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High School Students' Gender Role Perceptions Regarding Various Professions

Abdullah Atliⁱ

Inonu University

Abstract

This survey study aims to determine the gender role perceptions of high school students regarding several professions. 724 female (56.9%) and 548 male (43.1%) formed the sample of a total of 1272 high school students. The "Gender Role Perceptions regarding Various Professions Questionnaire" was used to determine the gender role perceptions of high school students based on various professions. The findings demonstrated that high school students perceived the professions of *teacher*, *doctor*, *lawyer*, *psychologist*, and *dentist* suitable for both male and female gender equally (neutral occupations). High school students perceived the professions of district governor (public administration), military officer, policeman, engineer, judge, prosecutor and architect as predominantly male occupations. On the other hand, students perceived the professions of nurse and dietician as mainly female occupations. The study findings demonstrated that high school students classify various professions as strictly male or female professions. These results demonstrated the significance of school psychological counselors who provide counseling services to students during the career selection process to raise awareness of the students by organizing group guidance activities on gender role perceptions and possible outcomes of various professions.

Keywords: gender role perception, professions, choice of profession, high school students.

ⁱAbdullah Atli, Dr., Department Of Counselling & Guidance, Inonu University, Malatya, Turkey.

Correspondence: abdullah.atli@inonu.edu.tr

Introduction

Today social gender inequality still prevails at a great extent, and it is of utmost importance that women should gain a seat in various areas of business life for the improvement and sustainability of the quality of life of the society. A general examination of the salaries of male and female employees in the professional life demonstrated that male-dominated occupations are better paid and perceived as being higher in status than female-dominated occupations (Buschor, Kappler, Frei & Berweger, 2014). Despite the widespread acceptance that women's participation in the labor force is an important factor for sustainable progress, the women's share in the workforce has been declining gradually in Turkey. Female participation in labor force was around 34.1% in 1990, however it declined to 27.9% in 2002 and to 23.3% in 2004 (Korkmaz, Alacahan, Cesim, Yücel & Aras, 2013). By 2015, however, female participation in labor force raised slightly to 32.1 (TÜİK, 2015). One of the major obstacles preventing women's active participation in the work force is the social gender role perception regarding various professions.

Gender is an important factor in career choices (Hooley & Yates, 2015). Traditionally it has been perceived that females are passive, nourishing, sensitive, emotional, could succeed in home making and social sciences, and could fail in fields such as mathematics and engineering (Özyürek, 2013). Cejka and Eagly (1999) stated that the perception of femininity and masculinity is effective on career choices. The perception of femininity; the perception of being courteous, supportive, helpful, social, polite, and cooperative, shapes women's vocational choices.

Social gender roles for women, starting from early years, are shaped by the traditional messages emanating from families, teachers, and media. Social inhibitions and strict gender roles result in women increasingly assuming the roles of motherhood and home making (Fitzgerald & Betz, 1994; Pascall, Parker, & Evetts, 2000; Swarbrick, 1997). The vocational role perceptions of the parents are highly effective in shaping children's vocational gender role perceptions (Hadjar & Belinda Aeschlimann, 2015; Hauser & Garvey, 1983). Parents encourage the male child to take risks in the external world, while they expect the female to engage in malleable activities requiring less risk (Adya & Kaiser, 2005). These types of restrictions could have resulted in women's inclination towards lower status and low-income careers (Hackett, Betz, Casas, & Rocha-Singh, 1992). The fact that males have more risk-taking experience in their early years compared to females could steer them to take risks during the process of career choices, thus advancing in their careers more rapidly (Taylor, Madill, & Macnab, 1990). Another impediment in women's vocational choices is the social perception related to women's duty as mothers. The choice of women for professions that are considered to be unsuitable for their role as a mother harbors concerns about their inability to perform their duties as a mother and responsibilities of raising children (Fitzgerald & Harmon, 2001; Houser & Garvey, 1983; Shaw, 1995; Taylor, 1995). Those social perceptions directly or indirectly define the individual's mode of behavior as a woman or a man and in her or his career choices. Females receive confusing and not sufficiently supportive messages from their environment (Bogart & Stein, 1987). These messages could inevitably affect females' self-esteem in a negative way.

Culture has a significant impact on women's efficiency in professional life. The culture, in which the individuals live, determines the roles that should be adopted by women and men in that society (Adya & Kaiser, 2005; Ortiz, 1996; Zuckerman, 1981). Attempts by women to leave the vocational roles assigned to them would have them face various obstructions (Pascall et al., 2000; Rochlen & O'Brien, 2002). General social creed in Asiatic countries such as China, Japan and Vietnam suggests that women should display shy and less-demanding behavioral patterns. These expectations have prevented active contribution of women in professional life in a great extend (Fujitomi & Wong, 1973). For instance, when a female in Turkey wants to become an engineer or engage in commerce, she may receive less encouragement from the community, and she could even be prevented to go beyond the traditional roles cut for females, as implied in traditional statements like "don't try to do a man's job," "be a home maker," or "that's not a female's business."

Chusmir (1983) stated that women are channeled towards the vocations of social work, nursing or teaching that are approved by the society as appropriate for women in contrast to vocations such as engineering, science, law or medicine. In their study, Betz and Hackett (1983) demonstrated that self-efficacy perception of male students was higher than female students in science and mathematics. In his study, Catsambis (1995) stated that women have higher level of anxiety for success in math and sciences than men. In addition, men feel more confident that they would succeed in math and sciences. Similarly Brown (1993) showed that women experience problems in choosing the fields of mathematics, engineering and science, and only 4% of females attending high school choose vocations related to math, as compared to 13% of males. Wheeler (1983) identified that women were inclined towards choosing traditional vocations and had low self-efficacy perception on their career choices. However, certain studies demonstrated that females tend towards math related and scientific vocations more than male students, and others (Steinmeyer, 2003) stated that gender was not effective in career choices and male and female students approach mathematical and scientific fields equally. These findings show that the traditional perceptions towards certain professions have started to change in time. This development will be more significant as the frequency of women that choose outside the socially inscribed careers and succeed would increase. Especially the fact that young women observing the achievements of their peers and taking them as role models would be effective.

Literature review did not reveal any studies on perceived gender roles for high school students in Turkey. Thus, the present study aims to identify the female-male vocational perceptions of high school students and to create awareness on gender and choice of profession. It was also considered that the findings of this study would determine the gender role perceptions of students at a critical age (15-18 years old) on various professions to make a choice for their career so that vocational education programs could be designed to help raise awareness among students about that process.

The aim of this study is to determine gender role perceptions of high school students about various professions. Consequently, the study aims to answer the following question: What are the gender role perceptions of high school students about certain professions?

Method

Design

The present study is a quantitative study conducted using the survey method. Survey design enables the quantitative or numerical description of tendencies, attitudes or views in a population by studying a sample selected within the population (Creswell, 2014). Questionnaire forms (Gender Role Perceptions on Various Professions-GRPVP) were used to collect data in an economic and speedy way as provided by the survey design in the study. Data was collected from high school students using single pass group application method (Fowler, 2009).

Population and Sample

The study was conducted in the province of Malatya located in East Anatolia region in Turkey with a population of 740,643 and officially considered as a metropolis. The population of the study included 15,119 (7312 male, 7807 female) high school students who attended schools in Malatya province, Yeşilyurt district, located at the city center. Due to the accessibility and convenience of the participants, non-probabilistic adequate sampling (Creswell, 2014) method was used. The sample of the study included a total of 1272 high school students, 724 female (56.9%) and 548 male (43.1%), that attended 5 vocational and 6 Anatolian high schools. In the first stage of the study that aimed to determine the occupations preferred by high school students, the application was conducted with 101 males (36.5%) and 175 females (63.5%), a total of 276 students. The second part of the study was conducted with 549 female (55.1%) and 447 male (44.9%) students, a total of 996, to determine the vocational gender role perceptions of high school students.

