeliha, believed that recognizing cultural differences is the best way to go about creating a mainstream culture within society. She defined multiculturalism as follows:
More than one culture should be accepted. Multiculturalism is the recognition of various cultural elements, such as race, language, sexual orientation, gender, age, social class, education, religious orientation, and the continuity of the lives of individuals with different cultural characteristics. In other words, multiculturalism is a mixture of cultural elements that constitute a social phenomenon and is formed via the common values they share. (Zeliha, final interview, July 13, 2016)

Although Zeliha grounded both her first and final definitions of multiculturalism in the acceptance of existing groups of people in society, she was more specific regarding the different groups, such as those related to race, language, gender, and age, in her final definition. According to Zeliha, multicultural education is a concept that goes beyond “accepting differences in people; it is also a social phenomenon created by these diverse groups of people” (Zeliha, final interview, July 13, 2016).

**Final Definitions of Multicultural Education**

The findings related to final definitions of multiculturalism and multicultural education has been divided into three themes.

**Beyond multilingualism and ethnic structure.** One participant, Mete, noted that whether or not students come from the dominant culture in a society, they should have access to equal opportunities. According to Mete,

[Multicultural education is] an education given to all students from different racial, ethnic and social groups to create equal educational opportunities, to organize the school environment according to the students, to recognize differences based on cultural characteristics, to accept differences as normal, and to respect and tolerate these differences. (Mete, final interview, August 13, 2016)

Mete stated that multicultural education calls for policies that enrich cultural awareness in schools. In both of his definitions, he mentioned the importance of diverse groups of people being able to live together.

Harun believed that this course provided him with an opportunity to see that multiculturalism and multicultural education do not only mean educating people who know more than one language. He said,

Before the course, multiculturalism and multilingualism were one and the same to me. I now understand that differences are more than this, and some things that I did not previously think of as differences are indeed differences, and people should be educated together regardless of their differences. (Harun, final interview, August 2, 2016)

As Harun mentioned, his new definition goes beyond the concept of “multilingualism,” and he began to recognize that multicultural education is not only a means of bilingual education; rather, it also encompasses the many different aspects of diversity as it exists in society.

“I understood that the concept of multicultural education is not only rooted in ethnic differences; it can depend on many things” said Olcay. She believed,

[There is] no single culture that can or should shape the truth in a given society. And multicultural education can effectively lead students to understand cultural differences and thus eliminate misinformation regarding those differences. (Olcay, final interview, July 9, 2016)
Instead of defining multicultural education, Olcay talked about the possible functions of multicultural education in society. Thought she defined it in her first definition as providing equal opportunities for people associated with different cultures, her final definition consisted primarily of discussion regarding the elimination of misunderstandings regarding differences as a function of multicultural education.

Another participant, Zeliha, talked about how the structure of schools should change and how new policies should be made in order to support diversity in schools. She said:

Multicultural education not only has to do with respect for differences, but it also involves transforming educational services and policies so that they account for these differences and produce a system that appeals to everyone. It is an education that considers the differences and restructures the education system starting from the physical structure of the school, the ideas of the people, the curriculum used, and the content of the education. (Zeliha, second interview, July 13, 2016)

According to one participant, Rana, multicultural education has to do with more than racial and language differences. She said,

This concept used to make me think only of racial or language differences. I have learned, however, that there are different parts of multicultural education, not just teaching differences as they pertain to race, language or religion. I see that age groups, sex, and gender orientation are also related to multicultural education. (Rana, final interview, June 23, 2016)

She added new categories to her final definition. She said that multicultural education is not only for the people from diverse racial and language backgrounds; rather, she believed that other differences, such as those related to age, gender, sex orientation, should be a part of education. However, she mentioned only what issues might be related to multicultural education; she did not fully define what the function of multicultural education is or how it would be implemented.

Explanation of cultural differences. Nalan believed multicultural education to be the best means of incorporating differences into the education system in order to create an environment conducive to teaching about cultural differences. According to Nalan, “Multicultural education is to wonder about the differences and to adapt them to education” (Nalan, final interview, July 2, 2016). Nalan’s pre-course and post-course definitions are similar, but her final definition places greater emphasis on the importance of creating culturally diverse environments.

Gokhan made a distinction in his knowledge between the theoretical and practical foundations of multicultural education. He said:

I thought I had some ideas about these concepts in theory and in practice in terms of respect for different cultures, intercultural understanding and tolerance, but since completing this course, I can see how useful and necessary these concepts are, especially when I look at the dimensions of education. Of course, when we assess this through this lens, we are able to better see the various political and social perspectives regarding the many problems that exist in Turkey. We are experiencing intercultural conflict, and I think that this lesson will serve as a good foundation upon which to learn the causes of the conflict and to generate possible solutions. (Gokhan, final interview, August 15, 2016)

Gokhan’s more in-depth, post-course explanation of multicultural education referred back to some components of his previous definition. In addition, he believed that multicultural education might also be the best way to find solutions for social problems and intercultural conflicts that exist in Turkey.
Equal access to educational opportunities. The definitions of multicultural education have also been separated into a theme referred to as “equal access to educational opportunities”. Ayse suggested that schooling components (e.g., curricula, teachers) should be arranged based on students’ cultural differences such that all students are privy to the same educational opportunities. She said:

Multicultural education, as an applied concept, is expected to have a positive impact on school curricula, educational strategies, even teachers’, students’ and parents' relations with each other, supporting critical pedagogy and democratic bases of justice. The main objectives of an educator adopting this idea are to remove the inequalities that stem from cultural differences and help the students to develop positive intercultural behaviors, perspectives and attitudes. It is a philosophy based on respect for diversity that requires more empathy for diversity in society. (Ayse, final interview, June 22, 2016)

According to Ayse, multicultural education is a concept that involves encouraging students to assume positive attitudes with regard to diversity. Although her previous definition focused on the utilization of differences in education, her final definition included additional elements such as establishing intercultural understandings, empathy development, and promoting equality in education.

Finally, another participant, Fatma, notes that multicultural education is comprised of multiple dimensions that allow for equal educational opportunities. She defined multicultural education as a means of promoting “respect for individuals in order to increase tolerance and equality, improving justice and empathy, and reducing prejudice and discrimination” (Fatma, final interview, June 17, 2016). Fatma was the only participant who defined multicultural education very similarly before and after the course. However, her first definition centered on providing equal opportunities for diverse groups of people, while her final definition centered on reducing prejudice and creating empathy for diversity.

CONCLUSION AND RECOMMENDATION

According to the findings, all study participants had an idea of what multiculturalism and multicultural education were before the course. During the course, they improved upon and enhanced their understandings and thoughts; however, they still need to extend their perspectives so as to more fully understand what those concepts mean.

According to Nieto (1994), individuals may understand the concepts of multiculturalism at four levels: tolerance, acceptance, respect, and affirmation, solidarity and critique. While they did not seem to fully understand the concept of multiculturalism via the first and final levels, the study participants did seem to understand the concept per Nieto’s other two levels. Nieto (1994) claimed that if teachers are in the first level of multicultural understanding, the tolerance level, then they can acknowledge students’ differences, but they are not yet able to fully notice “why some students are more successful than others” (p. 4). If the teachers are in the second level of multicultural understanding, the acceptance level, then they can acknowledge students’ differences, and their differences would thus never be denied nor belittled. In the third level of multicultural understanding, the respect level, teachers should hold in high esteem the differences and diverse backgrounds of the students, and not just try to help the students to adapt to the mainstream culture in the classroom; it should also support the teachers throughout their education. It requires more interaction between parents, teachers, and schools, and students’ experiences (Nieto, 1994; Nieto & Bode, 2008). Finally, the last level of multicultural understanding, the affirmation, solidarity and critique level, requires teachers to assume responsibility and support students in critiquing their own cultures as well as those of others in order to understand the differences.

When teacher and teacher candidates’ definitions of multiculturalism were examined, it was concluded that their understandings of the concept were most aligned with Nieto's acceptance and respect levels. Further, findings indicate that study participants are more aware of their students’
diverse backgrounds and that they are beyond the tolerance level of multicultural understanding even though, prior to this course, they never took any formal education courses related to multiculturalism or multicultural education.

At the end of the course, however, it appeared that the participants’ understandings of multiculturalism had not reached the affirmation, solidarity and critique level, which is the last level they must reach in order to fully understand and apply the concept of multiculturalism. Without reaching this level, Nieto (1994) claimed that one’s understanding of multiculturalism would remain at the romantic stage, which does not allow teachers to criticize their own or others’ cultures.

Nevertheless, when we examine participants’ definitions of multicultural education, we see that their definitions included concepts associated with Nieto’s (2004) definition of multicultural education, which was used for this research. According to Nieto’s (2004), multicultural education is to redesign the school to appeal to all students, to ignore all racist ideas in school culture, and to develop a pluralist thought system in students. Further, per Nieto, starting from this pluralist system of thinking, multicultural education is also defined as the reconstruction of the curriculum that will be strengthened by the connection among teachers, schools, students, and families. When we look at the definitions participants provided at the beginning of the study, we could see that the first perceptions of multicultural education were primarily shaped by the integration of differences into the education system and the reorganization of educational opportunities to offer equal opportunities to all kinds of differences in schools. Despite the fact some participants’ definitions of multicultural education included some concepts introduced by scholars, it was observed that at the beginning of the study, there were still deficiencies in participants’ abilities to explain this concept.

In addition, with regard to the definitions of multicultural education that the participants shared at the end of the study, we can see that the participants further elaborated on their definitions; that is, they provided more specific examples that served to strengthen their definitions and make them increasingly similar to Nieto’s definition of the concept. While explaining their latest perceptions of multicultural education, participants were found to have broadened their definitions beyond those they shared earlier in the study. According to a number of participants, their definitions of multicultural education were reshaped, and this kind of educational system is not merely a necessity of multilingualism and ethnic difference, but it is the integration of every kind of difference that is considered to exist in society within the educational environment. There are also participants who think that this concept is a way to teach to others the range of cultural structures that exist within and among individuals. Lastly, the issue of equal access of all individuals to educational opportunities, which is an issue that participants noted during their first interviews, was discussed again in the final interviews; in their final interviews, participants suggested that multicultural education is a way to equalize access to these opportunities.

Further, when we assess participants’ final definitions of multiculturalism and multicultural education, we can say that the teachers and teacher candidates who participated in the study have also developed similar understandings regarding the aims of multicultural education created by Sleeter and Grant (2007). According to Sleeter and Grant, allowing for cultural pluralism and providing equal access to opportunities are the primary components of the goals of multicultural education. Most of the participants mentioned that multiculturalism is an indispensable system of thought for a society designed according to the concept of pluralism. Thus, after establishing a society in which the idea of pluralism has been established, they argued that it is inevitable that the education system should become a structure that provides individuals with equal access to equal opportunities. Additionally, with regard to the provision rooted in pluralism that ensures equal access to opportunities for all regardless of background, nearly all of the participants argued that society will create a common culture and protect the structure of unity. It is evident that these ideas broadly overlap with the goals of multicultural education set out by scholars such as Sleeter and Grant, and Nieto, who have had a say in multicultural education and have framed this study.
This study specifically examined the understandings of multiculturalism and multicultural education among teachers and teacher candidates enrolled in a MULT-500 graduate level course. The research findings suggest that teachers’ and teacher candidates’ understandings of multiculturalism and multicultural education have been shaped via their previous experiences related to diversity, their classroom experiences, and the MULT-500 course instruction. Future studies can examine these two target groups separately and compare the findings with those from this study.

The research findings also indicate that participants’ understandings did not reach the highest level of multicultural understanding. Having less teaching experience and being new graduates not assigned to a classroom could affect their understanding. It would be worthwhile to conduct a study with experienced teachers in Turkey. Their rich experiences and the challenges they face may add deeper perspectives to the literature.

REFERENCES


A Metaphoric Study on Classroom Teacher Candidates’ Perception of Nuclear Power Plants in a Socio-Scientific Issues-based Environmental Education Class

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Abstract

The purpose of this study is to determine the metaphors that the candidate teachers develop about the nuclear power plants in a socio-scientific issues-based environmental education class and the justification of these metaphors. The study was constructed on the basis of a qualitative research model and phenomenological (phenomenology) pattern was used. The study was conducted during an academic semester in the environmental education course. The researcher presented to the classroom teacher candidates the positive and negative effects of the socio-scientific situations on environment, human development, economy, and health. It was ensured that teacher candidates were able to relate these issues to the subjects of environmental education course, assess the difficulties and discuss them with large group studies. A study for building the metaphors was conducted in the activity carried out for nuclear power plants as the last activity of the implementation process. The research was conducted with 197 classroom teacher candidates and the data were collected through a metaphor questionnaire prepared in a semi-structured form and the content analysis method was used in data analysis.

Keywords: Environmental education, metaphor, nuclear power plants, socio-scientific issues

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INTRODUCTION

With the development of science and the advancement of technology, the life of humans becomes easier, however, some problems come along with these developments. These problems are the issues that need to be discussed in terms of their scientific nature and the environment and society that they affect. These problems can create a dilemma so that it would be impossible to consider as wrong or right, to find a single solution and to take a common decision. A newly produced vaccine, GMO foods developed as a remedy for hunger, cloning of living tissues or shifting to alternative sources of energy certainly have a direct impact on society and it is necessary to consider these factors. The controversial social issues, which relate to science and society and are ill-structured, open-ended problems having multiple solutions are considered as socio-scientific issues (Sadler, 2003; Tüzün, 2013; Sağlam, 2016). While these issues are a product of scientific knowledge, it is not possible to give definite answers since they are related to many aspects of society. Hence, they are accepted as controversial issues (Topçu, 2010). Scientific studies can directly or indirectly affect society, it is necessary to consider the opinions of the society since it is not possible to consider separately the science, technology, and social structure (Sürmeli, Duru & Duru, 2017). Consequently, the individuals compare the different dimensions and related disciplines when evaluating the socio-scientific issues and these issues encourage them to think in a multidimensional level (Çavuş, 2013).

With the improvements in technology, people strive to dominate nature and strive to facilitate the life. On the other hand, governments aim to grow in every field so that they can provide a better life for the citizens and they use the energy as a prominent input. Because energy is used in many areas such as industry, transportation, residence, and health, it is regarded as the basic requirement for fast economic growth and development. However, this requirement increases the need for energy resources. For solving the energy problems that the Governments may encounter, they tend to increase the number of power plants they use and renewable or non-renewable energy sources (Aksan & Çeliker, 2018; Yılmaz & Bilge, 2018). Hence, nuclear power plants are one of the alternative energy sources that countries establish for producing energy.

In nuclear energy, enormous amounts of energy are released by splitting the heavy radioactive atoms as the fission reactions into smaller atoms by the collision of a neutron or by the fusion reaction of light radioactive atoms forming heavier atoms (Sağlam, 2016). In nuclear power plants, the neutrons in the fission reaction are reactivated again and the continuity of nuclear power generation is ensured (Ministry of Energy and Natural Resources, 2010). Accordingly, the enormous amount of energy produced from nuclear power plants is regarded as an alternative to fossil fuels both because of their high economic contribution and their lack of carbon emissions (Benzer & Şahin, 2012). Some countries even fulfill most of their energy needs from their nuclear power plants. While France derives over 75% of its electricity from nuclear energy, the USA derives 15% of its electricity from nuclear energy. There are more than 400 nuclear power plants around the world and more than 100 are located in the USA (TEİAŞ, 2011). When evaluated in terms of Turkey, the increase in the urbanization, population growth, supply and demand and the expansion of the manufacturing sector can trigger an energy crisis in the future. Hence, it is recommended to use nuclear energy alongside the other energy sources to fulfill the energy demand requirements (Temurçin & Aliağaoğlu, 2003; Udum, 2010). In order to meet the energy needs of the country in the future, the establishment of nuclear power plants is among the country's principal political goals. For this purpose, it is planned to increase the energy production by the commissioning of the nuclear power plants to be established in Akkuyu and Sinop until 2023 (Ministry of Energy and Natural Resources, 2010).

While energy policies to satisfy the energy needs through nuclear power plants are argued to be cheaper and less polluting from an economist point of view, there are also intense reactions to the establishment of these power plants under the influence of environmentalist groups in many countries (Sürmeli, Duru & Duru, 2017). The reactions are based on the presence of radioactive substances used to release nuclear energy. The negative effects of the radiation emitted by these substances on human and the environment are the principal reasons for these concerns. The radioactive waste used as fuel carries a high risk and cannot be entirely destroyed. It is probable that this waste can be fragmentized.
and leaked into natural environments (groundwater, river, sea, drinking water) even if the waste is stored in the steel plates and buried underground. Furthermore, the potential risks of this energy source are introduced as being exposed to natural disasters such as earthquakes, floods, tsunamis or terrorist attacks in the reactors (Benzer & Şahin, 2012; Yapıcı, 2015).

The establishment of nuclear power plants and their use in the energy sector become a socio-scientific issue, when evaluated from two different perspectives. While some people defend the "nuclear renaissance" and the energy production through nuclear power plants, also argue that nuclear power plants are the cleanest source of energy in preventing global warming when releasing enormous amounts of energy. On the other hand, the view of "nuclear nightmare" focuses on the safety of the power plants and the indestructible nature of the waste and hence, these people highly oppose to the establishment of nuclear power plants while they argue that the current power plants should be shut down (Aygün, 2005). It is expected that individuals will create solutions with sustainability consciousness in the solution of environmental problems in terms of science education for these controversial issues. This can only be achieved if the socio-scientific subjects are included in the curriculum or if the educational approach focuses on socio-scientific subjects, or if the educational model is used in the science course (Bakırcı et al., 2018). Many institutions and organizations in the world emphasized the significance of teaching socio-scientific subjects and including these subjects into the science programs, presenting them to students, discussing, analyzing and raising awareness about these issues (American Association for the Advancement of Science [AAAS], 1990; National Research Council [NRC], 2012; Ministry of National Education [MEB], 2013; 2018). Accordingly, it is valuable for the science education program in Turkey that the students are aware of the socio-scientific issues that influence the environment and environmental issues since they start their basic education, that the students can comprehend the issues correctly and discuss them (MEB, 2018). Several alternative methods can be used in science to receive the opinions, comments, and perspectives of the students on socio-scientific issues. Researchers and practitioners often use metaphoric thinking, one of these alternative methods.

The reason why metaphors are used in educational research is it is possible to demonstrate and explain a concept or situation in order to communicate effectively with the target audience (Midgley & Trimmer, 2013). Individuals want the audience to comprehend their ideas and expect that these ideas influence the audience permanently. In this case, the individuals develop various ways to explain the concepts, thoughts, and emotions they want to express and make efforts to explain clearly (Yıldızlı, et al., 2018). It is possible to depict the situations and concepts that are similar through the metaphors or to compare the situations or concepts, where there is no similarity (Özgürbüz, 2013). Metaphors explain an experience with a more well-known experience, to describe a concept or an expression in a way that the concept or the expression is more easily understood (Lakoff & Johnson, 2005). Metaphors are individual outcomes containing explanations, where individuals can use their knowledge and ability to think differently due to their powerful cognitive structure (Ekici & Akdeniz, 2018). Consequently, the metaphor created on any concept is truly the reflection of the person's interest, who creates the metaphor. Thus, a new dimension is opened for whatever needs to be explained and the concept, thoughts, and feelings become more understandable and permanent.

According to Morgan (1998), metaphors extend the imagination of a person by generating powerful insights and encourage the person to think and behave differently. Insight is reached through metaphors, thereby enables new possibilities and opportunities to develop. For efficient learning, it is necessary to develop thinking skills, gain the expected positive attitudes and use these attitudes and behavior acquired in daily life (Martin, Sexton & Franklin, 2009). It initiates a cognitive process for both readers and listeners by the use of metaphors. The developing cognitive process triggers the affective effect while the processes influence each other. This certainly proves the power of influence of the metaphors on the individual (Yazar, Özekinci & Lala, 2017) and it enables more efficient learning. Through metaphors, thoughts and experiences are shown in a more understandable way by supplying the justifications as well (Ho, 2005). In order to ensure effective learning in science education, the metaphorical thinking activities can be used for determining the meanings attributed to concepts and justifications.
It is assumed that teachers and teacher candidates who will raise awareness about socio-scientific subjects have sufficient knowledge about the socio-scientific issues and that these issues will be discussed and interpreted in the class and presented to students with various teaching techniques (Eryaman, 2006). When the relevant national studies are considered, several studies have been determined about the nuclear energy for teacher and teacher candidates (Aksan & Çeliker, 2018; Ateş & Saraçoğlu, 2013; Demircioğlu & Uçar, 2014; Kutluca, 2016; Özdemir, 2014; Özdemir & Çobanoğlu, 2008; Sağlam, 2016; Sürmeli, Duru & Duru, 2017; Şenyuva & Bodur, 2016; Turan, 2017). The study focuses generally on the concept of energy, which is essential in building a sustainable environmental awareness while it focuses particularly on the metaphorical perceptions of the classroom teacher candidates about the nuclear energy plants, which are under construction and highly discussed in the public during the environmental education course that is structured according to the socio-scientific approach. The principal source of knowledge of the students, who will encounter socio-scientific subjects for the first time in their educational life is certainly the classroom teachers. Hence, the researcher considers that it is important to inform the classroom teacher candidates on socio-scientific issues for raising their awareness about the environment since they have been received the environmental education course during their undergraduate education. It is also essential that the candidates earn experience through an activity about the metaphorical thinking by using a socio-scientific approach.

The purpose of this study is to determine the metaphors that the candidate teachers develop about the nuclear power plants in the socio-scientific issues based environmental education class and the justification of these metaphors. Within this scope, the answers to the following questions were sought:

1. What are the metaphors that the classroom teacher candidates have related to nuclear power plants?
2. What are the justifications that the classroom teacher candidates use for the nuclear energy plants, how can we categorize them?
3. What are the characteristics of the justifications that the classroom teacher candidates use for the nuclear energy plants?

METHODOLOGY

Research Model

Based on the qualitative research model, the study uses the phenomenological pattern. In this pattern, the perceptions and reactions of individuals to various events such as phenomena, concepts, perceptions, experiences, and situations that may be encountered in the world can be analyzed in depth. In the phenomenology pattern, we focus on the phenomena that we are aware of, but we do not have the in-depth knowledge (Fraenkel, Wallen & Hyun, 2012; McMillion, 2000; Yıldırım & Şimşek, 2013). In this design, the researcher examines the perceptions of the participants and the meanings attributed to the concepts and aims to determine the facts without going to a generalization (Akturan & Esen, 2008; Patton, 2014). On the other hand, this study determines the justified perceptions of the classroom teacher candidates about the nuclear power plants.

Application Procedure

The application procedure is designed in two stages as structuring the Environmental Education course as socio-scientific issues and the creation of the metaphors. The researcher conducted the study with the teacher candidates, who had taken the Environmental Education course.
While Environmental Education courses for teacher candidates contain the activities of ecosystems, they also include natural resources development such as soil, water, and forest and protection activities. Consequently, it is aimed to render teacher candidates efficient and volunteer participants in environmental management (Peyton, et al., 1995; Ünal & Dımıski, 1999).

With the advancement of technology, many socio-scientific situations that may have a positive or negative influence on the environment and human life can constitute the subject of Environmental Education course (Eryaman, et al., 2010). The researcher identified the socio-scientific issues generally discussed in the public among the subjects of the Environmental Education course. These issues are as follows; electric-powered/gasoline-powered vehicles, use of plastics, GMOs, hydroelectric power plants, solar panels, cloning, vaccination, and nuclear power plants. The researcher showed with an impartial perspective the positive and negative impacts of socio-scientific subjects on areas such as environment, human, development, economy, and health to classroom teacher candidates. Within the framework of these socio-scientific issues, the researcher administered the course of Environmental Education during an academic period. Afterward, the classroom teacher candidates are expected to relate the courses with exemplary socio-scientific issues, to have knowledge about these issues and to evaluate these contradictory situations. Then, teacher candidates are asked to express their opinions about the socio-scientific issue that is presented as the group discussion activity and to share the issue with other teacher candidates. Hence, the opinions of classroom teacher candidates constitute the main focus of the courses. This process has been applied in two periods of the course.

During the last activity of the application procedure, the process has been designed in the form of metaphor formation instead of large group discussion in the activity on nuclear energy plants. Before conducting the study, teacher candidates were informed about the use of metaphors as a teaching activity in the educational studies. The definition of metaphor, the purpose of use, the subjects to be considered in the learning-teaching processes and examples of their implementation are presented. After this process, 15 minutes were given to the teacher candidates that are volunteered to participate in the study and the candidates created their own metaphors for nuclear power plants and showed the justifications for the metaphors they have created.

Study Group

This research was carried out with 197 classroom teacher candidates enrolled in a faculty of education of a university in Central Anatolia. In order to minimize the difficulties that may occur, the purposive sampling method was used. When creating the purposive sampling group, the following criteria are taken into consideration: the accessibility of the researcher to the study group, if the teacher candidates take the socio-scientific based environmental education class and the enthusiasm of the teachers to participate in the study.

Data Collection Instrument

The researcher collected the data of the study via the metaphor form, prepared in a semi-structured way. The metaphors created by the participants cannot reflect independently the descriptive and visual strength, and after the process of metaphor formation, it was necessary to ask the question "why" (Yıldırım & Şimşek, 2013). Consequently, the expression of "because" can be reflected the participants so that they can provide the justification of the metaphor (Ekici and Akdeniz, 2018). Hence, the teacher candidates participated in the study were asked to finish the sentence as follows, “The nuclear energy plants are like .......... Because ........” . The metaphor form designed in this way will be able to determine the perceptions of the classroom teacher candidates about nuclear power plants together with the justifications.
Data Analysis

Content analysis technique was used to analyze the data in this study. Content analysis is a research tool used to determine the presence of certain words, themes or concepts within some given qualitative data (Sönmez & Alacapınar, 2014; Yıldırım and Şimşek, 2013). Before starting the data analysis, all data were numbered as TC-1, TC2, TC-3, etc... Subsequently, the justifications of the metaphors created by the teacher candidates were coded. Among these codes, themes that own meaning and integrity were developed, which reflect the perceptions of teacher candidates based on a logical basis. Then, we have defined the category, in which the justifications will be evaluated. An example of the generated code and themes is presented in Table 1.

Table 1. List of themes, categories, and codes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Categories</th>
<th>Examples related to the codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Characters of Nuclear Power Plants</td>
<td>Environmental Impact</td>
<td>Prejudiced</td>
<td>Efficiency, development, cost reduction, power, carbon emission, air pollution reduction, etc.</td>
</tr>
<tr>
<td></td>
<td>Economic Benefit</td>
<td>Impartial</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uncertain</td>
<td></td>
</tr>
<tr>
<td>Negative Characters of Nuclear Power Plants</td>
<td>Environmental Risks</td>
<td></td>
<td>Explosion, natural disaster, accident, leakage, initial organization cost, production of the weapons, etc.</td>
</tr>
<tr>
<td></td>
<td>Economic Factors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In line with the aim of the research, metaphors and justifications of the teacher candidates are categorized based on themes and the data was interpreted after calculating the frequencies. Furthermore, the word cloud is presented to show the findings of the research and the direct quotes from the candidates so that the opinions of the candidates are reflected in the most effective way.

Validity and Reliability

When analyzing the qualitative data or reports, other specialists can be included in the study in order to make evaluations and ensure reliability (Fraenkel, Wallen & Hyun, 2012). For this purpose, an expert was included by the researcher to the study for completing the encoding requirement and for categorizing the metaphors that the teacher candidates have created. After the individual analyses of the researcher and the encoding specialist, the reliability estimation [Reliability = Consensus/(Consensus + Disagreement)] proposed by Huberman (1994) was calculated. If this value is higher than 70% and above, it means that the reliability in qualitative research is achieved. At the end of the calculation, the reliability of 88% was achieved, and in the no-consensus disagreement, the encoding specialist and the researcher provided a coding together and they have reached the consensus. In addition to this, the process starting from the design to the conclusion of the study at the transmissibility point has been precisely and clearly reported, and the findings are presented to the reader in an explanatory manner with tables and direct quotes. The findings collected in order to increase the consistency of the research were interpreted and the connections with other findings in the literature were ascertained. In order to ensure the confirmability of the research, it is explained in detail how the data is collected and how the data is analyzed.
FINDINGS

In this section, the metaphors declared by the class teacher candidates for nuclear power plants, the justifications of these metaphors and the categorical evaluation of the research justifications are presented under the headings.

Findings About the Created Metaphors

The metaphors created by the teacher candidates for nuclear power plants are displayed in Table 2.

Table 2. Metaphors of Classroom Teacher Candidates About Nuclear Power Plants

<table>
<thead>
<tr>
<th>Order of the Metaphor</th>
<th>Metaphor Name</th>
<th>f</th>
<th>Order of the Metaphor</th>
<th>Metaphor Name</th>
<th>f</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Love/Being in love</td>
<td>15</td>
<td>31</td>
<td>Natural disasters</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Internet</td>
<td>14</td>
<td>32</td>
<td>Money</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Getting married</td>
<td>13</td>
<td>33</td>
<td>Iceberg</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Using medication</td>
<td>11</td>
<td>34</td>
<td>Cancer</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Gun</td>
<td>9</td>
<td>35</td>
<td>Teacher that cannot be assigned</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Frenemy</td>
<td>9</td>
<td>36</td>
<td>Support column</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>Using a phone</td>
<td>8</td>
<td>37</td>
<td>Ginger</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Eating dessert</td>
<td>8</td>
<td>38</td>
<td>Blank paper</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Bomb</td>
<td>7</td>
<td>39</td>
<td>Getting a diploma</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>Gambling</td>
<td>7</td>
<td>40</td>
<td>Going out in the cold weather</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Smoking</td>
<td>7</td>
<td>41</td>
<td>Putting on Make up</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Technology</td>
<td>5</td>
<td>42</td>
<td>Azrael</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Alcohol</td>
<td>4</td>
<td>43</td>
<td>Poisonous gases</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Thorny rose</td>
<td>4</td>
<td>44</td>
<td>Discount product</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Human</td>
<td>4</td>
<td>45</td>
<td>Sea</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Fire</td>
<td>4</td>
<td>46</td>
<td>Diamond</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Bee</td>
<td>4</td>
<td>47</td>
<td>Making pottery</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>Eating bread</td>
<td>3</td>
<td>48</td>
<td>Going to school</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Scientific experiment</td>
<td>3</td>
<td>49</td>
<td>Hate</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>Wild animal</td>
<td>3</td>
<td>50</td>
<td>Sun</td>
<td>1</td>
</tr>
<tr>
<td>21</td>
<td>Getting on the plane</td>
<td>3</td>
<td>51</td>
<td>Driving a car</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>Using salt</td>
<td>3</td>
<td>52</td>
<td>Motherless child</td>
<td>1</td>
</tr>
<tr>
<td>23</td>
<td>Using coal</td>
<td>3</td>
<td>53</td>
<td>Writing</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>Power</td>
<td>3</td>
<td>54</td>
<td>Cheating</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>Change</td>
<td>3</td>
<td>55</td>
<td>Putting on perfume</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
<td>Disease</td>
<td>2</td>
<td>56</td>
<td>Night-day</td>
<td>1</td>
</tr>
<tr>
<td>27</td>
<td>Wearing a mask</td>
<td>2</td>
<td>57</td>
<td>Finding a treasure</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>Snake</td>
<td>2</td>
<td>58</td>
<td>Moving</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>Police</td>
<td>2</td>
<td></td>
<td>Total 197</td>
<td></td>
</tr>
</tbody>
</table>

When Table 2 is analyzed, it has been concluded that class teacher candidates created 197 metaphors in 58 different classifications related to the nuclear power plants. The first ten ranks of the metaphors used by the classroom teacher candidates about the nuclear power plants consist of the following categories; love/falling in love, internet, getting married, using medication, weapon, frenemy, using a phone, bomb, eating dessert, gambling, and smoking. While 32 of these metaphors were repeated twice or more than twice while 26 metaphors were created only once. In general, metaphors containing an action (such as falling in love, getting married, smoking, etc.) are more created by teacher candidates than by metaphors including concepts (internet, technology, scientific experiment, etc.). If we pay attention to the following metaphors are very related to the age of the
teacher candidates and they are the concepts that the teacher candidates are highly interacting with; falling in love, internet, getting married, using the phone, smoking, using medication, etc. Consequently, the teacher candidates mostly formed metaphors about their close circle.

**Findings Related to the Justifications of the Metaphors**

Table 3 presents the findings related to the categories of the justifications of the metaphors that teacher candidates used for nuclear power plants.

**Table 3. Categories of the Justifications of the Metaphors that the Teacher Candidates Used about the Nuclear Power Plant**

<table>
<thead>
<tr>
<th>Categories</th>
<th>Justifications</th>
<th>Metaphors</th>
<th>(f)</th>
<th>Total (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In favor of Nuclear Energy Power</td>
<td>Justifications that fully support</td>
<td>Power (3), Sun, Diamond, Support column</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Justifications Taking into Consideration the Risks</td>
<td>Using the phone (6)<em>, Using medication (6)</em>,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technology (5), Thorny rose (4),</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Love/falling in love (4)*, Bee (4), Internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(4)*, Wild Animal (3), Change (3), Doctor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>intervention (2), Natural disasters (2), Police</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2), Putting on Make up, Getting a diploma,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cold air, Blank paper, Ginger, Band-aid,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Writing, Finding treasure, Driving, Going to</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>school, Getting on a plane*, Eating dessert*,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Human*, Fire*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neutral to the Nuclear Power Plant</td>
<td>Getting married (10)*, Weapon (9), Internet</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncertain Justifications</td>
<td>(8)<em>, Love/Being in love (7)</em>, Human (3)*,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fire (3)*, Scientific experiment (3),</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gambling (3)*, Using coal (3), Using</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>medication (2)<em>, Using a phone (2)</em>, Getting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>on a plane (2)*, Night-day, Teacher that</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>cannot be assigned, Moving, Making pottery,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sea, Money*, Snake*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opposed to Nuclear Power Plant</td>
<td>Justifications taking into consideration the Supporters</td>
<td>Friendly looking enemy (9), Eating dessert</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(8), Smoking (7), Using medication (4)*,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Love/Falling in love (4)*, Alcohol (4),</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gambling (4)<em>, Getting married (3)</em>, Using</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>salt (3), Bomb (3)*, Eating a bread (3),</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Internet (2)*, Wearing mask (2), Discounted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>product, Iceberg, Cheating, Motherless child,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Putting on perfume, Snake*, Money*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely Rejecting Justifications</td>
<td></td>
<td>Bomb (4)*, Disease (2), Cancer, Hate,</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Azrael, Poisonous gas</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Metaphors having different justifications.

When the justified answers given to the metaphors of the classroom teacher candidates in Table 3 are considered, it is comprehended that whether the metaphors are in favor of nuclear power plant or they are neutral or they are opposed to the nuclear power plant. Although there are many justifications provided as opposed to the nuclear power plants (f= 70), however, it is ascertained that the numbers in three categories are very close to each other (f= 65; f= 62; f= 70). Moreover, it was ascertained that classroom teacher candidates could also take into account the risky areas of nuclear power plants in the justifications they have created for metaphors (f= 59), while it was determined that they could take into account the positive aspects that are in favor of the nuclear power plants (f= 60).
Since the teacher candidates who are neutral to nuclear power plants can take into account the positive and risky aspects (f=62), it has been comprehended from their answers that they cannot make any decision. While 181 teacher candidates among the participants (sum off=59, f=62 and f=60) could take into account the risky and positive aspects and could evaluate the different aspects of the subject, 16 teacher candidates (sum off=6 and f=10) used a unilateral perspective. From this point of view, classroom teacher candidates were able to recognize nuclear power plants as a significant socio-scientific issue; have been able to take into account the positive and negative effects of nuclear energy in terms of the production, use, and its reflections on the environment and economy. Examples of metaphors created by the classroom teacher candidates and the justifications in the determined categories are presented below.

Classroom teacher candidates, who were determined to be in favor of the nuclear power plant by the justifications they used, created 6 metaphors and used "power" metaphor at the most.

"... is like power. Because we will earn many things when we use this. Since there will be economic contributions, we will become a stronger country” (TC-121).

"... is like power. We will be stronger the economic and military field when we have the nuclear power. In this period when the political wars prevail, we will be relieved with nuclear power” (TC-75).

Classroom teacher candidates, who were determined to be in favor of nuclear power and who didn't ignore the risks of the power plants, created 59 metaphors and used "using a phone", "using the medication" and "technology" metaphors at most.

"... is like the phone. It has both benefits and damages. You need money to buy it and it emits radiation. Since the phone brings more benefits than damages, we all use the phone. Consequently, the benefits of nuclear power plants are so many and they should be established in our country” (TC-17).

"... is like using medication. Because it's necessary when we're sick, we need it. However, there are side effects as well as damages. When used accurately and safely, the medication is beneficial and it is indisputable that it will bring us benefits” (TC-43).

"... is like the technology. We have increased our living standards by acquiring new knowledge. Today, technology is indispensable for our lives. However, technology can serve according to the different tastes of the people while it can be used badly and it can be addictive. Nuclear power must also be used, it is possible to minimize the damage by taking precautions” (TC-160).

Classroom teacher candidates, who were determined to be neutral to nuclear power and who didn't ignore the risks and the positive aspects of the power plants, created 62 metaphors and used "getting married", "gun", "internet" and "love/being in love" metaphors at most.

"... is like getting married. Because marriage is expensive in the beginning, it signifies power. If the marriage is not managed well, the marriage will harm couples, their health, their psychology, and their families as well. Nevertheless, if the appropriate conditions are provided, there will be benefits of the marriage. It is costly to establish nuclear power plants, and if it does not have proper conditions, it will greatly harm the environment. If these favorable conditions are met, it provides good benefits to the country, just like the marriage does” (TC-91).

"... is like a gun. Whoever has the weapon has the power ultimately. However, the possibility of a burst scares the human” (TC-108).
"... is like the internet. If it is used in the right place at the proper time, it will be profitable to humanity. But if it is not used correctly, it will be harmful for humanity” (TC-8).

"... is like falling in love. Although it feels good in the beginning, it will bring harm if there is too much love. We always want more. It is the same for the nuclear energy. There is certainly a need for energy, but we also damage the environment with excessive energy production. We tend to get bored if we receive too much attention. Then, it will be harmful to us and to our partner as well” (TC-180).

Classroom teacher candidates, who were determined to be opposed to nuclear power plant and who didn't ignore the positive aspects of the power plants, created 60 metaphors and used "frenemy", "eating dessert" and "smoking" metaphors at most.

"... is like a frenemy. Because you think that this is friendly, maybe it brings benefits to you, however, it secretly poisons you. This is the same for nuclear power plant. There are hidden damages, that's why we shouldn't establish the power plants” (TC-143).

"... is like eating dessert. Because our body needs desserts but people always eat too much and the sweets greatly harm our health” (TC-82).

"... is like smoking. Because when you smoke, you like it and you don't realize that you smoke. But ultimately, the results are deadly” (TC-150).

Classroom teacher candidates, who were determined to be opposed to the nuclear power plant and who thought unilaterally created 10 metaphors and used "bomb" and "disease" metaphors at most.

"... is like a bomb. The bomb is given to you. With the slightest mistake, you use your life. You can't repair your mistake” (TC-113).