Instrument

To determine the gender role perceptions of high school students on various professions, GRPVP questionnaire form designed by the author was utilized in the study. To determine the occupations included in the questionnaire, a pilot scheme was conducted with 276 high school students. In the pilot scheme, the students were asked one open-ended question: "Which professions would you like to prefer in the future?" And the following professions were determined based on the student responses: medical doctor (n=51), engineer (n=43), teacher (n=28), policeman (n=25), attorney in law (n=18), architect (n=16), military officer (n=11), dietician (n=10), nurse (n=10), prosecutor (n=10), dentist (n=8), judge of law (n=8), psychologist (n=5), public administrator (n=4) and others (for example: archeologist, veterinary, flight stewardess, musician, bank employer, football player) (n=39). Professions preferred by each student among the 39 participating students were mentioned only once. As a result, only the 14 professions selected more than once were used in the next stage of the study. In the second stage of the study, a different sample group of 996 high school students were asked their perceptions about the rate of preference of these 14 professions by females and males. The vocational gender role perceptions of students for 14 designated professions were determined on a five-point (-2=only for women, -1=mostly for women, 0=equal for women and men, 1=mostly for men, 2=only for men) scale. The negative and positive values used in the evaluations for the survey form did not reflect any positive or negative implications, but only used in mathematical calculations. In the framework of the above scale, the professions in the range of -.50 to +.50 points were classified as neutral (professions that could be performed by females or males equally); the range of -.51 to -2 points as female professions (that could be performed by females only); and the range of +.51 to +2 points as male professions (that could be performed by males only).

Data Analysis

Point averages for 14 professions that were included in the survey form were calculated and plotted on a graph to determine the gender role perceptions of high school students. The graph was designed based on the model by Gottfredson (2005, p. 78), which displayed the female, male and neutral attitudes of students towards certain vocations. In the graph designed for this study, gender role perceptions of high school students reflect the point averages of the student preferences for professions. For instance, in Figure 1, the profession of nursing was rated with the related average ($\bar{X} = -1.11$) and plotted on the right side of the figure. The professions rated by the students as suitable for both female and male gender were described as neutral (their averages were close to zero). As the values disperse towards the left from zero (neutral), they demonstrate that concentration of perceptions for these professions are more suitable for men, while the values disperse towards right from zero (neutral), they reflect that perceptions for these professions are predominantly suitable for women.

Results

Average scores for gender role perceptions of high school students for various professions are presented in Table 1.

Table 1. Point averages for gender role perceptions of high school students for various professions (n=996)

Professions	Gender	n	\bar{X}	s
Architect	Female	549	.48	.971
	Male	447	.85	1.030
	Total	996	.65	1.014
Dentist	Female	549	.44	.893
	Male	447	.51	1.015
	Total	996	.47	.950
Dietician	Female	549	-.79	.583
	Male	447	-.86	.618
	Total	996	-.82	.599
Engineer	Female	549	1.05	.998
	Male	447	1.15	.963
	Total	996	1.09	.983
Judge	Female	549	.75	.996
	Male	447	.99	.970
	Total	996	.86	.991
Lawyer	Female	549	.11	.675
	Male	447	.34	.799
	Total	996	.21	.743
Medical Doctor	Female	549	.11	.539
	Male	447	.20	.646
	Total	996	.15	.591
Military Officer	Female	549	1.53	.674
	Male	447	1.47	.692
	Total	996	1.50	.682
Nurse	Female	549	-1.08	.651
	Male	447	-1.15	.797
	Total	996	-1.11	.721
Policeman	Female	549	1.09	1.013
	Male	447	1.28	.946
	Total	996	1.18	.988
Prosecutor	Female	549	.78	.997
	Male	447	.91	.990
	Total	996	.84	.996
Psychologist	Female	549	-.23	.652
	Male	447	-.27	.793
	Total	996	-.25	.719
Public Administrator	Female	549	1.55	.745
	Male	447	1.53	.704
	Total	996	1.54	.727
Teacher	Female	549	-.09	.395
	Male	447	-.02	.384
	Total	996	-.06	.392

Table 1 displays average scores for gender role perceptions of high school students on certain professions such as; lawyer (\bar{X} =.21), dentist (\bar{X} =.47), dietician (\bar{X} =-.82) medical doctor (\bar{X} =.15), nurse (\bar{X} =-1.11), architect (\bar{X} =.65), engineer (\bar{X} =1.09), public administrator (\bar{X} =1.54), teacher (\bar{X} =-.06), policeman (\bar{X} =1.18), psychologist (\bar{X} =-.25), military officer (\bar{X} =1.50), judge (\bar{X} =.86), and prosecutor (\bar{X} =.84).

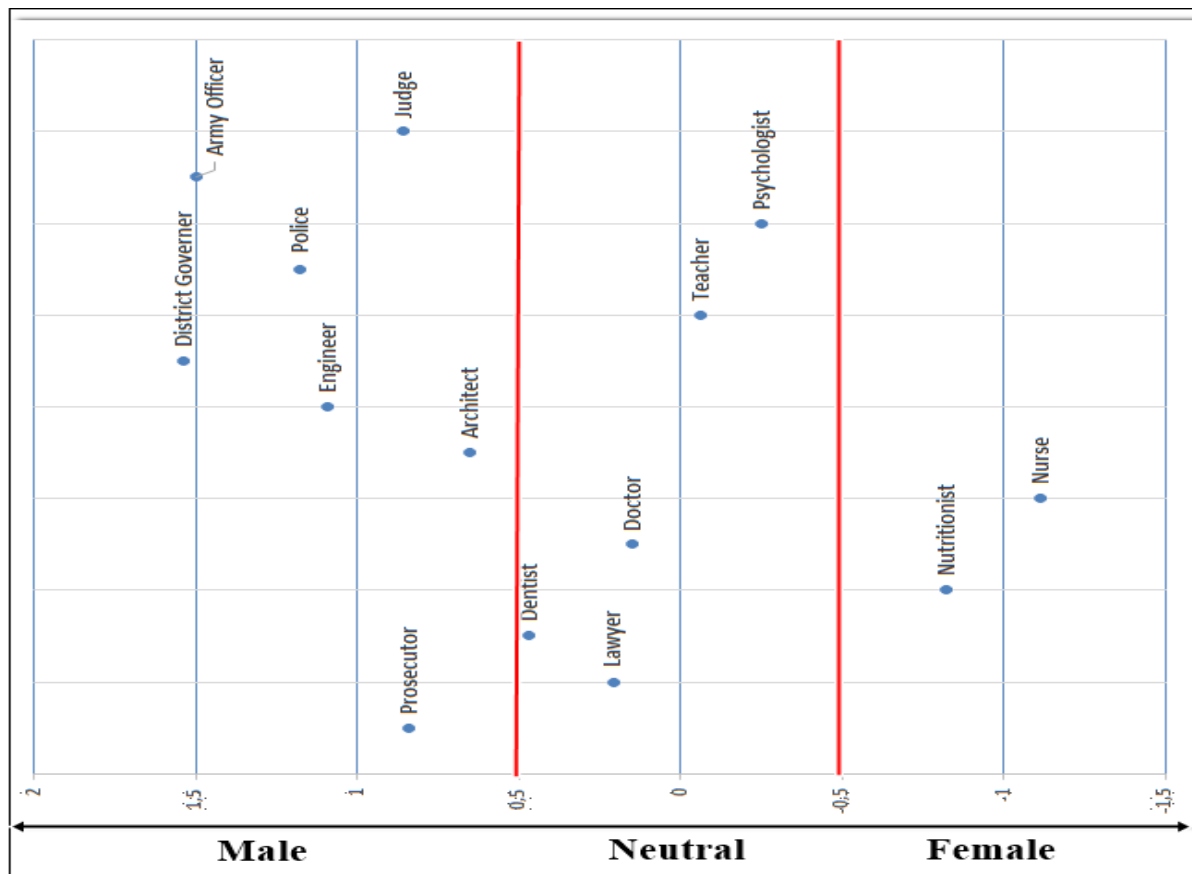


Figure 1. *Gender role perceptions of high school students on various professions*

Figure 1 demonstrates that teaching, medicine, practice of law, psychology and dentistry were perceived as gender-neutral professions. The students described the professions of district governor, army officer, policeman, engineer, judge, prosecutor and architect as more suitable for men in that order. Students described nursing and nutrition as more appropriate for women, in that order.

Conclusion, Discussion and Recommendations

The present survey study aimed to determine the gender role perceptions of high school students regarding professions. High school students determined the professions of teaching, medicine, practice of law, psychology and dentistry as professions that could equally be performed by women and men (gender-neutral professions). The students perceived the vocations of district governor, army officer, policeman, engineer, judge, prosecutor and architect as more suitable for men. In addition, students perceived nursing and nutrition as more appropriate for women. High school students considered 7 of 14 professions as male professions and only two professions are female professions. This suggests that gender role perception limits women's occupational alternatives. Graph 1 demonstrated that the gender role perceptions of high school students have led to a strict determination of the limits of various professions as male and female professions. For example, it was observed that the difference between the scores for the perception of district governor as the most masculine profession and the nursing profession perceived as the most feminine occupation was very high (Graph 1). This finding showed that the profession of district governor was a distant choice for a female student, while the nursing profession was a distant choice for a male student. As a matter of fact, male students in Turkey experience various social oppression and manipulations if they select a career as a nurse. These pressures are manifested in the fact that the nursing departments have a very small number of male students.

The professions perceived as the most masculine were district governor (public administration) and military officer. District governor in Turkey is the civilian authority and the senior public administrator in a district, responsible for the general administration, representing the state in the district. Students perceived senior management as a masculine profession. This finding might be considered as the general attitude of a male-dominant society that the administrators should be selected among men. The perception that women should perform as auxiliary staff instead of administration or professions that require leadership (Kadushin, 1976) might result from the fact that men have higher motivation towards top-tier professional vocations than women (Williams, 1994). Another reason for women perceiving senior management vocations as male professions is the fact that women start their careers in more junior posts than men and they face higher obstacles during their ascend in the corporate ladder (Boushey & Cherry, 2003; Day, 1997; Pascall et al., 2000). For instance, in Turkey's highest public office, Parliament of Turkey (TBMM), only 77 (14.37%) of 536 representatives were women in 2014. The fact that the parliament members who occupy the highest public posts are predominantly men reflects the social perception that managerial and administrative occupations should be performed by males.

Military occupations historically were considered as male professions. Military service is mandatory for men in Turkey. Women could become officers, however almost 90% of the military academy quotas are reserved for men in Turkey. The expectation that women should be cleanly, fancy and with good attire in the society results in men preferring military vocations more frequently than women (Colman, 1990). Even though procurement of females as military officers or sergeants have increased during recent years in Turkey, military occupations are generally perceived as reserved for males.

Study findings also demonstrate that high school students perceive the profession of nursing as a female occupation. Even though in recent years' men have started to serve as nurses in Turkey, high school students perceive nursing as a women's occupation. Reverby (1987) states that since nursing is an occupation that does not necessitate expertise and due to its low prestige, it has been perceived as a female occupation. According to Reverby (1987), nursing is perceived as a reflection of women's natural duties of assistance and care and an extension of women's daily chores at home. Similarly, a study by Schollossberg and Goodman (1972) that was conducted with sixth grade students to determine their gender perceptions on professions demonstrated that both genders considered nursing was performed more by women than men.

Another occupation that high school students thought to be performed more by women was the profession of a nutritionist. There is a perception that women consider concepts like nutrition, nutritive regime and diet more closely. The perception that women are interested in aesthetic concerns, weight problems, nutrition problems, cooking and its content more than men could have been the reason behind the high school students' perception that the profession of a dietician was a woman's occupation. Furthermore, in several societies, the perception that it is the mother's responsibility to prepare a healthy diet and general care of the growing and developing children could have led to the consideration of the profession of a dietician as an occupation reserved for women.

In general the study findings demonstrated that male and female students have a neutral attitude regarding only 5 professions (teacher, psychologist, doctor, lawyer, dentist) among 14 professions. Students displayed the highest neutral attitude towards the profession of teaching (near zero). This suggests that for high school students, the teaching profession was perceived as a profession that is highly regarded for both genders and does not involve any limit based on gender. According to high school students, seven professions were male professions and two were female professions except for the professions they considered as neutral. The study demonstrated that both female and male students perceived most of the occupations included in the research as male professions. This finding demonstrates that women usually do not have the opportunity to display their talents within a wide spectrum of occupations in professional life. They could be distanced from various lines of business, in which they could be successful, just because they were not given fair opportunities. Vocational theoreticians (Betz & Fitzgerald, 1987; Super, 1990; Zytowski, 1969) stated

that female career processes are quite different from that of the males, and women's special needs should be considered during the counseling process (Zunker, 2006). These differences should be especially considered for the high school student females who are about to make career choices, and their unrealistic perceptions on social restrictions should be altered. School guidance counselors that provide professional assistance for high school students on their career decisions should restructure school vocational guidance programs by taking the effects of gender role perception on career selection into account. School guidance counselors should determine the gender role perceptions of students regarding various professions using several measurement tools. Unrealistic gender restrictions by high school students regarding various professions would be limited by taking women who work in predominantly male occupations as a role model and sharing their experiences with female and male students. It was considered that, in changing the gender role perceptions on various professions, male students also could contribute significantly. The perceptions of male students on certain professions as male or female occupations are significantly effective due to the motivation of female students would be accepted by the opposite gender. Thus, the change in perception of male students has a critical significance in changing unrealistic gender role perceptions.

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Pre-service Social Studies Teachers' Views about the Teaching Knowledge Test

Adem Beldagⁱ

Recep Tayyip Erdogan University

Abstract

The aim of this study is to determine pre-service social studies teachers' views about the Teaching Knowledge Test (TKT). The study was conducted within the framework of case-study which is one of the qualitative research methods. The study-group consists of 13 pre-service teachers. Two semi-structured interview forms were used to collect data. Descriptive analysis approach was utilized for the analysis of the collected data. Upon reviewing of the results, it was seen that during the interviews both before and after the exam, pre-service teachers were of the opinion that the content knowledge test should be continued to be conducted; that the number of questions in the exam is not sufficient to measure the content knowledge; that giving weight to undergraduate academic lessons will have an affirmative contribution to this exam.

Keywords: Social studies, Teaching Knowledge Test, teacher training

ⁱ**Adem Beldag**, Assist. Prof. Dr., Faculty of Education, Recep Tayyip Erdogan University, Rize, Turkey.

Correspondence: adem.beldag@erdogan.edu.tr

Introduction

A nation's best self-expression form can be summarized with the behaviours it desires the next generations to embody. The features which must be owned by next generations constitute the character of education curriculum. It goes without saying that the most important element involved in implementation of the curriculum is the teacher (Yaylacı, 2013). When an education system is examined, it is understood that everything changes and is replaced inevitably –blackboards replaced by glass boards and smart boards eventually. However, teachers remain as the most important element unaffected by this change. They represent the basic element of education and the main practitioner of any education policy and curriculum.

Departing from this conceptual framework, different policies have been followed in teacher preparation as one of the most important elements of education in Turkey. In the bottom of the educational policies, the desire to reach the best and bring up the practitioners of the curriculum to meet the needs of the era lies. Mistakes in the selection of teachers will adversely affect not only students' education life but also educational institutions and overall education system (Safran, Kan, Üstündağ, Birbudak & Yıldırım, 2014). It is emphasized that success in school can be achieved only with teachers who comply with certain standards; for this reason, it is necessary to identify the standards in the selection of teachers (Hartley, 1998; Eryaman & Riedler, 2009). Stephens and Crawley (1994) list these standards as content knowledge, teaching skills, classroom management, student level (performance) determination and recording, and understanding that teaching is a lifelong profession.

In Turkey, the Ministry of Education (MEB) lists general qualifications required for teaching profession as: (a) personal professional values, (b) recognition of students, (c) teaching and learning process, (d) monitoring and evaluation of learning and development, (e) school, family and community relationships; and (f) curriculum and content knowledge (MEB, 2004). When considered in the particular context of this study, field-specific qualifications for social studies teachers are determined as; (a) planning and regulating the teaching process, (b) learning-teaching process, (c) monitoring and evaluation, (d) collaboration with the school, family and the community; and (e) ensuring professional development (MEB, 2008). Abovementioned qualifications imply that the teaching profession is a field of specialization.