"... is like a disease. It is like a person that feels weak and dominated by the germs, the nuclear energy plant signifies the germs and evil” (TC-47).

Findings Related to the Characteristics of the Justifications

Table 4 presents the findings of the justifications characteristics that classroom teacher candidates created about the nuclear power plants.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Justifications</th>
<th>(f)</th>
<th>Total (f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive aspects of nuclear</td>
<td>Economic benefit</td>
<td>High energy efficiency</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>power plants</td>
<td></td>
<td>Enabling economic growth</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fulfilling the energy needs</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cheap energy</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Power generation</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Providing energy independence</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>
When the data in Table 4 are analyzed, it is remarked that the classroom teacher candidates have justified their metaphors in terms of the positive and negative aspects of nuclear power plants. It can be stated that the classroom teacher candidates created justifications for the negative aspects (f=166) in comparison to positive aspects (f=144) of the nuclear power plants. This is probably due to the fact that environmental education, environmental pollution, the use of resources and sustainability are more significant for classroom teacher candidates. Hence, their perception of the negative aspects of nuclear power plants may come into prominence. While some teacher candidates mention the "economic growth" justification more when drawing attention to the benefits of nuclear power plants, the other teacher candidates mention the "environmental risks" by drawing attention to the damages. Thus, the controversial (positive/benefits and negative/damages) status of nuclear power plants as a socio-scientific issue has emerged in the justifications mentioned by the classroom teacher candidates.

While classroom teacher candidates mention more the economic growth as the positive aspects of the nuclear energy plants, they have provided the following justifications at most; "high energy efficiency", "enabling economic growth", "fulfilling energy needs". In terms of environmental impacts, 12 teacher candidates mentioned the "non-carbon emitting" character of nuclear power plants. Five teacher candidates described nuclear power plants as "beneficial" and did not provide any explanation as justification. The example justifications of classroom teacher candidates about the positive aspects of nuclear power plants are presented below.

"... this is a need for energy production in our country ...” (TC-19)

"... although it will be beneficial in every way..." (TC-26)

"... it is like the bee producing honey with high power..." (TC-173)

"... we can be more powerful in terms of the economy by producing more energy...” (TC-106)

"... we can achieve wealth and power when we reach the treasure..." (TC-41)
"...the nuclear power plant does not pollute the air, beautifies the environment..." (TC-66)

"...we are going to grow when we have the nuclear energy in our country, and we will be stronger as we grow..." (TC-83)

"...it is more economical in comparison to other non-economic methods. we can get the energy we require in a short time at reasonable prices." (TC-83)

"... enormous energy is released at low cost by the combination or fission of two entities..." (TC-137)

"...it is the necessity of this century for not being in need of anything, we cannot get out of date." (TC-63)

Classroom teacher candidates evaluated the negative aspects of nuclear power plants in terms of the environmental risk at the most and used the following justifications; "accident/explosion risk", "risk of disease", and "leak risk". In terms of economic factors, 9 teacher candidates mentioned "the high installation costs" while 3 teacher candidates created "war" as the justification. Only 7 teacher candidates described the nuclear power plants as "harmful" and they didn't provide any justification. The example justifications of classroom teacher candidates about the negative aspects of nuclear power plants are presented below.

"...the weapon can serve the war." (TC-98)

"... it can spread secretly and it may harm humanity..." (TC-3)

"... with the slightest accident, people may die..." (TC-156)

"...it may poison the people." (TC-90)

"... the genetic deterioration continues for years..." (TC-151)

"...there may be unpredictable results if there is an earthquake..." (TC-168)

"...if you think deeper and more comprehensively, you can observe the damages. (TC-107)

"...you may build it with hope, but it may explode and you may harm the environment." (TC-192)

"...it may emit too much radiation. if you use it too much like the telephone, it may cause various diseases." (TC-117)

"...it is costly at first, it signifies power." (TC-81)

The word cloud of the metaphors that the classroom teacher candidates created for nuclear power plants is presented in Figure 1.
CONCLUSION AND DISCUSSION

In this study, the metaphors created by the teacher candidates about nuclear power plants and the justifications of metaphors were ascertained. Teacher candidates created 197 metaphors in 58 different kinds for nuclear power plants and the metaphors used the most are as follows; love/falling in love, internet, getting married, using medication, weapon, frenemy, using phone, bomb, eating dessert, gambling, and smoking. The time period, when teacher candidates experience the metaphors more frequently, the age of the teacher candidates or their environment have been very influential in the creation of the metaphors. According to Yıldızlı et al. (2018), metaphors signify more than words, they facilitate to comprehend the world by including cultural, economic and social factors. The mental images created by metaphors can vary based on the person and factors such as culture, education and environment play a significant role in this difference (Aslan & Filiz, 2018). Consequently, the metaphors that the teacher candidates created such as love, marriage, telephone usage, social media, technology, smoking, etc. highly reflect the inner circle of the teacher candidates.

When the reasons why the classroom teacher candidates use the metaphors are reviewed, it has been concluded that they basically create supportive, opponent and impartial reasons for the nuclear power plants. We have observed that there are many views that oppose nuclear power plants. The literature studies examined; on the establishment of nuclear power plants of University students, they have a negative attitude (Saraf & Basha, 2016), environmental, economic, security, nuclear power plants and biological dimensions of prospective teachers that considers the possible risks because the establishment of this plant have looked negative (Accent & Charles, 2018), class and science teachers because they are against the establishment of nuclear power plants (Sexy, Dey and Dey, 2017), Chernobyl the explosion of the nuclear power plants nuclear power plants adversely affected by thoughts about the (P, Slow & Allen, 2010), as well as conclusions. However, in this study, it was observed that the justifications are very similar and that the classroom teacher candidates perceived the nuclear power plants as a socio-scientific issue and they have realized the contradictory situations. In terms of the production, use, environmental and economic reflections of nuclear energy, class teacher candidates could take beneficial and harmful aspects into consideration. In a study by Turan (2018),
classroom teacher candidates described nuclear power plants as an essential power but drew attention to the damages of the nuclear power plants by creating metaphors such as "bomb". In a study conducted with science teacher candidates, it is comprehended that candidates have a prejudice against nuclear power plants yet they believe that the nuclear power plant is beneficial (Ateş & Saraçoğlu, 2013). In a study on teacher candidates, it was ascertained that almost all of the teacher candidates didn't have sufficient knowledge about nuclear energy, which is highly a socio-scientific subject (Özdemir, 2014). In Sağlam's (2016) study, it has been determined that the number of supporting arguments for the use of nuclear power that the classroom teacher candidates use is highly more than the rebutting arguments. Hence, the study suggested it would be beneficial to include socio-scientific courses in the license program so that the components of the argument can be used more easily. In this study, classroom teacher candidates were able to perceive the issue of nuclear power plants as a socio-scientific issue, and that's because the Environmental Education was based on socio-scientific issues. The environmental education course was presented to teacher candidates in the socio-scientific structure during the academic term and socio-scientific situations related to the society and the environment were discussed in the classroom. In this context, the majority of teacher candidates tend to recognize contradictory situations related to nuclear power plants. This was clearer for the teacher candidates, who are uncertain about nuclear energy and any sided justification cannot be determined in their justifications, by focusing on beneficial/positive and harmful/negative aspects of nuclear energy plants.

Classroom teacher candidates have created justifications based on the positive and negative characteristics of nuclear power plants, and it has been determined that they have more justification for negative characteristics rather than for positive aspects. While teacher candidates, who concentrate on the positive characteristics of nuclear power plants have mentioned justifications primarily about the benefits such as economic growth and fulfilling the energy needs. On the other hand, the teacher candidates, who focus on the negative aspect of nuclear power plants, mentioned mainly the environmental risks such as accident/explosion, disease and leak. In the survey conducted, Yılmaz and Bilge (2018) concluded that the most significant factor affecting the approval of nuclear energy of university students is the benefit of the energy and trust perception while they have mentioned the accidents occurred because of the natural disasters as the major risk factor. In their study, Ateş and Saraçoğlu (2013) found out that if the necessary precautions are not taken, there may be accidents, leakage of radioactive substances and this may cause cancer in the region. However, in the same study, the teacher candidates also asserted the use of nuclear power will minimize the dependence on other countries. In this study, the positive/beneficial and negative/harmful aspects of nuclear power plants have been the very base of the justifications that the classroom teacher candidates used and it has been understood that the teacher candidates were able to perceive the nuclear power plants as a socio-scientific issue.

Since the resources in the world are limited, energy policies along with the developing technology and consumption habits will always be among the indispensable factors of the future. A sustainable environmental education approach should be applied to shape the energy policies that are strictly related to all societies, and societies that have become environmentally conscious need to be formed. It is expected that teachers and teacher candidates, who will teach the environmental awareness to the next generation will have sufficient knowledge about socio-scientific issues that concern the environment. Accordingly, special attention should be given to environmental education to be provided to teacher candidates for enabling sustainable growth and it is necessary to evaluate the situations with its economic and environmental aspects by using a socio-scientific approach. Consequently, it would be possible to raise individuals, who can comprehend the environment, use the resources effectively, produce solutions for the environmental problems they encounter and consider many factors when searching for a solution. In this study, the researcher used the metaphoric teaching approach. It is possible to conduct different studies with different methods and techniques.
REFERENCES


Examining the Print Script Letters Shapes Taught in Primary Schools in Turkey

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Abstract

The aim of this study is to examine the basic vertical letters based on the opinions of the primary school teachers. This qualitative research study employed phenomenology as a research method. Critical sampling and appropriate sampling methods were used in determining the participants. The participants of the study consisted of 111 classroom teachers working in primary schools in Yozgat city center. In the determination of the participants, the service life as a criterion has been determined as at least 10 years. Semi-structured interview form was used as data collection tool. The researcher has prepared a semi-structured interview form called “vertical basic writing letters writing form”. Data were collected in November 2018. 111 class teachers were interviewed with semi-structured interview form. Two types of analysis technique were used for data analysis. Frequency (f) and percentage (%) were used for quantitative data analysis. Content analysis was used to analyze the qualitative data. As a result of study, 89% of the teachers think that the capital letter A is appropriate. It is seen that 11% did not approve of the big letter A. The eligibility for capital letter I is 96%. Eligibility for capital letter J is 84%. The eligibility rate for all other capital letters is 100%. The conformity rate of lowercase letters after capital letters was examined. It is seen that the rate of conformity of the lowercase letter is 97%. Eligibility of small letter f is 62%. The rate of compliance with the letter l (lemon) is 65%. Conformity rate of small t is 81%. The compliance rate of all other lowercase letters is 100%.

Keywords: Print script, font, letter, Turkey.

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In many countries in the world, writing instruction is usually started with the basic vertical letters. The main reason for this situation is that it is easy to write the basic vertical letters. In addition, the use of the basic vertical letters in everyday life is very common. Any drawn, written, printed, or typed character, lowercase or uppercase, can be recognized as an allograph of the alphabet of any language (Huber & Headrick, 1999). Each one of the signs, is indicating a sound in the language and forming the alphabet (Turkish Language Society, 2018). The phonetic use of symbols to represent syllables of words probably commenced with the endeavours to write foreign names, which conveyed no meaning other than identification. From this, syllabic usage spread into everyday words (Huber & Headrick, 1999). The letter is not the simplest stimulus element for the child. In the reading period, the child divides the letters and divides them into certain elements. The existence of similar elements in different letters requires the reciprocal relations of letters. Similarities in different elements are perceived more easily than the differences in similar elements. Children understand different elements in different letters more quickly. But they have difficulty in finding the differences in similar letters. In addition, this distinction requires the stimulation of a particular region of the brain (Özcan, 1992, s. 173).

Teaching correct letter formation involves providing learners with opportunities to talk about the names, features of letters, the sounds they represent. This enhances letter recognition in texts on computer keyboards and in the environment. Looking at the letters and undertaking the movement of writing then helps learners see and feel how each letter is formed, fixing the letter in the learner’s visual memory for future identification and reproduction (Department of Education, 2009, p. 19). The basic goal of handwriting instruction is to help students develop legible writing that can be produced quickly with little conscious attention. A critical ingredient in achieving this goal is teaching students an efficient pattern for forming individual letters (Graham, 2009, p. 23). Teaching methods that require the copying of letters, whole words and sentences in infant unjoined print should be challenged. Teaching handwriting needs to begin with movement training and penhold exercises and develop into writing letters and simple words from ‘inside the head’, i.e. from memory. Copying from the board (far point copying) involves holding the spelling in short-term memory for a time and writing from this temporary memory store and thus extra errors can creep in. Even near point copying (writing below teacher’s model) can give rise to similar errors. Tracing does not involve the word memory store; it only involves strengthening exercise in the motor movements which can be more fluently taught in other ways (Montgomery, 2007, p. 39). In the speed and readability dimension of the writing, it is important that the letters are simple and easy to produce in shape (Akyol, 2006, p. 51). If children cannot form letters or cannot form them with reasonable legibility and speed—they cannot translate the language in their minds into written text (Graham, 2009, p. 20). The second point of writing is the ease of teaching. The beginning of these letters, beginning and end points, lines from left to right and from top to bottom, writing the letters with less movement. The writing direction is suitable for the student’s muscular development, facilitating the teaching of writing. The starting point of writing the letter as a writing direction is emphasized. The importance of typing letters without raising the hand (with less movement) is known for writing fast and readable. It is also important to start writing in small letters. Because the small letters are used in the reading and writing process. Therefore, more emphasis is given to the writing of small letters (Güneş, 2017, p. 3; Güneş, 2007, p. 101).

The vertical basic writing is written from top to bottom and from left to right with short and dashed lines. Straight and simple lines are drawn to create letters. This is not written in this aspect, rather than drawn is writing (Güneş, 2017, p. 4). Generally, the vertical basic writing in the world countries is used in the first two years of primary school. Vertical basic lettering gives primary school students the ability to write more readable and faster (Gray, 1975, p. 238). It is stated that it simplifies the teaching of reading and writing as it is similar to the printing or printing letters of vertical basic writing. The child writes the same text. It is suggested that it is easier to learn, faster and more legible than other letter forms (Güneş, 2017, p. 5). Vertical basic writing is simple, non-stylized and easy to write. Basic writing is the foundation on which decorative and art writings are based (Ministry of
National Education, 2012, p. 20). After each line and letter the hand is removed and the pen is placed again. To write some letters, the hand is removed four times and the location of the item is changed four times (Güneş, 2017, p. 4). Vertical font is 90 degrees upright and unconnected (Güneş, 2017, p. 2). The writing of vertical basic letters starts at nine different points, and is completed at eight different points (Başaran & Karatay, 2005). Six separate actions are made to write vertical lower case letters (Akyol, 2006, p. 55). At vertical basic lettering students who are new to elementary school do not face much difficulty and use simplified figures to get to know the writing. These are letters consisting of upright and rounded lines. This is called vertical writing. In some countries, the first literacy teaching is started with the basic writing (Güneş, 2017, p. 4).

With the structural characteristics of the letter to be written in line studies, the lettering aspects, the main characters and the aesthetics of writing should be handed to the students to give the flexibility of hand. In order to write in vertical base letters, steep, curved, circular and horizontal lines should be drawn. When the circular line is taught in the basic writing format, it must be started from the 2 point of the clock and drawn to the left until the hands are at the same point without being removed from the paper. The writing directions of the vertical letters should be shown from left to right and from top to bottom (Ministry of National Education, 2018, p. 11). Vertical print letters in Turkey is shown in Figure 1.

![Vertical basic letters shape in Turkey](Ministry of National Education, 2018, p. 12).

During the teaching of reading and writing, the four-line, three-spaced standard writing pad should be used. The line spacing should be 4-5-4, at least 1.3 cm wide. The lines in the writing notebook should be used during the initial reading and writing of the letters. Syllables in the materials to be used in wider line spacing should be used (Ministry of National Education, 2018, p. 12). Students should not be forced to write about letters, shapes, geometry, slope, steepness of letters in their writing studies. Students should be expected to form the basic form of the letter. First of all, the capital letters should be shown. Then, the lower case should be shown (Ministry of National Education, 2018, p. 13, Artut, 2005, p. 73).

In the initial reading success, knowing the names of the letters is the most powerful factor. The effect of naming the letters is explained in a number of different ways: If a child can remember many letters with complete confidence, s/he will have more time to spell words and learn letter sounds than a child trying to remember the letters. From another point of view, the power of the letter
information can be interpreted as follows: when the children see all the letters in the automatic way, they will see the words with the letter patterns or the names of the letters are related to their voices (Karakelle, 2004, p. 47). The basic vertical capital letters get from geometric forms (Çiçek, 2005, p. 16). The basic vertical capital letters geometric forms are shown in Figure 2.

![Figure 2. Geometric structure of basic vertical letters (Ministry of National Education, 2012, p. 20)](image)

In general pedestal, vertical basic writing is used in the first two years in school. It is learned more quickly. It gives the students the opportunity to write more readable and faster. The benefits of using this font at this level have been summarized as follows (Gray, 1975, p. 238-239). Although vertical basic lettering is used a lot, there is no need for lines to merge letters together. The writing of vertical basic writing is very close to that of children. The letters of the vertical basic lettering inscription are the same of the children's books. This eliminates the confusion that may arise from a combination of two shapes for each letter. With the vertical basic writing, children can express their ideas more quickly in writing. Thus, they begin to pay attention to the writing earlier and they are more successful. In the wall plates, brochure covers and art works, the basic writing has a clearer and more beautiful appearance. Children can compare the letters they draw to the printed letters, so that they can find the errors they make more easily. The use of vertical base letters encourages creative expression by facilitating the written expression of ideas. The clarity of this writing creates a sense of emotional trust in student. The use of vertical basic letters is suitable for the muscle and movement development of primary school children.

There have been various research related to the letters shapes. As a result of the research conducted by Duran (2011), the teachers who participated in the study stated that the spelling of the letters “b, d, f, k, r, s, v, z, B, D, L, T, Z” should change. As a result of the study conducted by Calp (2013), the number of mistakes of the student at first decreased; has also reached an acceptable level of readability. At the end of the study carried out by Kodan (2016), it was observed that there was a decrease in writing errors and improvement in writing. As a result of the research conducted by Şahin (2012), it was determined that the students made more mistakes in the letters “f, r, s, k” and “F, H, G, T, D”. As a result of the research conducted by Özcan (1992), it was stated that a child who had written a letter in the word, and then falsified the letters he wrote correctly. In addition, errors in line placement, missing letters or missing letter elements to add new elements, drawing errors have been identified.

The aim of this study is to examine the basic vertical letters with the opinions of the class teachers. Between 2005 and 2017, the teaching of writing with oblique writing has been compulsory as stated in Turkish Curriculum. In 2017, the teaching of Turkish Lessons is given to the preference of the class teacher by the use of orthogonal basic letters or cursive letters. In 2017, the determination of
errors in writing instruction in vertical basic letters, which has recently been introduced, is important in many aspects. It is important in terms of giving feedback to the commission that prepares the Turkish Course Curriculum in the Ministry of National Education. Besides, it is thought that these research results will be useful for the first reading and teaching Turkish.

**METHOD**

**Research Design**

This research is conducted by using the phenomenology method which is one of the qualitative research methods. Phenomenology describes the common meaning of the experiences of a few people in relation to a phenomenon or concept (Creswell, 2013, p. 77). Phenomenology is the methodological, attentive and in-depth illustration and description of how people experience phenomena (Eryaman, et al. 2013, Patton, 2014, p. 104; Gliner, Morgan & Leech, 2015, p. 97; Fraenkel, Wallen & Hyun, 2011, p. 432). Another definition of phenomenology is to define a phenomenon in terms of the experience of individuals or a particular group (Christensen, Johnson & Turner, 2015, p. 408). In this study, experimental (transcendental or psychological) phenomenology type was preferred among the phenomenology types. Experimental (transcendental or psychological) phenomenology is less emphasized by the researcher's comments and more emphasis on the description of participants' experiences (Creswell, 2013, p. 80). Experimental (transcendental or psychological) phenomenology explores the basic meanings of individual experience (Patton, 2014, p. 104). In this study the phenomenon is vertical print letters. Phenomenology method was used in this study because it was the phenomenology method which is the most suitable research method for the determination of the opinions and experiences of the classroom teachers about the vertical print letter forms.

**Participants**

Critical sampling and appropriate sampling methods were used in determining the participants (Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz & Demirel, 2012, p. 92). Appropriate sampling means that it is easy to save time, money and effort (Patton, 2014, p. 244). The basic of the critical sampling method is to study all situations that meet a predetermined set of criteria (Yıldırım & Şimşek, 2006, p. 112). Critical sampling means selecting all situations that provide certain criteria (Patton, 2014, p. 243). The participants of the study consisted of 111 classroom teachers working in primary schools in Yozgat city center. In the determination of the participants, the service life as a criterion has been determined as at least 10 years. The purpose of determining this criterion is to get experience, experience and observations of class teachers who have more than one year of service. Demographic characteristics of the participant classroom teachers are shown in Table 1.

**Table 1. Demographic Characteristics of Participants**

<table>
<thead>
<tr>
<th>Demographic Information</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional seniority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-20 year</td>
<td>96</td>
<td>87</td>
</tr>
<tr>
<td>21-30 year</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-40 age</td>
<td>80</td>
<td>73</td>
</tr>
<tr>
<td>41-50 age</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>51-60 age</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woman</td>
<td>51</td>
<td>46</td>
</tr>
<tr>
<td>Man</td>
<td>60</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
<td>100</td>
</tr>
</tbody>
</table>
When Table 1 is examined, 87% of teachers have a seniority of 10-20 years. 13% have 21-30 years professional seniority. 73% are between 30-40 years old. 24% are between 41-50 years old. 3% are between 51-60 years old. 46% of teachers are women and 54% are men.

Data Collection Tool

In this study, semi-structured interview form was used as data collection tool. The semi-structured interview form approach includes a list of questions or topics to be addressed to the interviewer during the interview (Yıldırım & Şimşek, 2006, p. 122). The semi-structured interview form helps the subject to be opened with different questions during the conversation, to reveal various dimensions and to reach new ideas on the subject (Merriam, 2013, p. 88). The researcher has prepared a semi-structured interview form called “Vertical Basic Writing Letters Writing Form”. The semi-structured interview form was firstly examined in the literature. The semi-structured interview form, which was formed after examining the literature, was presented to a faculty member who is specialized in measurement and evaluation in education. Later, presented to the opinion of a faculty member specialized in the field of classroom teaching. After the expert opinions, various arrangements were made in the semi-structured interview form. Then, the semi-structured interview form was applied to two classroom teachers as pilot interviews. After the pilot interviews, the semi-structured interview form was finalized. The semi-structured interview form has two parts. In the first part, there are questions about the demographic characteristics of the class teachers. In the second section, there are questions about letter shapes. Form consists of two columns with three columns. In one of the tables there are small contiguous italics, while in the other the large contiguous italics are arranged in the first column according to “A-Z” letters. In the second column of the tables there are “appropriate” and in the third column “not appropriate”. Teachers were asked to mark the appropriate column if they found the appropriate contiguous font. If they do not agree with the letter is written, they are asked to mark the “not appropriate” column. Make a suggestion for the writing of the letter. Data collection tool is shown in Figure 3.

Figure 3. Data collection tool
Data Collection

The main data collection tool in the phenomenological research is interviewing (Christensen, Johnson & Turner, 2015, p. 409; Gliner, Morgan & Leech, 2015, p. 97). Data were collected in November 2018. 111 class teachers were interviewed with semi-structured interview form. Each interview lasted an average of five minutes. The interview questions in the semi-structured interview form are briefly explained to the class teacher. Teachers were given a form. The basic letters of the letters were examined by the teachers. After this examination, teachers marked the relevant place for the vertical letter. Then the questions in the semi-structured interview form were asked to the class teacher who was interviewed. The interviews lasted a total of 562 minutes.

Data Analysis

Two types of analysis technique were used for data analysis. Frequency (f) and percentage (%) were used for quantitative data analysis. These calculations were performed with the help of SPSS 21 program. Content analysis was used to analyze the qualitative data. Data analysis in phenomenology research is aimed at revealing experiences and meanings (Yıldırım & Şimşek, 2006, p. 75). After the data are encoded in the content analysis, analytical techniques are used to search for themes and patterns in the data (Glesne, 2012, p. 255). Interviews were recorded on the computer by the researcher. After reading the opinions written more than once, the coding was done. Themes from codes to sub-themes, themes have been reached (Creswell, 2013, p. 82). Key phrases are listed in the content analysis process. In the next step, the researcher has developed meaning sets, groups within these themes, based on these important expressions. The validity and reliability of the study was carried out according to the mentioned by Yıldırım & Şimşek (2006, p. 257-268). In the internal validity dimension, the findings were shared with the participants. The codes and themes reached with the participants were examined. In the external validity dimension, the research process is explained in detail. In the context of external reliability, the method and stages of the research are explained clearly and comprehensively. Data collection, processing, analysis, interpretation and reaching the results are clearly defined. In the internal reliability dimension, research questions are clearly stated. The researcher's position in the research process has been clearly defined. Expert examination method was employed in the whole study. The obtained data were collected under the themes and presented to the reader easily.

RESULTS

The results obtained by frequency (f) and percentage (%) are indicated and interpreted according to the capital and small letters. Table 2 presents the opinions of the participants in the capital letters.
Table 2. Opinions of the Classroom Teachers about the Vertical Basic Capital Letters

<table>
<thead>
<tr>
<th>No</th>
<th>Capital letter shape</th>
<th>Appropriate f</th>
<th>Appropriate %</th>
<th>Inappropriate f</th>
<th>Inappropriate %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>99</td>
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<td>29</td>
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<td>111</td>
<td>100</td>
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</tbody>
</table>
When Table 1 is examined, it is understood that 89% of the class teachers find the form of the capital letter A suitable. It is seen that 11% did not approve of the big letter A. Eligibility for capital letter C is 97%. Eligibility for capital letter I is 96%. Eligibility for capital letter J is 84%. The eligibility for capital letter K is 97%. The eligibility rate for all other capital letters is 100%.

The conformity rate of lowercase letters after capital letters was examined. Table 3 presents the views of the participants in the basic lowercase letters.

**Table 3. Opinions of the Classroom Teachers about the Basic Lowercase Letters**

<table>
<thead>
<tr>
<th>No</th>
<th>Lowercase letter shape</th>
<th>Appropriate</th>
<th>Inappropriate</th>
</tr>
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<td>4</td>
<td></td>
<td>108 97</td>
<td>3 3</td>
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<td>111 100</td>
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<td>69 62</td>
<td>42 38</td>
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<td>72 65</td>
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<td>29</td>
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<td>111 100</td>
<td>0 0</td>
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</tbody>
</table>
When Table 3 is examined, it is seen that the compliance rate of the lowercase ç letter is 97%. Eligibility of small letter f is 62%. The rate of compliance with the letter l (lemon) is 65%. Conformity rate of lowercase ş letter is 97%. Conformity rate of small t is 81%. The compliance rate of all other lowercase letters is 100%.

After examining the frequency and percentage, the opinions and suggestions of the primary school teachers regarding the letter-writing patterns are indicated. The opinions and suggestions of the classroom teachers about the letters of writing are as follows:

**Capital A Letter Recommendation**

12 of the participant classroom teachers stated that the spelling of the uppercase letter A was inappropriate. According to the views of the classroom teacher, the horizontal line of letter A should be in the second line from the top. Teachers' writing suggestions are presented in Table 4.

<table>
<thead>
<tr>
<th>Table 4. Capital A Letter Form Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of National Education capital A letter shape</td>
</tr>
<tr>
<td>A</td>
</tr>
</tbody>
</table>

**Capital Ç Letter Recommendation**

Three of the participating classroom teachers stated that the spelling of the uppercase letter Ç was not appropriate. According to the views of the classroom teachers, the vertical line under the letter must be the point instead. Teachers' writing suggestions are presented in Table 5.

<table>
<thead>
<tr>
<th>Table 5. Capital Ç Letter Form Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of National Education capital Ç letter shape</td>
</tr>
<tr>
<td>Ç</td>
</tr>
</tbody>
</table>

**Lowercase f Letter Recommendation**

42 of the participant teachers stated that the lowercase letter f was not suitable. According to the views of the classroom teacher, the lowercase letter f should not be written on the top two lines. The lowercase letter f should be written in the lower two lines. Teachers' writing suggestion are presented in Table 6.

<table>
<thead>
<tr>
<th>Table 6. Lowercase f Letter Form Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of National Education lowercase f letter shape</td>
</tr>
<tr>
<td>f</td>
</tr>
</tbody>
</table>
Lowercase ğ Letter Recommendation

Three of the participating classroom teachers stated that the spelling of the lowercase ğ letter was inappropriate. According to the views of the classroom teacher, the horizontal line should be the place of the slash above the letter. Teachers’ writing suggestions are presented in Table 7.

Table 7. Lowercase ğ Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education lowercase ğ letter shape</th>
<th>Lowercase ğ writing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ğ</td>
<td>g</td>
</tr>
</tbody>
</table>

Capital I Letter Recommendation

Four of the participant classroom teachers stated that the spelling of the capital I (Idea) letter was inappropriate. According to the views of the classroom teacher, there should be a short horizontal line above and below the capital letter I. The reason for this suggestion, small letter l (lemon) with the capital letter I (Idea) is used each other. Teachers’ writing suggestions are presented in Table 8.

Table 8. Capital I Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education capital I letter shape</th>
<th>Capital I writing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

Capital J Letter Recommendation

18 of the participating classroom teachers stated that the spelling of the uppercase letter J was not appropriate. According to the views of the classroom teacher, there should be a point above the capital J letter. The reason for this suggestion is that it should be a point in the capital J because it is a dot in the lowercase j letter. Teachers’ writing suggestions are presented in Table 9.

Table 9. Capital J Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education capital J letter shape</th>
<th>Capital J writing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td>J</td>
</tr>
</tbody>
</table>

Lowercase l Letter Recommendation

39 of the participant classroom teachers stated that the spelling of the lowercase letter l (lemon) was inappropriate. According to the views of the classroom teacher, there should not be quotes to the right under the lowercase letter l. The teachers' opinions on the small letter l are:

“Students do little to the right under the letter l, the slight bend is too much. Instead it should be a straight line (Teacher 8).

“Due to the nail to the right under the letter l, it is similar to the upper case L. Small nails should be removed to the right under the lowercase letter l (Teacher 92).”
Teachers’ writing suggestions are presented in Table 10.

**Table 10.** Lowercase l Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education capital l letter shape</th>
<th>Capital l writing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

**Capital Ş Letter Recommendation**

Three of the participating classroom teachers stated that the spelling of the uppercase letter Ş was inappropriate. According to the views of the classroom teacher, there should be no line below the capital letter Ş. It is stated that this line should be a point instead. Teachers’ writing suggestions are presented in Table 11.

**Table 11.** Capital Ş Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education capital Ş letter shape</th>
<th>Capital Ş writing recommendation</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Lowercase t Letter Recommendation**

Twenty-two of the participant classroom teachers stated that the spelling of the lowercase letter t was inappropriate. According to the views of the classroom teacher, there should not be quotes to the right at the bottom of the lowercase letter t. It is also suggested that the vertical line t is the upper two line spacing. Teachers’ writing suggestions are presented in Table 12.

**Table 12.** Lowercase t Letter Form Suggestion

<table>
<thead>
<tr>
<th>Ministry of National Education capital Ş letter shape</th>
<th>Capital Ş writing recommendation</th>
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**DISCUSSION AND CONCLUSION**

As a result of study, 89% of the teachers think that the capital letter A is appropriate. It is seen that 11% did not approve of the big letter A. The eligibility for capital letter I is 96%. Eligibility for capital letter J is 84%. The eligibility rate for all other capital letters is 100%. The conformity rate of lowercase letters after capital letters was examined. It is seen that the rate of conformity of the lowercase letter is 97%. Eligibility of small letter f is 62%. The rate of compliance with the letter l (lemon) is 65%. Conformity rate of small t is 81%. The compliance rate of all other lowercase letters is 100%. As a result of the research conducted by Özcan (1992, p. 175), it was stated that primary school students made drawing mistakes when writing letters. As a result of the research conducted by Taşkaya and Yetkin (2015, p. 162), it was stated that the students could not make the shapes of the letters completely.

As a result of study 12 of the participating classroom teachers stated that the spelling of the uppercase letter A was inappropriate. According to the views of the classroom teacher, the horizontal line of letter A should be in the second line from the top. Hofmeister (1992, p. 41) likewise illustrates the writing of the capital A letter. Three of the participating classroom teachers stated that the spelling
of the capital letter Ç was not appropriate. According to the views of the class teacher, the vertical hyphen under the capital letter Ç must be the point instead. The results of the research conducted by Taşkaya and Yetkin (2015, p. 162) indicated students’ the mixing of dotted and non-dotted letters. 42 of the participant teachers stated that the lowercase letter f was not suitable. According to the views of the classroom teacher, the lowercase letter f should not be written on the top two lines. The lowercase letter f should be written in the lower two lines. As a result of the research conducted by Duran (2011), teachers stated that the spelling of the letter f should be changed. Three of the classroom teachers stated that the spelling of the lowercase letter ğ was inappropriate. According to the views of the classroom teacher, the horizontal line should be the place of the slash above the letter ğ. Four of the participant classroom teachers stated that the spelling of the capital letter I was inappropriate. According to the views of the classroom teacher, there should be a short horizontal line above and below the capital letter I. Hofmeister (1992, p. 41) likewise illustrates the writing of the capital letter I. 18 of the participating classroom teachers stated that the spelling of the uppercase letter I was not appropriate. According to the views of the classroom teacher, there should be a point above the upper J letter. The reason for this suggestion is that it should be a point in the upper case J, because there is a dot in the lower case j. As a result of the research conducted by Taşkaya and Yetkin (2015, p. 162), it was stated that the students had difficulty in writing j. 39 of the participant classroom teachers stated that the spelling of the lowercase letter l (lemon) was inappropriate. According to the views of the classroom teacher, there should not be quotes to the right under the lowercase letter l. The reason for this suggestion, small letter l (lemon) with the letter l (Idea) is used each other. As a result of the research conducted by Taşkaya and Yetkin (2015, p. 162), it is stated that the writing of the letters with the extension from the top and bottom is wrong. Hofmeister (1992, p. 41) shows the writing of the lowercase l in the same way. Three of the classroom teachers stated that the spelling of the uppercase letter Ş was inappropriate. According to the views of the classroom teacher, there should not be line below the capital letter Ş. It is stated that this line should be a point instead. As a result of the research conducted by Duran (2011), teachers who participated in the research indicated that the spelling of the letter should change. The results of the research conducted by Taşkaya and Yetkin (2015, p. 162) indicated the students’ mixing of dotted and non-dotted letters. Twenty-two of the participant classroom teachers stated that the spelling of the lowercase letter t was inappropriate. According to the views of the classroom teacher, there should not be quotes to the right at the bottom of the lowercase t letter. It is also suggested that the vertical line t is the upper two line spacing. Hofmeister (1992, p. 41) shows the writing of the small letter t in the same way.

At the end of the research it is recommended to write the small letter f on the bottom two lines. In addition, it is considered appropriate to remove the right fingernail under the letter I. In addition, it is considered appropriate to write the small letter t on the top two lines. For the future research to be carried out, it is recommended to study the adjacent oblique writing letters.

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High School Teachers’ Perception of Institutional Trust

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Kırşehir Ahi Evran University

Tufan Aytaç
Kırşehir Ahi Evran University

Abstract

The current study aims to determine the teachers’ views on trust in high schools. The study group of the research consisted of 138 teachers who served general, Anatolian, and vocational high schools within the borders of city of Van. The researcher developed a semi-structured interview form as a data collection tool. Nine sub-titles were included in relation to the reasons for trust and distrust. Teachers’ responses in the interview form were computerized and their percentages and frequencies were calculated. Each response was numbered and coded and put on the statistics software. Through the statistics software, percentages and frequencies of teacher views in relation to high school type, gender, and seniority were obtained. Teachers stated 604 views in total. 314 of these views were of trust and 290 were of distrust. In relation to trust, teachers mostly stated reasons stemming from administrators and teachers; they mostly stated the reasons stemming from students and parents, in relation to distrust. General and vocational high school teachers stated that they felt reassured when students were respectful and polite whereas Anatolian high school teachers said that they felt reassured when students were admitted through an exam. Both general and Anatolian high school teachers stated that they felt unsafe due to inefficient administrators whereas vocational high school teachers stated that they felt unsafe due to favoritism by administrators.

Keywords: Institutional Trust, Teachers, High school, Secondary education,
INTRODUCTION

It is possible to see the positive or negative impact of trust on people either in organizations or in everyday life. Without trust, it is no easy to find solutions for social problems. In order for the social structure to be preserved, it is important to establish a network based on trust. This is also so for the organizations. It is not considered possible for the servers of organizations, not based on trust, to improve working qualities. Trust develops gradually and is always questioned; it is quite sensitive and fragile.

Institutional trust is about the employees feeling safe within the organization and being supported by the employer (Gilbert & Tang, 1998; Lahno, 2001). Trust is not only one person’s issue but it is for everyone. It relates to administrators and colleagues. Trust requires acting up to the norms and values. Trust means being honest. If someone is promised about something, the promise is kept (Lahno, 2001); then, the trust will minimize the risks. The trust unites people and this unity, at the same time, instills safety in them. The trust is also very fragile and can be easily shattered. Its failure will be painful and destructive for both the organization and the people (Gilbert & Tang, 1998).

Brownell (2000) lists the points to take into account for institutional trust as follows: to fulfill promises and pledges, to be open and honest in communication channels, to know how to listen, making employees feel safe, to be reachable, to tell the truth, to respect, to be fair and consistent, to organize collaboration and seek for ways to help, not to look for excuses and not to blame, and to be open to accountability. Communication available within the organization will reduce obscurity and increase the dependability and credibility of the organization. Open communication positively impacts the employees’ attitudes towards change. Administration must be constructive towards its employees and value their views in order to establish trust through open communication (Gilbert & Tang, 1998).

A significant and positive relationship was found between the trust and the organizational loyalty, job satisfaction, and the social responsibility in studies. Namely, as the trust for the top management and the trust within the organization are established, employees’ organizational loyalty, job satisfaction, perception of institutional justice, and levels of social responsibility increase. Through the established trust in organizations, employees’ intentions of quitting the job, in attention to work, walk out, and job transfer decrease and, thus, organizational efficiency increases (Polat, 2007; Özbek, 2006). Halis, Gökgöz, and Yaşar (2007) found in their studies that employees’ participation in decision-making process, their being authorized in their own fields, and their receiving of performance feedback increase institutional trust; thus, employees’ loyalty in the organization and institutional performance increase.

A culture of trust at school improves collaboration among administrators, teachers, students, and other employees and also encourages and supports them about innovations implemented at school (Erden, 2008). In order for a safe environment to be established at school, teachers’ personalities must be respected and they must be paid attention. Teachers must comfortably express their opinions and principals must be open to new ideas. A network of relationships based on trust must be constructed at school. Teachers must not hurt one another in relationships (Kochanek, 2005).

Once an environment of trust at school is established between the teachers and the administrators, the parties will put more energy and effort in their work. If an environment of trust is not built at school, the administrator will adopt a more controlling, pressurizing, and authoritarian management style (Başaran, 1998). This will be reflected negatively on teachers and they will feel constantly threatened and pressurized; thus, their teaching and job quality will be negatively impacted. Parents depend on teachers about their children’s education and teachers on the other hand depend, on administrators about improving the environment of education to the best. In order for the environment of education to be improved, first of all, trust within the school is required (Kochanek, 2005).