One of the goals of teacher preparation curricula implemented in our country is to bring up candidate teachers with specialized knowledge in a particular area (Çelikten, Şanal & Yeni, 2005). Many studies can be carried out to enhance the education of candidate teachers. Among others, teachers should receive a good education and develop themselves in their fields as the most important priority. In short, teachers should first learn so that they can teach students (Connelly, Clandinin & He, 1997; Eryaman & Riedler, 2010). To keep pace with this change, a proposal was offered in the 18th National Education Council as "In the tests performed in teacher recruitment, candidates should be asked questions relating to their specific fields of graduation along with professional knowledge of teaching and world knowledge."

Failure to make good planning regarding employment of teachers as well as to plan well the process of teacher employment beginning from opening education faculties to their recruitment has caused an accumulation of pre-service teachers before recruitment. To prevent the accumulation, a selection examination has been applied for recruitment of teachers since 1999 (Atav & Sönmez, 2013). The examination was held as "Civil Service Exam" (DMS) in 2000 and "Public Vocational Exam" (KMS) in the following year. Lastly, it has been held under the name of "Public Personnel Selection Examination" (KPSS) since 2002 (the Cabinet decision dated 18.03.2002 numbered 3975) (Ercoskun & Nalçacı, 2009). While the recruitment of teachers is performed through the test called KPSS in Turkey, similar tests are carried out under different titles in other countries. For example, in Germany, state exams I and II are applied; in France, pre-service teachers take a test in the introduction of the teaching profession; on the other hand, several European countries have interviews for recruiting teachers (Kilimci, 2006). The issue of improving quality in education is brought up to the agenda in

not only Turkey but also all other countries, and studies are carried out to improve the quality of education (Berliner, 2005). Applying of such examinations may be a criterion to eliminate the idea that pre-service teachers are not at the desired level considering the qualities they are required to have (Yaylacı, 2013). First, pre-service teachers took world knowledge, general skills and educational sciences tests in the KPSS. Thus, they did not attach importance to undergraduate courses during their higher education (Erdem & Soylu, 2013). However, considering that teaching is a profession which requires specialized knowledge and skills, candidates need to have a number of competencies in order to be able to fully perform requirements of the profession (Şişman, 2001). One of them is to have content knowledge in respective areas. Content knowledge is of critical importance for teachers (Koehler & Mishra, 2009). In this regard, in the National Education Basic Law of 1739, teaching was defined as the “specialized profession” which assumes the state's education, training and administrative duties associated with them. In addition, this specialized area consists of world knowledge, field-specific content knowledge and pedagogical content knowledge. Teachers with the content knowledge know how students will create the knowledge, acquire the skills, and use the mental skills supportive of learning (Koehler & Mishra, 2006). In the light of these, in order to train more qualified teachers with mastery in their fields, it was started to apply teaching content knowledge tests besides other skills such as world knowledge, general skills and educational sciences.

KPSS Teaching Knowledge Test (TKT) consists of 80% of field-specific courses including history, geography, political science, the foundations of the social studies, social psychology, archaeology, anthropology, sociology, philosophy, economics, science, technology and social change, art and aesthetics, human relations and communication, today's world problems, and social project development; and the rest of 20% is composed of questions about respective field of specialization. The latter exam covers a substantial part of the lessons learned during the undergraduate education. In the field of social studies teaching, TKT was applied for the first time in 2013 for pre-service teachers who completed their undergraduate studies during that year.

In the literature, studies about candidate teachers' views regarding KPSS Teaching Knowledge Test (TKT) are available (Erdem & Soylu, 2013; Demir & Bütüner, 2014; Özkan & Bağçeci, 2015; Yiğit & Alev, 2015). The current literature provides information about opinions of pre-service teachers after taking the Teaching Knowledge Test. The significance of our study arises from its attempt to shed light onto expectations of pre-service teachers regarding the Teaching Knowledge Test, which was applied for Social Studies Education area during the 2012-2013 school year for the first time, to determine their views after the exam and finally to make an overall assessment. The aim of this study is to determine expectations of pre-service teachers that graduated from the social studies education department of the education faculty of a state university in Turkey during the 2012-2013 academic year from the Teaching Knowledge Test, and to find out their post-test views. For this purpose, the study was carried out to seek answers for the following research questions before and after the Social Studies teachers took the Teaching Knowledge Test (TKT).

- What views do candidate Social Studies teachers hold regarding applying of the TKT?
- What views do candidate Social Studies teachers hold regarding whether the TKT measures field-specific knowledge or not?
- What views do candidate Social Studies teachers hold regarding their level of preparation for the TKT?
- What views do candidate Social Studies teachers hold regarding the contribution of the university education to the TKT?
- What views do candidate Social Studies teachers hold regarding the support obtained from private teaching institutions in preparation for the TKT?

Method

The study was designed as a case study since it offers the most suitable method for both the topic and aim of our study, which intends to make an in-depth analysis and to determine the pre-service social studies teachers' views on the teaching knowledge test before and after taking the test.

Case study is a qualitative research approach in which the researcher gathers detailed and in-depth information, puts forward a state description or condition themes about real life, a current limited system (a case) or multi-limited systems (cases) within a specific time through multiple information sources (Creswell, 2009). In the context of qualitative research, case study refers to intensively studying an event or a phenomenon (Glesne, 2006). In this type of research, answers are sought for the questions about how and why the cases arise (Denzin & Lincoln, 2005).

Participants

The study group consists of 13 pre-service teachers attending the social studies department affiliated with the education faculty of a Turkish state university during the 2012-2013 academic year. The participants were selected by using the criterion sampling method as a type of purposeful sampling. The main point of this sampling method is the study of all cases that meet a set of predetermined criteria (Yıldırım & Şimşek, 2011). In this study, the predetermined criteria were identified as having graduated from the department of social studies education, being about to take/having taken the Teaching Knowledge Test (TKT), and willingness to participate in the study. Interviews were held with the participants both before and after the TKT.

Data Collection Instrument

In order to collect data, semi-structured interview forms consisting of open-ended questions were used in this study. Open-ended questions include a certain number of questions covering the headings/areas the researcher is interested in, and, consequently, these questions offer the possibility of more detailed discussion of the headings to both the researcher and interviewees while defining the area under investigation (Hancock, 1998). In order to determine pre-test expectations of the TKT and post-test evaluations, two interview forms were prepared. The interview form was developed by a number of sequential steps such as the literature interview, writing of the questions, receiving opinions from experts in the field, pilot scheme and finalizing the questions accordingly. The participants involved in the pilot scheme were excluded from the main implementation. The most powerful aspect of interviews is that they allow to obtain information about what is not seen and to make alternative explanations about what is seen (Glesne, 2006).

Data Analysis

Data analysis is defined as exporting of the data (Merriam, 2009). In this study, the data collected from pre-service social studies teachers about their expectations prior to the TKT and their assessments after the examination were analyzed with the descriptive analysis approach. In this approach, obtained data are summarized and interpreted in the light of predetermined themes. In order to reflect the views of interviewee(s), excerpts are frequently cited from the interview. The data are described and then interpreted. Next, some conclusions are drawn and proposals are put forward for future researchers (Yıldırım & Şimşek, 2011). During data analysis, expert opinion was obtained to ensure reliability and sub-themes were created separately. The formula $Reliability = (Consensus / (Consensus + Dissidence)) \times 100$ was applied. Matching of 83% was reached between two coders in pre-test analysis, and 89% in post-test analysis. Matching rate equal to or greater than 70% is regarded sufficient (Miles & Huberman, 1994). The participant teachers were coded as P1, P2... when cited in direct quotations as a rule of descriptive analysis techniques.

Results

The findings from the research were evaluated according to the research questions. As a result, pre-service social studies teachers' expectations and assessments regarding the Teaching Knowledge Test were grouped under five main themes. The findings relevant to the study aim were presented by supporting with direct citations from the participants' views in accordance with the descriptive analysis approach.

Views Regarding Application of the Teaching Knowledge Test (TKT)

Results from the interviews before the TKT;

The pre-service social studies teachers were asked about their views regarding necessity of applying the TKT. Of the candidate teachers interviewed before the examination, 12 participants stated positive opinions about necessity of the exam while one person stated negative opinion. The participants expressed their expectations of the exam while expressing their views on this matter.

As a result of the analysis, the positive views were collected under three sub-themes as "there must be the test but the timing is wrong", "it will bring quality" and "just field-specific exam should be applied". The negative statement was placed in another sub-theme as "knowledge of practicum should be measured".

Examination of the positive opinions regarding the necessity of the TKT shows that the highest frequency falls under the sub-theme "there must be the test but the timing is wrong" (8 participants). Two of the participants expressed their views in this direction as following:

With the changes made during the term, our study schedule has completely changed and our focal points have differed. We did not even have enough time to study for the field exam (P10). It is a system which needs to be implemented for the students who are currently in the first grade, not in the 4th grade. This field education must begin from the first class and students should develop themselves accordingly (P11).

Also, the analysis of data revealed that the pre-service social studies teachers emphasized the opinion that quality of education will be enhanced by the test (3 participants). According to the proponents of this view:

...It should have been done from the beginning. We have already passed the general culture and general ability tests, what is important is measurement of the field knowledge (P9). and Now that we are going to perform this profession, of course we need to be proficient in our field (P13).

One participant stated that only field-specific examination should be applied as following:

I find it right; I think that there should be just the field exam. So, the courses required for teaching should be included in one exam without causing such chaos (P2).

The respondent holding a negative view regarding this matter stated that measurement should be for practicum instead of content knowledge as following.

I think that practical teaching knowledge must be measured rather than information because this is more important than the content knowledge (P6).

Results from the interviews after the TKT;

From analysis of the interviews following the Teaching Knowledge Test, all of the pre-service teachers reported positive opinion for continuation of the exam and expressed their expectations regarding the contents of the examination. These opinions were collected under three sub-themes as "the content should be changed", "the test is decisive" and "the weight of the field knowledge test needs to be increased in the exam".

Examination of the participants' views on this matter yielded the highest frequency for continuation of the exam, but according to the participants the content should be changed (9 participants). As an example:

...some changes should be made in the content of the field exam. Teacher candidates should be questioned on how well they can teach their subject courses, rather than the knowledge of the field (P11). "Redundancies should be reduced in the course area. After all, everyone does not have to be knowledgeable in all areas, it is better to be proficient in their own field (P13).

In addition, the participants' views indicating that the field exam is decisive seem at a remarkable frequency (4 participants). The following comments were extracted from the analysis of the interviews:

...Many department graduates unfortunately are thrown into a career by answering a lot of questions with nothing to do at all with their respective field; field examination should be conducted to prevent this (P3). ...If one fails the exam, s/he hopes to do better in another. Also the challenges brought by the education system and difficulty of eliminating the pre-service teachers who will be recruited have made such a test obligatory (P4).

In interviews after the exam, the pre-service teachers (2 participants) stated that the weight of the knowledge test in the exam should be increased. These views are cited as follows:

Now that I'm studying social studies education, don't let them ask me maths questions because I will not teach mathematics at school... in my opinion, questions about necessary courses and topics should be asked (P7).

Views Regarding Measurement of Field-Specific Knowledge by the Teaching Knowledge Test (TKT)

Results from the interviews before the TKT;

During pre-test interviews, the pre-service teachers were asked for their opinion regarding measurement of the field knowledge by the TKT. It was found out that all of the respondents expressed negative opinions. The views in this regard were divided into four sub-themes as "small number of the questions," "uncertainty," "test anxiety" and "being late of the institution".

It seems from the interviews that the views indicating the small number of the questions (10 participants) are at a remarkable level. Some of the opinions expressed in this direction are given below:

Since the field examination is an examination consisting of 50 questions, the number of questions will be consequently very limited for an area like social studies. In short, the content validity will be too low (P4). When we look at the distribution of the topics in the field exam, there are questions mainly about history, geography and citizenship as well as other social sciences... If there were 80 questions, it would be more reliable and valid (P11).

When the pre-service teachers' opinions on whether the TKT would measure field-specific knowledge or not were taken into consideration, an uncertainty was identified regarding the examination (2 participants). A citation from this sub-theme is given below:

Since we are the first victims of the field exam and we do not know what sort of questions will come up, it is a bad situation; I do not believe that it will fully measure our knowledge (P12).

The views concerning measurement of the field knowledge by the TKT include test anxiety (1 participant) and belated timetable of the institution for arranging the examination (1 participant). In this sub-theme, one of the views is given below:

This is readily impossible due to test anxiety... we will take the field exam unpreparedly and worriedly; in addition, we do not know if this is an advantage or disadvantage; after all, nobody is ready (P1).

Results from the interviews after the TKT;

After taking the Teaching Knowledge Test, the pre-service social studies teachers were asked about their opinions regarding whether the test measures the field knowledge. When the teacher candidates' answers were examined, negative responses were found to be given by 12 people, while 1 person responded positively. During the analysis, the negative responses were collected under two sub-headings as "small number of the questions," and "quality of the questions". On the other hand, the positive opinion constituted of the sub-theme "the exam covers the field".

In post-test interviews with teachers, the highest frequency corresponds to the candidates indicating the small number of questions (8 participants). Some of the views are as following:

...When we finished the exam, everyone thought the same thing, the field exam did not measure the field. ... For example, there were questions about economy, politics, philosophy, arts and aesthetics and a question from a huge book on citizenship or the Constitution. So, does this test have the content validity? (P1). I think that the KPSS field exam does not measure my knowledge of the field and it is not a synthesis of four years of my knowledge. One question asked was randomly from the course I studied for one semester, nothing but luck (P6).

Analysis of the data on this matter revealed another noteworthy sub-theme as lower quality of the questions (5 participants). Some of these views are as below:

...it is the first field test, so the questions were not much at the level to measure the field knowledge. ... For me, they were not very good quality questions (P11). This year's questions must have been prepared in a little rush (P13).

The positive opinion on the exam was found under the sub-theme that the examination covers the field (1 participant).

Almost all the questions in the exam are about the field that a social studies teacher is supposed to know, but the degree of difficulty of this exam will rise slightly in the future, I think. (P10).

Views Regarding the Level of Preparation for the Teaching Knowledge Test (TKT)

Results from the interviews before the TKT;

During the pre-test interviews, all of the participants provided negative responses meaning that they did not prepare well enough for the teaching knowledge test. Their views in this regard were collected in three categories as "belated announcement of the exam", "uncertainty" and "intensity of the faculty courses".

Scrutiny of the views on this matter indicated a marked frequency of the sub-theme of belated announcement of the exam (9 participants). The participant teachers pointed out their views as follows:

... developments and changes in the educational process have negatively affected me. I have lost all my concentration. Then, panic occurred. Which one will we review: general culture, general abilities, educational sciences or field content? (P4). The content of the exam was published in April and 3 examples of questions do not sample the content ... (P6).

Another marked sub-theme in the interviews was found as uncertainty related to the exam (5 participants). In this regard, one participant's expression is given below:

We have neither books to refer nor a guidance. One must be very lucky or genius to be able to predict what we will face with the 4 questions published. ... Especially the idea of being the guinea pig for such an unknown system takes one into pessimism demotivating for studying...(P10).

Lastly, intensity of the faculty courses was mentioned by 3 participants. Relevant opinions on this matter include the following expressions:

... I think that the faculty management should collect the courses on a certain test to leave us free time to study for the exam, especially the courses regarding school practice should be given in the 3rd grade. (P3). I had a busy year. I do not remember more intensive time in my life. University courses, school practice, attending the private teaching institution; I did a combination of these three (P7).

Results from the interviews after the TKT;

The pre-service social studies teachers' views regarding the level of preparation after the test were grouped under two sub-themes as "giving importance to the faculty courses" and "planned study".

In the interviews, all of the respondents were seen to pay attention to their school courses (13 participants). Some of them are cited as below:

I studied the lessons to learn, not to pass the exam (P2). If I started university today, I would buy a notebook for each course and take notes of what the lecturer tells. For example, I took the economy course in the first grade and I was studying just to pass the course, like most of our friends (P10).