Administrators must not judge employees and everyone must have equal rights within the organization. Work groups must be supported and collaboration among groups must be provided. Each
individual within the organization must respect others’ rights and a sense of unity must be instilled in the employees. Employees must not be discriminated and transparent management must be maintained. The organization must not be biased on race, gender, nationality, and religion (Kochanek, 2005).

An environment of trust both for teachers and students must be provided for an efficient education (Öğülmüş, 2006). In an environment where teachers do not feel safe, effective learning and teaching are hard to take place. Schools are required to be places where every teacher feels safe against any type of physical and psychological threats and dangers and finds opportunities of collaboration; individual differences are accepted and respected. A teacher, whose basic needs are not met, not feeling safe against any danger and threats will not be adequately fruitful about teaching and instruction. Therefore, in relation to organizational objectives, schools must build environments where both teachers and students feel safe (Sonmez & Eryaman, 2008; Öğülmüş, 2006).

Many studies, with majority (Aktan, 1999; Kamer, 2001; Günaydın, 2001; Özen İşbaşı, 2001; Güneşer, 2002; Aş, 2003; Yaşar, 2005; Tüzün, 2006; Özbek, 2006, as cited in Çokluk-Bökeoğlu & Yılmaz) in organizational settings, on the concept of trust have been conducted in Turkey. Recently though, the number of studies (Memduh & Zengin 2009, Çokluk-Bökeoğlu and Yılmaz 2008, Erden 2007, Geyin 2007, Polat 2007, Özer et al. 2006, Yılmaz 2005, Özdil 2005, Turan, 2001) conducted on trust in educational settings has well been increasing. However, the studies conducted in eastern cities and particularly high schools are very limited in numbers (Dönmez & Güven 2003, Dönmez & Güven 2002). The current study, conducted in high schools in Van as an eastern city, is intended to fill a gap. Nevertheless, more studies in high school settings are required to be conducted.

The current study aims to determine the perceptions of trust in high schools by teachers employed in high schools. The following questions have been answered for this purpose:

1. What are high school teachers’ perceptions of trust in high schools?
2. Are there any differences among high school teachers’ perceptions of trust in high schools, in relation to high school type, gender, and seniority?

**METHOD**

The current study aiming to determine high school teachers’ perceptions on institutional trust was conducted in the general survey model. Survey model aims to describe the studies subject as it was in the past or it is presently. General survey model is a research design to study a universe with multiple elements as a whole or a group from that universe (Karasar, 2009, 77).

**Study Group**

The study group of the current research consisted of 138 volunteering high school teachers with 58% (80) from seven general high schools, 17% (23) from three Anatolian high schools, and 25% (35) from two vocational high schools (25%) located in Van city center in 2009. 20% (27) of the participants were female whereas 80% (111) were males. Seniority groups of the participating teachers were as follows: 30% (41) in 0-5 years, 49% (68) in 6-10 years, and 15% (21) in 11 years and over.

**Data Collection Tool**

The semi-structured interview form “Perception of Trust in Schools” developed by the researcher was used as the data collection tool. The form included one basic question asking whether teachers feel safe at their schools and, following this question, nine sub-titles associated with the reasons why teachers feel or do not feel safe at the schools. The interview form was examined by literature experts and teachers in relation to language accuracy and by the field experts in relation to
content validity. Upon feedback of form evaluation, required changes were made on the interview form and it was applied.

**Data Collection and Analysis**

Research data were collected by the researcher. First of all, each teacher’s responses were separately entered into Microsoft Office Word Software. The frequency of cyclical responses within the entered responses was obtained and each response was numbered and coded. Later, teachers’ personal details and their responses were entered into the statistics SPSS Software. Through the Crosstabs software, percentages and frequencies of teachers’ responses in relation to high school type, gender, and seniority were found.

**FINDINGS**

Findings on reasons why teachers felt safe and did not feel safe and how these were expressed in relation to high school type, gender, and seniority have been included under this heading.

**Teachers’ Views on Reasons Why They Felt Safe**

Teachers’ views on reasons why they felt safe were presented in relation to administrators, principals, teachers, students, parents, and department head, ministry of national education, environment, participants, and some other reasons.

Majority of the participant teachers (21) stated that they felt safe because their administrators listened to them; they were interested and sensitive without prejudice; they were understanding and tolerant. In addition (from most frequently stated to less frequently stated), teachers stated that they felt safe when administrators helped them (16); performed their duties (12); were unbiased (6); maintained order (6) and mutual trust (4); and were experienced (3) and felt safe whereas teacher m1 said “I feel safe because we share the same culture with our administrators”.

High school teachers mostly attributed the reasons for trust based on school culture to ‘their school as a well-established institution respected by those around’ (10). In addition, teachers stated that they felt safe when there was a warm and sincere medium at school (3); their school was successful (2); the school maintained a good order (2). Teacher d14 stated that students from rural areas respect teachers more than other students. Another teacher d15 said that s/he felt safer with professional collaboration among teachers.

High school teachers mostly attributed the reasons for trust based on teachers to sincere relationships based on respect and love (19). In addition, teachers stated that they felt safe based on the following: collaboration and solidarity (13), and a good communication among teachers (10), teachers being tolerant and reasonable (5) with expertise and pedagogical formation (4), teachers acting in harmony (3) sensibly (3). In addition, teacher c1 stated that s/he felt safe because students motivated teachers with love and respect. Teacher k5 put forward guiding students, teacher m4 mentioned providing order, teacher s1 included young teachers, and teacher s2 added sharing a common goal as reasons for feeling safe.

Teachers mostly attributed the reasons for trust based on students to students acting with respect and politeness (24). In addition, teachers stated that they felt safe based on the following: high achieving students admitted through an exam (8), good relations with students (8), students with the sense of responsibility (3), students put in order through discipline (2). Whereas teacher T8 mentioned students owning their teachers as a reason for safety, teacher V3 added majority of students from outside the city, teacher m5 included students from better economic backgrounds, and teacher m6 mentioned hardworking students as reasons for safety.
Teachers mostly attributed the reasons for trust based on parents to *some parents caring and helping teachers* (12) and *sensible and wise parents* (10). In addition, teachers stated that they felt safe when *parents trusted, respected, and valued them* (5). Teacher E3 stated that s/he felt safe because *parents did not frequently visited school*.

Teachers mostly attributed the reasons for trust based on the Provincial Directorate for National Education to *better control and follow up by the Directorate* (5). In addition, teachers stated that they felt safe when *the relations with the Provincial Directorate for National Education were better* (3) and when *the Directorate did not practice favoritism* (3) and encouraged positive activities.

High school teachers mostly attributed the reasons for trust based on themselves to the following: *proficiency in the profession and satisfactorily fulfilling duties* (18) and *good relations with students, teachers, and parents* (10). Teachers also stated that they felt safe based on the following: *love for the profession and the students* (4), *being a safe person* (3), *being patient and wise* (2). Teacher m2 mentioned *his/her first years in the profession* as reasons for safety, teacher z4 added *being authoritative in the class*, teacher f5 put forward *knowingly applying to work in the school and knowing the administrators*, and teacher ms7 included *trying to have students apply to jobs* as reasons for safety.

In addition, teacher z5 stated that an increase in guidance-counselling services would make them safer; teacher v8 mentioned multiple numbers of teachers and teacher k1 added multiple social and cultural activities as reasons for feeling safe.

**Teachers’ Views on Why They did not Feel Safe**

Findings associated with why teachers did not feel safe were presented in relation to administrators, school culture, teachers, students, parents, and head of education department, environment, participants, and other reasons.

High school teachers stated mostly the following as the administrator-based reasons of distrust: *inefficiency among administrators* (10) and *favoritism* (7). In addition, they stated the following as other factors that made teachers feel unsafe: *administrators supporting the students when teachers confront the students* (5), *no security staff employed at schools* (3), *inattentive administrators* (2), and *teachers not being trusted* (2). Teacher m6 mentioned *very formal relationships* as a reason for unsafety, whereas teacher k7 added *no appreciation for achievements*, teacher h3 included *school administration together with students negatively spying on teachers*, and teacher e9 put forward *often replaced school administration*.

The most frequently stated reason, based on school culture, for distrust at schools by the teachers was *cultural conflict* (6). The following also were stated as the reasons, based on school culture, for distrust by the teachers: *no existing school culture* (2), *violence viewed as the solution to problems* (2), and *school with a negative image in the environment* (2). Teacher h2 added *wide-spread back biting at school* as another reason for feeling unsafe.
Teachers mostly stated the *cliques among teachers* (10) and *professional inefficiency* (5) for reasons to feel unsafe for. In addition, teachers stated the following as reasons why they felt unsafe: *people with behavioral issues* (3), *no loyalty towards the school and not embracing the school* (3), *very frequent changes* (3), *telling on people* (2), *teachers reflecting political views in the work environment and using students against others* (2). Teacher a3 added *viewing violence as solution* and teacher e4 mentioned *financial needs* as reasons for feeling unsafe.

Teachers stated mostly the following as the student-based reasons of distrust: *aggressive students capable of violence and crime and students fighting* (15) and *students exhibiting negative and disrespectful behaviors* (11). In addition, teachers stated that they had worries about the following: *students’ low and inefficient levels* (9), *irresponsible and insensitive students* (7), *language problems and local differences* (3), *students threatening teachers and their families* (2), *cliques among students* (2), *students acting impulsively* (2), and *unstable students without self-confidence* (2). Teacher v7 added *students’ financial issues*, and teacher o5 mentioned *TV and internet-addicted students* among reasons for feeling unsafe.

Teachers mostly stated the *inattentive and insensitive parents* (26) as the parent-based reason for distrust. Other reasons that teachers stated for distrust were as follows: *uninformed and insensible parents with low-levels of education* (6), *some parents sending their children to school only to be away from home* (5), *parents inclined for violence* (5), *parents always blaming teachers for their under-achieving children* (5), *some parents pressurizing and threatening teachers to let their children to pass* (3), and *parents coming to school with prejudices instilled by students* (2). Teacher o9 added *parents viewing claiming their rights against teachers as sending them to exile* as another reason for feeling unsafe.

Teachers mostly stated that they felt unsafe due to *inattentive and insensitive Directorate of Education in the city* (8) and *favoritism practices by the directorate* (4). Teachers also listed the other reasons why they felt unsafe as follows: *inefficient employees* (3), *difficulties in an unorganized structure* (2), *constant support only for administrators and students* (2), and *administrators securing their own interests* (2). Teacher a5 added *over-authorized administrators*, teacher z8 mentioned *viewing teachers as the source of all problems*, teacher s9 included *pressurizing teachers*, and teacher v9 *not doing an extensive work for schools and parents* as reasons for feeling unsafe.

Teachers stated that they mostly felt unsafe because they had *inadequate salaries and employee personal rights* (10) and *teachers were not valued adequately* (8). Teachers also stated the following reasons for feeling unsafe at work: *a structure practicing favoritism and not valuing worthiness* (5), *frequent changes in the education system* (3), *irregularities not being fixed* (2), *ministry acting to get students graduated not matter what it takes* (2), *very flexible discipline regulations* (2), *inattentive ministry not controlling education and instruction and not following up* (2), *inadequate resources provided to schools* (2), *curriculum far from the school level*, and *frequently replaced minister of national education*.

Teachers stated that they felt unsafe mostly due to *insensitive people with low education levels around* (10) and *school not located in a good environment* (6). In addition, teachers stated that they felt unsafe further due to the following reasons: *violence in the environment* (4), *strangers, around the school, occasionally harming the students* (4), *the lost respect towards teachers* (2), and *low socio-economic status of teachers* (2). Teacher m8 added *mass media placing violence in people’s agenda*, and teacher c2 included *disbelief in education* as reasons for feeling unsafe.

Interviewees mostly stated their *inadequate experience* (4) and *decrease in motivation due to economic problems* (3) as distrust reasons based on teachers themselves. In addition, they stated the following distrust reasons, based on teachers themselves: *exhaustion and reluctance* (3), *occasional sudden reactions, with nerves on edge* (2), and *being unable to tolerate unfairness* (2). Teacher ab7 added *upon being raised and educated in the west, not being able to adjust to the local culture*, teacher
v2 mentioned *starting to act selfishly*, and teacher m6 included *being sharp-tongued* among reasons for feeling unsafe.

In addition, high school teachers listed the following in relation to distrust: inequality in education in Turkey; increasing distance between the west and the east (teacher h3) and discipline regulations without deterrence (teacher ms4).

**The Reasons Why High School Teachers Felt Safe and Unsafe in relation to High School Type**

The reasons why teachers felt safe and unsafe were examined in relation to general, Anatolian, and vocational high school types.

**General High Schools**

General high school teachers mostly stated the following as reasons why they felt safe: *administrators fulfilling their duties* (10), *attentive, sensitive, understanding, unbiased, and tolerant administrators who listen to teachers* (10), and *who support and help them about anything* (8); *an established school respected by those around* (5); *sincere relationships based on love and respect among teachers* (9); *support and solidarity among teachers* (7); *respectful and polite students* (17); *some attentive parents who help teachers* (10); *City Directorate of National Education not practicing favoritism* (3); *ministry viewing the problem with an unbiased lens* (2); *safe school environments* (7); and *professionally efficient teachers satisfactorily fulfilling their duties* (9).

General high school teachers mostly stated the following as reasons why they felt unsafe: *inefficient administrators* (5), *cultural conflict* (6), *cliques among teachers* (5), *teachers’ professional inefficiencies* (5), *students with potential for fight and crime and inclination for violence* (11), *inattentive and insensitive parents* (13), *inattentive and insensitive City Directorate of National Education* (5), *ministry not adequately valuing teachers* (7), *teachers’ inadequate salaries and employee personal rights* (7), *not a good environment around the school* (4), *teachers’ low levels of education and insensible teachers* (4), and *interviewee’s lack of experience* (4).

**Anatolian High Schools**

Anatolian high school teachers mostly stated the following as reasons why they felt safe: *attentive, sensitive, understanding, unbiased, and tolerant administrators who listen to teachers* (6), *an established school respected by those around* (4), *sincere relationships based on love and respect among teachers* (5), *high achieving students admitted through test* (7), *sensible and wise parents* (4), and *professionally efficient interviewees satisfactorily fulfilling their duties* (5).

Anatolian high school teachers mostly stated the following as reasons why they felt unsafe: *inefficient administrators* (3), *inattentive and insensitive parents* (4), and *a structure practicing favoritism and not valuing merit* (5).

**Vocational High Schools**

Vocational high school teachers mostly stated the following as reasons why they felt safe: *administrators supporting and helping teachers with any issues* (8), *an established school respected by those around* (4), *support and solidarity among teachers* (6), *respectful and polite students* (5), *a safe environment around the school* (5), and *professionally efficient teachers satisfactorily fulfilling their duties* (4).
Vocational high school teachers mostly stated the following as reasons why they felt unsafe: favoritism (4), cliques among teachers (3), students’ low and inadequate levels of education (4), students with potential for fight and crime and inclination for violence (4), inattentive, insensitive, and insensible parents (9) with low levels of education (5).

**The Reasons Why High School Teachers Felt Safe and Unsafe in relation to Gender**

Among female teachers, the most frequently stated reason why they felt safe was about administrators fulfilling their duties (4) whereas male teachers stated that they felt safe if the administrators listen to the teachers and is attentive, sensitive, understanding, unbiased, and tolerant (18). Both female and male teachers stated the following reasons why they felt safe at school: the school as an established institution respected by those around, sincere relationships based on love and respect, respectful and polite students, and professionally efficient teachers who fulfill their duties. Male teachers mostly stated the following reasons why they felt safe: some attentive parents helping the teachers (11), ministry applications supporting teachers, and safe environment around the school. However, female teachers’ views could not form a consensus about why they felt safe.

Both female and male teachers stated that they felt unsafe when the following occurred: cliques among teachers, students with potential for fight and crime and inclination for violence, inattentive and insensitive parents, and teachers’ inadequate salaries and employee personal rights. Female teachers mostly stated the school not being in a good environment as reason why they felt unsafe whereas male teachers said that they felt unsafe because those around were insensible with low levels of education. Male teachers mostly stated that they felt unsafe due to inefficient administrators and inattentive and insensitive City Directorate of National Education. However, female teachers’ views could not form a consensus about why they felt unsafe.

**The Reasons Why High School Teachers Felt Safe and Unsafe in relation to Seniority**

All seniority groups mostly stated that they felt safe for the following reasons: the school as an established institution respected by those around, respectful and polite students, and professionally efficient teachers satisfactorily fulfilling their duties. The teachers within 0-5 and 6-10 years seniority group mostly stated that they felt safe when the administrators listened to the teachers and were attentive, sensitive, understanding, unbiased, and tolerant, when the relationships among teachers were sincere, and based on love and respect, and the environment around the school was safe. However, views of teachers within 11-and-more-year seniority group did not form a consensus. 0-5-year seniority group mostly stated that they felt safe when the parents were sensible and wise whereas 6-10-year-and-more group felt safe when some parents were attentive and helped teachers.

All seniority groups stated that they felt unsafe with inattentive and insensitive parents. Teachers in both 0-to-5 and 6-to-10-year groups mostly stated that they felt unsafe for the following reasons: cliques among teachers, students with potential for fight and crime and inclination for violence, and inadequate salaries and employee personal rights. However, the views of 11-year-and-over group teachers did not form a consensus. Teachers in the 6-to-10-year seniority group mostly stated that they felt unsafe when their administrators were inefficient and when teachers had cultural conflict but the views of other seniority groups did not form a consensus on that.
DISCUSSIONS AND CONCLUSIONS

In conclusion, high school teachers stated some views on the reasons for trust and distrust. It is considered significant what views teachers mostly emphasized. Frequencies of views that teachers stated about the reasons for trust and distrust are presented in Table 1.

<table>
<thead>
<tr>
<th>Reasons for trust and distrust</th>
<th>Frequency of views on trust</th>
<th>Frequency of views on distrust</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator</td>
<td>72</td>
<td>31</td>
<td>103</td>
</tr>
<tr>
<td>School culture</td>
<td>20</td>
<td>13</td>
<td>33</td>
</tr>
<tr>
<td>Teacher</td>
<td>61</td>
<td>28</td>
<td>89</td>
</tr>
<tr>
<td>Students</td>
<td>48</td>
<td>55</td>
<td>103</td>
</tr>
<tr>
<td>Parents</td>
<td>27</td>
<td>52</td>
<td>79</td>
</tr>
<tr>
<td>City Directorate of NE</td>
<td>12</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>Ministry</td>
<td>14</td>
<td>38</td>
<td>52</td>
</tr>
<tr>
<td>Environment</td>
<td>19</td>
<td>31</td>
<td>50</td>
</tr>
<tr>
<td>Interviewee</td>
<td>41</td>
<td>17</td>
<td>58</td>
</tr>
<tr>
<td>Total</td>
<td>314</td>
<td>290</td>
<td>604</td>
</tr>
</tbody>
</table>

N=138

As seen in Table 1, high school teachers stated more reasons for trust in total. Teachers stated reasons for trust and distrust mostly in relation to administrators (103) and students (103); then, respectively, teachers (89), parents (79), interviewees (58), ministry (52), environment (50), city directorate of national education (37), and school culture (33). Teachers stated reasons for trust mostly in relation to administrators (72), teachers (61), students (48), and interviewees (41) and reasons for distrust mostly in relation to students (55), parents (52), ministry (38), administrators (31), and environment (31).

As can be observed, teachers’ views on trust or distrust may be considered their perception of the points representing safety and unsafety. Namely, teachers’ views may indicate that teachers had the most trust issues with administrators and students and the least trust issues with the city directorate of national education and the school culture. Low level of trust issues with the school culture actually attracts attention. This may mean that teachers do not know what is included in the school culture because, during the data collection process, teachers often asked the researcher about what was included in the school culture.

In the current study, teachers in general complained about inefficient administrators acting biased. In Memduhoğlu and Zengin’s (2009) study conducted with Van elementary teachers, teachers also stated that the school administrators were the least fair and unbiased. Similarly, in Erdem’s (2008) study on general high schools around Turkey, teachers stated that they felt unsafe when their administrators were unfair and biased and practiced favoritism.

Teachers stated that they felt unsafe when students had potential for fight and crime and inclination for violence. In Karataş’ (2008) study also, more than half number of teachers in Ankara stated that students committed crime at school and acted violently. Similarly in Sarpkaya (2005, 242) and Karataş (2008) studies, teachers complained about inefficient rules for discipline and stated that a better understanding of discipline would prevent violence.

Teachers stated that they felt unsafe when parents were inattentive, insensible, insensitive, and aggressive. In Geyin’s (2007) study, as in the findings of the current research, teachers listed the incident when parents attacked the school administrator among reasons for feelings of distrust. At the same time, the weak relationships among parents, teachers, and students were considered associated with violence (Kepenekçi & Çınkır, 2006). As in studies on particularly job satisfaction, the quality of
job life (Erdem, 2008), and salaries, in the current research also, teachers complained about inadequate salaries and employee personal rights.

**In relation to high school type:**

In the current study, both general and vocational high school teachers stated that they felt safe *when students were respectful and polite* whereas Anatolian high school teachers stated that they felt safe *when the students were admitted through a test*. Similar to the findings of the current study, teachers said that they felt safe mostly when students were respectful towards school staff in Karataş’ study (2008) on general high schools in Keçiören, Ankara.

Both general and Anatolian high school teachers stated that they felt unsafe *when administrators were inefficient* whereas vocational high school teachers said that they felt unsafe *when their administrators practiced favoritism*. Similar to the findings of the current study, teachers stated that they felt unsafe when the administrators inefficiently supervised and controlled and inefficiently implemented the discipline measures in Dönmez and Güven’s (2002) study.

General high school teachers stated that they felt unsafe when the students were *aggressive with potential for fight and crime and had inclination for violence* whereas vocational high school teachers said that they felt unsafe *when the students’ levels were low and inadequate*. Similar to the findings of the current study, in Erdem’s (2008) study, teachers stated that they mostly felt unsafe due to acts of violence among students. Similarly, Dönmez and Güven’s (2002) study conducted in Malatya found that teachers felt unsafe due to threatening by students, fights among students, and teacher-students conflicts. Geyin’s study (2007) lists the safety issues experienced by general high school teachers as follows: students keeping dangerous materials such as knife or pocket knife on them, violence among students, students fighting within the school, and students beating teachers. In Öğülmüş’s (1995) study conducted about violence and aggressiveness in high schools, many students stated that there were fights outside the school borders and some students were injured. The same study indicated that general high schools more than the vocational high schools had similar issues. Students stated that there were physical attacks on teachers in many high schools. The same study found that there were more physical attacks on teachers by students in general high schools than vocational high schools.

General high school teachers stated that they felt unsafe *when the school was not in a very good environment* whereas vocational high school teachers said that they felt unsafe with *low levels of education without any awareness*. Teachers listed factors in the environment and the cultural characteristics as the most important issue impacting the trust of the school and stated that they felt unsafe with those around with low levels of education without awareness. In Geyin’s (2007) and Dönmez and Güven’s (2003) studies on high schools, teachers stated that they felt unsafe when some people around the school disturbed students. The disconnections between the school and the society as well as the decrease in ownership by the society are considered among the factors leading to violence and bullying at schools (Kepenekçı & Çınkır, 2006).

There was no significant difference in total found in the study conducted by Özer et al. (2006) on trust in general. However, on lower dimensions, there was a significant difference on the trust towards parents and students between the vocational and other high schools. Level of trust in vocational high schools was found higher than those in other high schools.

**In relation to gender:**

Female teachers stated different views than males did *on reasons why they felt safe* in relation to administrators, parents, ministry, and environment around the school. They shared the same views with male teachers in relation to school culture, teachers, students, and the interviewees.
On reasons why they felt unsafe, female teachers stated different views than male teachers did in relation to administrators, city directorate of national education, and the environment around the school. Female teachers shared similar views with the male teachers about teachers, students, parents, and the ministry.

Polat (2007), Geyin (2007), and Özer et al.’s (2006) studies on trust found that male teachers had higher perception of trust than female teachers did. Male teachers had particularly higher levels of trust towards administrators. Researchers thought that this may have been associated with better relationships with male administrators outnumbering female administrators. Yılmaz’s (2005) and Çokluk-Bökeoğlu and Yılmaz’s (2008) studies did not find such significant difference; however, male teachers’ levels of trust toward administrators were found to be relatively higher.

In relation to seniority:

On feeling safe, teachers in the 0-to-5 and 6-to-10-year seniority groups mentioned reasons associated with teachers, administrators, and the environment around the school, differently from the views of teachers in the 11 years-and-over group. However, teachers in all groups shared the same views on the reasons associated with the school culture, students, and the interviewees.

On feeling unsafe, teachers in the 0-to-5 and 6-to-10-year groups mentioned reasons with teachers and the ministry, differently from the views of teachers in the 11 years-and-over group. However, teachers in all groups shared the same views on the reasons associated with parents.

Geyin (2007) and Özer et al.’s (2006) findings showed that teachers in the beginning years had less trust in administrators than teachers in other seniority groups did. However, Polat’s (2007) study found just the opposite. Memduhoğlu and Zengin (2009), Çokluk-Bökeoğlu and Yılmaz (2008), and Yılmaz (2005) studies did not find a significant difference between female and male teachers.

In the current study, the following points that teachers listed associated with trust attracted attention: favoritism, cultural conflict, cliques among teachers, language issues, and some local differences. In the studies conducted on trust, a significant difference in relation to variables of number of teachers and school size in general was found. Level of trust is higher in schools with less numbers of teachers and students whereas it is lower in schools with higher numbers of teachers and students (Polat 2007; Özer et al., 2006, Çokluk-Bökeoğlu & Yılmaz 2008, Geyin 2007). The current study did not examine the levels of trust in relation to the number of teachers and students because general and vocational schools often have higher numbers of teachers and students whereas Anatolian high schools have less numbers of those. Therefore, it was not possible to run a comparison on teachers and students in the current research.

REFERENCES


The Effect of Interactive Book Reading Activities on Children’s Print and Phonemic Awareness Skills

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Abstract

The purpose of the current study is to investigate the effect of interactive book reading activities on children’s print and phonemic awareness skills. In the current study, the semi-experimental pretest-posttest control group design was used. The sampling of the study consists of 34 children attending independent kindergartens in the city of Kars. Of these 34 children, 17 were assigned to the experimental group and 17 were assigned to the control group. To the experimental group students, children’s books were read three times a week for eight weeks in total through the interactive books reading method. The control group students, on the other hand, were read books through the traditional book reading method. In the analysis of the collected data, Mann Whitney U Test and for relational measurements, Wilcoxon Signed Ranks Test was used. At the end of the study, it was found that the interactive books reading activities had significant effects of the development of the children’s phonemic and print awareness skills.

Key Words: Interactive book reading, phonemic awareness, print awareness, pre-school period

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INTRODUCTION

The experiences gained by children in pre-school period affect their cognitive and socio-emotional development and provide the basis for reading and general academic achievement in the following years by improving their early literacy skills (Ergül, Akoğlu, Sarıca, Tufan and Karaman, 2015). One of the experiences provided to children in preschool period and affecting their early literacy skills is co-reading activities. According to Ergül, Sarıca, Akoğlu (2016), book reading activities, which children perform at home and school together with adults, are one of the intervention methods frequently used to develop early literacy skills. Oghi, Loo and Mizuike (2010) compared the neural activations of the children listening to stories from the video and those of the children to whom their mothers read stories and found that the children listening to their mothers had more neural activities in their frontal lobe responsible for the attention and linguistic development than the children watching videos.

There is a strong relationship between the quality of reading activities in the preschool education programs and children’s linguistic and early literacy development (Justice and Pullen, 2003). When the related literature is examined, it is seen that the studies that emphasize the effects of the quality of book reading on children's early literacy skills draw attention to different book reading methods. According to Triviette and Dunst (2007), there are three methods to develop early literacy skills of pre-school children. These are, dialog-based book reading (interactive book reading), interactive collaborative book reading and collaborative book reading.

Interactive book reading is a book reading technique developed by Whitehurst et al. to develop children’ linguistic and early literacy skills in the pre-school period by means of children’s active participation and reciprocal collaboration. In this method of book reading, adults direct children to open-ended questions rather than close-ended questions, expand their answers by repeating them and use reinforcements according to the interests of children (Efe and Temel, 2018; Justice and Pullen, 2003; Lonigan, Anthony, Bloomfield, Dyer and Samwel, 1999).

Whitehurst et al. (1994) described the role of children and adults in interactive book-reading activities through the techniques called CROWD (Completion – Recall – Open-ended – Wh-questions - Distancing) and PEER (Prompt – Evaluate – Expand - Repeat). The technique abbreviated as CROWD includes activities such as asking children to define a term or sentence of a story, asking questions about characters or events, asking open-ended questions requiring children to describe pictures and to make guesses, asking 5N1K questions about the book, asking children to establish links with their own lives and the events. The PEER technique includes activities such as initiating the speech, checking the accuracy of the answers given by the child, expanding the child's answers using appropriate words or sentences, and asking for the repetition of the corrected or expanded responses. The main aspect that distinguishes interactive reading from other reading methods is that the roles of reader and listener are interchanged between children and adults during the reading. Adults ask questions as active listeners, encourage children to explain in more detail the events or pictures in the book and provide them with tips. Children are reinforced in line with their answers and adults expand their answers (Zevenbergen & Whitehurst, 2003).

Opel, Ameer and Aboud (2009); in their study conducted to explore the effect of the interactive book reading and the traditional book reading methods on preschoolers’ vocabulary, found that a significant increase occurred in the vocabulary of the children who were read interactively while no change was observed in the vocabulary of the children exposed to the traditional book reading activities. Şimşek (2017) compared the interaction-based book reading, e-book reading and traditional book reading methods and calculated the receptive language, expressive language and total language scores of the participants. As a result of this study, the difference between the pretest and posttest mean scores of the children in the interaction-based reading group was found to be higher. While no difference was found between the pretest and posttest mean scores of the children in the e-book
reading group, the traditional method was found to have increased their receptive language mean score. Research on interactive book reading emphasizes that this method provides more gains than traditional book reading methods. In this context, reading activities in preschool educational institutions should be seen as a method that significantly affects early literacy skills rather than being perceived as a necessity of the curriculum. The use of interactive reading methods rather than traditional reading methods is important for supporting early literacy skills (Ergül et al., 2015). Interactive book reading significantly affects children’s literacy experiences and attitudes in the following years by considerably improving their early literacy skills. Print and phonemic awareness is among the early literacy skills affected by the interactive book reading method. Phonemic awareness includes recognizing words, syllables, first sound, final sound and sound units (Strout, 2008). Children acquire phonemic awareness skills through books that are read to them and the interaction environment provided for them. Children who start to understand the structure of sounds can make a significant progress in the early literacy process. In order to support the development of early literacy skills in pre-school period, it is very important to understand the relation between written language and spoken language and to gain awareness about the sound units (Phillips, Menchetti and Lonigan, 2008).

Print awareness is the ability to understand the rules and functions of the written language. In the preschool period, children are expected not to read what has been written, but to learn the concepts of the written language and to develop awareness about writing (Justice and Ezell, 2004). Questions such as “What do children do when they take a book in their hands? Do they open it correctly? Do they start from the front face of the book? Do they look at the first page of the book? Are they interested in pictures or writings? Do they turn one page at a time? Where do they start the story? Where do they start reading? In which direction do they read?” are all related to print awareness skills (Clay, 2000). According to Justice and Sofka (2010), the components of print awareness are “book and writing order (name of the book, author, order of the pages and direction of the letter); meaning of the writing (function of the writing, environmental writings, and the concept of reading); letters (capital and lower-case letters, letter names, the concept of letter) and words (concepts related to words, short and long words, definition of the word)”.

The related research emphasizes that in the interactive reading method, adults follow the writings in a book with their finger and voice the target sound units, which helps children to establish a connection between writing and reading, to recognize the sound properties of writing and words and that explanations made about the words before listening to a story contribute to children’s learning vocabulary and promote their linguistic and vocabulary development (Ezell and Justice, Luo et al., 2014; 2000; Sim and Berthelsen, 2014; Wasik and Bond, 2001; Wing-Yin Chow, McBride-Chang, Cheung and Ce Chow, 2008; Zucker, Cabell, Justice, Pentimonti and Kaderavek, 2013).

In addition, studies that emphasize the effect of interactive book reading activities on language and early literacy skills of children in risk groups indicate that children at risk can perform similar to their peers in terms of literacy, reading comprehension and academic skills through these activities (Akoğlu, Ergül and Duman, 2014; Ergül et al., 2015; Fleury and Shwartz, 2017; Lonigan et al., 1999; Towson and Gallagher, 2016; Vally, 2012). Considering the relevant research, it is clear that the use of the interactive book reading method in pre-school period is important to support the multifaceted development of children. When the literature related to this subject in our country is reviewed, it is seen that research highlighting the effect of different intervention conditions and the family in the interactive book reading process comes to the fore. Determination the effects of the interactive book reading method used by teachers in pre-school education institutions is important to increase the diversity in the field and to shed light for further studies. In addition, conducting empirical studies on this subject will contribute to the widespread use of the interactive book reading method and active intervention programs instead of traditional book reading activities. In this regard, the purpose of the current research is to determine the effect of interactive book reading activities on children’s print and phonemic awareness. To this end, answers to the following sub-questions were sought.
• Is there a significant difference between the pretest scores of the children subjected to the interactive book reading method and those of the children not subjected to this method?

• Is there a significant difference between the posttest scores of the children subjected to the interactive book reading method and those of the children not subjected to this method?

• Did the children’s vocabulary and print awareness and phonemic awareness skills improve significantly after interactive book reading activities?

**METHOD**

**Research Design**

The current study employed the pretest posttest quasi experimental design with a control group. Experimental research allows exploring the effect of the differences created by the researcher on the dependent variable (Büyüköztürk, 2012). As the experimental and control groups were not randomly assigned and a match was sought between the pretest scores related to the dependent variable in the current study, the study can be defined as quasi-experimental. The independent variable of the current study is interactive book reading activities and the dependent variable is preschoolers’ phonemic and print awareness skills.

**University and Sampling of the Study**

The universe of the current study is comprised of children attending state and independent preschool institutions in the city of Kars in 2017-2018 school year. The sampling of the study consists of 34 children selected by means of the convenience sampling method. In the selected kindergarten schools, pre-test was administered and one of the classes with similar pre-test scores was assigned to the experimental group and another one was assigned to the control group. In both of the experimental and control groups, there are 17 students.

**Data Collection Tools**

The data in the current study were collected by using the “Phonemic Awareness Scale” and the “Pre-school Word and Print Awareness Evaluation Tool”. The “Phonemic Awareness Scale” developed by Yangın, Erdoğan and Erdoğan (2008) aims to measure children’s sensitivity towards sounds. The scale has five tasks each of which has seven items. While administering the 35-item scale, children are asked different questions. Each correct answer is assigned 1 point and each false answer is assigned 0 point. In order to evaluate the other dependent variable of the study; children’s word and print awareness skills, the “Pre-school Word and Print Awareness Evaluation Tool” adapted to Turkish by Bayraktar (2013) was used. The evaluation tool consists of two parts which are concepts of writing (name of the book, front cover, back cover, title page, direction and function of writing and the concept of word and direction of the letter) and word recognition (short, long, initial, final letters, the number of words in a page, capital and lower-case letters, letter names, the concept of letter). For each part, a separate story book is used. Each correct answer is given 1 point and each false answer is given 0 point.

**Data Collection and Analysis**

In the kindergarten classes from the independent pre-school institution, the “Phonemic Awareness Scale” and the “Pre-school Word and Print Awareness Evaluation Tool” were administered as the pretest. Two classes with similar pretest scores were selected and one of them was
assigned to the experimental group and the other one was assigned to the control group. Considering the pre-reading stages of the interactive book reading method, a total of 24 books were selected to be read, three books each week, thus a total of 24 books in the 8-week period. The selected books were suitable for the development level of the students and for each book, the target words and sound units were determined. Then, the questions, examples and explanations were determined and the necessary physical arrangements were made. The seating of the children in the class was determined and then the children were introduced to the books. Via the open-ended questions, the children’s guesses were elicited and then their answers were rearranged. During the reading process, the meanings of the target words were explained. The meanings of the target words were clarified with pictures and supplementary materials and examples that would be associated by the children with their own lives were presented. The other stages followed during the interactive book reading process were repetition of the meanings of the target words, making the story more relevant through past experiences, supporting phonemic and print awareness skills, asking 5N 1K questions, using repetitions and expansions and enhancing vocabulary with sentence completion. After the completion of the reading of the book, the story was summarized by using open-ended questions and through the activities, retention of the gains was reinforced (Ergül et al., 2016). In the experimental group, the interactive book reading activities were carried out by the researcher by following these stages for the 8-week period. No intervention was made to the control group; only traditional book reading activities were conducted. At the end of the 8-week period, both the experimental group and the control group were administered the “Phonemic Awareness Scale” and the “Preschool Word and Print Awareness Evaluation Tool” as the posttest. The collected data were entered into SPSS (Statistical Package for Social Sciences) program package. As the data did not show a normal distribution, non-parametric tests were used in the analysis process. In order to determine whether there is a significant difference between the participants’ pretest and posttest mean scores depending on the group type, Mann Whitney U Test was used. In order to determine the effect of the interactive book reading activities on the children’s word and print awareness skills and phonemic awareness skill, Wilcoxon Signed Ranks Test was used.

**FINDINGS**

In this section of the current study, the findings are presented in the order of the sub-problems. Within the context of the first sub-problem of the study, Mann Whitney U Test was conducted to determine whether the children’s receptive and expressive language skills vary significantly depending on the group variable and the results are presented in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Group</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>U</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td><strong>Word Awareness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Experimental</td>
<td>17</td>
<td></td>
<td>20,50</td>
<td>348,50</td>
<td>93,50</td>
<td>.070</td>
</tr>
<tr>
<td>Control</td>
<td>17</td>
<td></td>
<td>14,50</td>
<td>246,50</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Print Awareness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>17</td>
<td></td>
<td>16,53</td>
<td>281,00</td>
<td>128,00</td>
<td>.561</td>
</tr>
<tr>
<td>Control</td>
<td>17</td>
<td></td>
<td>18,47</td>
<td>314,00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 1, there is no significant difference between the pretest mean scores taken by the experimental and control groups from the sub-dimensions of the Word and Print Awareness Evaluation Tool (word awareness: U= 93,50; p> .05; print awareness U= 128,00; p> .05). This shows that before the experimental intervention, the word and print awareness skills of the experimental and control group students were similar.
As can be seen in Table 2, there is a significant difference between the posttest mean scores taken by the experimental and control groups from the sub-dimensions of the Word and Print Awareness Evaluation Tool (word awareness: U= 5,00; p> .05; print awareness U= 13,50; p> .05). When the mean ranks are examined, it is seen that the word and print awareness skills of the experimental group students subjected to the interactive book reading method are higher than those of the control group students. Thus, it can be argued that the interactive book reading method is more effective in enhancing children’s word and print awareness skills.

As can be seen in Table 3, there is no significant difference between the pretest mean scores taken by the experimental and control groups from the sub-dimensions of the Phonemic Awareness Test (U= 129,50; p> .05). This shows that before the experimental intervention, the phonetic awareness skills of the experimental and control group students were similar.