The other striking view reported during these interviews was about the opportunity for planned study (8 participants). Some of the views on this sub-theme are given below:

...I had a field book and started studying. This exam is beyond some students' depth. This year I realized that I underestimated the exam, I shouldn't have done (P4). A student who has followed the courses on a regular basis for 4 years can be very successful in his/her field (P4).

Views Regarding Contribution of University Education to the TKT

Results from the interviews before the TKT;

Regarding the contribution of the education received at university to the field exam, teachers were found to indicate negative opinions. These negative views were found to fall under three sub-themes as "the course lecturers having a background outside the field," "candidate teachers' ignorance of the lessons" and "not teaching of the courses according to the content".

The course lecturers having a background outside the field was seen to be the most notable sub-theme (9 participants). Two participants expressed their views as following:

"... the great majority of the courses we took were taught by teachers outside their area of expertise. In short, teachers just applied the procedures (P4). "We had some problems in terms of university teachers in the early years. However, in recent years we have met the teachers qualified in their field (P8).

Another view drawing attention during these interviews was students' ignorance of the courses. Their views on this issue are exemplified below:

“... then the learning consciousness was not important to us. The important thing was to pass the course. If I had known that the field exam would be conducted, I wouldn't have been in this situation (P1). ... we feel inadequate. Of course, that we didn't do any research and reading, and we expected everything from the faculty instructors played an important role (P4).

The last attention-grabbing sub-theme was not teaching of the courses according to the content (3 participants) as reported by participants. This view was expressed as follows:

The lessons were not given as required by the instructors (P11).

Results from the interviews after the TKT;

The post-test interviews with the pre-service social studies teachers displayed negative feedback regarding the contribution of the university education to the TKT. The sub-themes are “incompatibility between the courses and the exam content”, “the lecturers having a background outside the field”, and “ignoring of the lessons”.

The most striking sub-theme was found to be the incompatible course syllabus and exam content (5 participants). Some of the views are as following:

Some courses were enough for the exam. But it was not for measuring the knowledge with questions (P2). ... though I can't say the same thing for the ... course, I do not think it made contribution to the ... course. The field exam questions were not in parallel with the course syllabus (P6).

Another remarkable sub-theme was noted as course instructors from outside the area by 4 participants. These views include:

It has not made much contribution because most lessons were taught superficially. Some of the important courses for us were given by the non-specialist teachers (P5).

Lastly, the participants drew attention to their ignorance of the courses during university education. As an example:

To speak frankly ... because some of my idealist teachers forced to teach some things, I could do several questions in the field exam... (P10).

Views Regarding the Support Obtained from Private Teaching Institutions in Preparation for the TKT

Results from the interviews before the TKT;

As a result of the pre-test interviews about the contribution of private teaching institutions to the preparation for the Teaching Knowledge Test, 8 participants stated negative opinions while 5 participants stated positive opinions. Negative views were summarized under two sub-themes as “width of the field and uncertainty about questions” and “private teaching institutions will not be sufficient for the field”. On the other hand, positive views were described in relation with one sub-theme as “providing the opportunity to study for the exam in a planned way”.

Among the teachers giving negative responses, the frequency of reported width of the field and uncertainty regarding questions seems striking (8 participants). Some of these views are as following:

There are approximately 40-45 courses ... in the field of social studies. Attending the private teaching institution for all these courses is just a waste of time, because our field is based on reading skills (P4). I do not think it will be useful, because nobody knows exactly what to do (P9).

Also it was suggested that the private teaching institutions would not be sufficient for the examination (2 participants). One of these views is given below:

Field courses should be taught by specialist teachers and I do not think that there are such teachers specialised in their areas in the private teaching institutions (P2).

On the other hand, it was seen that the positive opinions regarding the support from such institutions were combined under the sub-theme of planned study for the exam (5 participants). Some of these views are as following:

Private training institutions are useful because the courses we learnt in the university are not taught in compliance with the examination system, rather they are taught in a more academic way (as it should be). I think private training institutions have more contribution to the exam since they focus on the examination system and discriminate topics as important and trivial, etc (P6).

Results from the interviews after the TKT;

In post-test interviews regarding the support of private training institutions to the preparation for the TKT, 8 respondents reported negative opinions, while 5 respondents stated positive views. Both negative and positive views were summarized under one sub-theme for each one as “width of the field and uncertainty about questions” and “providing the opportunity to study for the exam in a planned way”, respectively.

During post-test interviews, the width of the field and uncertainty about questions (8 participants) was found as an outstanding negative opinion about the contribution of private institutions to the exam. Some of these views were as follows:

That the subjects to be asked in the exam were not certain literally until April caused inefficient and ineffective courses held in private training institution. (P3). I regret going to the private training institution, as it provided no benefit. We just used the books (P9).

On the other hand, positive feedback of participants was gathered under the sub-theme of providing the opportunity to study for the exam in a planned way. Citations are given below:

...provides the opportunity to study regularly and planned studies give more determination to work (P5). ... learning may be more effective, there may be the environment for talking and discussing questions with friends, and everyone can teach something to each other. There is an environment where collaborative learning could occur (P11).

Discussion and Conclusion

In this research, the pre-service teachers' views about necessity of the KPSS Teaching Knowledge Test were found consistent before and after the test. Similar results were found by Şimşek and Akgün (2014); Demir and Bütüner (2014) reporting that the exam is regarded as a positive and belated implementation, and the field exam seems to recruit pre-service teachers with the field knowledge and mastery of the theoretical knowledge in respective field. Also high level of consistency was noted between findings of our study and Erdem and Soylu's study (2013). In both studies, pre-service teachers reported similar views regarding measurement of field knowledge as a pre-requisite for appointment of teachers and planning. The emphasis on the necessity of the exam can be explained with the large number of pre-service teachers leading to difficulty of selection. It can be suggested that the pre-service teachers participating in this study see the Teaching Knowledge Test as a fair selection tool.

Kuran (2012), in his study carried out with pre-service teachers, found out that weight should be given to the questions measuring the field knowledge in the exam, which seems to support our

findings. Regarding this aspect, the studies placing emphasis on the need to change the content of the exam are abundant in the literature (Çimen & Yılmaz, 2009; Erdem & Soylu, 2013; Arslan & Özpınar, 2008). It is thought that the great number of pre-service teachers cause the unemployment problem and thus it is inevitable to conduct an examination to select qualified teachers (Sezgin & Duran, 2011). As a solution, the content knowledge test, which is defined as "having knowledge of the subject to be taught or learnt" (Koehler & Mishra, 2006), will help both facilitate the selection and recruit more qualified teachers knowledgeable about their field. Since the importance of field knowledge will increase along with the level of instruction, teachers need to be well-equipped in their field (Beşoluk & Horzum (2011).

Pre-service teachers noted in both pre-test and post-test that the exam would be incomplete to measure their field knowledge. A similar result was also found by Demir and Bütüner (2014), indicating that 50 questions are not enough to reflect the scope exactly. This could be explained with the fact that social studies represent a wide discipline formed by benefiting from a range of social sciences (Öztürk, 2012) and thus the number of questions to be asked/asked could not be sufficient to measure the field knowledge. In performance of the teaching profession, field knowledge and professional knowledge form the pedagogical knowledge (Koehler & Mishra, 2009). Departing from this, it is emphasized that the number and weight of the questions in the field exam should be increased (Çimen & Yılmaz, 2009). The view that the number of questions is insufficient brings to our mind the idea that other criteria related to the field could be employed (Erdem & Soylu, 2013). In this context, Atav & Sönmez (2013) highlighted that a system should be brought to perform the selection of qualified teachers and consistent policies should be followed. In this regard, the pre-service teachers' opinion that practical skills should be considered besides the content knowledge test seems quite remarkable.

During pre-test interviews concerning their level of preparation for the exam, pre-service teachers stressed that belated announcement of the exam timetable had an adverse effect on their preparation process. On the contrary, they stressed during post-test interviews that giving importance to faculty courses would increase the success. In this aspect, support is extended to our study by Kuran (2012) noting that pre-service teachers will be more successful and negative factors such as stress or anxiety will be reduced if they start studying for the exam in a planned way since the third grade. Moreover, Yeşil, Korkmaz and Kaya (2009) concluded that academic grade average has a positive impact on KPSS. In the light of these findings, it could be suggested that the importance attached to courses at undergraduate level is a determining factor in the success of preparing for the exam.

Another result obtained from the study is that university education will not/did not contribute enough to the field test from the participants' point of view. Although in pre-test interviews, it was explained with teaching of the courses by instructors from other fields, after the test it was stated that syllabus of the courses did not overlap with the content of the examination. However, a striking finding in the post-test interviews was that giving importance to faculty courses would increase the success according to the pre-service teachers. Differing views of the prospective teachers before and after the test can be explained with expectations about the content of the exam. Demir and Bütüner (2014) reached similar conclusions and explained this situation with indifferent course instructors, superficial or no lecturing, and their inability to have mastery of the subject and course. The findings seem to be parallel with Atav and Sönmez (2013) reporting that pedagogical formation syllabus at university is not enough for pre-service teachers to answer educational sciences questions in the examinations, and education faculty course syllabus does not match with the content of educational science examination. Apart from that, a lot of studies investigating the KPSS and TKT questions for content validity noted that the content of teaching profession courses at university does not match with the exam coverage (Başkan & Alev, 2009; Eraslan 2004; Karataş & Güleş 2013; Demir & Bütüner 2014). In contrast to the conclusions reached above, Sezgin and Duran (2011) found out that the content of university courses overlaps with the examination content and emphasized that differences are due to the instructors, reaching similar conclusions with a portion of the findings.

Though it was predominantly pointed out during interviews that positive contribution is not expected of private training institutions, opposite views were seen at a marked level. Negative opinions were based on the width of the field area and verbal content of the subject; whereas, positive views were supported with provision of a regular education environment, review of the lessons learned during the four years by private institutions, and they also help narrow the gap between the faculty course syllabus and examination content. These conclusions are also supported by the literature (Kuran, 2012; Eraslan, 2004; Karataş & Güleş 2013; Sezgin & Duran 2011; Şimşek & Akgün 2014). Different views among students regarding potential contribution of private teaching institutions could be explained with students' personal study habits and with the fact that social studies is a large area, which benefits from many different disciplines.

As a conclusion, the most interesting result is that pre-service teachers' expectations and what they encountered in reality were found largely similar in pre and post-test interviews. Participants stated a common view on the need to apply the exam; yet, they claimed arrangements should be better planned and the exam content should be oriented to teaching field and practical knowledge. Another interesting point about the content of the exam is the emphasis on the fact that that fifty questions will be not enough to measure a wide range of content such as social studies. During pre-test interviews regarding the failure to be well prepared for the exam, much attribution was made to the announcement of the exam timetable few months prior to the exam. However, it was underlined during post-test interviews that giving importance to faculty courses would increase the academic achievement. The participants also argued that the education they received at university would not/did not make a contribution to teaching of the courses by academicians with irrelevant backgrounds and incompatibility between the course content and exam content. Another striking result of the study is the belief that contribution can be brought by private training institutions, which is not supported by the literature. It is thought to be due to the verbal nature of social studies area comprised of too many subjects.

Finally, in the light of the study results and evaluations, following recommendations are brought, respectively:

- Planning of changes concerning the education system must be for a long term. Our teacher training model in this regard should be consistent. Other criteria such as graduation degree should be accounted besides KPSS and TKT for the selection of teachers who are in the position to prepare the future of a nation.
- Courses should be assigned to instructors in conformity with their specific fields. Compatibility of contents of the undergraduate courses and the field exam should be maintained.
- The purpose of the exams should be to select highly qualified teachers rather than eliminating most of the candidates.
- Undergraduate academic averages and field exam grades could be studied comparatively.
- Analyses can be performed for content of undergraduate courses and field exam questions. In addition, reference books in classes can be studied comparatively in relation with the course content and exam content.

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The Examining Reading Motivation of Primary Students in the Terms of Some Variables

Merve Atas Biyikⁱ

Karadeniz Technical University

Tolga Erdoganⁱⁱ

Karadeniz Technical University

Mustafa Yildizⁱⁱⁱ

Gazi University

Abstract

The purpose of this research, is to examine reading motivation of the primary 2, 3 and 4th grade students in the terms of gender, class and socioeconomic status. Research is structured according to model of survey in the descriptive type. In the collection, analysis and interpretation of the data “mix method”. The sample consists of total of 769 students studying in the same province including class 2, 3 and 4 in three different schools. Research data is collected by scale of Motivation to Read Profile. According to the survey results, however students' value of reading is affected class and gender variables, students' value of reading is not affected by socioeconomic status. The value of reading of 3rd grade students is higher than 4th grade students. The value of reading of girls is higher than male students. Self-concept as reader and reading motivation of students variate depend on class, gender and socioeconomic status. In addition, reading motivation of 2nd grade students is higher than the 4th grade students. Self-concept as reader and reading motivation of students having upper socioeconomic status are than self-concept as reader and reading motivation of students having lower and middle socioeconomic status.

Keywords: reading, motivation, reading motivation, self-concept as a reader, value of reading

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ⁱ**Merve Atas Biyik**, Res. Asst., Department Of Primary Teacher Education, Karadeniz Technical University, Trabzon, Turkey.

Correspondence: merveatas90@hotmail.com

ⁱⁱ**Tolga Erdogan**, Assoc. Prof. Dr., Department Of Primary Teacher Education, Karadeniz Technical University, Trabzon, Turkey. Email: tolgaerdogan.edu@gmail.com

ⁱⁱⁱ**Mustafa Yildiz**, Assoc. Prof. Dr., Department Of Primary Teacher Education, Gazi University, Ankara, Turkey. Email: mustafa@gazi.edu.tr

Introduction

Changes and innovations taking place in nowadays require individuals composing the society to improve themselves. With the start of information age, individuals face of being literate in many fields of life reality such as maintaining their daily lives, gaining desired success, adjusting technology, forming a social environment, spending their free times more constructively. In this respect, linguistic skills require the usage of four basic linguistic skills effectively beyond being literate. "Reading" is the most important one of these basic linguistic skills.

"Reading is an important factor widening individual's world, forming his/her personality and connecting him/her to others." (Demirel, 2003, s.78). According to Sever (2004, s. 14), "Reading is an effective learning tool, not only for students but for everyone to open up to a wide information universe, to improve thought and sensitivity and to enter a healthy communication with society.

According to Güneş (1997, s. 4), one of the common features of reading, among its definitions, is that reading is a complex behavior containing several skills. When reading process is examined, it is seen that many mental mechanisms participate in this process and work in coordination. Several mechanisms can be counted within the mental mechanisms that play an effective role in reading process, such as memory, attention, auditory perception, usage of high level language skills.

Along with mental mechanisms that are used in reading process, some emotional mechanisms are also mentioned. One of these emotional mechanisms is motivation. According to Akyol (2011, s.5), Baker and Wigfield (1999, s.452), reading is an activity requiring motivation since it is an activity that children may prefer to do or not. Motivation is one of the key factors in learning reading and improving it. Even if a reader has strong cognitive skills, if his/her motivation for reading is not at adequate level, s/he doesn't make sufficient time for reading.

Psychological structure of a student is one of the most effective factors in achieving a good reading level. Carrying a student who got up to a certain level in perception and thinking processes of mind, to emotional maturity is also important. (Demirel, 2003, s.77). According to Akyol (2009), it should be aimed that every kid explores that reading is a delightful activity and experiences the success.

Motivation is one of the key factors in terms of learning and improving reading, value parted with reading and reader's sense of self. According to Atkinson and Hilgard (1995, s.435), if we look at definition of motivation, factors energizing the behavior and leading it are called motivation. In fact, source of motivation is physical, psychological or social requirements of an individual. In that case, motivation is a driving power that activates an individual for exhibiting required behaviors and reaching to a certain goal in certain situations. (Balaban, 2006, s.169). In other words, motivation is about reasons leading individuals to behaviors.