As can be seen in Table 4, there is a significant difference between the experimental and control group students’ posttest phonemic awareness mean scores (U= 17,00; p> .05). When the mean ranks are examined, it is seen that the phonemic awareness skills of the experimental group students subjected to the interactive book reading method are higher than those of the control group students. Thus, it can be argued that the interactive book reading method is more effective in enhancing children’s phonemic awareness skills.

The results of Wilcoxon signed ranks test conducted to determine whether the children’s pretest and posttest word and print awareness skills vary significantly are presented in Table 5.
Table 5. The Results of Wilcoxon Signed Ranks Test Conducted to Determine whether the Children’s Pretest and Posttest Word and Print Awareness Skills Scores Vary Significantly

<table>
<thead>
<tr>
<th></th>
<th>Pretest-Posttest</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
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<td>.00</td>
<td>3.66</td>
<td>.00</td>
<td></td>
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<tr>
<td>Positive Ranks</td>
<td>17</td>
<td>9.00</td>
<td>153.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Print Awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
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<td>.00</td>
<td>.00</td>
<td>3.66</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>17</td>
<td>9.00</td>
<td>153.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>0</td>
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<td></td>
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</table>

As can be seen in Table 5, there is a significant difference between the participating children’s pretest and posttest word and print awareness mean scores ($z=3.66$, $p<.05$). When the mean ranks and sums of the difference scores are examined, it is seen that this difference is in favor of the posttest mean scores. Thus, it can be argued that the interactive book reading instruction has a significant effect on the development of the children’s word and print awareness.

The results of Wilcoxon signed ranks test conducted to determine whether the children’s pretest and posttest phonemic awareness skills vary significantly are presented in Table 6.

Table 6. The Results of Wilcoxon Signed Ranks Test Conducted to Determine whether the Children’s Pretest and Posttest Phonemic Awareness Skills Scores Vary Significantly

<table>
<thead>
<tr>
<th></th>
<th>Pretest-Posttest</th>
<th>n</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
<th>z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phonemic awareness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
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<td>.00</td>
<td>.00</td>
<td>5.025</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>33</td>
<td>17.00</td>
<td>561.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ties</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As can be seen in Table 5, there is a significant difference between the participating children’s pretest and posttest phonemic awareness mean scores ($z=3.66$, $p<.05$). When the mean ranks and sums of the difference scores are examined, it is seen that this difference is in favor of the posttest mean scores. Thus, it can be argued that the interactive book reading instruction has a significant effect on the development of the children’s word and print awareness.

**DISCUSSION AND CONCLUSION**

In the current study, examining the effect of interactive book reading activities on children’s phonological and print awareness, it was found that the phonological and print skills of the children subjected to the interactive book reading method improved more than the other children. This can be explained as the reflection of the interactive book reading method on the children’s phonological and print awareness skills. While interactive book reading activities were conducted in the experimental group for eight weeks, the traditional reading method was used in the control group. Through the stimuli provided by adults in the interactive book reading method, children can recognize the rules of the written language and raise their awareness of the direction of writing, letters, spelling and punctuation. Efe and Temel (2018) investigated the effect of the interactive book reading program on the print awareness of the preschoolers with low socio-cultural characteristics and in this connection, they applied the program to the experimental group students for ten weeks, three days a week. At the end of this ten-week period, it was found that the interactive book reading program highly increased the print awareness performance of the children of the families with low socio-economic
characteristics and speaking a language different from the language of education. Justice and Ezell (2002) investigated the effect of interactive book reading activities on the print awareness and the skill of focusing on writing of the preschoolers from low-income families. As a result of the study, it was concluded that in all the measurements regarding writing, recognizing the words in writing and alphabet knowledge, the experimental group is more successful than the control group. Ergül et al., (2016) researched the effect of the interactive book reading (EKO) applications on the early literacy skills of the children at low socio-economic level and found that this intervention program had significant effects on the children’s print awareness and phonemic awareness skills (Ergül et al., 2016). Research on the interactive book reading method (Chow and McBride-Chang, 2003; Hargrave and Sénéchal, 2000; Hindman, Skibbe and Foster, 2014; Levin and Aram, 2012; Mol, Bus, de Jong and Smeets, 2008; Şimşek and Işıkoğlu, 2015; Wasik and Bond, 2001; Whitehurst and Lonigan, 1998) emphasizes that these intervention programs offered to children at early ages make important contributions to their receptive and expressive language skills. When the findings of the current study are evaluated together with the related literature, it can be argued that the interactive book reading method has significant effects on the development of children’s word and print awareness skills.

Another sub-problem of the study requires the comparison of the experimental and control group students’ phonemic awareness skills as a result of the application of the interactive reading book method. It was found that the phonemic awareness skills of the experimental group students developed more than those of the control group students. These results are parallel to the findings reported in the literature. Justice, Kadevarek, Bowles and Grimm (2005) examined the effect of parents’ interactive book reading activities on children’s phonemic awareness skills and found that the interactive book reading activities enhanced the children’s phonemic awareness when the parents drew the children’s attention to phonemic characteristics of the words. Ergül et al (2015); Ezell and Justice (2000); Luo et al. (2014); Sim and Berthelsen, (2014); Whitehurst et al. (1994) are other studies reporting that interactive book reading activities have significant effects on language skills including phonemic awareness.

According to Ergül, Sarica and Akoğlu (2016), phonemic awareness skills included within the early literacy skills and associated with the future literacy skills can be nurtured through interactive book reading applications. The target phonemes determined before reading should be highlighted where appropriate during reading (e.g. attracting children’s attention to the target phoneme when it is located at the beginning of the word, showing other words beginning with the same phoneme in the story, etc.) and phonetically encoding the target words (pronouncing individual phonemes making up words one by one) will contribute to the acquisition of phonemic awareness skills. In addition, asking children to repeat these encodings will help children to realize the phonological organization of words and to apply this skill to other words. In the current study, while the interactive book reading method was applied in the experimental group, the traditional book reading method was applied in the control group. Tepetaş Cengiz (2015) examined the relationship between children's language development and pre-school teachers’ picture story book reading activities. In the study, it was found that preschool teachers did not perform any activity in the scope of phonological skills during the picture story books reading activities and that the phonological skills of the children aged 48-60 months were not supported by the preschool teachers. When the findings of the current study are evaluated in light of the related literature, it can be argued that the negligence of the phonemic awareness skills in the traditional reading methods can be one of the reasons for the less development of these skills in the control group students of the current study. Within the context of the current study, it was also determined whether the word and print awareness and phonemic awareness skills of the experimental group students varied significantly after the application. In light of the findings obtained in the current research, it can be said that interactive book reading method has a significant effect on the development of the children’s word and print awareness and phonemic awareness skills. In studies conducted in different settings (family) or with different study groups (children at risk) in relation to interactive reading activities, the impact of these activities on language skills has been emphasized. Akoğlu, Ergül and Duman (2014) investigated the effect of an interactive book reading program on the receptive and expressive language skills of children at the age of 4-5 who are at risk and are in need of protection. As a result of the research carried out with the children staying in nursery schools and girls'
orphanages and continuing their pre-school education, it was determined that the interactive book reading program led to an increase in the number of morphemes and words and the diversity of different words used by the children. Yıldız Bıçakçı, Er and Aral (2018) examined the effect of parents' interactive story readings on language development of children. A three-session seminar was given to the parents about the process of book reading. After the seminar, parents were asked to read a total of 27 books to their children; three books a week. As a result of the research, it was concluded that the interactive book reading activities improved the children's language skills. Evans, Williamson and Pursoo (2008) conducted a study to determine the interest of preschool children in writing during the process of interactive book reading. Within the context of the research, the 3-5 year old children’s interest in writing was investigated during the process of interactive book reading in relation to the variables of age, individual differences, and adults’ pointing at the words. As a result, it was found that when the adults pointed at the words, the children looked at the book longer.

In light of the findings of the current study, the following suggestions can be made: Considering the impact of interactive reading activities on children's early literacy skills, these activities can be promoted instead of traditional reading activities. Research can be planned for the implementation of interactive book reading activities in different intervention environments (such as home, private education institutions, child protection institutions). In-service trainings for pre-school teachers can be organized on the role of teachers in the early literacy process. The current study employed the quantitative research method. The effectiveness of interactive book reading activities in terms of children, parents and children can be investigated by means of qualitative or mixed research methods.

REFERENCES


A Descriptive Content Analysis of the Studies on Mathematics Education in International Classroom Teaching Education Symposium (USOS)

Sedat Turgut
Bartin University

Abstract

By using the descriptive content analysis, this research study aimed to evaluate the studies on mathematics education presented within the scope of International Classroom Teaching Education Symposium (USOS) and published in proceeding book between 2014-2018. Findings of the study indicated that the number of studies conducted about mathematics teaching has increased in last five years. In terms of publishing language, the studies were in Turkish and conducted by Turkish researchers although USOS is an international scientific event. In terms of research field, the number of the studies conducted in the field of geometry and examining mathematics and geometry together is quite few. In terms of study group/sample, the research studies were conducted with elementary students, pre-service elementary teachers and elementary teachers. In terms of research model/pattern, survey and case studies were preferred by a majority. Besides, the information on research model/pattern was not stated in a majority of research studies. As a data collection tool; test, interview form, scale, open-ended question and questionnaire were mostly used. In some studies, the information about data collection tool was not given. As data analysis technique, content analysis and predictive statistical techniques were commonly used. In a majority of the studies, the information about data analysis technique was not given.

Keywords: Elementary teaching, Descriptive content analysis, Mathematics teaching, Symposium, Paper

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INTRODUCTION

Mathematics is a part of modern life. It can be said that having basic mathematical knowledge and skills makes it easier to meet daily life needs. Depending on the scientific and technological developments, the individuals who can understand and achieve mathematics will have many more opportunities in terms of their future in gradually digitalizing world (National Council of Teachers of Mathematics [NCTM], 2000). Mathematics equips the individual with strong tools as logical reasoning, problem solving and the ability of concrete thinking for understanding and changing the world. Mathematics is important for most employment areas in everyday life (Department for Education and Employment [DfEE], 1999). It is clear that many professions require mathematical efficacy. From this point of view, it can be identified that having mathematical efficacy is an important factor for slightly opening the doors of a better future.

Mathematical efficacy includes five elements patterned into each other as conceptual understanding, operational fluency, strategic competence, adaptable reasoning and productive tendency. Conceptual understanding includes the comprehension of concepts, operations and relationships. Operational fluency expresses flexible, correct and relevant way of doing the operations. Strategic competence contains the skills of formulating, representing and solving mathematical problems. Adaptable reasoning is associated with the capacity of logical reasoning, explaining, reflecting and justifying. On the other hand, productive tendency expresses accepting mathematics as contributive and worth the effort, combining individual belief in diligence with personal efficiency (Kilpatrick, Swafford and Findell, 2001). Conducting mathematical instruction by focusing on mathematical efficacy elements will increase the quality of teaching. Thus, the students will not be exposed to a way of mathematics teaching depending on the presentation of a mere teacher or a context of a book and they will perform behaviors towards mathematical efficacy elements. Consequently, they will be grown up as competent and qualified individuals who are able to apply mathematics.

It can be stated that efficiency and effectiveness of mathematical instruction is related to the interaction among mathematical context, teacher and student. The teachers’ way of using mathematical knowledge and mathematical context, their concern about the students and participation of students in mathematical tasks are effective in mathematics learning and teaching (Kilpatrick et al., 2001). Teachers’ way of motivating students in activities, their expectations from students, their interactions with the students, the contents and presentations they prepare can be listed as the main factors effecting teaching and learning.

Elementary school is the place where the students primarily meet mathematics as a subject which is instructed. This meeting is the start point of a long journey of developing mathematical knowledge and questioning. Elementary school years are the times when the students learn to love or hate mathematics, the feelings of hopelessness and failure appear first, misconceptions frequently occur and get lost very hard. Therefore, elementary teachers should be aware of their own roles in overall mathematics teaching process. Elementary teachers introduce mathematical language, symbolism, meanings and ways of thinking to the students. Thus the basic opinions which will be needed in following years will be established strictly in an early stage (Cowan, 2006; Lerman, 1998).

Encouraging, motivating and interesting tasks and activities should be used by teachers in order that the acquisition of basic mathematical skills can be at the required level and their achievement by all students can be provided (Cowan, 2006). The students should have the tendency of using mathematics in order to develop mathematical methods for interpreting the world, to develop problem solving skills and solve the problems they encounter (Jørgensen and Dole, 2011). Elementary mathematics teaching should adopt the pedagogies that address to the variety within the classroom. It is important for students to be able to associate mathematics with real world beside of being able to establish relationships between mathematics and the other fields. Elementary teachers have a significant role in providing students with the awareness of the fact that mathematics is a discipline directing many areas of the life. Elementary teachers should appreciate students and believe that all
students can learn mathematics. They should develop instructional activities towards improving the knowledge and self-confidence of the students towards using and applying mathematics.

The scientific studies examining the continuous interactions among teacher, students and mathematical context are important in determining the effectiveness of teaching. The existing and further scientific studies about the nature, development and evaluation of mathematical efficacy will direct mathematics teaching. Scientific proofs will provide making improvements, making effective decisions and updating curriculums in mathematics teaching. Depending on this, it can be said that extensive, systematic and continuous scientific research studies are needed. It can be identified that national and international scientific events have an effective role at this point. USOS held in Turkey in the field of elementary teaching education is an important scientific event where the studies conducted about the field are shared with scientists, undergraduates and graduates, and teachers. The event organized first in 1994 with the name of National Classroom Teaching Education Symposium has continued to be held on different dates and hosted by different universities. The seventeenth symposium of the event having had an international status from the fourteenth one was organized in 2018.

Investigating the literature, Bektaş, Dündar and Ceylan (2013) did a study investigating the papers presented in National Classroom Teaching Education Symposium between 2006-2010 years in terms of various variables. They investigated 705 papers by approaching their different dimensions in their research. In this study, it is aimed to evaluate the papers related to only mathematics teaching, presented within the scope of USOS and published in proceeding book in last five years (2014-2018). The factors that the electronic and published versions of abstract books of these years can be reached and USOS has been held as an international scientific event since 2015 were effective in preferring the last five years. Current status of elementary level will have been described via this research that focuses on mathematics teaching. Thus, it is considered that contributive information can be presented to the researchers by providing a holistic viewpoint to mathematics teaching in primary school. With this purpose, abstract books of the symposiums held between 2014-2018 years were investigated. The following research questions were searched within this scope.

1. What is the distribution of the research studies in terms of number according to years?
2. What is the distribution of the research studies in terms of language according to years?
3. What is the distribution of the research studies in terms of number of authors according to years?
4. What is the distribution of the research studies in terms of author title according to years?
5. What is the distribution of the research studies in terms of author nationality according to years?
6. What is the distribution of the research studies in terms of research field according to years?
7. What is the distribution of the research studies in terms of their purpose according to years?
8. What is the distribution of the research studies in terms of their subject according to years?
9. What is the distribution of the research studies in terms of study group/sample according to years?
10. What is the distribution of the research studies in terms of research model/pattern according to years?

11. What is the distribution of the research studies in terms of data collection tool according to years?

12. What is the distribution of the research studies in terms of data analysis technique according to years?

METHOD

In this research, descriptive content analysis was used. The research results and tendencies are systematically evaluated by approaching all the research studies done on any subject in descriptive content analysis (Çalık and Sözbilir, 2014; Lin, Lin and Tsai, 2014; Selçuk, Palancı, Kandemir and Dündar, 2014; Sözbilir, Kutu and Yaşar, 2012). With this purpose, the general tendencies of the research studies can be determined by systematically investigating the qualitative and quantitative research studies having been done in association with the determined subject (Selçuk et al., 2014). Thus, the general status and the tendencies related to the field can be presented to the researchers (Cohen, Manion and Morrison, 2007). In this research, the qualitative and quantitative research studies towards mathematics teaching were approached in terms of USOS and the results were presented by being evaluated through descriptive content analysis technique.

Data Collection

The data were obtained by document analysis. With this purpose, electronic or published versions of five abstract books of USOS organized between 2014-2018 years were reached. The following criteria were determined in order to provide that the papers in abstract book were entirely related to the aim of the research: (i) The papers should be presented at USOS between 2014-2018 years, (ii) The papers should be published in USOS abstract book between 2014-2018 years, (iii) The papers should be related to mathematics teaching. Regarding these criteria, the abstract books of five years were investigated and the research studies that would be included in content analysis were determined. When table of contents sections of abstract books were investigated, it was seen that the papers were divided according to their subject fields. Depending on this, the papers placed within the scope of mathematics teaching section were investigated in each abstract book. Consequently, 244 papers were included in content analysis.

Data Analysis

Content analysis technique was used for analyzing the data. The similar data are interpreted by being grouped within the frame of the determined themes and categories and presented to the reader in a comprehensible way in content analysis (Creswell, 2014; Yıldırım and Şimşek, 2011). A coding technique existing in the literature can be used in content analysis while a new coding technique can be developed. Additionally, the intended data can be reached by adding new codes to an existing coding technique within the scope of research requirements (Smith, 2000). A form including descriptive information about the papers that were approached within the scope of the research purpose was developed in this research. The descriptive information in the form are as follow: research year, research language, research author number, title of the author(s) conducting the research, author(s) nationality, study field of research, research purpose, research subject, research study group/sample, research model/pattern, data collection tools used in the research and the techniques used for analyzing research data. The papers were coded by the researcher carefully within this frame. In order to provide coding reliability, the researcher repeated coding operation three weeks after the first coding. Finally, the coding forms were compared. Any differences were not found between the coding forms compared. After this operation, the data were analyzed in regard to the coding form and the findings are presented in tables.
FINDINGS

The findings obtained on the basis of the questions determined in accordance with research purpose are respectively presented in tables. The distribution of the research studies in terms of number according to years is given in Table 1.

Table 1. Distribution of the Research studies in Terms of Number According to Years

<table>
<thead>
<tr>
<th>Number of Research studies</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22</td>
<td>36</td>
<td>77</td>
<td>43</td>
<td>66</td>
<td>244</td>
</tr>
</tbody>
</table>

Investigating Table 1, it is seen that minimum number of research studies related to mathematics teaching were done in 2014 with 22 research studies while maximum number of research studies were in 2016 with 77 research studies. Totally 244 research studies were done in this field in five years.

The distribution of the research studies in terms of language according to years is given in Table 2.

Table 2. Distribution of Research studies in Terms of Language According to Years

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkish</td>
<td>22</td>
<td>35</td>
<td>74</td>
<td>42</td>
<td>65</td>
<td>244</td>
</tr>
<tr>
<td>English</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Total Research Number</td>
<td>22</td>
<td>36</td>
<td>77</td>
<td>43</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

Investigating Table 2, it is seen that all of the research studies were written in Turkish in 2014. One study in 2015, three studies in 2016 and one study in 2017 were written in English. In 2018, all of the studies (except for one) are given with both their Turkish and English version.

The distribution of the research studies in terms of number of authors according to years is given in Table 3.

Table 3. Distribution of Research studies in Terms of Number of Authors According to Years

<table>
<thead>
<tr>
<th>Number of Authors</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Author</td>
<td>4</td>
<td>7</td>
<td>14</td>
<td>13</td>
<td>14</td>
<td>52</td>
</tr>
<tr>
<td>Two Authors</td>
<td>10</td>
<td>16</td>
<td>35</td>
<td>15</td>
<td>43</td>
<td>119</td>
</tr>
<tr>
<td>Three Authors</td>
<td>4</td>
<td>12</td>
<td>23</td>
<td>8</td>
<td>5</td>
<td>52</td>
</tr>
<tr>
<td>Four Authors</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>7</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Five Authors</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Investigating Table 3, it is seen that the research studies were most frequently conducted by two authors. The number of the research studies with four and five authors is few.

The distribution of the research studies in terms of author titles according to years is given in Table 4.
Investigating Table 4, it is seen that titles of research authors are not placed in abstract book published in 2017. Author titles are not stated in the abstract books published in some years. The research studies were generally conducted by academic staff. Among academic staff, mostly assistant professors and research assistants conducted the research studies. The number of the research studies conducted by undergraduates is quite few. Additionally, it can be said that the number of research studies conducted by teachers and graduates is also few.

The distribution of the research studies in terms of author nationality according to years is given in Table 5.

Investigating Table 5, it is seen that the authors of the research studies carried out in last five years towards mathematics teaching are all Turkish. USOS has been continued as an international event since 2015. Nevertheless, a foreign researcher is not found among the conductors of the research studies towards mathematics teaching within the scope of USOS.

The distribution of the research studies in terms of study field according to years is given in Table 6.

Investigating Table 6, it is seen that the maximum number of studies were conducted on mathematics in terms of study field. It can be implied that the number of studies conducted in geometry field is small; the number of studies where geometry and mathematics fields are studied together is quite few.
The distribution of the studies in terms of their purposes according to years is given in Table 7.

### Table 7. Distribution of Studies in Terms of Purpose According to Years

<table>
<thead>
<tr>
<th>Purpose</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Described</td>
<td>5</td>
<td>15</td>
<td>23</td>
<td>13</td>
<td>25</td>
<td>81</td>
</tr>
<tr>
<td>Measured</td>
<td>14</td>
<td>13</td>
<td>22</td>
<td>16</td>
<td>16</td>
<td>81</td>
</tr>
</tbody>
</table>

The research studies, purpose of which is clearly stated and all information is completely given are considered only.

Investigating Table 7, the research studies are approached under two headings as described and measured. By described heading, qualitative research studies; by measured heading quantitative research studies are represented. The number of studies within the scope of described and measured titles varies according to years. Even so, the total numbers of studies approached under two headings in five years are equal. More detailed information about research purposes is given in Table 7a.

### Table 7a. Distribution of Research studies in Terms of Purpose According to Years

<table>
<thead>
<tr>
<th>Purpose</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Described</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opinion/Thought</td>
<td>1</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>31</td>
</tr>
<tr>
<td>Strategy</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Metaphor</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Behavior</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Error</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Perception</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Awareness</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Skill</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Achievement</td>
<td>3</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>Motivation</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Attitude</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Belief/Faith</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>3</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Value</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Perceived</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Awareness</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Skill</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

Investigating Table 7a, it is seen that the research studies approached within the scope of described heading are mostly related to opinion and thought. It is aimed to reveal the opinions and thoughts about the related subject in this type of research studies. On the other hand, the studies related to achievement are the most frequent ones within the scope of measured heading. In this type of studies, it is aimed to measure the achievement in related subject. In addition to this, perception and awareness related research studies are found within the scope of both described and measured headings. At this point, describing the perception or awareness is aimed in one study it is aimed to measure it in another one.

The distribution of the studies in terms of their subjects according to years is given in Table 8.
### Table 8. Distribution of Research studies in Terms of Subject According to Years

<table>
<thead>
<tr>
<th>Subject</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Numbers (Natural numbers, fractions, whole numbers)</td>
<td>1</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Four Operations</td>
<td>-</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Problem</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>8</td>
<td>11</td>
<td>43</td>
</tr>
<tr>
<td>Pattern</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Proof</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mathematical Language</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching Experience</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Thinking Techniques</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Mathematics Teaching</td>
<td>1</td>
<td>8</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>Program</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Field Knowledge</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Game</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Technology</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>International Comparison</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Mathematical Modeling</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Mathematics Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realistic Mathematics</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conception</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>Misconception</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Activity</td>
<td>2</td>
<td>-</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Mathematics Course</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>2</td>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>Book</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

Some studies are included in both headings according to their subjects.

Investigating Table 8, the research studies are approached under two headings as mathematics and mathematics education in terms of their study subjects. The subjects of problems and numbers were studies within the scope of mathematics heading. A majority of the studies related to numbers is about fractions. Under the heading of mathematics education, the subjects of mathematics course, mathematics teaching and conception were intensively studied.

The distribution of the studies in terms of study group/sample according to years is given in Table 9.

### Table 9. Distribution of Research studies in Terms of Study Group/Sample According to Years

<table>
<thead>
<tr>
<th>Study Group/Sample</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elementary Students</td>
<td>7</td>
<td>5</td>
<td>27</td>
<td>9</td>
<td>31</td>
<td>79</td>
</tr>
<tr>
<td>Pre-service Elementary Teachers</td>
<td>8</td>
<td>14</td>
<td>14</td>
<td>10</td>
<td>12</td>
<td>58</td>
</tr>
<tr>
<td>Elementary Teachers</td>
<td>1</td>
<td>7</td>
<td>16</td>
<td>4</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Middle School Students</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>Course books</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Pre-service Mathematics Teachers</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>3</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>PISA-TIMSS Data</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Mathematics Teaching Program</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Elementary Teacher and Students</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Middle School Mathematics Teacher</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Graduate Dissertations</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>3</td>
</tr>
</tbody>
</table>
Investigating Table 9, it is seen that elementary students, pre-service elementary teachers and elementary teachers generally constitute the study groups/samples of the research studies. Besides, there are some studies including pre-service elementary, preschool, mathematics and science teachers, pre-service elementary and mathematics teachers, pre-service preschool and elementary teachers, pre-service elementary, mathematics and science teachers, elementary and mathematics teachers, preschool and elementary teachers together. Once again, there are some studies sample of which are constituted by pre-service mathematics teachers, pre-service preschool teachers, middle school students, middle school mathematics teachers and high school students.
The distribution of the research studies in terms of research model/pattern according to years is given in Table 10.

**Table 10. Distribution of Researches in Terms of Research Model According to Years**

<table>
<thead>
<tr>
<th>Research Model/Pattern</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantitative</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Survey</td>
<td>5</td>
<td>4</td>
<td>4</td>
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Investigating Table 10, it is seen that the number of the studies not including the information of research pattern/model is relatively high in all the abstract books of five years. While surveys and case studies were more commonly preferred, meta-analysis and meta-synthesis studies were conducted less often.

The distribution of the research studies in terms of data collection tools according to years is given in Table 11.

**Table 11. Distribution of Research studies in Terms of Data Collection Tools According to Years**

<table>
<thead>
<tr>
<th>Data Collection Tool</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
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<td>Form and Self-Evaluation Form</td>
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<td>5</td>
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</table>

Investigating Table 11, it is seen that the data collection tool used is not stated in some research studies. Test, interview form, scale, open-ended question and questionnaire were most commonly used as data collection tools in the research studies. Whereas the data collection tools were generally used singly, multiple data collection tools were used in some research studies.
The distribution of the research studies in terms of data analysis technique according to years is given in Table 12.

**Table 12. Distribution of Research studies in Terms of Data Analysis Technique According to Years**

<table>
<thead>
<tr>
<th>Data Analysis Technique</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>Total</th>
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<tbody>
<tr>
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<td>20</td>
<td>5</td>
<td>19</td>
<td>52</td>
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<td>7</td>
<td>19</td>
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<td>52</td>
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<td>2</td>
<td>4</td>
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<tr>
<td>Descriptive Analysis Techniques (%, f, mean, standard deviation, etc.)</td>
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<td>1</td>
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<td>25</td>
<td>18</td>
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</table>

Investigating Table 12, it is seen that content analysis and predictive statistical techniques were most frequently used as data analysis techniques. In some studies, multiple techniques were used together. Additionally, it has been seen that the data analysis technique was not stated in a majority of the research studies.

**DISCUSSIONS, RESULTS, AND RECOMMENDATIONS**

In this study, the research studies presented in USOS and published in abstract books have been investigated through content analysis method. According to research findings, it is seen that the number of studies conducted about mathematics teaching has increased for the last five years. There were 65 research studies about mathematics teaching in National Classroom Teaching Education Symposium between 2006 and 2010 years (Bektaş et al., 2013). The number of research studies conducted between 2014 and 2018 is 244. Depending on this, it can be said that the number of researchers towards elementary mathematics teaching and interest in the field has increased.

It has been seen that the research studies are generally in Turkish in terms of their publishing languages. On the other hand, the Turkish and English versions of the research studies were published together in the abstract book of 2018. Similarly, Çıtaş, Güler and Sözbilir (2012), stated that a majority of mathematics education research studies conducted between 1987 and 2009 years were published in Turkish. It can be said that publishing English versions of the research studies is important in terms of international literature. Hence, the researchers will be provided with being referenced in international literature and conducting mutual research studies. Thereby it can be said that the researchers should be encouraged to publish their works in English.

The research studies were generally carried out by two authors. This result is consistent with the literature (Alper and Gülbahar, 2009; Kutluca, Birgin and Gündüz, 2018; Kutluca and Demirkol, 2016; Tatar, Kağızmanlı and Akkaya, 2013). The number of the studies conducted by four or five authors is quite few. Accordingly, it can be said that the researchers in the field are not in enough cooperation and teamwork. Additionally, the point belonging to each author decreases as the number of authors increases when the scientific research studies are graded in Turkey. This might be encouraging researchers for working individually or with fewer colleagues.
It has been identified that the research studies are carried out by academics generally. Among the academics, assistant professors and research assistants have a larger place. Investigating the literature (Kutluca et al., 2018; Kutluca and Demirkol, 2016), similar results have been obtained. Depending on this, it can be said that the participation of elementary teachers, undergraduates who study in elementary teaching department and graduates who carry out research studies in this field should be promoted in USOS.

USOS has been organized as an international symposium since 2015. However, it has been seen that all of the research studies in last five years in USOS were conducted by Turkish researchers. Depending on this, it can be expressed that USOS should be introduced within a larger international scale. Participation at an international level can be provided in this way.

The research studies mostly focus on mathematics field. It has been seen that the number of studies in geometry field or both in mathematics and geometry fields is few. When elementary mathematics teaching program is reviewed, geometry-related outcomes are placed at each grade from 1st to 4th grades in terms of learning domain (MoNe, 2017). Regarding this, it can be said that more studies are needed towards teaching geometry in elementary schools. Revealing opinions and thoughts and measuring achievement was intended mostly in the research studies. Correspondingly, it can be enounced that there are not enough studies regarding implementation. Important contribution can be provided to the field by conducting practical research studies.

The studies related to problems and numbers were carried out in terms of mathematics subjects. In mathematics teaching issues, the subjects of mathematics course, mathematics teaching and conceptions were intensively studied. This result is similar to some research results in the literature. Kutluca, Birgin and Gündüz (2018) stated in their research that mathematics education related issues were generally studied; pedagogical field knowledge and conceptual issues had a larger place among these. Ulutaş and Ubuz (2008) stated that the numbers subject was mostly studied in the research studies conducted in the field of mathematics education. According to Yaşar and Papatğa’s (2015) research results, four operations and problem solving subjects were most frequently studied. When elementary mathematics teaching program is reviewed (MoNE, 2017), outcomes related to the learning domains of numbers and operations are predominant. In addition to this, the outcomes related to the learning domains of geometry, measurement and data processing are placed in the program with different bodies. Thereby it can be said that the number of studies towards geometry, measurement and data processing learning is few, many more studies are needed in these domains.

In terms of study group/sample, the research studies were generally carried out with elementary students, pre-service elementary teachers and elementary teachers. This result has similarity with the studies in the literature (Bektaş et al., 2013; Küçüoğlu and Ozan, 2013; Ulutaş and Ubuz, 2008). Besides, there are some studies including pre-service mathematics teachers, pre-service preschool teachers, middle school students, middle school mathematics teachers and high school students as study group/sample. USOS focuses on classroom/elementary teaching. Therefore, it can be said it is expected that elementary students, elementary teachers and pre-service elementary teachers are focused by the research studies.

In terms of research model/pattern, surveys and case studies were more frequently preferred. This result is similar to existing literature (Çiltaş et al., 2012; Çiltaş, 2012; Küciğözlu and Ozan, 2013). The meta-analysis and meta-synthesis studies were done rarely. The studies conducted within a certain field can be approached in a holistic way through meta-analysis and meta-synthesis studies (Çalık and Sözbilir, 2014). Thus, the current status of the field can be determined and the researchers can be offered with an insight to the field. Thereby it can be said that there is a need of meta-analysis and meta-synthesis studies at elementary level. Additionally, it has been identified that the information of research model/pattern was not stated in a majority of research studies. Similarly, Küciğözlu and Ozan (2013) determined some studies not including the pattern in their research studies. It can be stated that this is an important deficiency. Hence, it can be expressed that the research studies not including research model/pattern should not be placed in abstract books. Furthermore, it has been observed in
the research studies in which some overall expressions like “in this quantitative/qualitative study ..., ...quantitative/qualitative approach has been accepted, in the study where quantitative/qualitative research paradigm was accepted ..., the research is a qualitative/quantitative research and ...” etc. were used and the research model/pattern was not stated. Depending on this, it can be said that the researchers should be careful when deciding on the expressions they will use.

Test, interview form, scale, open-ended question and questionnaire were mostly used as data collection tool in the research studies. This result is similar to the research results in the literature (Çiltaş et al., 2012; Çiltaş, 2012; Ulutaş and Ubuz, 2008; Yaşar and Papatğa, 2015). It has been seen that only one data collection tool was utilized in the research studies. The information obtained from a single measurement tool, method and technique can be limited and subjective (Denzin, 1989). Variety in research studies provides the opportunity of reaching more extensive and deeper knowledge (Miller and Fox, 2004). Accordingly, it can be identified that multiple data collection tools can be used in the research studies in order to reach more extensive and reliable results. Once again, the information of data collection tool was not given in some research studies. It can be considered that this can cause problems with validity and reliability of the research results.

Content analysis and predictive statistics techniques were mostly used as data analysis techniques. Similarly, Çiltaş et al., (2012), Küçüoğlu and Ozan (2013) pointed out in their research studies that descriptive statistics and predictive statistics methods were used as data analysis techniques. According to Çiltaş (2012), Bektaş et al., (2013), predictive statistics and descriptive statistics were mostly used. Differently in this research, it has been revealed that content analysis technique was commonly used for data analysis. Depending on this, it can be said that the use of qualitative research methods has increased. Single data analysis technique was utilized in the research studies. It can be said that this result is directly related to data collection tools. As the variety of data collection tools extends, the probability of using multiple data analysis method will increase. It can be said that validity and reliability of the research studies will be affected positively. In a majority of the research studies, the information of data analysis technique was not given. In some studies, general expressions like “the data was analyzed through qualitative techniques, quantitative method was used in data analysis” were used. This will affect validity and reliability of research results negatively.

Stating the steps followed in the research studies in a clear and comprehensible way will provide reaching scientifically correct results. Therefore, it can be said that the studies not including enough information about the steps such as study group/sample, research method/pattern, data collection tool, data analysis technique etc. should not be placed in scientific publications like abstract books. Thereby it will be beneficial in terms of the scientific perspective if the researchers become more regardful by considering the related factors when conducting their studies.

REFERENCES


**Proceeding Books Included in Descriptive Content Analysis**


Understanding the polygon with the eyes of blinds

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Abstract

This study investigated the concept images of blind students about the polygon concept. For this purpose, four open-ended questions were asked to five blind middle school students. During the interviews, geometric shapes were presented with raised-line materials and blind students were given opportunities to construct geometric shapes with magnetic sticks and micro-balls. Qualitative research techniques applied in grounded theory were used for analyzing documents pictures, which were taken from magnetic geometric shapes that blind students constructed, raised-line materials and researchers’ observation notes and interviews. As a result, it is determined that blind students have more than one concept image for the polygon concept. They scrutinized the polygon concept analytically not with a holistic perspective. They were often conflicted about triangle, rectangle, square, circle and circular region whether or not being a polygon. They also encountered with the difficulties associated with the combination of polygon sides’ endpoints consecutively.

Keywords: blind students, concept definition, concept image, polygon, geometry education
INTRODUCTION

In our changing and developing world, individuals understanding geometry and admiring geometry in nature and its effects in daily life may have the opportunity to shape their own future, because geometry develops individuals’ logical and intellectual abilities (National Council of Teacher of Mathematics [NCTM], 2006). So, individuals begin to see, know and understand their physical world (Ubuz, 1999). However, it is obvious that it is not easy to understand the physical world for the visually impaired students (VISs), i.e. partially sighted or blind students (BSs). The communication of mathematical knowledge such as writing algebraic and geometric notations, graphics, diagrams mostly in visual forms (Edwards, Stevens & Pitt, 1995), makes the situation even harder. Moreover, without the ability to read and write the symbols representing the mathematical concepts, mathematics does not exist for VISs (Kapperman & Sticken, 2003). But everyone has a different way of learning. VISs, especially BSs, learn by touching, hearing and most importantly via cognitive processing because of their inability of seeing or partially seeing ability. Therefore, teachers should configure BSs’ comprehension of mathematical and especially geometric concepts much better. In fact, mathematics has a socially shared and logically configured conceptual system (Godino, 1996). For this reason, the importance of teaching and learning concepts in BSs cannot be ignored. However, there are some remarkable studies upon teaching mathematics and especially geometry to VISs. According to these studies, VISs, especially BSs faced some challenges. The first challenge is about the absence of textbook, note taking tools, access to symbols and technological assistance like electronic braillewriter, drawing tools, auditory or raised-line or tactile materials (Dulin, 2008; Kohanová, 2008; Pritchard & Lamb, 2012; Rule, Stefanich, Boody & Peiffer, 2011). The second challenge is about contextual situations. For instance, teachers have difficulties about guiding BSs to an understanding of concepts for which they have no context such as estimation, perspective, solids of rotation (Dulin, 2008; Pritchard & Lamb, 2012). In addition, they have difficulties mostly in generalizing, translating activities into mathematical knowledge, and translating and transferring three-dimensional objects into two-dimensional iconic forms (Kohanová, 2008). Besides, the major part of the VISs form their own particular mathematical language in accordance with their conditions and requirements (Kohanová, 2008). The third challenge is about VISs’ mathematics teachers and their teaching. Because the mathematics and geometry use so many drawings, graphs, diagrams, symbols, charts, and other illustrations to present content and relationships, these have been particularly challenging for VISs, and difficult for many special education teachers who are unfamiliar with the content (Rule et al., 2011). Nevertheless, the achievement of VISs is directly affected by their teachers’ teaching effectiveness. Indeed, teacher of these students are not specially educated in this field in Turkey like in some other countries, they often have to use the ‘trial and error’ method to find the best way of teaching as Kohanová (2008) referred. Research shows that if the instruction is tailored to individual needs, any students can reach his/her cognitive potential in this process (Pritchard & Lamb, 2012; Spindler, 2006) because, blind individuals’ visual images and memories have astonishingly remarkable capacity (Haber, Haber, Levin, & Hollyfield, 1993; Landau, Gleitman, & Spelke, 1981; Landau, Spelke & Gleitman, 1984; Millar, 1985). According to Kohanová (2007), VISs can explain objects like cube, prism, pyramid, cylinder, triangle, circle, trapezoid, square, and rectangle better and more precise than the sighted students in the concepts of shape and location. Moreover based on senses, they can name and distinguish basic geometric shapes and solids (Srichantha, Inprasitha & Ariratana, 2008). Furthermore, Kennedy (1993) observed the ability to draw 3D objects of BSs. This capacity of BSs can be used for mathematical thinking and understanding. By this means, the opportunities for BSs to understand geometry and thus physical world better can be provided. For this reason, educators need to understand how VISs understand the concepts and need to know what is going on in VISs’ minds to get a quality education. In fact, there is disharmony between concepts formulized by mathematicians and interpreted by students (Tall, 1992). At this point the concept image (CI), which is first brought out by Vinner and Hershkowitz (1980), emerges. Tall and Vinner (1981) defined the CI as one’s total cognitive structure related to a mathematical concept such as processes, evokings, features and mental images. These structures are formed as a result of individual’s experiences and continuous changes with a new stimuli, that is, they are formed as a result of students experiences occurred with concepts’ definitions and examples (Vinner & Dreyfus, 1989). Namely knowing the concept definition does not guarantee comprehension of that concept (Vinner,
1991) but helps understanding concepts truly. Thereby, mathematical knowledge is not a phenomenon transferred only formally. Furthermore, the CI of individuals may be inconsistent about its content and may evoke images appearing contradictory to each other in different times that a student is not aware, if those individuals do not see these relations and transitions (Rösken & Rolka, 2007; Tall & Vinner, 1981). The reason for this may be the idea of Vinner and Dreyfus (1989) that ‘CI generally consists of typical examples, but not of a concept definition’. In fact, Fujita and Jones (2007) points out that learners’ thinking is likely to be influenced by specific examples called prototype. According to Hershkowitz (1990), each concept has one or more prototype examples that are attained first, and therefore, exist in the CI of most subjects. Thus, learners use prototypical judgement either in a visual form or in the form of knowledge of the properties or attributes of the geometric figure (Hershkowitz, 1989, 1990). It should be conceived here that every geometrical concept has also a visual image. In this context, Fischbein (1993) explained geometrical figures as figural concepts because of their double nature. Thus, geometrical figure is not only a visual image but also a concept itself. However, visual images of that concept may be more dominant than the concept (Türnüklü & Berkünn, 2013). Therefore, it can be said even in the existence of a formal definition that the relationship between the visual prototype and the definition of the shape is often disconnected. As a result of this, most individuals have difficulties and numerous misconceptions even in naming, classifying and determining the most basic geometry concepts (Akuyusal, 2007; Carreño, Ribeiro & Climent, 2013; Erez & Yerushalmey, 2006; Erşen & Karakuş, 2013; Fujita, 2012; Fujita & Jones, 2007; Heinze & Ossietzky, 2002; Hershkowitz, 1989; Horzum, 2016, 2018; Kartal & Çınar, 2017; Monaghan 2000; Shaughnessy & Burger, 1985; Türnüklü & Berkün, 2013; Ward, 2004). One of the geometrical concept challenging for individuals is polygon. For example, 7th grade students did not accept the polygons with special names such as rhombus, square rectangles as polygons (Akuyusal, 2007). According to this, the students thought that the geometric shapes with five sides or more are polygon. Carreño and her colleagues (2013) found that when a preservice teacher was asked to draw polygonal and non-polygonal shapes, she had a regular and convex polygon image. The results obtained from various age groups showed that individuals have problems with hierarchical classification of quadrilaterals and with naming, drawing/constructing, defining polygons (Erez & Yerushalmey, 2006; Erşen & Karakuş, 2013; Jujita, 2012; Fujita & Jones, 2007; Heinze & Ossietzky, 2002; Monaghan, 2000). Related to these results, the ‘horizontal length’ of typical images of rectangles disturbed individuals’ perceptions of ‘inclusion relationships’ of quadrilaterals and caused them not likely to accept that a square is a special type of rectangle (Hershkowitz, 1989; Monaghan, 2000; Ward, 2004). Ward (2004) reported that K-8 preservice teachers’ CIs for right triangles were comprised of gravity-based right triangles, and for hexagons were regular, convex, and gravity-based too. In addition, some researchers (Kartal & Çınar, 2017; Shaughnessy & Burger, 1985) reached the conclusion that defining polygons with straight sides could not prevent the individuals to decide a shape with curve being polygon. Individuals also have misconceptions related to the sum of interior and exterior angles of polygon. Students thought the sum of the exterior angles increases as the number of sides increases just like the interior ones (Hadas, Hershkowitz & Schwarz, 2000). Despite all these difficulties and misconceptions, the concept of polygon has a major place in teaching geometry especially at a primary and middle school level. It is important that the side, corner and polygon CIs are structured in a healthy way in the minds of the individuals up to middle school level. Because of containing most of the geometry concepts and being included in many concepts such as prism, pyramid, teaching and learning polygon is significant effect on geometry education. Considering that sighted individuals, even preservice teachers and teachers have conceptual difficulties, it is important to study polygon concept in VISs to provide the equitable teaching. Besides, the experiences that the first author of this investigation had in her volunteer lessons for three years to the VISs have directed to this study. For example, some of VISs mentioned that there are polygons called in Turkish as ‘birgen’, ‘iğken’, ‘iğen’ and so on. These naming were obtained by suffixing the word ‘-gon’ at the end of the numbers. In this way, it was observed that these VISs ignored the attribute of having 3 or more sides which is the most critical critical attribute for the polygon. Thus, learning the images of the VISs about the polygon may give clues to mathematics teachers, special education teachers and teacher educators for teaching geometrical concepts to VISs.
Mathematics education and the visually impaired students

Six basic principles for a qualified mathematics education were introduced in reform movements, which were started by NCTM in 1989 and have reached today: Equity, teaching program, teaching, learning, evaluation and technology. One of these, enacting equity in education has increasingly become a common concern for practitioners and policy makers in the World (Herrera, Jones & Rantala, 2006, p.7). Thus, the importance of education for every person is emphasized with some documents such as Individuals with Disabilities Education Act (IDEA, 2007) which were signed as The Education for All Handicapped Children Act in 1975 and were organized a few time, Salamanca Statement (UNESCO, 1994), Principles and Standards for School Mathematics (NCTM, 2000) and No Children Left Behind Act (2001). That is to say, many countries such as Australia, Canada and USA support disabled individuals’ education through regulations and state policies and there are also detailed regulations for disabled individuals’ education in Turkey as well. Basic National Education Act (with number 1739) and Special Education Services Regulation (MoNE, 2006) are the most important ones. For example, Basic National Education Act (with number 1739) indicates that “all children have right to have education regardless of their disabilities”. Considering the fact that many students are struggling with mathematics and fail over and over again (PISA, 2015; TIMMS, 2016), it can be guessed that disabled students may have to cope with more difficulties than even from students without any disability. But whatever their personal characteristics, previous experiences or physical difficulties, all students must find opportunities to receive mathematics education and learn mathematics (NCTM, 2000, p.12).

Visual impairment is one of the disabilities that individuals may face. VISs, especially BSs cannot benefit from their visual senses, and so they are disadvantaged because they have to learn concepts only related to hearing, touching etc. As a matter of fact, visual impairment affects a person’s development in other areas somehow and generally all dimensions of development are negatively affected by disabilities (Brian & Haegle, 2014; Erol, Riedler & Eryaman, 2016; Lieberman, Houston-Wilson & Kozub, 2002). While mental functions of most of them are normal, their cognitive, social and language skills are negatively affected as they cannot receive and understand any visual information from their environment (Kizar, 2012; Sucuoğlu & Kargın, 2006). For that reason, they may face many serious problems especially about area and space concepts. VISs can use the reflection of a voice through their hearing ability and know the distance and direction of the object; however, it may not be possible for them to know what the object is without touching it or asking information from other persons with direct experience (MEGEP, 2013, p.13). However, all concepts cannot be learned through touching and hearing. Especially abstract ones are difficult to learn for VISs. According to Rule and her colleagues (2011), VISs have difficulties because of the abstractness of mathematical or geometrical concepts. Nevertheless, there are limited number of studies that handle VISs’ understanding about concepts such as triangle and some other geometrical concepts (Argyropoulos & Argyropoulos, 2002; Horzum, 2013, 2016). It is determined that VISs have the right understanding as well as misconceptions about the related concept. For example, they knew the angle as a point, a side, an interval between the rays/line segments (Argyropoulos & Argyropoulos, 2002; Horzum, 2013, 2016). VISs also believed that the interval between the rays/line segments is a line segment and this situation led VISs to perceive sides as angles in triangles, and even triangle as a straight angle (Horzum, 2013, 2016). Consequently, correct expression of definition is important in academic sense, scrutiny of personal descriptions and properties of concept directed by the conceptual understandings are also significant. Thus, one can gather deep knowledge upon BSs’ learnings by providing clear description of cognitive structure about concepts. With this, BSs’ conceptual comprehensions and misconceptions can be revealed. In this regard, as one of the basic concept of geometry and being introduced since primary school and containing most of the geometry concepts, the polygon is handled in this study. In this investigation, what the images of BSs for the polygon are investigated through qualitative approaches. It is important to emphasize that comparing the sighted and visually impaired individuals is not the aim of this study.
METHOD

This qualitative investigation is a case study to investigate deeply the CIs related to the polygon of BSs. A case study requires investigating and analyzing a group or an event deeply (Merriam, 2009). The case in the current study is the BSs chosen to determine CIs related to the polygon.

Participants

This investigation was realized with five congenitally BSs aged between 12-15 studying at a school for the visually impaired in Central Anatolian region of Turkey. All participants were selected through in-course/out-course observations, the opinions of mathematics teachers of visually impaired students and voluntariness of students and named as S₁, S₂, S₃, S₄, S₅ for anonymity and confidentiality reasons. During the 2-month observations, the first author observed the social activities, friendship relationships, and habitats of the students in their boarding school without interfering with the lives of the participants. Besides, the performances in the mathematics courses during 2-month observations were a factor in the selection of these students. The participants volunteered to participate and they were students who had taken the mathematics courses which the polygon handled in elementary education (1-4 grades) and the secondary school 5 grade. According to school records, all of these students were successful in the overall assessment of the mathematics courses in the earlier years.

Data collection tool and process

Different data collection methods were used in order to get various information about BSs’ understanding of the polygon. The semi-structured interviews were applied as the main data collection tool. Besides, observation notes and pictures of geometric shapes created with magnetic materials (micro-balls and magnetic-sticks), raised-line materials and geometry board were used as supporting data collection tool. In the interviews, BSs were asked four different questions to solve (see Appendix). While preparing these questions, three justification were taken into consideration. The first one of them is that the students’ awareness about the existence of concave and complex polygons is beneficial in terms of learning the concept of polygon (Argün, Arikan, Bulut & Halıcıoğlu, 2014, p.86). Second, the identification of examples and non-examples of a given concept, problem solving and mathematical proofs can encourage students to use the formal concept definitions (Vinner, 1991). Third, non-examples were useful if they were sequenced by matching them with examples in such a way as to focus on the critical attributes (Tennyson, Steve & Boutwell, 1975). Then for the validity of interview questions, it was consulted with the three experts having a PhD degree in mathematics education, a geometry scholar, a PhD student in mathematics education, and two teachers teaching mathematics to VISs. In order to determine the appropriateness of interview questions, a pilot study was realized with two low-visibility students who took mathematics courses in elementary, middle and high schools and required corrections were made. As a result, in the first question BSs were asked to draw (meaning here to construct) three polygon and then they were asked to indicate why these shapes are polygon. In the second question, BSs were asked to determine whether the given 15 different shapes (examples, non-examples) are polygon or not and to state the reasons for being or not being a polygon. Thus, it was questioned which definitions and characteristics were used by BSs for the concept of polygon. It is important to specify that 5th, 6th, 7th, 10th, 12th, 13th, 14th, 15th figures do not provide the definition of polygon given in the data analysis section. For example, the 5th figure, in other words circle, does not have any sides which should be line segment for being a polygon. The 6th figure specifies a rectangular area. In the 7th, 12th and 14th figures, combining of the sides at the endpoints is not provided. The consecutive junctions of the sides is not provided in the 10th and 15th figures. The 12th, 13th and 14th figures have curve segments. Besides, 4th and 9th figures are complex polygons and 1st, 2nd, 8th and 11th figures are non-convex polygons. The third and fourth questions were used to deepen the results of the first two questions. According to this, it was aimed to obtain deeper information about the participants’ CIs about the angles of polygon through a concave quadrilateral.
given in the third question. Finally, it was aimed to obtain deeper information about the participants’ CIs related to the sides properties of polygon with the fourth question.

During the interviews, the participants was requested to use geometry board or the magnetic materials to constitute the geometrical shapes. So, it is assumed that constructing geometric shapes with these materials is equivalent to drawing of that shape. Because, Klingenberg (2007) specified that the drawing is difficult for blind individuals. In addition, some of the questions were presented to the students through the raised–line materials. Before the interviews, magnetic and raised-line materials were introduced and BSs were asked to think of the micro-balls as points and magnetic-sticks as thin threads. This is second assumption of this investigation. Moreover, participants were allowed to interact with these materials for a while before the interviews. Participants were asked to answer questions with as much detail as possible. Interviews were audiotaped and videotaped with permission of participants and their families. Additional interviews were performed in the situations in which the students were not clear. BSs’ non-verbal behaviors during interviews were also observed. Lastly, document analysis included analyzing every kind of representation used by participants when answering the questions such as pictures which were taken from magnetic geometric shapes that BSs constructed and raised-line materials. For this, the audio and video-recorded data were transcribed and the data were checked by the researchers. Later on, the pictures of geometrical shapes constructed by participants, observations of researchers and the implications of students were inserted to the data into transcribed data.

Data analysis

The data were first one-by-one and then comparatively scrutinized and the analysis was supported with data analysis techniques of grounded theory- that is open coding, axial coding and selective coding. The process of data collection and analyzing was carried out simultaneously. In this process, the answers for the first and second question were separately categorized and sub-categorized. These categories and sub-categories were compared with each other. After this coding process, common categories were formed for the first and second questions. However, after the axial coding it was found that some of the categories were still unclear, undiscovered or superficial. Therefore, additional interviews were applied to clarify these uncertainties and to deepen the superficial statements. For example, some of the BSs who defined polygon as a geometrical shape, having sides referred in the first question that the sides of the polygon should be line segments. But some of them did not say anything about the nature of the polygon’ sides and referred in the second question that the 5th and 12th figure were polygon. In this situation, it was needed to ask these BSs about the nature of the polygon’s sides. Then 3rd and 4th questions were applied to deepen the obtained categories which were about the understanding the polygon as a geometrical shape having sides and angles. Similar methods such as analyzing firstly the data from third question and then data from 4th question, after that additional interviews were applied. After all these processes were completed, the categories and sub-categories were combined to form common categories and they were compared among the students constantly. Finally, additional interviews were held to determine the dominant images of BSs who used contradictory expressions at the same or different times. In these interviews, to determine the dominant CIs of BSs, the questions that created contradictions in different time periods were asked at the same time. When this method does not work, interviews were conducted with questions similar to the questions that constituted the contradiction. However, if BSs still specified conflicting expressions, it was assumed that the BSs had two different CIs in their minds.

During the data analysis process, understandings of BSs on polygon were merely focused on. According to this, data analysis was done by taking into account the definitions of polygon, concave polygon, convex polygon, complex polygon, and the exterior angle of a polygon. According to Argün and his colleagues (2014, p.84), the definition of the polygon is as follows: Let’s consider three non-linear \(A_1, A_2, \ldots, A_n\) points (corners) in the same plane, where \(n\) is a natural number, \(n \geq 3\). \([A_1A_2] \cup [A_2A_3] \cup \ldots \cup [A_{n-1}A_n] \cup [A_nA_1]\) is called polygon in which \([A_1A_2], [A_2A_3], \ldots, [A_{n-1}A_n], [A_nA_1]\) are line segments. Yet, there is widespread opinion among the mathematics educators that the circle is a polygon, but the definition of the polygon concept handled in this study reveals that the circle can not
be a polygon. Because, we can not construct the circle through the points with finite number and line segments combining them (ibid, p.86). Besides, polygons can be classified as convex and non-convex polygons. According to Downing (2009, p.254), ‘most useful polygons are convex polygons; in other words, the line segment connecting any two points inside the polygon will always stay completely inside the polygon’. And he describes the non-convex polygon as a polygon that is not convex (concave), that is, it is caved in. On the other hand, complex polygon is a polygon whose sides cross over each other one or more times (“TurtleDiary.com”, n.d.; “Tutorvista.com”, n.d.). Lastly, an exterior angle of a polygon is an positive angle formed by one side of the polygon and the line that is the extension of an adjacent side (Downing, 2009, p.125).

The coherence was provided by checking the relationships between the themes obtained from data and sub-themes forming the themes. To increase the internal validity of the research, the researchers separately analyzed the data. In addition, a third researcher independently rechecked obtained codes. Using the formula – Reliable = Agreement/(Agreement + Disagreement) suggested by Miles and Huberman (1994), consistency percentage was calculated as 89%. To increase external reliability of the research, what was performed throughout the research was comprehensively presented without making any direct comments.

RESULTS

The results are presented in three sections: the first polygon as a geometrical shape having sides, the second polygon as a geometrical shape having angles and the third polygon as a geometrical shape having at least three corners. These themes have been presented as study findings. It is important to note that BSs described the polygon as a geometrical shape – together or separately – having sides, angles and at least three corners. But these images are presented separately here.

**Polygon as a geometrical shape having sides**

All BSs defined the polygon as a geometrical shape having sides. This situation was called polygon as a geometrical shape having sides. BSs who had this image, took into consideration of some situations such as the nature of sides, the number of sides, junction of sides at their endpoints and finally naming polygons by the number of sides.

With this image, BSs stated that the sides of a polygon might be a line segment and a curve segment. BSs often used the statements such as ‘side’ and ‘line’ for the ‘line segment’ concept. For example, S1 said ‘This circle…is not a polygon because it does not have any sides’ for 5th figure at the second question. Similarly, S1 used following expressions for 13th figure as well: ‘This is not a polygon. Is this a side? Does it have 2 sides? No, this is not polygon. [Paying attention to curve segment]’. Moreover, S2, who identified the side with beeline, said that 6th figure was not a polygon and, she defended this with the expressions of ‘The side is not evident. Whatever its corner, side, brink are, should be evident’. On the other hand, she stated that 8th figure was a hexagon – comparing with the geometrical shapes she had previously stated that it was not a polygon - with the following sentence: ‘But, what this is may come up with something when you have made something with the beelines’.

Majority of the participants who pointed that the sides of a polygon should be line segment agreed upon that circle is not a polygon. On the other hand, as for some of the participants, they stressed on the fact that a circular region cannot be polygon. Unlikely, as for S3 who said that a circle was not a polygon, constituting a relationship between a circle and a circular region, she claimed that a circle is a circular region. For example, S3 used following statement for 5th figure at the second question ‘Circular region does not have side. Therefore it is not a polygon’.

S6 and S7 mentioned that the sides could be both a line and a curve segment uttered the concept of a ‘curve segment’ in distinctive ways. These expressions emerged in form of ‘being round’, ‘being a circle or circular region’. For example, when the first problem was asked, S7, saying ‘I have
tried to make a circle’, made following geometric shapes (Figure 1). Upon being asked by the researcher to S_2 why the shape that she made was a polygon, she gave the following explanation ‘It begins from the circle and goes on with quadrilaterals, pentagons and hexagons. Circle has no side and corner’. On the other hand, S_2 argued for not being a polygon of the 3^rd figure at the second question with the following defensive sentences; ‘It does not have any sides, nor a corner, if it were a circle. Then, I would say yes’. Thus, although she was also aware that a circle does not have any side, S_2 defended that circle is a polygon.

Secondly, BSs stressed on some criteria regarding the number of sides of a polygon. These are number of sides being at least 2 or 3 or 4 or 5. Here, particularly what the remarkable case is that the BSs use statements that may conflict with each other in different questions/times. For example, while S_2 stated the number of sides of a polygon to be at least 3 and at least 4, S_3 and S_4 defended it to be at least 3 and at least 5 sides. When asked to make a polygon at the first question, first making a square, S_3 made the following statement; ‘Triangle is not a polygon. The numbers of sides is not much. But, as far as I could remember quadrilateral, pentagon, hexagon, and octagon, these are polygon. In my opinion, number above four are in it’. However later on, forming a circle and triangle, she used the expressions of ‘This time, I am pricely decisive. There is nothing with 2 sides; one that has higher than 2 sides certainly is a polygon I am sure’. On the other side, for the same question S_3 formed respectively hexagon and pentagon and then said ‘Rhombus is four-sided...yet I am not sure. Can it...be a polygon...I guess not though’. In this way, S_3 reported that a polygon should have at least five sides. However in the additional interview, S_3 referred the presence of at least 3 sides saying ‘We used to say whether or not it was a polygon according to the number of sides. It is supposed to be greater than two. Because, two does not constitute a full shape, there is a gap in-between’. Another understanding related to the number of sides, the situation expressed by S_3 is that the polygon should have at least two sides. At the first question, S_3, first making a square, said that the square consists of four sides. Then saying, ‘If it has 2 sides, it likes a little more polygon. But if it was a one-side shape, people would not call it polygon’, she pointed that a polygon should have more than one side.

Thirdly, BSs stated that the polygons are named according to numbers of sides that can be differentiated. Here the polygons BSs emphasized were the triangle, quadrilateral, pentagon, hexagon, heptagon, octagon, decagon and hendecagon. According to this, BSs who stated that if a polygon has three sides, then it will become a triangle, expressed that triangles are named according to their side sizes. Participants pointed the types of triangles such as ‘equilateral’, ‘isosceles’ and ‘scalene’ triangles referring to the equality of side lengths. Participants mentioned that another name for the equilateral triangle is smooth triangle and angle measurements hereof are equal. On the other hand, BSs stated that in case where a polygon has four sides, it would be called quadrilateral. BSs stated that the rectangle is different from square and it has two short and two long sides and it is not a regular polygon. For example, S_2 made the following explanation for 10^th figure ‘That inner square and outer one as well. It can be either a square or rectangle. Yes, both of these are square. They have four sides. Unlikely the rectangle, all of its sides are equal in size. Two of it in the rectangle are equal namely, two of them are short, and two of them are long’.

For the pentagon, hexagon and octagon, BSs explained mentioning whether or not they are regular. For instance, S_2 said for pentagon ‘Pentagon. Even if its five sides are not equal, you know it is required to have five sides. Pentagon has two types: Ones with equal sides and ones with unequal
sides’. On the other hand, $S_1$ made the distinction for the hexagon: regular and damaged hexagon. It can be understood here that $S_1$ has an understanding of a hexagon with equal sides and equal angles and $S_1$’s understanding as for the hexagons which do not match with this situation, it can be comprehended with her statements that they are considered to be damaged:

‘Hexagon has six sides. Even if we change it in this way, it becomes a hexagon again. We can increase their lengths. Surely, you are required to increase all equally. There seems to be damaged if the sides are different, it would be okay even if it were wider [showing gap between two sides] though, it has six sides too. It gets a little damaged’.

Lastly, all participants addressed to the junction of the sides at their endpoints. Except from the $S_3$, all students gave conflicting statements for combining of the sides at the endpoints. For instance, for the square he made, $S_1$ emphasized combining of the sides at the endpoint with the statement of ‘Let’s assume that this side does not join with the other one. It does not become a square’. On the other hand, for 7th figure at the second question $S_1$ said ‘Triangle…yes. One second…here is not existing [getting surprised]. When here is missing...did you intentionally eliminated here? Then, this is not a polygon, it has 2 sides. It does not have the third one...then polygon...even so polygon...1, 2, 3’. Hence, even though $S_1$ firstly paid attention junction of the line segments at the endpoints, later on he stated that this combination does not have a characteristic of being a polygon. As a result, in process of forming the polygons, while paying attention for the junction line segments at their endpoints and even orally defending this, it can been seen that $S_1$ did not pay attention to such combination in determining whether or not a given shape was a polygon.

Some participants who took into consideration of junction of sides at their endpoints paid attention the sides not to be linear as well. For example, $S_3$ tried to place the sides of hexagon and pentagon she formed in a negative direction (Figure 2).

![Figure 2. $S_3$’ understanding regarding the placement of sides](image)

**Polygon as a geometrical shape having angles**

BSs who had a polygon image as a geometrical shape having angles, addressed to the cases where the sum of angle measurements differed and kinds of different angles existed. However, BSs except from $S_3$ stated that number of angles in a polygon can alter. Here, BSs questioned the existence of equality in terms of the number of interior and exterior angles by addressing the relationship between interior and exterior angles. In this place, $S_2$, who referred four interior angles, made contradictory explanations at the third question remarking the existence of first only one and then four exterior angles (Figure 3).
S3, who addressed that the number of angles could change, pointed that polygons were named according to number of angles. For example, she made the following explanation ‘These are two triangles…look like having been divided from the center. This might be a polygon’ for 15th figure at second question. Even though she explained the reason for being a polygon to have numerous sides, counting the angles, she said ‘There are two right triangle here. 1, 2, 3, 4, 5…6 angle, hexagon’. Another topic the participants mentioned that the polygon have angles as many as its number of sides. S3 expressed this situation for triangle as follows: ‘Since there are 3 angles in triangle, pentagon has 5 angles, hexagon has 6 angles’.

Secondly, BSs emphasized presence of two angle types for the polygon such as interior and exterior angle. Participants pointed that the exterior angle was at the outer region of the polygon and the interior angle was at the inner region of the polygon. In this entire process, they focused on the angle which had smaller size. While talking about interior angles of the polygon, BSs thought that these angles had two different nature. According to this, the angles are sides and interval between two sides. For the exterior angle, participants made different interpretations depending on whether or not the polygon is convex. For instance, S2 and S3 addressed that the every sides are angles in a non-convex polygon. S1, S2 and S3 referred that interval between two sides is angle. When hand motions of participants were examined, it was realized that BSs showed these intervals as an arc segment (Figure 4).

BSs also discussed presence of an exterior angle in a non-convex polygon. In a regular polygon, while S2 was defending the presence of an exterior angle, S1 and S2 claimed that there could not be. This situation might be related to BSs’ description of the exterior angle as an angle facing outward.

Figure 3. Conflicting explanation of S2

Figure 4. Interior and exterior angles mentioned by BSs in a polygon
Thirdly, BSs mentioned that sum of interior angles changes according to the number of sides. In this case, if the number of sides increases, the sum of interior angles increase too. In this place, $S_2$ and $S_3$ tried to find out sum of interior angles with more than one method. On the other side, while all of the participants excluding $S_5$ used memorized expressions for the sum of interior angles, $S_2$ tried to determine that sum according to the polygonal areas inside the polygon, $S_3$ with only $(n-2) \cdot 180^\circ$ formula and finally $S_1$ by dividing polygon into the known polygons. For instance $S_5$ said ‘We have learned it from our teacher. Our formula is as follows. If it has five sides, I calculate it as five minus two equals to 3. Three multiplied by 180 produces the result of 540. Our formula $(n-2) \cdot 180^\circ$. On the other side, BSs who used memorized expressions, addressed to triangle and quadrilateral. According to this, the sum of interior angles of a triangle is $360^\circ$ or $180^\circ$, and for quadrilateral it is examined with respect to the convexity. If the quadrilateral is convex, the sum of interior angles of a quadrilateral is $360^\circ$, if it is non-convex, it is random. For example, $S_3$ said, ‘When it has four sides, the interior angles’ measurement becomes 360. If we had done one more side and create a pentagon, the sum of its interior angles increases…the more the number of sides, the larger the interior angle’. Figure 5 demonstrates the images of $S_1$’s memorized or random expression of the sum of interior angles of a non-convex quadrilateral.

![Figure 5. Randomly expressed sum of interior angles by $S_1$](image)

BSs also stated that the sum of exterior angles of polygon might change. In this condition, the convexity of the polygon played a role. For a convex polygon, $S_3$ and $S_4$ stated that as the number of sides increases, so does the sum of exterior angles. On the other side, for a non-convex polygon, while $S_5$ pointed that each one of exterior angles is $180^\circ$, $S_2$ and $S_3$ expressed that the sum of exterior angles should be equal to the sum of sides lengths. For instance, $S_4$ said for triangle, ‘The exterior angle of every shape would be $180^\circ$…there were three exterior angles…we think it becomes $540^\circ$. On the other hand, the explanation of $S_3$, who described the side as an exterior angle, is given with Figure 6.

![Figure 6. Calculating process of the sum of exterior angles by $S_3$](image)

**Polygon as a geometrical shape having at least three corners**

BSs made statements thirdly about the three or more corners. According to this, some of participants stated that they named the polygon according to the number of corners and they referred the nature of corners. For instance, $S_4$ pointed to the existence of at least three corners in a polygon. $S_2$ pointed that naming the polygons depends on finding how many corners the polygon has and suffixing the word ‘gon’ at the end of that number. For example, counting the corners $S_4$ said, ‘Those combined places are corners. Starting from there…1st, 2nd, 3rd…and 4th corner…quadrilateral…I mean, polygon’
to determine whether 4th figure at the second question is a polygon or not. In additional interviews, saying ‘Quadrilateral is a polygon. It is a closed shape...It has more than 3 corners’ S₄ emphasized that the number of corners should be at least three. On the other hand, S₂ described the concept of corner as an angle and a junction of two sides to the outward (Figure 7).

![Figure 7. S₂’ corner understanding in a polygon](image)

**DISCUSSION AND SUGGESTIONS**

This study investigated the CIs of BSs about the polygon. These CIs make it possible to draw some profiles about BSs. It cannot be concluded that the participants had completely wrong understandings or they had completely deficient knowledge about the polygon. Even if comparing the sighted and BSs is not the aim of this study, the most substantial outcome required to be paid attention to is that BSs are not cognitively different from the students who see completely. Because the majority of the findings obtained in this study are similar to the results obtained from studies conducted with sighted individuals in different age groups. Indeed, some researchers (Haber et al., 1995; Landau et al., 1981; Landau et al., 1984; Millar, 1985) state that BSs have an amazing capacity for visual and mental images in conceptualization as in this study. Accordingly, it is found that BSs have more than one CI for the polygon. BSs’ CIs about polygon provided clues of what the understandings that BSs had. In this context, it is determined that BSs scrutinized the polygon analytically not with a holistic perspective. Consequently, as with most research studies accomplished in the literature (Erez & Yerushalmy, 2006; Fujita, 2012; Heinze & Ossietzky, 2002; Horzum, 2013, 2018; Monaghan, 2000), it is identified that the participants used partial classification. For example, side properties came into prominence for square and rectangle, and so the participants defended that the square is not a rectangle. Furthermore, the rectangle definition of some participants ‘quadrilateral possessing two long and two short sides’ shows parallelism with the study by Fujita and Jones (2007). Nevertheless a clear result cannot be given since the understandings related to quadrilaterals were not studied in this study. Thus, a comprehensive research is needed regarding how BSs categorize the quadrilaterals and what they know about the quadrilaterals.

BSs addressed the descriptions for the polygon related to presence of only sides, only angles or only at least 3 corners and the descriptions in which two or three of these are together as well. In these images, BSs have correct understandings as well as some misconceptions and difficulties because of not knowing the formal definition of the polygon or failing to apply it. It is thought that this situation caused BSs to describe the polygon in different forms in the different time zones. Indeed, researchers (Rösken & Rolka, 2007; Tall & Vinner, 1981) stated that inconsistent images appearing contradictory to each other in different times might evoke. In the cope of this investigation, it can be
suggested that teachers of the VISs should often emphasize and remind VISs the definition of the polygon in geometry lessons especially when teaching related concepts such as triangle, quadrilateral, prism, pyramid.

The most obvious of BSs’ difficulties is that BSs fell into contradiction regarding whether a circle, circular region, triangle, rectangle and square are a polygon. This contradiction canalized BSs to think at least how many sides are required in the polygons. Following this reasoning, some participants state that a polygon should have at least two sides; some of them state at least 3, 4 or 5 sides. The use of language may cause these different understandings of the number of sides. These reasons emerged in two ways. First, some participants focused on the word of ‘poly’ in the polygon and interpreted the word of ‘poly’ by themselves: such as not being a polygon having single-side. Secondly, some participants focused on the absence of ‘-gon’ suffix at the equilateral triangle, rhombus, rectangle, and square. This situation coincides with the result of Akuysal (2007) obtained from the seventh grade students. This result is ‘thinking that the geometric shapes having special title cannot be a polygon and naming the geometric shapes whose number of sides are five or more are polygon’. The other situation related to the use of language, BSs mentioned the polygons with different names such as smooth triangle and damaged hexagon. According to Kohanová (2008), this is because students adapted their own language to their conditions and requirements. Here, the limitations on the use of Turkish language come into prominence. To get accustomed to the mathematical language, BSs’ participation of the classroom discussions related to the polygon together with their teachers may contribute to the development of mathematical language skill.

The participants were able to define, name and usually distinguish the geometrical objects as stated by some researchers (Kohanová, 2007; Sriantha et al., 2008). However, this does not mean that BSs had entirely accurate conceptual understanding. Indeed, it was determined that the participants had some misconceptions/conflicts due to the effect of blindness and using frequently their intuitions as well. For example, BSs utilized different strategies to figure out the sum of polygon’s interior angle. While some participants used \((n-2)180^\circ\) formula, n number of sides, some of them tried to find out that sum by separating the given shape into polygon parts they knew (equilateral triangle, square, rhombus). Some participants used memorized expressions, some stated it with the space inside the polygon. However, for any polygon the sum of interior angles is a function of \(n\), number of sides: \(S(n)=(n-2)180^\circ\). Besides, students set up an expectation that the exterior angles of polygons are like the interior ones, while BSs are expected to say that the sum of exterior angle of a polygon should be constant and 360°. They stated that exterior angle should also increase as the number of sides, similar to study of Hadas and colleagues (2000), and each one of the exterior angles is 180° and the sum of exterior angle is equal to the sum of side lengths. This result may be due to the difficulty of determining the exterior angle in non-convex polygons. Because, an exterior angle of a polygon is a positive angle formed by one side of the polygon and the line that is the extension of an adjacent side (Downing, 2009, p.125). Whereas in the non-convex polygon, negative angles are in question and the sum of exterior angles of a polygon is still constant and 360°. Here the situation, which particularly attracts attention, is that the sides are identified with the angle. Another misconception is related to side nature of polygon and reflections of this situation. While all participants (mostly while forming the polygon) expressed that the sides were a line segment, at the same time, some of them defended (particularly in the second question) that it might be a curve as in harmony with the studies in literature (Kartal & Çınar, 2017; Shaughnessy & Burger, 1985). As a result of this, the participants express that circle, even a circular region is a polygon. However, majority of participants who stated that the nature of side is a line segment also expressed that a circle and a circular region cannot be polygon either. On the other hand, one participant claimed that the circle and circular region are the same concepts. This situation reveals that there is a serious problem in the concept of dimension and there is a necessity of preparing appropriate learning environments for this. Therefore, teachers of VISs should design activities and teaching environments to overcome the lack of knowledge about properties of polygons and the relation between the different types of polygons. The fourth misconception is related with the nature of polygon corners. Only two of the participants touched upon to the polygon corners and one of them expressed that the corner (namely point) is an angle. The angle concept, which is characterized in different ways throughout the study.
being interval, point, and side, shows that BSs had difficulties with the angle concept as in the BSs’ literature (Argyropoulos & Argyropoulos, 2002; Horzum, 2013, 2016). The fifth misconception of participants is related to whether the sides combine at their endpoints. All participants paid attention to ensure the sides to be combined at their endpoint and stressed on this when constructing the polygon, except only one of them did not pay attention to this combination. And they also defended that such combination was not available at all in the second question. This situation reveals the positive aspect of the magnetic materials used in the study because when forming polygons, the participants used these materials and realized that this combination was provided with the gravitational force of the magnets. Additionally, these materials provided clues for the participants that the sides of a polygon should be a line segment and will not be able to form a circle/circular region with these materials. With this perspective, the magnetic materials used in the study forced the participants to recognize their erroneous thoughts and positively affected them in taking decision. Therefore, the magnetic materials might be useful in teaching particularly polygon and the other geometrical concepts to BSs (also to the students with sense of sight). Finally, BSs stated that regular polygons such as square and regular hexagon could not have exterior angles. This situation shows that the participants focused on the figural representations. According to the statement of Hershkowitz (1989, 1990); this situation is the result of the visual-perceptual limitations which affect the determination capabilities of the individuals. Besides, these dominant images related square and regular hexagon overlap with the results of some studies (Carreño et al., 2013; Ward, 2004). For this reason, by adapting to VISs, irrelevant attributes such as position and dimension can be presented and non-examples or unusual examples can be given to VISs to understand the critical attributes of polygon.

This study provided an opinion related to how polygon understandings of BSs was shaped and with what misconceptions they addressed. The findings acquired which are similar with other studies show that there is a cognitive process usually encountered in terms of certain misconceptions and typical cases that might be come across in the understandings of polygons. To enable this cognitive process to be determined, a study which can be realized with larger and distinctive working groups may be suggested. And it seems important to have a suitable teaching design-particularly geometry lessons- in order to form correct images of polygon.

REFERENCES


**Appendix**

1. Draw three polygons. Which features of these shapes cause them to become polygon?

2. Determine whether or not the following planar shapes are polygons according to the given example. State the names of those which are polygons and explain why those not being polygons are not Lpolygons.

3. In the following geometrical shape:
   a) Find the sum of interior angles of this geometrical shape.
4. As the number of sides increases in a polygon;
   
a) How does the sum of its interior angles change?
   
b) How does the sum of its exterior angles change?

b) Find the sum of exterior angles of this geometrical shape.
A Phenomenological Study of Practicum Experience: Preservice Teachers’ Fears

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Abstract

This study examines and explores PSTs’ fears realised during the practicum period. In order to achieve an in-depth understanding, a phenomenological and holistic approach has been adopted. Data were collected from 22 preservice teachers via reports with open-ended questions on a weekly basis during the whole practicum period. 211 reports were analysed through inductive thematic coding. The analysis led to discrimination of twelve different yet interrelated sources of fear. It is argued that PSTs’ fears are learnt and resulted from a perception of threat, uncertainties involved in situations, possibility of deteriorating conditions of the future events and/or anticipatory reflections. The paper also explicates on the protective feature of fear, which is discussed to have a potential to support PSTs’ self-development and professional-preparation.

Key words: practicum, preservice teachers, fears, fear sources

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INTRODUCTION

Practicum of preservice teachers (PST) has long been on the research agenda, dating back to 1960s (Shuman, 1965). Since then practicum of PSTs received considerable research attention. Initial research attempts on practicum focused on the determination of necessary teaching skills that PSTs should acquire to perform effective teaching with an improved student performance (Lortie, 1975). The aims and structures of practicum process in relation to the teacher preparation and paradigm change was another emerging research theme in the field (Zeichner, 1983). Studies, especially after 1980s, were more concerned with teacher actions and decisions during the practicum process in the school settings (Calderhead 1984). PSTs’, for example, ideas and thoughts on their own actions/experiences (e.g. images, beliefs and perceptions) were often studied (Hollingsworth, 1989). After 1990s, researchers focused on PSTs’ enculturation process within the educational settings (Ashforth & Saks, 1996) and the teacher educators’ supervisions (both university and school-based) in supporting PSTs’ development (Cohn & Gellman, 1988). Another line of research emerging as from 1990s was related to social and emotional growth (or changes) of PSTs as part of their practicum experience in connection with initial teacher training (Goleman, 1995). These studies attended to such issues as PSTs’ adaptations, interactions with members of school community, identity formation, understandings (and utilization) of institutional norms, values, rules and resources (Ashforth & Saks, 1996; McNally, Cope, Inglis, B, & Stronach, 1997; Riedler & Eryaman, 2016). After 2000s, studies on PSTs’ practicum experience evolved towards more specific issues such as their needs (e.g., technical and emotional support, technology support, improvement of knowledge base), improvement of teaching skills, changes in PSTs’ beliefs and perceptions, interactions with different agents (such as students, teachers, peers and mentors) (Allsopp, DeMarie, Alvarez-McHatton, & Doone, 2006; Eryaman, 2007; Goh & Matthews, 2011; Trent, 2010).

One common finding of such diverse research undertakings is that although practicum has quite an influential role in the lives of PSTs during the process of becoming a teacher, it is recognised that practicum is a rather challenging and stressful endeavour for many PSTs (see Gardner, 2010). Therefore there appears an inclination to study the practicum through the eyes and experiences of PSTs themselves (Grant-Smith & Gillett-Swan, 2017). Studying the lived-in experiences of those who are novices of teaching life has a potential for researchers to better understand and conceptualise this stressful endeavour as practicum creates an environment in which PSTs find themselves in a position to explore the self, others and the new scenarios (Caires & Almeida, 2012). This perspective suggests that becoming a teacher goes well beyond a technical growth (i.e. scientific, procedural and pedagogical) and acknowledges the importance of moral and emotional dimensions of their experiences (Hargreaves, 1998). In this regard, Caires, Almeida and Vieira (2012) point out the significance of “cognitions, emotions and meanings that emerge, to listen to the dilemmas, doubts and fears of the student teachers regarding their teaching practice, as well as their drives, beliefs and expectations about the profession.” There appears an agreement that PSTs’ fears and doubts realised during the practicum provides an important opportunity for teacher educators in supporting PSTs’ technical, emotional and moral growth in the transition period of the teaching profession (Poulou, 2007).

PSTs doubts, fears and dilemmas experienced during the practicum are seen important and hence studied by several researchers, though with some other alternative terms. PSTs’ practicum experiences, for example, were analyzed with regard to challenges (Koc, 2012; Tsai & Liu, 2013), concerns (Goh & Matthews, 2011; Poulou, 2007), difficulties (Al-Hassan, Al-Barakat, & Al-Hassan, 2012) and problems (Boz & Boz, 2006). Although these studies make important contributions to our understanding of PSTs’ fears, they have some serious shortcomings as well. First of all, the researchers often limit the scope of PSTs’ fears often with a focus on teaching (see Goh & Matthews, 2011; Poulou, 2007). Such an approach reflects a reductionist perspective of PSTs’ fears to the teaching practice. This ignores, for example, surrounding environment of school ethos and contextual components such as rules, values and communication patterns of different agents. Secondly, data collection tools are often structured vaguely, creating confusion on the part of participants on what to include/exclude in their responses (e.g. Al-Hassan et al., 2012; Boz & Boz, 2006). Thirdly, data
collection usually does not span over the practicum period. Instead researchers tend to gather data on PSTs’ experiences either with a one-shot interview (e.g. Koc, 2012), questionnaire (e.g. Tsai & Liu, 2013) or on a limited part of the practicum period (e.g. Poulou, 2007). This situation creates formidable challenges in achieving a holistic and broader understanding of the PSTs’ fears. It is perhaps due to similar observations, several researchers argue that studying PSTs’ fears with a phenomenological and holistic approach would contribute greatly to a deeper understanding of the complexities, dynamics and idiosyncrasies of becoming a teacher (Caires, et.al., 2012).

With these in mind, this study attempts to investigate PSTs’ fears from a phenomenological and holistic perspective. More specifically this study aims to examine and explore PSTs’ fears experienced or realised during the practicum period. Adoption of a phenomenological and holistic perspective would, I believe, contribute to an in-depth understanding of the nature, development and sources of fears as well as dynamics practicum process.

METHODS

Context and Participants

In designing this study a phenomenological approach was adopted. Participants of the study were the teacher candidates enrolled in a Turkish language teaching program of education faculty in a mid-sized university in Turkey. In Turkish context, initial teacher preparation programs usually lasts for four years during which enrollees attend subject matter and method courses. In the last year of the program, the teacher candidates complete two separate school experience modules in two semesters (one in each semester). The first one is called School Experience during which teacher candidates are expected to observe and get acquaintance with the school environment. The other module, given in the second semester, is more practical in that teacher candidates are expected to teach at least 20 hours in class under the supervision of the mentor teacher. As a requirement of the course, they also spend at least 6 hours in the placement school every week. The data in this study were collected during the second school placement module in the spring term.

The PSTs were informed about the purpose of the study and the research procedure was explained in detail. Participants were also informed that, if volunteered, they were expected to perform certain duties as follows:

- Filling a form with several open-ended items (see below) weekly on the basis of their experiences and observations in the school
- Handing in the forms on a weekly-basis regularly
- Attending in a one-hour meeting with the university tutor (i.e. the author of this paper) every week
- Not being absent in the placement school more than 20% of the compulsory time
- Making observations in different spaces and places of the school (e.g. canteens, staffrooms, school gardens)
- Keeping an agenda to make notes of observations which could be later used while responding to the open-ended form

At the beginning, from a cohort of 60 teacher candidates, 35 were volunteered. However, later on, some willingly drop out of the study and some did not comply with the expectations and hence being excluded. In the end, the study was completed with 22 students, 13 of whom prepared 10 reports and 12 prepared 9 weekly reports.
Data Collection Tool and Procedure

The data for this study were collected via a form with 9 open-ended items. The questions placed on the form were as follows:

When compared with the last week, in this week:

1. Q1. What have you learned?
2. Q2. What have you realised?
3. Q3. What were you critical of?
4. Q4. What was it that you supported?
5. Q5. What were the things that you started to get feared?
6. Q6. What were the things that encouraged you?
7. Q7. What practice(s) was exemplary for you?
8. Q8. What were the things that you would never do when you become a teacher?
9. Q9. How did you bridge the theory and practice?

At the outset, a meeting was held with the participants to introduce the data collection tool and instructions on how to fill the form were given. The PSTs were strongly advised to draw on their observations and experiences. They were also asked to go out of the classrooms especially during lesson breaks and in their free times; to spend some time in staffrooms for observational purposes; to have conversation with teachers, head teachers, deputies and auxiliary staff. During the weekly meetings, the tutor guide and motivate the PSTs to give detailed descriptions and clarified certain issues raised by the participants.

Data Analysis

Data analysis was structured on inductive thematic coding. According to Strauss and Corbin (1998) code is an abstract representation of phenomenon and coding is the process through which ideas are related to the data which then be used to support the ideas (Richards, 2009). The data analysis process in this study took place with a grounded, data-driven approach to coding and organizing information, eventually leading to emergent themes from the written data.

During the analysis process two researchers worked together (one is the author and the other is a field expert). At the initial stages, both of the coders worked separately reading and re-reading 211 reports from 22 participants in order to have a grasp of the data. During the repeated readings, both coders took notes of PSTs’ fears mentioned in any part of the reports and determined the initial codes. Those found more ‘interesting’ were taken under close scrutiny. Coders’ notes and observations were shared, compared and merged, when appropriate, and hence an outline has been created to analyse the reports. The analysis continued with a detailed examination of a sub-sample. Afterwards, the codes and emergent themes were compiled into a codebook including code definition, inclusion criteria and illustrative quotations. Emergent themes evolving around the codes were refined as the analysis progressed and earlier observations and derived implications were revisited during the full-sample report analysis. To deepen the understanding of participants’ fears and their nature, the coders used a constant comparative method across reports (Strauss & Corbin, 1990). Hence it could be said that emergent themes and codes were developed through an iterative, reflective and cyclical process. Data analysis process span over some time during which the two coders met periodically. They critically
evaluate the themes, codes and illustrative examples until they reached an agreement and had discussions about the theoretical implications by referring to the data and the relevant literature.

Results

The analysis led to determination of 12 main themes about which PSTs mentioned to have fears. One could see that themes are closely connected and carry a heavy emotional load on the part of PSTs. In what follows, these themes with their dominant and discernable features will be explained with illustrative quotations from the reports. While referring the PSTs, an abbreviation is used to refer to their sequence and report number; for example, PST1R3 refers to the third report of the first teacher candidate.

Fears of Academic Insufficiency

Academic insufficiency is one of the highest reported sorts of fear (by 15 participants). PSTs have fears of not being able to answer student questions while teaching, misleading and misinforming students, not being able to satisfy students with their subject matter knowledge.

PST2R3: This week, the topic of lesson was Jules Verne’s life and works…one student asked about one particular work of Verne’s…I didn’t know it…I feared to give the impression that I am unknowledgeable

When PSTs become aware of the deficiencies in their knowledge base, they start to have concerns of losing professional esteem and being ineffective for the students.

PST6R2: I am afraid to get caught unprepared. Students ask questions and expect satisfactory answers. If you fail to satisfy, then they say “Yeah, OK! We ask another teacher”. I wouldn’t want this happen to me.

PSTs’ fear of academic insufficiency appeared and reappeared in their reports during the whole practicum period.

Fears of Pedagogical Insufficiency

Perception of pedagogical insufficiency is another area of fear for 13 participants. This interestingly parallels to academic insufficiency as well. PSTs have concerns for such pedagogical issues as tailoring the content on student level, selection and application of activities for a successful teaching, deciding on the teaching strategies appropriate to a wide variety of student population, use and selection of instructional tools (e.g. smart boards, teaching materials), grasping and managing student attention and keeping up student motivation. For example, PST20R1 states “I have difficulties to explain…How can I teach? I am insufficient and students don’t understand.”

PSTs feel that their pedagogical insufficiencies might lead to some negative and irreparable effects on their students. For instance PST10R7 have fears causing to “impede students’ academic development” while PST18R5 states “students might loose interest to the subject matter or even to the school.” As can be seen PSTs hold real fears of not being beneficial to the students due to lack of pedagogical knowledge. With such awareness, they also declared their intention to improve their pedagogies and try hard to make progress:

PST18R2: Having heard of student questions, I had the impression that I would have difficulties in concretising the notions and concepts…and that concerned me much. But I will fight with deficiencies and aim to improve myself.
Fears Regarding Classroom Management

Majority of the participants (15 of them) mentioned about their fears about classroom management. PSTs’ concerns are often centred on discipline problems in classroom, whole class student orchestration, student misbehaviours, uninterested students, exploitation of their good intentions, and not being taken seriously by the students.

PST2R7: I realised that some students don’t take me seriously because of my tolerant and understanding approach to them. I had fears to perform a healthy classroom management. I decided to check out the distance between the students and me.

This quotation is exemplary in that most of PSTs are the seekers of constant tuning in establishing the relations with the students. Classroom management has become a real concern for many especially when they realised the mentor teachers’ difficulties:

PST11R2: Students were so restless and the class was so hectic I found it difficult to control. I thought it was because I am just an intern here…but when I realised the class behaved the same with the mentor teacher, I felt really helpless…

The classroom management is a complex endeavour for many of PSTs. However, PSTs tend to see the classroom as a ‘power domain’ and classroom management appear to be interpreted with regard to ‘establishing sovereignty.’ In this regard PST8R7 notes “I feared being unable to keep my power over the class” while PST6R5 mentions “I am afraid to be seen impotent and uninfluential on the class.”

Student-related Fears

The analysis of the reports suggests that most of the participants put students at the centre while describing their fears. As will become clearer, student-related fears are complexly intertwined in PSTs’ perceptions. These fears were collected under six categories.

Loosing Student Respect and Affection

13 participants directly and 7 covertly referred to this topic in their reports. PSTs consider it important to get accepted and valued by the students. Deprivation of respect and affection appears to be real sources of fear for many PSTs. In this respect PST8 notes:

PST8R9: I am afraid to gradually and eventually loose students’ respects and affection to me…because over time we get monotonous and so our warnings, caveats and advices become uninfluential. Not a feature of good teacher!

Whatever the reason (e.g. academic, pedagogic, personal) might be, PSTs are afraid to get alienated by students or find themselves in an ‘unwanted teacher’ position.

PST14R5: I got really scared to be seen as a clumsy teacher…unknowledgeable one… nobody likes then…I’m even afraid to get misunderstood while correcting student fault.

As can be seen, PST14 is much concerned with student acceptance and love that he is not sure whether to correct student faults. There were also others who were not sure whether to warn students when they do something wrong. This is because they think that as a result of continuous warning to students, they might become unwanted or unlovable teachers.
Student Criticism

Another source of fear for the participants was the criticisms of students. Regardless of the issue being criticised, 10 PSTs mentioned that they had the fear of student criticism:

PST17R5: Very much afraid to hear students making critical comments about me…even more scary if their criticisms are towards my personality and physical features rather than my lesson or subject area…I would be very sad if I might feel antipathy to them

PST17’s account is also related to student acceptance. It is interesting to see here that teacher candidate held the fear of getting criticised as much as developing antipathy against the students as a result.

New Generation of Students

A surprising source of fear for 12 participants is related to certain features and skills that new generation of students are believed to possess. PSTs emphasise students’ swift adaptation capacity to ever-changing technology. Students with this capacity, PSTs believe, have certain skills superior to teacher candidates. Among them, the following skills are the most mentioned: high self-confidence, technological disposition, practical intelligence, creativity, questioning, quick adaptation and openness to the novelties.

PST7R5: Today’s students are very clever. They learn from different sources. One day, I’m afraid to become academically insufficient to them.

PST8R3: Students are making the best use of technology and think of unpredictable questions…and in the middle of lesson they ask it without hesitation.

PSTs are afraid to fall short in responding to the needs and expectations of this population. Beneath their fears lie concerns of student acceptance and approval.

Uninterested Students

13 participants referred to this issue in their reports. PSTs noted that some students had no interests to the lessons/schools and that families spoiled their children who hence did not listen to teachers.

PST3R5: I was teaching 8th graders…due to puberty they are ignorant and don't listen. They can get disrespectful as they’re spoilt by the families. I’m scared of the future…

PST10R2: So many students…they show interest in everything other than lesson, dislike school, try to sabotage the lesson…there’re many of them…

As can be seen from the quotations, uninterested students turn into a source of concern for many of PSTs.

Inclusive Students

In Turkish education system, mainstream classrooms accommodate one or two special need students when required. Four PSTs stated that inclusive students constituted a source of concern for them.
PST1R2: Can I give inclusive students what they really need and deserve? Could I be of any use to remedy their behavioural problems? Could I catch up with them? Could I balance the instruction? These...really scare me!

This quotation is exemplary in that it represents the fears and concerns of many PSTs, who often question their ability to respond to the needs of inclusive students. They considered the inclusion of just one special need student turning the class into a much more complex whole. They question their capacities to handle inclusive students.

**Physical and Psychological Harms to the Students**

Majority of the participants (14 of them) evidently expressed their concerns on that matter. In this regard they mentioned that they were afraid to break students’ hearts, loose their control and use physical violence, get bad-tempered and use insulting language, breach students’ personal rights, leave damaging traces, generate school phobia on students and to have negative effects on their education life.

PST10R3: One day, even if unwillingly, I am scared to leave deep scars in students’ lives…because the classroom atmosphere is so different…sometimes you get angry and get harsh on them…It could shatter all the confidence, influencing the whole personality.

PSTs state that even if they are unaware of the consequences, such harms could occur unintentionally. Even though it is unwilling, they were aware of the importance of their effects on the students and feared to cause such harms.

**Fears about Demand of Profession**

Having been involved in the practicum period, teacher candidates start to make more realistic evaluations about the profession itself. Their observations lead them to develop certain insights into the routines of the profession and necessary/relevant qualities.

**Teacher Qualities**

Observations and teaching experiences gained during practicum lead PSTs to realise certain teacher qualities necessary for the professions. Followings were among the qualities referred to in the reports: conflict resolution, patience, impartiality, compassion, fairness, care, guidance, cautiousness, role modelling, empathy, keeping high expectations and understanding.

PST12R10: I like some students more than others. When I see them, start smiling…In the future there would be some students I’d like more…But what if I loose my fairness and impartiality due to my feelings?

Another participant question his ability to resolve confictions:

PST17R9: I witnessed a fight in the class…felt extreme discomfort and anxiety as I didn't know what to do. It makes me worry if I face similar situations in the future.

Upon such realisations, participants appeared to question their skills, qualifications, proficiencies and capacities in relation to the teaching profession. They also made evaluations as to the extent to which they could live up to the required qualities.
**Routines of Teaching Profession**

During the practicum, teacher candidates started to personally experience such routines of the profession as standing up long times, talking loudly, standing guard during the breaks and reading exam papers. Such routines and workloads seem to have become a source of concern for some participants (10 PSTs referred to this).

PST4R4: This week I got scared to have varicose…I see that teachers don't have the luxury of sitting down. You stand up all day…it’s worrying really.

PST13R4: I got exhausted this week. As continuously talking with high volume, I had the concern of getting aphonic…

As can be seen, PSTs have developed awareness as to the effect of teaching routines on their (health) life and this raises some concerns for them.

**Career-related Fears**

Some PSTs (8 participants) mentioned repeatedly about this issue. The two important reasons causing concerns for the participants are to find a job and obtain the tenure position. PST16R9 is, for example, passionate about the profession and state “My internship is going quite well and my relation with students is fine. I love teaching…I fear not to find a job position.” PST1R9 has concerns about tenure position: “everything starts after you assigned [to job]…you have to prepare reports and things…you’re always under close surveillance…to get tenured.” Participants’ concerns become even more evident in the final reports towards the end of practicum.

**Fears Related to Work Place or Working Conditions**

10 participants stated work place or working conditions to be a matter of concern. Participants’ comments and evaluations vary over the schools that they perform their practicums. Hence PSTs’ comments and understanding often remained context-specific in that the professed fears might not be the case if the practicum school was a different one. For instance, one participant doing the practicum in a school located in the city-centre stated her “fears of working in a village school” (PST3R3). Based on the presumption that physical conditions and stakeholders would be much different, she develops a fear of village schools. Another participant (PST1R7) shared his fear of working in a school with more populous classrooms than the ones he was doing the practicum. It is hence observed that the concerns expressed about the working place are often situational.

**Parent-related Fears**

Some participants (7 PSTs) mentioned that they were anxious about the parents. The stated reasons include: parent pressure for certain practices (e.g. asking to teach for the central exams), adverse effects of information sharing with parents on students, parents in a bad temper, confrontation with the parents, accusing teachers due to protective attitudes to students, parents instructing teachers how to teach, parents interfering in and hence disrupting the class harmony and issuing official complaint to higher authorities.

PST1R8: The mentor teacher hold question-solving session every week for the central exit-exam. Parents are forcing the mentor…I will not accept parent imposition. Because the classroom is my arena, it should be me to decide what to teach…But not with the orders of others. Yet I am afraid of facing problems…parents issuing official complaints about me to the authorities.
PST19R3: I heard one teacher in staffroom saying “Oh dear! Stay away from the parents”…all others excessively supported him. I think parents bother the teachers much. I’m curious; yet started to fear them.

PSTs’ concerns might at times stem from their experiences as in the case of PST1. However, experience-based fears are rather rare. Others, as in PST19, often develop fears (inflicted with prejudices) on the basis of stories heard from the others.

**Fears of Burnout Effect**

Burnout effect is one of the most cited sources of fear (by 16 participants). Interestingly enough, 6 PSTs mentioned this fear in their first week of practicum period. The participants referred repeatedly to this fear at different times of the practicum period with varying emphasis. PSTs expressed burnout with such terms as loosing interest to profession and/or students, feeling of irresponsibility, negligence, indifference, weariness, dissatisfaction, overly repeated practice, being monotonous, over-familiarization and boredom.

PST16R1: …having observed mentor teacher and others in staffroom…I’m afraid to distance from the profession…Generally speaking many teachers seemed to me bored and weary, talking unpleasant things about students…

As is seen here, PSTs watch teachers as an outsider and from the first weeks of the practicum, on the basis of their observations, they start to develop fears for the burnout. However, observation is not the only source feeding their fears; they also reflect on the practices and reach a ‘logical’ conclusion for burnout:

PST6R5: weariness and dissatisfaction with job fears me much! Everything is fine now. I teach at times but not at other times. But teaching the same things over the years, you could grow weary of it.

**Fears of University Mentor**

Though not frequent, some 5 PSTs noted their concerns about the university mentor. This is understandable as the mentor observes student teachers during practicum, gives feedback, monitors their development, assesses their performances and makes evaluations as to success or failure.

PST8R8: I was afraid to hear negative reaction of my supervisor. It would be terrible if he told my mistakes in the classroom environment.

PST18R10: I wouldn’t like to make mistakes in the presence of my supervisor. This thrill gets me nervous…I need to be well prepared. Because his feedbacks…might have been encouraging or discouraging…

As is seen from the quotations, PSTs attach a great importance to their supervisors’ comments and feedbacks. They apparently wished to gain mentor’s approval and appraisal as well as refrain from the possible criticisms.

**Fears of Exam-centred Teaching**

Teaching for exam appears to be a real source of concern for some 6 PST. These participants argued that exam-centred teaching had a mere emphasis on cognitive development:
PST10R5: teaching for exam aims at cognitive development...even this happens in a limited way. Emotional and thinking skills should be supported through instruction. But central exams are hard to resist. It forces you and limits your instructional freedom...

Though PSTs are reluctant to teach for exam, they are afraid that they might have to do so:

PST18R3: I am always critical of exams taken the only indicator of achievement. But then, I might have to teach for exam because of parents and head teachers’ pressures...

PSTs position themselves against teaching for exam for several reasons; including: this approach creates an obstacle to meaningful learning, emphasises only cognitive dimension of development, ignores students interests and needs, inhibits students’ social and cultural participation, leads students to loose track of the actual events, discourages students to develop higher-order thinking skills (such as creativity and critical thinking). Having been aware of such negative effects, they fear to perform such practice due to some external forces as parents’ and head teacher’s pressures.

Fears of Fictional Events

Interestingly some 7 PSTs noted to have fears about certain events, which could be described as fictional. The term fictional is preferred to emphasise that PSTs’ explanations are based on situations, which are imaginary, somehow irrational and extreme.

PST4R2: I am afraid to loose the control of the class and hence slap a student who in turn responds to me in the same way...I am afraid to break out into tears in the middle of the class.

This student teacher’s fear is fictive in that she has never experienced such an event, which only exists in her thinking. Even then, this might give a clue as to her worries and anxieties.

PST1R9: I am afraid of students jumping out of window when I am not watching them. The students’ ages are 11 but the word suicide is on their mouth frequently.

It is the same with this teacher that she makes up a scenario, which then becomes a source of fear for her. Although such fears are observed 8 out of 211 reports, it is still worth considering as they represent extremist perspectives.

DISCUSSION

The analysis of PSTs’ reports provides important insights into the notion of fear. To begin with, PSTs in this study appeared to have developed fears new to them during the practicum period. Of course, the participants might have already held some of their fears expressed in the reports even before their practicum period started (see for example, PST18R3). However, findings clearly suggest that some fears are learnt during the practicum experiences. For instance, fears of parents become existent when PST19 heard stories from the teachers (see PST19R3); burnout effect becomes evident to PST16 as a result of teacher observations in staffroom (PST16R1); and health concerns (i.e. varicose – PST4R4 and aphonia – PST13R4) arose for some PSTs. Hence it is safe to conclude that the practicum period, while helping PSTs get prepared for the profession (Caires & Almedia, 2005), also leads to development of fears new to them. By implication, when PSTs are assigned to a teaching post, hence, they may start the job with the fears (which may turn into prejudices by then) acquired during the practicum.

When the stated fears are examined closely, it will be realised that PSTs’ fears were almost always induced by a perception of threat or danger (see also Beck Emery, & Greenberg, 2005). Corroboration of this observation requires a deeper consideration of the stated fears, particularly the ones related to the classroom management. There seems to be a consensus among the researchers that classroom management is a source of concern for PSTs (see Al-Hassan et al., 2012; Moore & Cooper,
It is true that PSTs make every effort to, for example, keep the class or misbehaving students under control. A close scrutiny of PSTs’ accounts on this matter indicates that their concerns or fears go well beyond such ostensible management problems. Under the PSTs’ fears, there lies a perception of classroom as a power domain (e.g., PST1R8) where he/she is faced with the threat of losing his/her sovereignty. Hence a failure to manage classroom successfully would also mean failure to establish sovereignty in his/her power domain. In fact, anything that threatens their sovereignty within their own power domain constitutes a source of fear. The perceived threat might come from within their power domain such as misbehaving and/or uninterested students (PST10R2) as well as students exploiting teacher tolerance (PST2R7) and the ones sabotaging the lesson (PST10R2). The perceived threat might also come from external sources such as parents (PST1R8) or head teachers pressurising them (PS19R3) or central exams limiting their freedom and forcing certain types of instruction (PST10R5).

It appears that PSTs tend to see protection of their power domain and establishment of sovereignty to be dependent on their academic strengths. PSTs hold the belief that weaknesses in this dimension may harm their professional esteem and this once again constitutes a threat and hence creates a reason for fear. For example, PST2R3 stated that she should not “give the impression that [she is] unknowledgeable” because she “didn't know a particular work of [Jules] Verne”. Likewise, PST6R2 mentions that he should not “get caught unprepared” as otherwise students are unsatisfied and ask another teacher. The arguments and observations hitherto suggest that PSTs constantly define and redefine the perceived threats that shape their fears.

PSTs’ fears are often concerned with some sort of deteriorating conditions in the future events, which might eventually become unacceptable to them. In this respect, PSTs’ stated fears regarding students are eye opening. Some PSTs, for example, held the belief that new generation of students had certain skills superior to themselves such as quick adaptation and openness to the novelties with a special regard to the technological ones (PST8R3). They stated their fears of falling short in responding to the needs and expectations of this population especially in the future (PST7R5). Fears stemming from the worsening conditions in the future events were also stated with regard to uninterested and spoiled students (e.g. PST3R5) as well as physical and psychological harms (e.g. PST10R3).

Beneath the student-related fears, there lies a perception that attaches a great importance to being accepted, respected, appraised and valued. Apparently PSTs would like to see themselves rewarded by the students. Some 40 years ago, Lortie (1975) made similar observations and used the term ‘psychic rewards’ which refer to the rewards given by students to the teachers when they show affection and joyment for the learning process. The need of psychic rewards was all too apparent for the participants who even tended to take such kind of rewards as an indication of ‘being a good teacher’ (PST8R9). PSTs’ high expectancy of psychic rewards was among the sources that cause pressure and fear.

PSTs’ burnout fears are also related to the future events. 16 out of 22 participants somehow mentioned about this issue at different times of the practicum period. Some of the stated fears include dissatisfaction with the job in the future (PST6R5) as well as boredom and weariness (PST16R1) gained over the years. Research studies (e.g. Fives, Hamman, & Olivarez, 2007; Hong, 2010) conducted recently provide evidence of burnout effects beginning as early as the practicum experience. In this respect, Hong (2010) argues that burnout has close ties with professional identity and that burnout could be an effect of PSTs positioning themselves in relation to the teaching profession which might even result in dropout of the profession. Although burnout is not a direct focus of this study, it is interesting to see such a high number of participants mentioning about their fears on this. Fives et al. (2007) provide empirical evidence that student teachers experiencing high guidance show lower levels of burnout. The results of this study and some others (Caires et al., 2012; Ferrier-Kerr, 2009), implicitly or explicitly, point to the importance of support and guidance provided by mentor teachers to the PSTs in preparing them for the job. It is interesting that some participants of this study start to develop fears of burnout through their observations of mentor teachers (e.g.
This situation refers to a phenomenon that deserves further research attention. In addition, design of working support systems to help PSTs overcome their fears of burnout might also be a promising research agenda.

The fear directed to the future events like burnout might also be considered as fear of the ‘unknown’, which is yet to be experienced and could be comprehended fully only in situ. I believe that the fear of this kind occurs as the PSTs act in territories to which they do not yet belong and are not entrenched. Practicum schools are transitory places where PSTs are accommodated as ‘guests’ or ‘outsiders’ who are not ‘organic’ part of a meaningful whole. I posit that this situation increases the uncertainty on the part of PSTs as they continuously attempt to “acknowledge, interpret and give meaning to rules, values, resources and communications patterns” (Caires et al., 2012, p.164). Meanings and interpretations emerging from PSTs’ present observations as outsiders might lead them jump into hasty conclusions as to the fate and shape of future events.

This observation is reminiscent to the ideas introduced by Conway (2001) about the anticipatory reflection of the novice teachers. Conway claims that reflection is about looking backward as well as looking forward. He proposes that a crucial dimension of novice teachers’ experience is that, while reflecting, they look towards the future with the knowledge of the past from the perspectives of the present. Being inspired from Conway, it could be argued that fears directed to future events are anticipatory in that they are the results of a complex function of PSTs’ reflections ascending to and fro between the past and the future with the viewpoint of the present. PSTs interpret and give meaning to the objects (e.g. practices, communication patterns and resources) of their present observations with the knowledge that they gained in the past and make inferences about (i.e. imaginations and visions of) the future events, eventually feeding their fears. To concretise this argument, briefly consider PST1R8 in which student teacher notes that the mentor teacher is forced by parents to teach for exam (present observation) and he thinks that classroom is teacher’s arena and it should be up to the teacher to decide what to teach (knowledge/belief obtained in the past). Yet he is afraid of parents issuing official complaints to the higher authorities (an inferred fear for the future).

Several PSTs take anticipatory fears to the extreme with some unrealistic events. In order to describe such concerns, the term ‘fictional fear’ is preferred in this study to emphasise the imaginary and somehow irrational features involved in PSTs’ accounts (such as suicidal or physical violence, see PST4R2 and PST4R9). It is noteworthy that such fears are highly individualised and might also be viewed as related to anxiety disorder (Beck et al., 2005). However, such fears also give a clue that some PSTs experience overwhelming emotions during the practicum period. Occurrence of such incidents raises questions as to suitability of this group for the profession. Studies (Caires & Almeida, 2005; Cohn & Gellman, 1988; Fives et al., 2007) provide evidence that well established support systems help PSTs grow as skilful practitioners. On the basis of these findings, it is posited that as PSTs would grow, develop and learn with a constant support from the more knowledgeable others, fears including the fictional ones could gradually fade away. Of course, in some cases, PSTs, even after being assigned to a job position, may continue to suffer from fictional fears; but in those cases professional help might be needed.

In this study, it is observed that practicum constitutes an intense exploration and self-evaluation period for most PSTs with regard to the demand of profession. This observation has close ties with the research on PSTs’ reflection-oriented learning, which tends to focus on cognitive development of PSTs (see Hamilton, 1998; Poulou, 2007). In this study, however, it is realised that reflection also functions for the discovery of fears. When the PSTs experience the school and classroom environment with a variety of components, they tend to reconceptualise the ‘teacher image’ in their mind and the picture of the profession that they have developed. PSTs in this study (e.g. PST12R10 & PST17R9) hold, for example, that teacher should have certain features such as fairness, empathy, conflict-resolution, compassion, care and tolerance, described as “essential teacher qualities” by Tickle (1999). When the PSTs faced with the realities (about, for example, students, parents, classroom), they started to question if and to what extent they hold such qualities. It is through such reflections that PSTs make evaluations of the ‘observed’ realities of the profession. PSTs’ fears about
the demand of profession were almost always connected with uncertainties that they reach about their personalities as potential teachers.

The analysis also suggests that fear has a protective feature with a potential to support development. Having realised their fears, PSTs attempt to protect themselves from the threats or dangers involved in a situation. PSTs’ protective attempts are observed to come in three different forms: facing the fears, avoiding or taking pre-emptive measures. PSTs’ protective attempts are directed towards personal and professional features, including physical well-beings, professional esteems, autonomies and freedoms. For example, PST13R2 was afraid of aphonya. Hence she decided to avoid talking with a high volume while teaching. PST12R10 realised that she favoured some students and hence held the fear of losing fairness and impartiality. She faces her feeling and questions her approach. PST18R10 was worried about making mistakes in the presence of his university supervisor and to prevent this he decided to make serious preparations, which could be considered as a pre-emptive measure. These observations imply that fears have the potential to serve to PSTs’ personal and professional development. Therefore considering the protective and developmental potential of the fears, they do not necessarily refer to an emotional state to be described with negative terms.

Conclusions and Implications

In this paper, PSTs’ fears that they realise or gain during their practicum has been studied with a holistic and phenomenological perspective. The results show that PSTs’ fears are fed by many (12 of which were documented in this paper) different yet interrelated sources including students, parents, classroom environments, perceived pedagogical and academic sufficiency, work place conditions, conceived pressures (of, for example, parents and central exams) as well as assumed nature and demands of the profession. The analysis also suggests that PSTs develop new fears during practicum, indicating that fears are learnt. It is also realised that fear is a phenomenon concerned with perception of threat and with the possibility of worsening conditions (which might even become unacceptable) in the future events. Unknown features (of the teaching profession), which are yet to be experienced, increase uncertainties on the part of PSTs and this contributes towards fear development. Likewise, anticipatory reflections might also result in fear development on the part of PSTs. Finally it is observed that fear has a protective feature with a potential to motivate PSTs’ self-development and efforts to get prepared for the job.

This study with a focus on PSTs’ fears contributes to the ongoing discussions on the development of effective preparation programs. Studies on initial teacher preparation programs often aims at technical/cognitive growth of PSTs (e.g., scientific, pedagogic or subject matter knowledge). Relatively less research attention is paid to emotional dimension of such growth (e.g. Hargreaves, 1995; Poulou, 2007). Fears might pose fruitful opportunities to support PSTs’ development in that teacher educators and students could have productive discussions on the topics that really concern the candidate teachers. The program content might also be enriched with the topics causing fears to PSTs who hence find an opportunity to face, reflect and even find resolutions beforehand. PSTs’ involvement in such a preparation program might even help them to realise some ‘unrealistic’ expectations and hence might even reduce the dropout rate. Finally, PSTs would benefit from mentor teacher and supervisor (from the university) collaboration in helping to overcome fears. Design of effective support systems to realise this aim could be a desirable research agenda.

REFERENCES


The Effect of Chemistry Activities Applied in a Science Camp on Secondary School Students

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Abstract

The purpose of the study is to evaluate the effects of chemistry activities applied in summer science camp on secondary school students. Action research was used in the study as the method. The sample of the study consists of 48 7th grade students who study at elementary school in Çayeli district of Rize province, in Turkey. Each week 24 students participated in the camp, which lasted two weeks. The activities that were carried out are; “The Gases in the Air”, “Sad Tears of the Sky”, “Recycling”, “Let’s Use Soap and Be Clean”, “Soap Foam Fountain”. During the activities, “Chemistry Science Interview Form” including four open-ended questions related to chemistry was applied to the students before and after the activities in the camp. Besides, “Reflective Journals” were used to reveal the participants’ thoughts about the chemistry activities that were applied in the camp. Content analysis was used in analyzing the data collection tools. It was found out that students can use more conceptions and statements on chemistry, and they can associate them with daily life in a better way after the science camp. Also, the findings indicate that chemistry activities which were carried out within the scope of the project contribute to chemistry, and to the students’ interest in this profession.

Key Words: Science Camp, Chemistry Activities, Secondary School Students

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INTRODUCTION

Science laboratories are the most important learning environments that have a positive effect on students’ cognitive learning levels and attitudes. Therefore, in science teaching, activities in science laboratories, which enable students to discover scientific conceptions, need to be emphasised more (Bilgin, 2006). Since lessons are mostly taught as teacher-centered and they are exam based, students’ negative attitudes generally cannot be removed. Besides, teachers cannot include these laboratory practices because of various reasons such as time problem, insufficiency of the instruments, and preparation for common examinations. The studies that were done revealed that such problems cause students to lose their interest in science subjects and to develop negative attitude (Cürebal, 2004; Çakır, Şenler and Taşkın, 2007; Eryaman, et al. 2010; Jelinek, 1998; Osborne, Simon and Collins, 2003; Weinburgh, 1995).

In the examinations, which are held in Turkey, especially at the national level, students mostly fail in science lessons. It is also seen that there are similar results in international examinations, and the level of our country is lower than most countries regarding the average of countries. The reason for this fact is that students are not interested in the science lessons and they have negative attitudes towards these lessons. Marulcu, Saylan and Güven (2014) state that there are many ways to develop science literacy, and one of these ways is the practices including scientific activities such as science schools and science camps. It can be considered that the projects involving science camps make a great contribution to students’ interest and motivation towards science lessons. Akay (2013) stated in his study that the science school project based on learning by doing enhances a positive contribution to secondary school students’ thoughts towards the fact that science is a knowledge resource learnt by joy thanks to a lot of experiments, observation, and trip organisations.

Within the scope of this project in which the results of this study are examined, it is aimed at enabling students to develop a positive attitude towards science and environment via enjoyable experiment and activities and to increase their interest in scientific conceptions and natural phenomenon. With this aim, activities related to various disciplines were carried out as students centred. The students who are deprived of applied practices in laboratories and classrooms at school need to take part in such projects and activities in order to benefit from extrascholastic learning environments. By this way, there may be a positive change in students’ attitudes towards the courses, and it may contribute to their future educational stages (Ornstein, 2006). It is a fact that students’ learning problems emerge at the primary education level, and unless they are corrected, they are carried to upper levels as misconceptions. Primary school program has a spiral structure, and it causes students to carry their problems to future. Therefore, it is vital to change students’ attitudes towards science and enable them to be productive, searcher, debating, learning and deciding individuals.

Within this content, the purpose of this study was determined as evaluating the effects of chemistry activities that were applied in summer science camp on secondary school students.

METHOD

In accordance with the aim of this study, action research method was used. Since the definition of the application process of the camp was revealed regarding chemistry, and the researcher presented the evaluation of the effects of the process on students, this study can be considered as action research. There is a flexible approach in action research; besides, it is pointed out that the researcher is close to the data and follow the process closely (Yıldırım and Şimşek, 2009: p.84). While Johnson (2003-2014) defines action research as “a research process that is done to determine the quality of actions or to learn in the classroom or school environment and develop them”, Bogdan and Biklen (2003) explain it as “systematic data collection process to ensure social change”.

152
Sample Group

The sample group consists of 48 seventh grade students at primary schools in Çayeli district, in Rize province in Turkey. Every week 24 primary school students attended the camp that was carried out in Recep Tayyip Erdogan University during two weeks. These students were chosen from 5 different schools, and especially voluntary students’ participation were taken into consideration. Some students were not able to participate in the data collection process due to various reasons. Therefore, the findings were evaluated considering 44 students’ participation in the study.

Camp Period and Application Process

Summer Science Camp aimed at enabling primary school students to develop a positive attitude towards science and environment with the help of enjoyable experiments and activities, comprehend basic scientific concepts and natural phenomenon, and increase their interest. In order to realise this aim, instead of traditional education methods, student-centred activities were involved in the camp program to increase students’ sense of wonder, the eagerness of investigation and learning by enabling them to realise basic scientific phenomenon. In this camp, first four days of a one-week (5 days) program were carried out in the building of Faculty of Education in the university, and last day was carried out as technical visit and nature trip in different places. The purpose of the last day was to make students observe the species of birds and butterflies in their surroundings, take their photos, distinguish between the species and be informed about the agricultural and husbandry activities (tea shop and faculty of aquaculture) done in their environment.

In the activities that were carried out, students’ understanding basic scientific phenomenon in physics, chemistry, biology and environmental sciences, and their noticing the fact that these fields are inside the life were emphasised. The activities were visualized as far as possible, and teaching techniques (drama, brainstorming etc.) that need students’ active participation were preferred. Besides, multimedia factors (animations, presentation, video, interactive software) were benefitted in designing the learning environments.

It is emphasised involving activities, which can be carried out outdoors as well as in laboratories, in the program. The laboratory was organised for the activities that were done in laboratories, and this place was used for all disciplines. In the laboratory, tools and experiment equipment etc. were placed on the tables that were designated for each discipline, and it was facilitated for the students to reach them when needed. Instead of traditional desk arrangement in the laboratory, face-to-face desk arrangement, which enables group work, was created. During the activities, one moderator instructor who administered the activity, and three assistant instructors guided students.

While the moderator instructor administered the activity process in general, assistant instructors took part near the groups that they were responsible for and had the responsibility to enable the groups to do the activities as in desired productivity.

The camp was organised as two stages, and each stage lasted five days. Each day of the camp included just one discipline. 1st day was planned as “Journey to physics world” related to physics subjects. 2nd day was planned as “Journey to biology world” related to biology subjects. 3rd day was planned as “The mystery of chemistry” related to chemistry subjects. The 4th day was planned as “Geography explorer” related to geography subjects, and 5th day was planned as “Let’s learn by travelling”. The details related to the activities that were carried out on “The mystery of chemistry” day were presented in Table 1.
Table 1. The features of activities that were carried out on “The mystery of Chemistry” day

<table>
<thead>
<tr>
<th>Name of the Activity</th>
<th>Purpose of the Activity</th>
<th>Type of the Activity</th>
<th>The Way of the Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gases in the air</td>
<td>Comprehend the components that forming the air and the poisonous gases that harm the environment.</td>
<td>Drama Setting a Model Discussion</td>
<td>Individual-Team Work</td>
</tr>
<tr>
<td>Sad Tears of the Sky</td>
<td>Identify the acids and an acidic substance, understand how acid rain occurs.</td>
<td>Experiment Simulation Animation Discussion</td>
<td>Individual-Team Work</td>
</tr>
<tr>
<td>Recycling</td>
<td>Realize the advantages of recycled waste materials for the environment.</td>
<td>Experiment Simulation Discussion</td>
<td>Team work</td>
</tr>
<tr>
<td>Soap Fountain</td>
<td>Understand how soap is produced chemically, and which substances it includes.</td>
<td>Experiment Animation Discussion</td>
<td>Team work</td>
</tr>
<tr>
<td>Let’s use soap and be clean</td>
<td>Comprehend the importance of substances in the development of events via an example of a chemical reaction.</td>
<td>Experiment Discussion</td>
<td>Team work</td>
</tr>
</tbody>
</table>

In “The gases in the air” activity, students put green, blue, white and yellow beads together in a jar, considering the proportions of the gases in the air, and tested it representatively. Later, students shared roles for the drama named as “We are Poisonous Gases”, and presented it after they practised it. With the help of this drama activity, students have learnt that the gases such as CO, SO\(_2\), NO\(_2\) pollute the air, and where these gases come from, how they merge into the air and cause pollution. Besides, this drama activity includes the necessary solution offers to reduce the air pollution.

In the activity named as “Sad Tears of the Sky”, firstly students measured the acidity degree of some substances on simulation, then they put a coin, meat, fabric, zinc metal, pieces of marble into various acid solutions and observed them. In addition, as an example of the association of acids with daily life, they examined the occurrence of acid rain and its effects on the environment on an animation, and they discussed on it. With this activity, awareness was created in students about the areas of daily usage of acids, and their negative effects.

In “Recycling” activity, students soaked old newspaper and papers, mashed them and pulped them. Then, they experienced the process of reacquiring paper from the pulped paper. By this way, they had the opportunity of discussing the importance and advantages of recycling for nature. Students had the opportunity of spending enjoyable time not only with the activities but also with a simulation game related to the environmental cleaning.

In the activity named as “Let’s use soap and be clean”, students experienced how soap which is an important cleaning factor, is produced and which substances it includes by conducting producing soap experiment. They found out that olive oil which we frequently use in daily life is used in producing soap, and its reaction with sodium hydroxide. They were enabled to watch an animation
about which soap feature provides the cleaning things, and they were provided with necessary explanations.

In the activity named as “Soap Foam Fountain” students saw an example of a reaction that can occur as a result of the interaction of different substances underlying the chemistry science. They had an enjoyable time with an amazing gas out as a result of the interaction between potassium iodide and hydrogen peroxide with the liquid soap. They ended this activity with a discussion about how that happened. The pictures related to the activities that were carried out in chemistry day are demonstrated in Appendix 1.

**Data Collection Tools**

“Chemistry Science Interview Form” including four open-ended questions was applied before and after the implications of the activities in the camp. This form includes questions related to students’ situations such as what the chemistry is, their interest in chemistry, being able to associate chemistry with daily life (Table 2). These questions were prepared after three experts had checked them.

<table>
<thead>
<tr>
<th>Table 2. The questions in chemistry science interview form</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before the Science Camp (Pre-test)</strong></td>
</tr>
<tr>
<td>I have interest in chemistry. Because;</td>
</tr>
<tr>
<td>I am not interested in chemistry. Because;</td>
</tr>
<tr>
<td>I think that chemistry is science related to daily life because;</td>
</tr>
<tr>
<td>I think that chemistry isn’t science related to daily life. Because;</td>
</tr>
<tr>
<td>What is chemistry? What comes to your mind when we say chemistry?</td>
</tr>
<tr>
<td>Would you like to choose a career related to chemistry? Why?</td>
</tr>
</tbody>
</table>

Besides, to reveal the participants’ opinions about the chemistry activities that were carried out in the camp, reflective journals were used. Students were asked to involve the parts that they think as the most enjoyable, most surprising, most difficult, most boring etc., while they were writing their journals (Table 3).
Table 3. The questions that students used to fill in reflective journals

AFTER THE ACTIVITIES ON CHEMISTRY DAY

<table>
<thead>
<tr>
<th>Activity</th>
<th>Pre</th>
<th>%</th>
<th>Post</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoyed most on chemistry day</td>
<td>32</td>
<td>73</td>
<td>44</td>
<td>100</td>
</tr>
<tr>
<td>Surprised me most</td>
<td>12</td>
<td>27</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Had difficulty most</td>
<td>8</td>
<td>18</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>Bored most</td>
<td>36</td>
<td>82</td>
<td>22</td>
<td>50</td>
</tr>
</tbody>
</table>

To evaluate the day in general, how do you feel about it?

Data Analysis

In the analysis of chemistry science interview form, which includes reflective journals and open-ended questions, content analysis was used, and the data were coded separately by two researchers, and it was concluded that these codes were coherent. Then, the statements on which there is a consensus were presented in tables as percentage-frequency. The main procedure done in content analysis is to gather the similar data within the scope of certain concepts and themes and organise and interpret them as readers can understand (Yıldırım and Şimşek, 2006).

FINDINGS

In this part, the findings, which were collected with chemistry science interview form and reflective journals, were demonstrated in tables. After the explanations for tables, students’ statements were involved.

Table 4. Students’ interest in chemistry in pre-test and post-test

<table>
<thead>
<tr>
<th>Statements</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am interested.</td>
<td>32</td>
<td>44</td>
</tr>
<tr>
<td>I am not interested in chemistry.</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>I would like to choose a career related to chemistry.</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>I wouldn’t like to choose a career related to chemistry.</td>
<td>36</td>
<td>22</td>
</tr>
</tbody>
</table>

As it can be seen in Table 4, while ten students stated that they weren’t interested in chemistry in the pre-test, this percentage was set to zero in the post-test; thus, all students stated that they were interested in chemistry. The table shows that students’ thoughts have a positive increase in post-test about the choice of profession that is related to chemistry. The increase in the percentages implies that the chemistry activities that were carried out had a positive impact on students’ interests towards chemistry and the professions related to this field. The examples from the students’ statements are like that:
S4: The images that emerged from the experiment and activities which we carried out aroused our curiosity and my interest increased. If the results of all experiments are interesting, my interest will increase more.

S10: Yes, I’ve understood the logic of the things I know. Therefore, my interest increased.

S18: It increased. Indeed, I was afraid of chemistry, biology, and physics. I was afraid that I wasn’t able to succeed when I skipped to high school, but it is easy. I overcame my fear.

S30: It increased. Because I have seen that chemistry can do better things than I know and see.

S44: It increased. It was interesting to deal with chemical substances and conduct experiments with them, and it aroused interest.

S14: I would like to be a chemist in order to teach and learn new information like scientist.

S34: Certainly, I would like to choose such a career. I want to learn by experimenting, not by reading the book, so it affects my career preference.

Table 5. Students’ thoughts about whether chemistry is related to daily life

<table>
<thead>
<tr>
<th>Situation</th>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Chemistry is associated with daily life.</td>
<td>24</td>
<td>55</td>
</tr>
<tr>
<td>Chemistry isn’t associated with daily life.</td>
<td>15</td>
<td>34</td>
</tr>
<tr>
<td>No answer</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

As it can be seen in Table 5, while in pre-test 24 of the students stated that chemistry is associated with daily life, in post-test this number increased to 39 so that in post-test the number of the students who stated that chemistry isn’t associated with daily life reduced. Table 5 presents the students’ statements that support the situation of association between chemistry and daily life.

Table 6. Students’ ideas about the association of chemistry with real life

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making syrup</td>
<td>The substances in the human body</td>
</tr>
<tr>
<td>Water vaporization</td>
<td>Lots of natural events such as the formation</td>
</tr>
<tr>
<td></td>
<td>of rain, snow</td>
</tr>
<tr>
<td>Mineral deposits</td>
<td>Plasma state of substances</td>
</tr>
<tr>
<td>The content of perfume, toothpaste</td>
<td>Everything in our life</td>
</tr>
<tr>
<td>Solution of sugar</td>
<td>Recycling</td>
</tr>
<tr>
<td>Breathing</td>
<td>Acid rain</td>
</tr>
<tr>
<td>The content of medicine, detergent, soap</td>
<td>Cleaning agents-producing soap</td>
</tr>
<tr>
<td>Corrosion of some substances</td>
<td>The content of salt and how it occurs</td>
</tr>
<tr>
<td></td>
<td>The content of water and refining it</td>
</tr>
<tr>
<td></td>
<td>Platinum that is used in the field of medicine</td>
</tr>
<tr>
<td></td>
<td>Burning of coal and various petroleum products</td>
</tr>
<tr>
<td></td>
<td>Blowing up of flying balloons</td>
</tr>
<tr>
<td></td>
<td>Digestion</td>
</tr>
<tr>
<td></td>
<td>Freezing of water and its importance for our</td>
</tr>
<tr>
<td></td>
<td>life</td>
</tr>
<tr>
<td></td>
<td>Respiration</td>
</tr>
</tbody>
</table>
As Table 6 presents, in the pre-test, even if just a small number, students used simple statements such as “making syrup, water vaporisation, mineral deposits, the content of perfume and toothpaste, a solution of sugar, breathing, medicine, detergent, corrosion” about the association of chemistry with daily life. However, when the findings of post-test are analysed, it is found out that they can make very different chemistry associations as both a content and number. These associations are: “the substances in human body, many natural events such as formation of rain and snow, plasma state of substances, recycling, acid rain, producing cleaning agents-soap, the content and refining of water, platinum that is used in medicine, burning of coal and various petroleum products, blowing up of flying balloons, digestion, freezing of water, and its importance for our life, and respiration. Sample student statements:

S24: Thanks to chemistry, I have learnt that the importance of breathing, respiration which we need most in daily life. It used to seem easy, but I have learnt it with details.

S44: Chemistry is certainly everywhere, chemistry has an important part in each science field.

S21: If we assumed that chemistry has no place in daily life, many problems would remain unsolved.

The statements that students used as a response to “What is chemistry? What do you think about chemistry?” are presented in Table 7.

<table>
<thead>
<tr>
<th>Associated concepts</th>
<th>Pre-test</th>
<th>Associated concepts</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atom</td>
<td>4</td>
<td>Atom</td>
<td>24</td>
</tr>
<tr>
<td>Experiment</td>
<td>13</td>
<td>Experiment</td>
<td>20</td>
</tr>
<tr>
<td>Substance</td>
<td>9</td>
<td>Substance</td>
<td>20</td>
</tr>
<tr>
<td>Element</td>
<td>9</td>
<td>Element</td>
<td>16</td>
</tr>
<tr>
<td>Compound</td>
<td>3</td>
<td>Compound</td>
<td>14</td>
</tr>
<tr>
<td>Mixture</td>
<td>4</td>
<td>Mixture</td>
<td>11</td>
</tr>
<tr>
<td>Periodic Table</td>
<td>4</td>
<td>Periodic Table</td>
<td>10</td>
</tr>
<tr>
<td>Molecule</td>
<td>1</td>
<td>Molecule</td>
<td>8</td>
</tr>
<tr>
<td>Formula</td>
<td>3</td>
<td>Formula</td>
<td>7</td>
</tr>
<tr>
<td>Solution</td>
<td>1</td>
<td>Solution</td>
<td>6</td>
</tr>
<tr>
<td>Electron</td>
<td>1</td>
<td>Electron</td>
<td>5</td>
</tr>
<tr>
<td>Laboratory</td>
<td>2</td>
<td>Laboratory</td>
<td>5</td>
</tr>
<tr>
<td>Gas</td>
<td>11</td>
<td>Science</td>
<td>5</td>
</tr>
<tr>
<td>Acid</td>
<td>9</td>
<td>Reaction</td>
<td>5</td>
</tr>
<tr>
<td>Base</td>
<td>6</td>
<td>Physical-chemical event</td>
<td>5</td>
</tr>
<tr>
<td>Research</td>
<td>1</td>
<td>Physical-chemical bond</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Energy</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nucleus</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Proton</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ion</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Entropy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neutron</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orbit</td>
<td>1</td>
</tr>
</tbody>
</table>

As Table 7 demonstrates, the number of the concepts that students associated to chemistry in pre-test is not few, however, it is at a low level on the basis of the number of the students who stated them. It can be concluded that students are familiar with the common words such as “Experiment, substance, element, gas, acid, compound, laboratory etc.”. However, the findings of the post-test reveal that there is a significant increase in the number of the students who used similar concepts with
the ones that they used in the pre-test. Besides, except for the association, some students use different words such as “energy, nucleus, proton, ion, entropy, neutron, and orbit”. The statements that students expressed related to what chemistry is are like that:

**S19:** Chemistry identifies the features of substance and what happens when they are combined. Explosions, reactions are examples of this fact.

**S42:** It is the science field which involves the changes in the structure of the substance and their interrelations with each other.

**S40:** It is the science field which investigates the features of substances and their interactions.

**S34:** Chemistry means trying, making a mistake, finding a result and getting information. If a human being had never asked why and had never said I wonder, neither chemistry, nor physics, or biology would have existed. People wondered, questioned and found the answers by trying.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>The activity that you enjoyed most</td>
<td>Soap foam fountain (36 students)</td>
</tr>
<tr>
<td></td>
<td>Let’s use soap, be clean (8 students)</td>
</tr>
<tr>
<td>The activity that surprised you most</td>
<td>Let’s use soap, be clean (28 students)</td>
</tr>
<tr>
<td></td>
<td>Soap foam fountain (16 students)</td>
</tr>
<tr>
<td>The activity that you had the most difficulty</td>
<td>Sad Tears of the Sky (15 students)</td>
</tr>
<tr>
<td></td>
<td>Let’s use soap, be clean (7 students)</td>
</tr>
<tr>
<td>The activity that bored you most</td>
<td>Recycling (8 students)</td>
</tr>
<tr>
<td></td>
<td>Gases in the air (6 students)</td>
</tr>
</tbody>
</table>

According to Table 8, the activity students enjoyed most is “Soap foam fountain” (36 students) and “Let’s use soap, be clean” (8 students) activities. They even expressed that they would like to repeat it individually since they like it:

**S1:** Today, I had fun most in the activity called soap fountain, because that squirt was very beautiful and it was enjoyable to do it.

**S8:** Today I had fun most in soap fountain because it was the first time I saw such an activity. It was fun and interesting. I liked it very much.

**S9:** Today, of course, I had fun most in soap fountain experiment. I think that most students had fun in this activity because we did a great job with few materials. I was surprised by what I saw. I would like to conduct this experiment by myself.

The activity that surprised students most were “Let’s use soap and be clean” (28 students) and Soap foam fountain (16 students)”. They explained this situation like that:

**S7:** Today, I most surprised at making soap activity, because I didn’t know that oil is used in making soap and I didn’t think that the compound in the beaker would surprise us so much.

**S1:** Today, the activity called soap fountain surprised me most. I didn’t expect such a good activity, but it was great. We had an astonishment.
S9: I can’t say that I was most surprised by any experiment. I can say that it was a day when I gaped with astonishment. Making soap is the first. Soap fountain; it was amazing. I was generally surprised by everything.

The activity that had most difficulty was “Sad Tears of the Sky (15 students) and Let’s use soap and be clean (7 students)” activities.

S8: The activity that includes acid rain was difficult to form me because I had difficulty in learning the names of some elements. However, I understood how they occurred.

S12: I can say that I had difficulty in making soap because it was challenging for us to heat and stir the substance on fire.

The reflective journals show that the number of the students who used the statement “I wasn’t bored” is higher. They explained this situation like that:

S1: I wasn’t bored in any activity today. They were all good and fun. There was a sense of wonder at the beginning of each one, and we satisfied our curiosity in all activities.

S9: In general, I spent a day which I never got bored. All experiments were fun. Today, we did the things that we thought as very difficult.

The activity that they got bored most was “Recycling (8 students) and Gases in the air (6 students). They expressed this situation like that:

S5: I was bored in the Gases in the air activity because we did not do anything exciting as we did in other experiments. However, I have learnt something I do not know: the air consists of 78% nitrogen, not oxygen.

S9: I didn’t get bored in general, but to put them in order, the gases in the air activity was a bit pale in comparison.

S15: I got bored in recycling activity today because mashing, shaping papers took some time, and I was bored of waiting.

When students evaluate chemistry day, they generally expressed that they were pleased with such an atmosphere; they had fun so they have learnt the things that they can remember.

S3: We did very nice activities; we both had fun and learnt something. I was happy to conduct experiments with my group friends.

S4: Chemistry day activities were nice and enjoyable. I was pleased to prepare the compounds and experiments together.

S9: I think that I have learnt many new things by having fun and I can keep them in my mind better thanks to the experiments and observations in chemistry day.

S8: I have learnt the importance of the substances in the progress of events, what soap consists of and the substances in the air, in an enjoyable way.

DISCUSSION, RESULT AND SUGGESTIONS

This study evaluated the effects of chemistry activities that were carried out in a summer science camp on secondary school students. The findings reveal that in post-test, students’ interest increased as a result of the activities done in science camp, and they were able to associate chemistry to the events in daily life better. It was determined that they used chemistry concepts that include
different associations both numerically and as content. Journals and the student statements in the interview form also support this fact. Students’ opinions about choosing a career related to chemistry increased positively in post-test. The increase in the proportions shows that chemistry activities that were carried out had a contribution to the students’ interest in chemistry and the career in this field. In the study, it was established that science camp, which teachers applied to students, had a positive impact on their social skills and their opinions towards the nature of science (Hırça, 2012). Other studies concluded that the students who participated in the summer science camps developed a positive attitude towards science. They have positive effects on their desire of doing a career in chemistry (Avcı et al., 2015; Erdoğan, 2011; Foster and Shiel-Rolle, 2011; Gibson and Chase, 2002; Hammack et al., 2015; Knox, Moynihan and Markowitz, 2003; Özdemir, 2010; Sezen Vekli, 2013; Tekbıyık et al., 2013). Çelik (2012, p.17) stated that science camps and science festivals are the instruments which are used in specially developed countries to develop a positive attitude towards science and scientists.

It was also found out that students like surprising experiment and activities in which they can perceptibly observe the features like a gas outlet, colour changing; and which visually change quickly. Within the scope of the project, in evaluating the environment they were in, it was determined that students were pleased with the environments which involve such activities and experiments, they had fun, and they learnt different things that they can easily remember. The students were personally involved in the activity in this project, and they weren’t involved in many activities and text environment in their schools so that such a result was found out. Students discover scientific concepts by doing and experiencing themselves and the knowledge which is acquired by discovering becomes more permanent (Uzal, Erdem, Önen ve Gürdal, 2010). In a study that was carried out in literature, it was concluded that students found the activities done in the project more enjoyable and instructive than the activities done in the school, they learnt a lot of new information thanks to the project activities and they wanted to do such activities at school (Yıldırım, Atila and Doğar, 2016). Marulcu, Saylan and Güven (2014) stated that there are lots of ways to develop science literacy; and one of these ways is using the activities involving science schools or science camps. (Buluṣ- Kırıkkaya, Bozkurt and İmali (2011) and (Eş, Geren and Altan, 2015) point out in their studies that such projects make learning environments more enjoyable and productive; and the activities that students are most affected are the ones that they participate personally. Foster and Shiel-Rolle (2011) stated that in the six days long summer science camp, students were enabled to examine the concrete examples of abstract scientific concepts, and science camp developed the individuals’science literacy. Another aim of such projects is to prove that science lessons are enjoyable and easy to do (Marulcu et al., 2014). In the study carried out by Metin and Leblebicioğlu (2015), it was determined that the activities done in the camp have to impact on the students’ opinions about scientific models after science camp, and during these activities, students had the opportunity of creating their models and discussing by collecting data at first hand. Besides, Gilbert (2004), stated that the best way of developing students’ ideas about the nature of scientific models is to prepare them environments in which they can do different kinds of modeling activities actively and at first hand. The common point that can be inferred from all these studies is that it is vital for students to be in the environment that they can have their own experiences.

In consideration of these findings, following suggestions can be done;

Since this kind of activities will contribute to students’ scientific, social and personal development, the continuity of the applications, which can associate science with daily life, gains importance. Not only in science camps but also in schools such activities can be an example for teachers, pre-service teachers and students regarding an idea. Regarding the positive effects of camp on students, it can be suggested to popularise similar nature science camp applications in all the cities of our country with different target populations.
Funding

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REFERENCES


Appendix: Pictures of activities

“The gases in the air” activity

“Sad Tears of the Sky” activity

“Recycling” activity
“Let’s use soap and be clean” activity

“Soap Foam Fountain” activity
The Relationship between Solution-Focused School Leadership and Organizational Cynicism, Organizational Commitment and Teachers’ Job Satisfaction

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Abstract

The purpose of this study is to examine the relationship between solution-focused school leadership and organizational cynicism, organizational commitment and teachers’ job satisfaction. This study was designed in correlational survey model. The sample group was 246 teachers working in different schools. The sample group was determined by using cluster random sampling method. Data were collected via the four scales: Solution-Focused School Leadership Scale, Organizational Cynicism Scale, Organizational Commitment Scale, and short form of the Minnesota Job Satisfaction Scale. The results show that the teachers perceive a high level solution-focused leadership in the schools. The results also show that teachers have low level organizational cynicism, but high level organizational commitment and job satisfaction. It was found a high level statically significant negative correlations between the teachers’ organizational cynicism and school principals’ solution-focused leadership according to multiple regression analysis results. In addition, a high level statically significant positive correlations were found between the teachers’ organizational commitment and school principals’ solution-focused leadership. Moreover, a high level statically significant positive correlations were found between the teachers’ job satisfaction and school principals’ solution-focused leadership. The results also show that solution-focused leadership scores and organizational commitment scores differ statistically in favor of female teachers.

Keywords: Solution-focused leadership, Organizational cynicism, Commitment, Satisfaction, Correlation.

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INTRODUCTION

The solution-focused approach was developed by de Shazer and Berg in the first half of the 1980s at the Brief Family Therapy Centre (BFTC) in Milwaukee. This approach is a powerful, practical and proven approach to ensure positive change with people, teams and organizations. The radical simplicity of this approach is to take the direct route forwards, and simply head straight for the solution by sidestepping the often fruitless search for the causes of problems. It is foreseen that solution-oriented leadership will increase the job satisfaction and organizational commitment in schools and reduce organizational burnout.

Solution-Focused School Leadership

Focusing on deficits usually leads to an extensive time-consumption to explore of the problems’ causes, etiology and history (Sklare, 2005). The process of creating solutions starts with identifying the differences that individuals desire to be in their lives (DeJong & Berg, 1998). Solution-focused approach is a paradigm that based on the exploring and amplifying strengths and successes, rather than focusing on problems (DeJong & Berg, 2002). In other words, the solution focused approach offers a model which connects people in the process of the moving forward towards jointly identified goals through a range of solution techniques.

In a world changing rapidly, the problems increase inside and outside of the school due to these changings, so the school leaders should have the qualifications to identify and solve these problems (Bridges & Hallinger, 1997). The solution-focused educational leadership is a strength-based approach that offers all administrators the specific skills, fostering teachers’ strengths in a solution-building school (Iveson, George, & Ratner, 2012; Roeden, Maaskant, Bannink, & Curfs, 2011). There are numerous ways to practice the solution-focused school leadership, benefitting from the solutions which are already happening in the schools. The reason of the solution-focused approach being so attractive for school administrators is that it emphasises on the basic problems of the school and strong aspects of school management as well as the success of the school and its educational staff (Lueng, 2006). Identifying teachers’ strength aspects creates self-confidence, makes possible a solution and empowers teachers to improve their strengths. In addition, it creates positive changes for teachers and keep them away from the focusing on negative conditions (Kelly, Kim, & Franklin, 2008).

Exceptions are important parts of solution building, because the solutions occur when these positive experiences become the rule rather than anomalies (DeShazer, 1988). Thus, interviewing with teachers in times when the things are a little bit better (an exception) remains an important component of the solution building in the school (Smock, McCollum, & Stevenson, 2010). In addition, appreciation is an important part of solution-focused school leadership. Emphasising on the appreciation of the teachers’ existing resources, the solution-focused leadership approach ensures to school administrators a wonderful and effective tool, because it provides teachers to notice their own resources (Duclos, 2006). Appreciation is more appropriate when it is open and honest, clear and without reservation as well as relevant to the situation. In some practices, school leaders can extend the praises by asking solution-focused questions. For example, they can ask these questions more frequently: ‘how did you do that’ or ‘how did you come up with that’ (Röhrig, 2006).

Solution-focused conversation techniques are quite effective in terms of solution-focused school leadership. The interactions should focus on (1) platform building, (2) future perfect, (3) discovering what works, (4) affirming, (5) small next steps (signs), and (6) experiments, either or all of them or a selected subset (Godat, 2013). The appropriate praises and resourceful questioning can be usefully integrated to school principals’ everyday conversations (Cavanagh, 2008). Moreover, a school principal can better assist to the teachers by empowering and supporting them to believe in a future success and encouraging them about to use of their own resources. In other words, since the appreciation builds a bridge from social level to the self-esteem, a school principal can better motivate the teachers by appreciating (Jackson & McKergow, 2007). It is clear that, if the teachers’ self-esteem is satisfied appropriately they begin to feel that they are useful and have some effects on the school...
environment. Consequently, the school administrators should believe that to praise teachers’ strengths, appropriately is more effective than to criticize theirs weaknesses (Grant & Spence, 2010; Kashdan & Rottenberg, 2010; Peterson, 2006).

**Organizational Cynicism**

Cynicism has been defined and studied in various perspectives such as a personality trait, a belief, an emotion, as both a global and specific trait (Scott & Zweig, 2008). Cynicism is described as a mind-set characterized by hopelessness, disappointment, and disillusionment, and is also associated with scorn, disgust, and suspicion (Andersson, 1996). In another words, cynicism is defined as the individuals’ negative emotions such as mistrust, anger, disappointment, hopelessness towards their organizations (Steinmüller, 2014; Tayfun & Çatır, 2014). Similarly, organizational cynicism is defined as a member’s negative attitudes toward organization that comprises three dimensions: (1) lack of organizational integrity, (2) negative attitude toward the organization, and (3) tendency to disparaging and critical behaviours toward the organization (Dean, Brandes, & Dharwadkar, 1998).

According to Özler, Atalay and Şahin (2010), the first dimension of the organizational cynicism is lack of honesty which emerges with negative feelings such as anger, contempt and condemnation. The second dimension of organizational cynicism is emotional reaction to an object, and the third dimension is the tendency of negative behaviour. Organizational cynicism can also be stemmed from burnout of the employees (Özler & Atalay, 2011), and low organizational commitment (Türköz, Polat, & Coşar, 2013). James (2005), specified that the organizational cynicism increases depending on teachers’ job tension, burnout, counterproductive work behaviour, and complaint. In addition, the factors decreasing teachers’ performance, the negative attitudes toward the school, organizational alienation, and non-participation in decision-making process cause to the organizational cynicism (Sağır & Oğuz, 2012).

Social cynicism have a negative effect on job satisfaction (Leung, Ip, & Leung, 2010). Cynical hostility in work settings affects organizational citizenship behaviour and organizational commitment, negatively (Turner & Valentine, 2001). Cynical individuals more likely avoid to organizational trust and cooperation or tend to protection against to monitor, control, and other means of potential responsibility (Stavrova & Ehlebracht, 2016). According to Uysal and Yıldız (2014), organizational cynicism affects negatively the relationships between teachers, and minimizes school’s performance. Moreover, organizational cynicism reduces teachers’ job satisfaction and organizational commitment (Fındık & Eryeşil, 2012; Külc, 2011; Özgan, Külekçi, & Özkan, 2012), on the other hand, organizational trust decreases organisational cynicism (Akm, 2015). In addition, ethical leadership behaviours of principals (Doğan & Uğurlu, 2014), and teachers' life satisfaction (Aslan & Yılmaz, 2013) decreases organizational cynicism level. Therefore, understanding the causes and consequences of organizational cynicism can help school administrators to control or reduce the negative impact of the organizational cynicism, because, the sceptic teachers with destructive beliefs and negative emotions watch for an opportunity to display disruptive behaviours (Firoozi, Mokhtari, & Mokhtari, 2016).

**Organizational Commitment**

Organizational commitment is defined in general, as the psychological relationship of an employee with the organization (Mowday, Steers, & Porter, 1979). Organizational commitment, in a broader sense can be specified as a psychological marriage with the organization of an employee which continue to work in same organization throughout her/his work life (Singh, Gupta, & Venugopal, 2008). Balay (2000), deals with organizational commitment in three dimensions: cohesion, identification and internalization.

Meyer and Allen (1997), identifies three types of organizational commitment: emotional, continuance, and normative. The emotional commitment occurs when the individuals fully embrace
the goals and values of the organization. These individuals are in strong emotional commitment with the organization, and usually demonstrate high level performance, positive attitudes, and a desire to remain with the organization. The continuance commitment occurs when the individuals continue their relationship with the organization based on the acquirements which they receive in return for their efforts and the things which they will lose if they leave the work. These individuals demonstrate their best effort only when the rewards match their expectations. The normative commitment occurs when the individuals’ expectations such as organizational behaviour standards or social norms were met in the organization. These individuals give value to the obedience, cautiousness, and the formality.

Organizational commitment is the most important factor that holds the school as a strong institution and can catalyze the efforts of the school to transform as an effective organization (Nartgün & Menep, 2010). It is clear that when the teachers attached themselves sincerely to the school aims, they will more willing to remain in the school they work. In addition, the organizational commitment contributes to minimize the problems such as dislike of work, lack of satisfaction, late to work and separation from organization (Aydın, 1993; Bayram, 2005). Organizational commitment enables organizational durability by transforming teachers into the individuals who solve problem rather than create problems in school, and so gives opportunity to the principals’ effective utilization of human resources (Bozkurt & Yurt, 2013). To apply contemporary managerial techniques such as team work, system approach, problem solving, as well as the methods promoting creativity and participative management increases the teachers’ organizational commitment (Gören & Yengin-Sarpkaya, 2014).

Job Satisfaction

Lambert, Hogan and Barton (2002), describe job satisfaction as the subjective feelings of the individual about whether their occupation meets the needs of them. Moynihan and Pandey (2007) discuss the effects of individual qualifications, job characteristics and organizational variables on three main factors, job satisfaction, organizational commitment and job involvement. According to Güney (2011), job satisfaction is the meeting degree of the expectations of employees according to the psychological contract between them and their job. Moreover, job satisfaction has been viewed an important concept for two reasons. The first, job satisfaction is perceived as an indicator of psychological well-being or mental health in terms of employees (Arnold, Randall, & Patterson, 2010). Second, it is an assumption namely, the attitudes affect the behaviours and so to promote job satisfaction motivates employees, and influences their performance positively (Pratkanis & Turner, 1996; Spector, 1997).

According to De Witte and Buitendach (2005), job satisfaction is a complex construct and it is influenced from the environmental factors as well as innate characteristics of an individual. These factors have been tackled in two dimensions, namely, extrinsic and intrinsic factors. The extrinsic factors include the aspects such as wage, promotion opportunities, colleagues, and supervision. Intrinsic factors include personality, education, intelligence and abilities, age and marital status (Mullins, 2005). It is expressed that extrinsic and intrinsic factors are often in function together to influence job satisfaction (Spector, 1997). Similarly, Ololube (2006) refers that job satisfaction of teachers is influenced from various factors such as the relationships with school principal, the physical quality of school environment, and the fulfilment degree of school aims.

Job satisfaction should be regarded as an important factor by the managers for three reasons: (1) the employee with less job satisfaction is reluctant to work, and looks for another job, (2) the employee with high level job satisfaction is healthier, and (3) the employees who satisfied high level are happy and carry the happiness in their whole life and continue a happy life (Özkalp & Kurel, 2001). Moreover, the school principals should regard that the teachers with low level job satisfaction and low life quality have the less contribution to the school life (Taşdan & Tiryaki, 2008). In addition, the teacher performance has a vital role to achieve school goals, and the most important factors influencing teachers’ performance are job satisfaction and job stress. Consequently, to increase teachers’ performance in school, the principals should know the factors affecting teachers’ job satisfaction and job stress (Günbayı & Tokel, 2012).
In recent years, the researchers focused on teachers’ organizational behaviors such as cynicism, organizational commitment, and job satisfaction. Many studies focused on organizational cynicism (e.g. Akın, 2015; Demirtaş, Özdemir, & Küçük, 2016; Kalağan & Güzeller, 2010; Sezgin-Nartgün & Kartal, 2013). Some of them focused on organizational commitment (e.g. Ayele, 2014; Bağrıyanik, 2016; Bozkurt & Yurt, 2013; Gören, 2012; Karataş & Güleş, 2010; Özdem, 2012). It was also focused on teachers’ job satisfaction (e.g. Alemi, 2014; Büyükgoze & Özdemir, 2017; Ghengesh, 2013; Günbayı & Tokel, 2012; Kumah & Boachie, 2017; Karademir, 2016; Msuya, 2016; Okeke & Mtyuda, 2017; Sonmez & Eryaman, 2008; Şahin, 2013; Yıldırım, Akan, & Yalçın, 2017).

In some studies it was focused on the relationships between principals’ leadership styles and organizational commitment (e.g. Buluç, 2009; Serin & Buluç, 2012). In some studies it was focused on leadership styles and organizational cynicism (e.g. Altınkurt, Yılmaz, Erol, & Salali, 2014; Doğan & Uğurlu, 2014; Mete & Serin, 2015; Uzun & Ayik, 2016). In addition, it was focused on the leadership behaviour and job satisfaction (e.g. Ereş & Akyürek, 2016; Yılmaz & Boğa-Ceylan, 2011; Yüksel-Şahin & Sarıdemir, 2017). The studies focusing on the correlation between solution-focused school leadership and organizational cynicism, organizational commitment, and job satisfaction of teachers are limited. Therefore, in this study it is focused on the relationship between solution-focused school leadership and organizational cynicism, organizational commitment, and job satisfaction of teachers. For this purpose the following questions were sought:

1. What are the teachers’ perceptions on solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction in their schools?

2. Is there a significant relationship between the scores of solution-focused school leadership and organizational cynicism, organizational commitment, and job satisfaction?

3. Do the teachers’ perceptions on solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction statistically vary based on their gender, professional seniority, school type?

**METHOD**

This study was designed in correlational survey model. Survey models provide quantitative or numerical description of trends, attitudes or views in a universe through studies on a sample selected from within a universe (Creswell, 2014, p. 155). The current study aims to describe the predictive relationships between solution-focused school leadership on organizational cynicism, organizational commitment, and job satisfaction of teachers. A correlational research is concerned with the establishing relationships between two or more variables in the same population or between the same variables in two populations (Leedy & Ormrod, 2010). In a correlational study the relation degree is described between two or more quantitative variables, and to do this it is used a correlation coefficient. Correlational research is also sometimes referred to as a form of descriptive research because it describes an existing relationship between variables (Freankel & Wallen, 2009, p. 328).

**Study Group**

The target population of the study was 5,790 teachers working in Giresun in 2017-2018 academic year. The sample group was 246 teachers working in schools in Giresun city center. The sample group was determined by using cluster sampling method. Cluster random sampling is a technique which certain subgroups, or strata are selected for the sample in the same proportion as they exist in the population (Freankel & Wallen, 2009, p. 93). The demographic qualifications of sample group are given in Table 1.
Table 1. Demographic Characteristics of the Participants (N=246)

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
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<tbody>
<tr>
<td>Gender</td>
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<tr>
<td>Female</td>
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<td></td>
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<td></td>
<td></td>
<td>246</td>
</tr>
<tr>
<td>Male</td>
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<td></td>
<td></td>
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<td>100</td>
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<tr>
<td>%</td>
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<td>54.9</td>
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</tr>
<tr>
<td>Job Seniority</td>
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<tr>
<td>1-5 Years</td>
<td>82</td>
<td>61</td>
<td>36</td>
<td>35</td>
<td>32</td>
<td>246</td>
</tr>
<tr>
<td>%</td>
<td>33.3</td>
<td>24.8</td>
<td>14.6</td>
<td>14.2</td>
<td>13.1</td>
<td>100</td>
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<tr>
<td>6-10 Years</td>
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<td>11-15 Years</td>
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<tr>
<td>16-20 Years</td>
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<tr>
<td>Over 21 Years</td>
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<tr>
<td>School Type</td>
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<td></td>
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</tr>
<tr>
<td>Primary School</td>
<td>48</td>
<td>94</td>
<td>34</td>
<td>70</td>
<td></td>
<td>246</td>
</tr>
<tr>
<td>%</td>
<td>19.5</td>
<td>38.2</td>
<td>13.8</td>
<td>28.5</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Secondary School</td>
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<tr>
<td>Academic School</td>
<td></td>
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<tr>
<td>Vocational High School</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>%</td>
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</tr>
</tbody>
</table>

Data Collection Tools

(1) Solution-Focused School Leadership Scale: The scale was developed by Sezer (2017). The scale with quintet Likert-type rating scale and 11 items consists two sub-dimensions: ‘exemplifying’ and ‘encouragement’. The previously calculated Cronbach’s alpha reliability coefficient of the scale is α = .90. In this study, the Cronbach’s alpha reliability coefficient of the scale was recalculated. In ‘exemplifying’ sub-dimension Cronbach’s alpha reliability coefficient was α = .85, in ‘encouragement’ sub-dimension was α = .98, and for whole scale was α = .97.

(2) Organizational Cynicism Scale: The scale was developed by Brandes, Dharwadkar and Dean (1999), and adapted to Turkish by Kalağan (2009). The scale with quintet Likert-type 13 items, consists three dimensions: ‘cognitive cynicism’, ‘affective cynicism’, and ‘behavioural cynicism’. Cronbach’s alpha coefficient of the scale was calculated by Karacaoğlu and İnce (2012). The previously calculated Cronbach’s alpha coefficient of the scale in emotional cynicism dimension was α = .94, in cognitive cynicism dimension was α = .87, and in behavioral cynicism dimension was α = .82. In this study, Cronbach’s alpha reliability coefficient of scale was recalculated. Cronbach’s alpha reliability coefficient in cognitive cynicism sub-dimension was α = .93, in affective cynicism sub-dimension was α = .90, in behavioural cynicism sub-dimension was α = .92, and for whole scale was α = .92.

(3) Organizational Commitment Scale: The scale was developed by Allen and Meyer (1990), and adapted to Turkish by Çöl and Gül (2005). The scale with quintet Likert-type 14 items, consists three sub-dimensions: ‘emotional commitment’, ‘continuance commitment’, and ‘normative commitment’. The previously calculated Cronbach’s alpha coefficient of the scale in emotional commitment dimension was α = .83, in continuance commitment dimension was α = .75 and in normative commitment dimension was α = .74. In this study, Cronbach’s alpha reliability coefficient of the scale was recalculated. Cronbach’s alpha reliability coefficient in emotional commitment sub-dimension was α = .96, in continuance commitment sub-dimension was α = .96, in normative commitment sub-dimension was α = .95, and for whole scale α = .96.

(4) Minnesota Job Satisfaction Scale Short Form: The scale was developed by Weiss, Davis, England and Loftguist (1967). The scale was adapted to Turkish by Baycan (1985), and validity and reliability studies were performed. The Minnesota Job Satisfaction Scale with quintet Likert-type 20 items, consists two sub-dimensions: ‘internal satisfaction’, and ‘external satisfaction’. Cronbach’s alpha reliability coefficient of the scale was calculated by Çavuş and Abdildava (2014). Cronbach’s alpha reliability coefficient in intrinsic satisfaction dimension was α = .84, and in extrinsic satisfaction dimension was α = .82 and for whole scale was α = .91. In this study, Cronbach’s alpha reliability coefficient of the scale was recalculated. Cronbach’s alpha reliability coefficient in internal satisfaction sub-
dimension was $\alpha = .96$, in external satisfaction sub-dimension was $\alpha = .98$, and for whole scale was $\alpha = .96$.

**Data Collection and Analysis**

Data were collected via the four scales: Solution-Focused School Leadership Scale, Organizational Commitment Scale, Organizational Commitment Scale, and Minnesota Job Satisfaction Scale Short Form. Data were analyzed by using SPSS 22. Descriptive statistical techniques were used in the overall evaluation of the participants’ views. The multiple regression analysis technique was used to determine the effects of the school principals’ solution-focused school leadership skills on teachers’ organizational cynicism behaviours, organizational commitment attitudes, and job satisfaction. Independent t-test was used to compare mean scores in terms of gender variable, and the MANOVA was used in comparison of scores in terms of professional seniority and school type variables.

**RESULTS**

The first problem of the study is to determine the level of the teachers’ perceptions on solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction in their schools. The mean scores and standard deviations of the participants’ responses to the solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction were calculated based on the scores revealed from the scales and the sub-dimensions, and the results are presented in Table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sub-dimensions</th>
<th>$\bar{X}$</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Solution-focused leadership</td>
<td>Exemplifying</td>
<td>3.94</td>
<td>.85</td>
</tr>
<tr>
<td></td>
<td>Encouragement</td>
<td>3.87</td>
<td>.86</td>
</tr>
<tr>
<td></td>
<td><strong>Overall solution-focused leadership</strong></td>
<td>3.54</td>
<td>.75</td>
</tr>
<tr>
<td></td>
<td>Cognitive cynicism</td>
<td>1.91</td>
<td>.86</td>
</tr>
<tr>
<td>(2) Organizational cynicism</td>
<td>Affective cynicism</td>
<td>2.32</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td>Behavioral cynicism</td>
<td>2.19</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td><strong>Overall organizational cynicism</strong></td>
<td>2.12</td>
<td>.79</td>
</tr>
<tr>
<td>(3) Organizational commitment</td>
<td>Continuance commitment</td>
<td>3.39</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>Emotional commitment</td>
<td>3.43</td>
<td>.93</td>
</tr>
<tr>
<td></td>
<td><strong>Overall organizational commitment</strong></td>
<td>3.43</td>
<td>.87</td>
</tr>
<tr>
<td>(4) Job satisfaction</td>
<td>External satisfaction</td>
<td>3.50</td>
<td>.82</td>
</tr>
<tr>
<td></td>
<td><strong>Overall job satisfaction</strong></td>
<td>3.72</td>
<td>.72</td>
</tr>
</tbody>
</table>

In Table 2, it is seen that the scores are high [$\bar{X} = 3.54$, Sd= .75] for solution-focused leadership, in overall. Besides, the mean scores [$\bar{X} = 3.94$, Sd= .85] for the exemplifying sub-dimension are higher, relatively. In addition, the mean scores are low [$\bar{X} = 2.12$, Sd= .79] for the organizational cynicism, in overall. The lowest mean scores [$\bar{X} = 1.91$, Sd= .86] are seen in cognitive cynicism sub-dimension. It is seen that the mean scores are moderate level [$\bar{X} = 3.43$, Sd= .87] in organizational commitment, in overall. Furthermore, the mean scores [$\bar{X} = 3.47$, Sd= .91] in the normative commitment sub-dimension are higher, relatively. In addition, the mean scores are high [$\bar{X} = 3.72$, Sd= .72] in job satisfaction, in overall. The mean scores [$\bar{X} = 3.87$, Sd= .72] for internal satisfaction sub-theme are higher, relatively. In addition, the mean scores are moderate level [$\bar{X} = 3.50$, Sd= .82] in the external satisfaction sub-theme. These results show that the skills of school principals’ solution-focused leadership were evaluated by the teachers as ‘high level’. In Table 2, it is seen that the teachers notify low organizational cynicism, but high organizational commitment and job
satisfaction. These results show that solution-focused school leadership predicts organizational cynicism, organizational commitment, and job satisfaction of the teachers.

The second problem of the study was whether there was a significant relationship between the solution-focused school leadership and organizational cynicism, organizational commitment, and job satisfaction. When the correlation coefficient score is smaller than .30, it indicates the ‘low level’ relation, between .30 and .59 ‘average level’ relation, and when it is higher than .60, it indicates a ‘high level’ relation (Büyüköztürk, 2009).

The correlation matrix scores are presented in Table 3.

### Table 3. The Scores of Correlation Matrix

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Solution-focused leadership</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Cognitive cynicism</td>
<td>-0.61**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Affective cynicism</td>
<td>-0.69**</td>
<td>0.65**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Behavioral cynicism</td>
<td>-0.55**</td>
<td>0.56**</td>
<td>0.71**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Emotional commitment</td>
<td>0.73**</td>
<td>-0.50**</td>
<td>-0.65**</td>
<td>-0.52**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Continuance commitment</td>
<td>0.73**</td>
<td>-0.56**</td>
<td>-0.66**</td>
<td>-0.54**</td>
<td>-0.76**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Normative commitment</td>
<td>0.71**</td>
<td>-0.54**</td>
<td>-0.62**</td>
<td>-0.50**</td>
<td>-0.80**</td>
<td>-0.84**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Internal satisfaction</td>
<td>0.59**</td>
<td>-0.48**</td>
<td>-0.49**</td>
<td>-0.45**</td>
<td>-0.65**</td>
<td>-0.59**</td>
<td>-0.62**</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>9. External satisfaction</td>
<td>0.74**</td>
<td>-0.58**</td>
<td>-0.62**</td>
<td>-0.54**</td>
<td>-0.75**</td>
<td>-0.76**</td>
<td>-0.74**</td>
<td>-0.81**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

N=246, ** p< .01

In Table 3, a high level statistically significant negative relationship was seen between solution-focused leadership and sub-dimensions of organizational cynicism. The correlation score between solution-focused leadership and cognitive cynicism sub-dimension was \[r=-0.61, p< .01\], in affective cynicism sub-dimension the score was \[r=-0.69, p< .01\], and in behavioral cynicism sub-dimension the score was \[r=-0.55, p< .01\]. In addition, a high level statistically significant positive relationship was seen between solution-focused leadership and organizational commitment. The correlation score between solution-focused leadership and emotional commitment was \[r=0.73, p< .01\], in continuance commitment the score was \[r=0.73, p< .01\], and in normative commitment the score was \[r=0.71, p< .01\]. Moreover, a statistically significant high level positive relationship was seen between solution-focused leadership and job satisfaction. The correlation score between solution-focused leadership and internal satisfaction was \[r=-0.59, p< .01\], and in external satisfaction sub-dimension the score was \[r=0.74, p< .01\].

The multiple regression coefficients related to the solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction are presented in Table 4.

### Table 4. The Multiple Regression Coefficients

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SEβ</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution-focused leadership</td>
<td>2.18</td>
<td>.28</td>
<td>-</td>
<td>7.85</td>
<td>.00</td>
<td>-</td>
</tr>
<tr>
<td>Organizational Cynicism</td>
<td>-0.28</td>
<td>.05</td>
<td>-0.29</td>
<td>-5.55</td>
<td>.00</td>
<td>-0.71</td>
</tr>
<tr>
<td>Organizational Commitment</td>
<td>0.40</td>
<td>.05</td>
<td>0.46</td>
<td>7.35</td>
<td>.00</td>
<td>0.78</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td>0.15</td>
<td>.06</td>
<td>0.15</td>
<td>2.55</td>
<td>.01</td>
<td>0.69</td>
</tr>
</tbody>
</table>

\[R= .82, R^2 = .67, Adj.R^2 = .67, F=164.30, p< .01\]

In Table 4, it is seen that the solution-focused leadership predicts the organizational cynicism, organizational commitment, and job satisfaction \[R= .82, R^2 = .67, F=164.30, p< .01\]. In addition, a high level statistically significant negative relationship is seen between solution-focused leadership and organizational cynicism \[r= -0.71, p< .01\]. It is seen a high level statistically significant positive relationship between solution-focused leadership and organizational commitment \[r= 0.78, p< .01\].
Moreover, a high level statistically significant positive relationship between solution-focused leadership and job satisfaction [r = .69, p < .01]. Based on these result it can be said that depending on the solution-focused leadership skills of school principals organizational cynicism behaviors of teachers decrease, but organizational commitment and job satisfaction levels increase.

The third problem of the study was whether the teachers’ perceptions related to the solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction significantly vary based on their gender, professional seniority, school type. Based on the independent t-test results teachers’ perceptions related to the solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction vary in terms of gender variable. On the other hand, according to the MANOVA results teachers’ perceptions related to solution-focused school leadership, organizational cynicism, organizational commitment, and job satisfaction do not vary statistically in terms of their professional seniority, school type variables. Independent t-test results are given in Table 5.

Table 5. The Independent t-test Scores in terms of Gender Variable (N=246)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Gender</th>
<th>N</th>
<th>( \bar{X} )</th>
<th>Sd</th>
<th>t</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution-focused leadership</td>
<td>Female</td>
<td>111</td>
<td>3.69</td>
<td>.67</td>
<td>2.776</td>
<td>244</td>
<td>.01*</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>135</td>
<td>3.42</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational cynicism</td>
<td>Female</td>
<td>111</td>
<td>2.02</td>
<td>.79</td>
<td>1.800</td>
<td>244</td>
<td>.53</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>135</td>
<td>2.20</td>
<td>.78</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational commitment</td>
<td>Female</td>
<td>111</td>
<td>3.62</td>
<td>.78</td>
<td>3.117</td>
<td>244</td>
<td>.00*</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>135</td>
<td>3.28</td>
<td>.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Job satisfaction</td>
<td>Female</td>
<td>111</td>
<td>3.83</td>
<td>.66</td>
<td>2.013</td>
<td>244</td>
<td>.15</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>135</td>
<td>3.64</td>
<td>.76</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

p < .05

In Table 5, it is seen that solution-focused leadership scores differ statistically in favor of female teachers [t(244) = 2.776, p < .05] in terms of gender variable. In addition, the organizational commitment scores differ statistically in favor of female teachers [t(244) = 3.117, p < .05] in terms of gender variable. There is no statistically significant difference (p > .05) in terms of gender variable in organizational cynicism and job performance scores. The findings show that the female teachers evaluate the solution-focused leadership skills of the school principals [\( \bar{X} = 3.69, \text{Sd} = .67 \)] at a higher level than the male teachers [\( \bar{X} = 3.42, \text{Sd} = .80 \)]. Moreover, the female teachers have higher level organizational commitment [\( \bar{X} = 3.62, \text{Sd} = .78 \)] than the male teachers [\( \bar{X} = 3.28, \text{Sd} = .91 \)].

**DISCUSSION, CONCLUSION & SUGGESTIONS**

In this study, it was aimed to examine the effects of solution-focused school leadership on organizational cynicism, organizational commitment and job satisfaction of teachers. The results show that solution-focused leadership scores, in overall were ‘high level’. Based on the results, it can be asserted that the teachers perceive the school principals as the solution-focused school leaders. Similar findings were seen in previous studies. In a study conducted by Franklin, Streeter, Kim and Tripodi (2007), the findings show that the attitudes of the school principals’ solution-focused leadership reduce the dropout rates of the adolescents at risk group, enable them to earn high school credits, and graduate from the high school, over time. Besides, the scores in the exemplifying sub-dimension were higher, relatively. These results can be regarded as the meaningful that the school principals demonstrate exemplary attitudes in the problem-solving process. In previous studies conducted by DeJong and Berg (2002), and Godat (2013), the exemplifying was referred as an important component for solution-focused leadership.

The teachers notified low organizational cynicism scores, in overall. The lowest mean scores were seen in cognitive cynicism sub-dimension. Similar results were seen in previous studies. In studies conducted by Akin (2015), Kalağan (2009), Köybaşı, Uğurulu and Öncel (2017), the results
revealed that organizational trust, organizational support and organizational justice reduce the teachers’ organizational cynicism level. The teachers reported the ‘moderate level’ organizational commitment scores, in overall. Moreover, in normative commitment sub-dimension the mean scores were higher, relatively. Based on the results, it can be asserted that teachers’ expectations such as behavioral standards and social norms are met in the schools. Meyer and Allen (1997), state that when the individuals’ expectations such as behavioural standards or social norms were fulfilled in the organization the normative commitment occurs. In previous studies, conducted by Bozkurt and Yurt (2013), Göreń and Yengin-Sarpkaya (2014), Karataş and Güleş (2010) the results show that the teachers notify ‘high level’ emotional commitment scores, the ‘moderate level’ continuance, and normative commitment scores.

The job satisfaction scores of the teachers were ‘moderate level’, in overall. In addition, the scores in external satisfaction were moderate, but the scores in internal satisfaction were high, relatively. These results can be interpreted that the intrinsic satisfaction indicators such as personality, education, intelligence and abilities, age and marital status of the teachers are met in high level in the schools. But the extrinsic indicators such as wage, promotion opportunities, colleagues, and supervision of the teachers are met in moderate level in the schools (Mullins, 2005). Similarly, in studies conducted by Ghenghesh (2013), Kumah and Boachie (2017), Kumaş and Deniz (2010) the findings show that the intrinsic factors are more important for teachers in terms of job satisfaction.

The results revealed a high level statistically significant negative relationship between solution-focused leadership and organizational cynicism. The correlation score between solution-focused leadership and affective cynicism sub-dimension is higher than cognitive cynicism and behavioral cynicism. Based on the results, it can be asserted that solution-focused leadership skills of the principals are more effective on the teachers in terms of emotional aspect. It is clear that, if the teachers’ self-esteem is satisfied appropriately they begin to feel that they are useful and have some effects on the school environment. Furthermore, to praise teachers’ strengths appropriately is more effective than to criticize theirs weaknesses (Grant & Spence, 2010; Kashdan & Rottenberg, 2010; Peterson, 2006). Similar results were revealed in previous studies conducted by Akin (2015), Doğan and Uğurlu (2014), Mete and Serin (2015). In addition, a high level statistically significant positive relationship was revealed between solution-focused leadership and organizational commitment. These results are consistent with the findings in the study conducted previously by Yilmaz and Boğa-Ceylan (2011). Similarly, in the studies conducted by Buluç (2009), Serin and Buluç (2012), a high level statistically significant positive relationship was revealed between leadership skills and organizational commitment. Based on these findings it can be recommended that to increase the school commitment of the teachers, the school principals should demonstrate effective solution focused school leadership. The solution-focused leadership approach gives school leaders a wonderful and effective tool appreciating teachers’ existing resources, because, it provides to the teachers to notice their own resources (Duclos, 2006). Moreover, a statistically significant high level positive relationship is seen between solution-focused leadership and job satisfaction. Kelly, Kim and Franklin (2008) state that identifying teachers’ strengths creates self-confidence, makes a solution is possible and empowers teachers to continue the improvement of their strengths. Consequently, solution-focused leadership promotes teachers to create positive changes, and keep them away from to focus on the negative conditions.

The results revealed that solution-focused leadership and organizational commitment scores differ statistically in favor of female teachers in terms of gender variable. It is possible to encounter a number of studies on differences in organizational commitment scores in terms of gender variable. As a matter of fact, in the studies conducted by Alemi (2014), Büyükgöze and Özdemir (2017), Karataş and Güle (2010), the female teachers’ organizational commitment scores are low and the studies conducted by Çanak (2014), Kumaş and Deniz (2010), and Msuya (2016) the female teachers’ organizational commitment scores are high.

The results show that in schools where the school principals display a solution-focused leadership, the teachers perceive low levels of organizational cynicism, but high level of
organizational commitment and job satisfaction. Based on the results it can be asserted that the school principals should have solution-focused leadership skills. Senior managers should display a special effort to resolve the problems of schools in order to provide teachers' job satisfaction, reduce organizational cynicism and increase school commitment. School principals should be educated on solution-focused leadership skills and the efforts to strengthen the management of educational organizations in the context of solution-focused leadership should be widespread. In this study, it was examined the relationship between solution-focused school leadership and organizational cynicism, organizational commitment, and job satisfaction of teachers. Further research studies can be planned on the relationship between solution-focused leadership and organizational justice, the relationship between solution-focused leadership and organizational trust, organizational ethics or school security, and so on.

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The Relationship Between University Students’ Epistemological Beliefs and Teaching/Learning Conceptions

Mehmet Behzat Turan
Erciyes University

Abstract

The purpose of this study is to explore the relationship between the Epistemological Beliefs and Teaching/Learning Conceptions of the 1st, 2nd, 3rd and 4th grade students in the departments of Physical Education and Sports Teaching, Coaching Education, Sports Management and Recreation Education in the School of Physical Education and Sports in Erciyes University. The research population consists of randomly selected 706 students of the School of Physical Education and Sports. In the study, Epistemological Beliefs Questionnaire (Aypay, 2012) and Teaching/Learning Conceptions Questionnaire (Aypay, 2011) were used as data collecting tools. Data obtained through Personal Information Form, Epistemological Beliefs Questionnaire and Teaching/Learning Conceptions Questionnaire were statistically analyzed using SPSS 20.0 package program. Candidates’ personal information and inventory total points and factor points were presented by identifying frequency (f) and percentage (%) values. To indicate the relationship between the scores obtained from the questionnaires, Pearson Moment Product Correlation analysis (r) was conducted while multiple regression analysis was performed to determine whether the points are predictive of each other. (β) Consequently, it was found that the Epistemological Beliefs Questionnaire subdimensions Learning Process and Learning Effort positively influence the constructivist teaching/learning conceptions of the students of the School of Physical Education and Sports while the subdimensions Learning Process and Certainty of Knowledge positively affect the students' traditional teaching/learning conceptions. According to these results, it is considered that students will take an active role in the learning process and the constructivist education and training processes will develop and contribute to the new generation constructivist education and training process while performing the teaching profession.

Key Words: Epistemology, Belief, Teaching/ Learning, Student, University

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INTRODUCTION

The influence of individuals’ beliefs on their ideas and behaviours drove pedagogues to take into consideration beliefs in many different categories in terms of learning and teaching processes. Various theories of education occasionally gave prominence to different kinds of beliefs, making them the subject of educational studies. Among these beliefs, the subject of epistemological beliefs is critical in this framework (Eroğlu, 2004). In the broadest terms, epistemological beliefs can be defined as the subjective beliefs held by individuals as to what is knowledge and how knowing and learning occurs (Schommer, 1990). Schommer-Aikins and Hutter maintain that epistemological beliefs refer to the beliefs held by individuals about the certainty and organization of knowledge and about their control on knowledge (Schommer and Hutter 2002). Individuals’ personal interpretation about how they learn and teach is based on their epistemological conceptions. Individuals’ epistemological conceptions influence their perspective on reality, and based on this reality, what knowledge is, how it is learned, taught and produced (Tezci and Uysal, 2004). The tendency for the notion of belief in education stems from the consideration that beliefs are a factor that guides our behaviours. Starting from the assumption that beliefs can be changed, we can enable students to become more active “learners” and achieve more qualified learning. Their academic achievements can be affected in a positive way, and more importantly, they can become more competent at lifelong learning and succeed in different stages of their lives. In this context, the significance of epistemological beliefs in learning and teaching process cannot be denied (Karahan, 2007). The concept of teaching and learning conceptions refers to teachers’ preference for how they address teaching and learning methods (Chan and Elliot, 2004). In other words, teaching and learning conceptions correspond to teachers' beliefs about their own educational practices (Eryaman, 2007; Chan, 2003). Developments at different periods of educational sciences have brought along differences in teaching and learning conceptions. In this regard, we can mention two opposing teaching and learning conceptions in education (Schunk, 2008). These two are traditional and constructivist teaching-learning conceptions (Duffy and Roehler, 1986). In constructivist teaching/learning conceptions, knowledge cannot be considered independently from the individual, and while it is accepted that knowledge is contextual and personal, it is also highlighted that these meanings cannot be transmitted to others (Phillips, 2000). Constructivist teaching/learning involves an active process that individuals construct meaning by combining their prior knowledge with new ideas (Jones and Araje, 2002). In constructivist teaching/learning conception, students are not a passive recipient of external stimulus, but they internalize such stimulus and actively construct knowledge (Biggs, 1996; Eryaman & Genç, 2010). On the other hand, in traditional teaching/learning conception, teachers as the sole source of knowledge transmit knowledge to the students in the classroom who receive this knowledge without questioning (Riedler & Eryaman, 2016; Senemoğlu, 2004). Hence, it can be said that teachers that adopt traditional conception apply a teacher-centred teaching style in the classroom, considering students as the passive recipients of knowledge (Cheng et al. 2009).


Although there are several local and foreign studies on epistemological beliefs and teaching-learning conceptions in the relevant literature, we have encountered no study that explores these two variables together. In this context, starting from the idea that the examination of these two notions that are considered to be affecting each other significantly would be very useful, we decided to examine the relationship between the Epistemological Beliefs and Teaching-Learning Conceptions of the students of the School of Physical Education and Sports in Erciyes University.
MATERIAL-METHOD

Study Group

In the study, relational screening model was used. The model can be defined as "a screening model aiming to determine the existence and/or level of covariance between two or among more than two variables (Karasar, 2007).

The study is a descriptive one as it attempts to determine the relationships between the epistemological beliefs, teaching/learning conceptions, and demographical characteristics of the students of the School of Physical Education and Sports.

Data Collection Tools

When conducting the questionnaires in the study, the researcher and instructors in the university tried to create a healthy evaluation process for the candidates by making necessary explanations to each candidate in a broad time period, without making any rush. In addition, appropriate materials and environmental conditions were provided so that the candidates could fill the forms in a comfortable atmosphere. As data collection tools, Epistemological Beliefs Questionnaire, Teaching/Learning Conceptions Questionnaire and Socio-demographic Information Form were used in the study.

Formation of Volunteer Groups:

The research was conducted on the study group which is made up of the candidates in the 1st, 2nd, 3rd and 4th grades in the departments of Physical Education and Sports Teaching, Coaching Education, Sports Management and Recreation Education at Erciyes University.

A total of randomly chosen 706 students out of 1440 students in the School of Physical Education and Sports participated in the study.

Socio-demographic Information Form

When preparing the socio-demographic information form for the study, the socio-demographic information forms on academic frauds, academic delay and success orientation studies in literature were examined and a pool of the characteristics of students to be examined was created. Then, with the help of statistics specialists, a socio-demographic information form was prepared. The form included 6 questions in order to get information about the age, gender, department, grade, grade point average and weekly study time of the participants.
Table 1. Socio-demographic Characteristics of Participants

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>413</td>
<td>58.5</td>
</tr>
<tr>
<td>Female</td>
<td>293</td>
<td>41.5</td>
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<tr>
<td>Age</td>
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<tr>
<td>18-20</td>
<td>126</td>
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<tr>
<td>21-23</td>
<td>393</td>
<td>55.7</td>
</tr>
<tr>
<td>24-26</td>
<td>118</td>
<td>16.7</td>
</tr>
<tr>
<td>27 and above</td>
<td>69</td>
<td>9.8</td>
</tr>
<tr>
<td>Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPES</td>
<td>118</td>
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<td>Coaching Education</td>
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<td>Sports Management</td>
<td>196</td>
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<tr>
<td>Recreation Management</td>
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<td>29.3</td>
</tr>
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<td>Grade</td>
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<td></td>
</tr>
<tr>
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<td>160</td>
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</tr>
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<td>2</td>
<td>166</td>
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<td>3</td>
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<td>29.5</td>
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<td>4</td>
<td>172</td>
<td>24.4</td>
</tr>
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<td>GPA</td>
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<tr>
<td>1.75-2.25</td>
<td>65</td>
<td>9.2</td>
</tr>
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<td>2.51-3.00</td>
<td>438</td>
<td>62.0</td>
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<td>3.01-3.50</td>
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</tr>
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<td>Weekly Study Time</td>
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<tr>
<td>1-10</td>
<td>472</td>
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</tr>
<tr>
<td>11-20</td>
<td>198</td>
<td>28.0</td>
</tr>
<tr>
<td>21-30</td>
<td>33</td>
<td>4.7</td>
</tr>
<tr>
<td>31 and above</td>
<td>3</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Epistemological Beliefs Questionnaire

Chan and Elliot (2004) adapted Schommer’s (1990) 63-item “Epistemological Beliefs Questionnaire” to the EBQ. After testing its validity and reliability, Aypay (2012) adapted the instrument into Turkish. In the study group, the EBQ is considered as four factors which explain 37.18% of total variance. Load factor values of the items in the first factor vary between 0.732 and 0.360. It varies between 0.732 and 0.372 for the items in the second factor, and between 0.629 and 0.492 for the items in the third factor. Finally, the load factor values of the items in the fourth factor vary between 0.561 and 0.387. The first factor explains 12.6%, the second 10.47%, the third 7.53% and the fourth 6.54% of total variance.

Teaching/Learning Conceptions Questionnaire

Teaching and Learning Conceptions Questionnaire was developed by Chan and Elliot (2004), and translated into Turkish by Aypay (2011) after its validity and reliability were confirmed. The thirty-item questionnaire was subjected to Confirmatory Factor Analysis, and the results indicated a compatible model (GFI = 0.93, AGFI = 0.91, RMR 0.50, RMSEA 0.54). According to the results of the analysis, the questionnaire indicates a two-factorial structure that points out two approaches (constructivist conception and traditional conception). Thus, Alpha reliability coefficient was calculated for the whole of and sub-factors of the 30-item questionnaire form, and the values were found as .86, .84 and .84 respectively. To answer the items in the questionnaire, 5-Likert scale was used (5=Strongly agree - 1=Strongly disagree). Higher points obtained for the sub-factors are interpreted that the conception represented by that factor is adopted.
Data analysis

Data obtained through Personal Information Form, Epistemological Beliefs Questionnaire and Teaching/Learning Conceptions Questionnaire, and exam grades were coded and entered into SPSS 20.0 package program through which analyses were conducted. The candidates’ personal information and inventory total points, and factor points were presented by identifying frequency (f) and percentage (%) values. To indicate the relationship between the points obtained from the questionnaires, Pearson Moment Product Correlation analysis (r) was conducted while multiple regression analysis was performed to determine whether the points are predictive of each other. (β)

**FINDINGS**

**Table 2.** Descriptive statistics of the students’ responses to the questionnaire

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>X±SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Process- Casting Doubt on Authority/Expert Knowledge</td>
<td>706</td>
<td>1.64</td>
<td>5.00</td>
<td>3.71±0.54</td>
</tr>
<tr>
<td>Inherent /Fixed Ability</td>
<td>706</td>
<td>1.25</td>
<td>4.75</td>
<td>3.13±0.65</td>
</tr>
<tr>
<td>Learning Effort</td>
<td>706</td>
<td>1.20</td>
<td>5.00</td>
<td>3.69±0.68</td>
</tr>
<tr>
<td>Certainty of Knowledge</td>
<td>706</td>
<td>1.50</td>
<td>5.00</td>
<td>3.28±0.64</td>
</tr>
<tr>
<td>Constructivist</td>
<td>706</td>
<td>2.00</td>
<td>5.00</td>
<td>3.74±0.60</td>
</tr>
<tr>
<td>Traditional</td>
<td>706</td>
<td>1.56</td>
<td>4.94</td>
<td>3.49±0.55</td>
</tr>
</tbody>
</table>

As seen in Table 2, it was found that the university students’ mean score for the Epistemological Beliefs Questionnaire subdimensions Learning Process-Casting Doubt on Authority/Expert Knowledge is 3.71 while the mean score for the subdimension Innate/Fixed Ability is 3.13, and 3.28 for the subdimension Certainty of Knowledge. The mean scores for the Teaching and Learning Conceptions Questionnaire subdimension Constructivist Learning/Teaching is 3.74 and it is 3.49 for the subdimension Traditional Learning/Teaching.

**Table 3.** Correlation Coefficients between the Students' Epistemological Beliefs and Teaching/Learning Conceptions (n=706)

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Process- Casting Doubt on Authority/Expert Knowledge</td>
<td>r</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inherent /Fixed Ability</td>
<td>r</td>
<td>.254**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Effort</td>
<td>r</td>
<td>.522**</td>
<td>.217**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Certainty of Knowledge</td>
<td>r</td>
<td>.319**</td>
<td>.551**</td>
<td>.287**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constructivist</td>
<td>r</td>
<td>.516**</td>
<td>.189**</td>
<td>.417**</td>
<td>.272**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.004</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Traditional</td>
<td>r</td>
<td>.370**</td>
<td>.341**</td>
<td>.281</td>
<td>.422**</td>
<td>.599**</td>
</tr>
<tr>
<td></td>
<td>p</td>
<td>.000</td>
<td>.000</td>
<td>.052</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>706</td>
<td>706</td>
<td>706</td>
<td>706</td>
<td>706</td>
</tr>
</tbody>
</table>
The analysis of Table 3 indicated that there is a medium positive correlation between the subdimensions Learning Process-Casting Doubt on Authority/Expert Knowledge and Constructivist Teaching/Learning (r=.516, p=.000), and a low positive correlation with the subdimension Traditional Learning/Teaching (r=.370, p=.000).

A low positive correlation was found between the subdimension Innate/Fixed Ability and the subdimensions Constructivist Teaching/Learning (r=.189, p=.000) and Traditional Teaching/Learning (r=.341, p=.000).

While there are low positive correlations between the subdimension Learning Effort and Constructivist Teaching/Learning (r=.417, p=.004), there is no significant relationship with the subdimension Traditional Learning/Teaching (r=.281, p=.052).

There are low positive correlations between the subdimension Certainty of Knowledge and the subdimensions Constructivist Teaching/Learning (r=.272, p=.000) and Traditional Teaching/Learning (r=.422, p=.000).

| Table 4. Regression Table for the Students’ Epistemological Beliefs to Predict Their Teaching/Learning Conceptions |
|---------------|-----------|----------|--------|----------------|------------------|------------------|
|               | Learning Conceptions | β  | t         | p     | R   | R²   | F     | p    |
| Learning Process | Constructivist | .460 | 11.451 | .000 | .522 | .272 | 131.611 | .000 |
|                | Traditional    | .094 | 2.344   | .019 |      |      |        |      |
| Innate/Fixed Ability | Constructivist | -.024 | -.541 | .589 | .342 | .117 | 46.529 | .000 |
|                | Traditional    | .356 | 8.036   | .000 |      |      |        |      |
| Learning effort | Constructivist | .387 | 9.049   | .000 | .418 | .175 | 74.615 | .000 |
|                | Traditional    | .049 | 1.151   | .250 |      |      |        |      |
| Certainty Knowledge | Constructivist | .031 | .718    | .473 | .422 | .178 | 76.212 | .000 |
|                  | Traditional    | .403 | 9.446   | .000 |      |      |        |      |

F (2,703)

The analysis of Table 4 shows that the model established between the subdimension Learning Process-Casting Doubt on Authority/Expert Knowledge and teaching/learning conceptions presents a significant relationship (R=.522, R²=.272, p<0.01). The analysis of t-test results for the significance of regression coefficients indicates that Learning Process predicts the characteristics of Constructivist Teaching/Learning (t=11.451, p=.000), Traditional Teaching/learning (t=2.344, p=.019), Learning and Teaching Conceptions, explaining 27% of total variance (F2,703 = 131.611, p=.001).

The analysis of Table 4 shows that the model established between the subdimension Innate/Fixed Ability and teaching/learning conceptions presents a significant relationship (R=.342, R²=.117, p<0.01). The analysis of t-test results for the significance of regression coefficients indicates that the subdimension Innate/Fixed Ability predicts the characteristics of Traditional Teaching/Learning (t=.8036, p=.000), and Learning and Teaching Conceptions, explaining 11% of total variance (F2,703 = 46.529, p=.001).
The analysis of Table 4 shows that the model established between the subdimension Learning Process and teaching/learning conceptions presents a significant relationship (R=.418, R2=.175, p<0.01). The analysis of t-test results for the significance of regression coefficients indicates that the subdimension Learning Process predicts the characteristics of Constructivist Teaching/learning (t=9.049, p=.000), and Learning and Teaching Conceptions, explaining 17% of total variance (F2,703 = 74.615 p=.001).

The analysis of Table 4 shows that the model established between the subdimension Certainty of Knowledge and teaching/learning conceptions presents a significant relationship (R=.422, R2=.178, p<0.01). The analysis of t-test results for the significance of regression coefficients indicates that the subdimension Certainty of Knowledge predicts the characteristics of Traditional Teaching/learning (t=9.446, p=.000), and Learning and Teaching Conceptions, explaining 17% of total variance (F2,703 = 76.212 p=.001).

DISCUSSION – CONCLUSION

Physical education and sports are essential for physically, mentally and spiritually healthy individuals, so for a healthy society. In its multi-disciplinary structure, sports can be examined with its psychological dimensions on the one hand while an anatomic or physiological examination and philosophical questioning of sports can also be made on the other hand. In this sense, the findings of this study that aims to explore the relationship between the university students’ epistemological beliefs and teaching/learning conceptions indicate that there are significant relationships between the Epistemological Beliefs Questionnaire subdimensions (Learning Process-Casting Doubt on Authority/Expert Knowledge, Innate/Fixed Ability, Learning Effort, Certainty of Knowledge) and teaching/learning conceptions subdimensions (Constructivist, Traditional).

In the study, we found significant positive relationships between Learning Process-Casting Doubt on Authority/Expert Knowledge and constructivist teaching/learning and traditional teaching/learning conceptions. While there is no significant relationship between Innate/Fixed Ability and constructivist teaching/learning conceptions, significant positive relationships were found with traditional teaching/learning conceptions. While there is no significant relationship between Learning Effort and traditional teaching/learning conceptions, significant positive relationships were found with constructivist teaching/learning conceptions. Yet, there was no significant relationship between Certainty of Knowledge and constructivist teaching/learning conceptions while significant positive relationships were found with traditional teaching/learning conceptions. When the procedure of epistemological beliefs and teaching/learning conception was examined, it was observed that; together with the increasing Doubt Against Learning Process-Casting Doubt on Authority/Expert Knowledge the understandings of constructivist learning/teaching and traditional learning/teaching increased in low levels, with the increase in inherent/static ability, the understanding of traditional learning/teaching increased in low levels, with the increase in the learning effort the understanding of constructivist learning/teaching increased in low levels, together with the increase in the sharpness of knowledge the understanding of traditional learning/teaching increased in low levels. These findings from the research show that epistemological beliefs are the significant predictors of teaching/learning understandings. However, when the sub-dimensions of the 4 epistemological beliefs scales are addressed separately, it was concluded that the Learning process sub-dimension is a higher level predictor of teaching/learning understandings than the other sub-dimensions. Finally, the findings of the study reveal that epistemological beliefs are a significant predictor of teaching/learning conceptions. However, when the 4 subdimensions of the Epistemological Beliefs Questionnaire are analyzed separately, it is concluded that the subdimension Learning Process is a higher predictor of teaching/learning conceptions compared to the others. Thus, research findings suggest that students with sophisticated epistemological beliefs in learning process have more advantage compared to the students with unsophisticated epistemological beliefs, which means that some students are less successful in learning process because of their beliefs about knowledge and learning, not low IQ, lack of skills or not studying enough (Deryakulu, 2004).
In line with this view, Howard, Mcgee, Schwartz and Purcell (2000) maintain that sophisticated epistemological beliefs are in parallel with constructivist learning conception while unsophisticated beliefs are objectivist and in parallel with traditional learning conception. Hence, epistemological beliefs should be further improved in order to implement constructivist learning models in a more efficient way (Deryakulu, 2004).

Developments at different periods of educational sciences have brought along differences in teaching and learning conceptions. In this regard, we can mention two opposing teaching and learning conceptions in education (Schunk, 2008). These two are (i) traditional and (ii) constructivist teaching-learning conceptions (Ayapay, 2011).

In constructivist teaching/learning conceptions, learning is a process for constructing knowledge. This approach is not based on rote-learning, but on the learner to transfer knowledge, reinterpret previous knowledge and construct new knowledge (Perkins, 1999).

On the other hand, in traditional teaching/learning conceptions, teachers as the sole source of information are expected to transfer knowledge to students who receive such knowledge without questioning (Brooks and Brooks, 1999).

When these conceptions are examined, it is found that there is a tendency towards constructivist approach from traditional approach in literature (Ayapay, 2011).

In their study on the relationship between teaching style and epistemological beliefs, Windschitl and Andre (1998) suggest that university students with sophisticated epistemological beliefs learn better with a constructivist approach while students with unsophisticated epistemological beliefs learn better in the teaching processes arranged with a traditional approach (Windschitl, 1998).

Consequently, the study found that the Epistemological Beliefs Questionnaire subdimensions Learning Process and Learning Effort positively affect the constructivist teaching/learning conceptions of the students of the School of Physical Education and Sports while the subdimensions Learning Process and Certainty of Knowledge positively affect the students’ traditional teaching/learning conceptions. According to these results, it is considered that students will take an active role in the learning process and the constructivist education and training processes will develop and contribute to the new generation constructivist education and training process while performing the teaching profession.

Based on the findings of the study the following suggestions are developed: The use of constructivist educational method should be increased to improve students’ academic achievements. The class activities to improve students’ epistemological beliefs should be carried out. Instructors, professors and teachers should enable students to transfer the knowledge they receive, to interpret their previous knowledge, construct new knowledge and finally express their own opinions rather than preferring an educational system based on rote-learning.

REFERENCE