When it is thought in terms of student and learning, motivation can be thought as direction of effort providing student with a desire in learning (Eryaman & Genc, 2010). However, motivations differs regarding courses, subjects and fields else than being a general subject. (Yıldız, 2010, s.29). Reading is also included in motivation, which has a wide scope.

Guthrie and Wigfield (2000, s.405) explain motivation to read as "Personal goals, values and beliefs that effect reading periods, results and subjects." Until 1990's, the researches about reading motivation are quite limited. Being a factor (motivation) that determines individuals to prefer or not an activity, it has been effective for researchers to incline to motivation subject (Eccles, Wigfield and Schiefele, 1998).

Highly motivated readers are more successful in decision-making on their own and creating reading opportunities. These students are enthusiastic about reading and they choose reading for many

personal reasons, such as curiosity, instinct satisfaction, attention, social changes. (Gambrell, Palmer, Codling ve Mazzoni, 1996). According to Guthrie (1996), highly motivated readers create their literacy opportunities and they determine their fate by doing this as individuals learning literacy (Gambrell, Palmer, Codling and Mazzoni, 1996).

Some recent theories claim that skill for sense of self and value parted with duty are main determinants of motivation and work responsibility. For example, Eccles (1983) developed the "expectancy-value theory", which indicates that motivation is strongly affected by the expectancy of individual for success or failure. Eccles's expectation component is supported by some researches claiming that students and readers who believe that they are talented display better performance than individuals who don't believe such things. In addition, students who believe that reading are worthwhile and important, make a more planned and zealous effort for reading skill (Gambrell, Palmer, Codling ve Mazzoni, 1996).

When literature is examined, different dimensions of reading motivation are discussed in researches made about motivation to read (Yıldız, 2013; Ciampa, 2012; Jones and Brown, 2012, İleri, 2011). Motivation to read is examined within the frame of many concepts, such as interior and exterior motivation, self-efficacy, interest, goal, attitude, and worth. Within the scope of this research, motivation to read is discussed with the dimensions of "value of reading" and "self concept as a reader" as distinct from other researches. Points generated from these two dimensions lay out the reading motivation profiles of students. It is thought that determining how much students value reading and how they evaluate themselves as a reader, is a determining factor for teachers, families, students and relevant institutions.

Motivation, which is important for doing a work, is one of the essential factors with regard to reading skill. It is known that doing a work willfully affects the success of individuals. Using a skill willfully like reading, which is extremely important, will affect the value parted with reading and reader's sense of self. In this research, motivation to read is discussed within the frame of these two concepts. Value of reading is a concept expressing how much importance individuals attach when reading. Self concept as a reader is a concept indicating as what kind of reader individuals think of themselves. It is thought that value of reading and self concept as a reader varies depending on beliefs, values and goals of readers. In this research, motivation to read is examined in terms of socio-economic level, grade and gender variables.

Answers of such questions are searched for in research:

1. At what level are the self concept as a reader, value of reading and motivation to read of students?
2. Does value of reading of students vary depending on gender, grade and socio-economic level?
3. Does self concept as a reader of students vary depending on gender, grade and socio-economic level?
4. Does motivation to read of students vary depending on gender, grade and socio-economic level?
5. What are the opinions of students about reading narrative texts?
6. What are the opinions of students about reading informative texts?
7. What are the opinions of student about general reading?

Method

Research was conducted in screening model. "Mixed method", which is composed of quantitative and qualitative methods, is used in collecting, analyzing and interpreting data obtained in research. Main assumption of mixed method is that qualitative and quantitative methods will be used jointly; therefore research problem and questions will be understood and examined better (Cresswell, 2008).

Population and Sample

Population of research is 2nd, 3rd and 4th grade students of a primary school, which locates in the center of Trabzon. Sample group consists of 2nd, 3rd and 4th grade students of three primary schools, which are chosen in accordance with socio-economic level, which is one of the variables of the research. In research, data are collected over 769 students. When participant students are examined depending on gender distribution, 49% of students are female student and 51% of students are male students. Distribution of students, included in research group, depending on grade, gender and socio-economic level are given in Table 1.

Table 1. Distribution of students, included in research group, depending on grade, gender and socio-economic level

Variable	Categories	N	%
Gender	Female	374	48.6
	Male	395	51.4
Socio-economic Level	Low	249	32.4
	Medium	244	31.7
	High	276	35.9
Grade level	2	243	31.6
	3	271	35.2
	4	255	33.2
Total		769	100

When distribution of students participated in research is examined depending on gender, it is seen that 49% of students are female (N=374), 51% of students are male (N = 395). When distribution of students participated in research is examined depending on socio-economic level, it is seen that approximately 32% of students (N=244) come from lower socio-economic level, approximately 32% of students (N=244) come from medium socio-economic level, and approximately 36% of students (N=276) come from high socio-economic level. When distribution of students participated in research is examined depending on grade levels, it is seen that approximately 32% of students (N=243) are at second grade, approximately 35% of students are at third grade and approximately 33% of students are at fourth grade.

Data Collection Tools

In research, data is collected by using Motivation to Read Profile (MRP) adapted to Turkish by Yıldız (2013). MRP consists of two basic tools; Reading Survey with 20 items, which can be applied from second grade to sixth grade, and an interview form with 14 questions. Reading Survey consists of two factors; (10 questions) about value of reading and (10 questions) about self concept as a reader. At the end of reliability studies of MRP scale, two items with a low factor value were removed from scale and final survey form is constituted. Interview form consists of 3 sections. First section examines motivational factors related to reading narrative texts, second section examines information about informative reading, and third section examines general factors about motivation to read.

Analysis of Data

In analysis of data, a package program, Statistical Packages for the Social Sciences (SPSS), is used. Comparative analysis (T-Test and ANOVA) are used in research to examine whether motivation to read changes depending on grade, gender and socio-economic level. Gathered data is analyzed with t-test and ANOVA. Descriptive analysis is used in analysis of data gathered from interview. In descriptive analysis, direct quotations are often made to reflect opinions of observed individuals or interviewees. Gathered data are presented as organized and interpreted. For this

purpose, gathered data are systematically and clearly described. Descriptions are explained, interpreted, studied in terms of cause and effect relation, and a result is reached (Yıldırım and Şimşek, 2011). Accordingly, data gathered as a result of interview is interpreted by organizing it under certain themes.

Findings

Findings about comparison of motivation to read of students, depending on gender, grade level and socio-economic level, are shown in tables below.

Findings about First Research Question

Table 2. Findings about self concept as a reader, value of reading and motivation to read of students.

Dimension	\bar{X}	SS
Self concept as a reader	28.22	4.28
Value of reading	30.56	3.54
Motivation to read	58.78	6.58

When Table 2 is examined, arithmetic averages related to scores of motivation to read, which consist of self concept as a reader, value of reading and sum of these two dimensions, are given. Arithmetic averages of students for self concept as a reader is (\bar{X} =28.22), value of reading is (\bar{X} =30.56), motivation to read is (\bar{X} =58, 78). Value of reading of students is higher than self concept as a reader of students. Motivation to read is at mid level.

Findings about Second Research Question

Findings of t-test about comparison of value of reading of students depending on gender are given in table below.

Table 3. T-test results about comparison of value of reading of students to gender

Dimension	Gender	N	\bar{X}	SS	sd	t	p
Value of reading	Female	374	31.45	2.93	767	6.96	.000
	Male	395	29.72	3.86			

When Table 3 is examined, it is seen that there is a meaningful discrepancy ($t(767) = 6, 96$, $p<.05$) in dimension of value of reading of motivation to read, in favor of females. It can be said that value of reading of female students is higher than value of reading of male students.

Conducting ANOVA test is required to compare motivation to read of students to grade level. Before conducting ANOVA test, average values and standard deviation values related to value of reading, self concept as a reader and motivation to read depending on grade level are determined. Average values and standard deviation values about value of reading of students depending on grade level are shown in Table 4.

Table 4. Average values and standard deviation values about value of reading of students depending on grade level

OMP Dimensions	Grade Level	N	\bar{X}	SS
Value of reading	2	243	30.66	3.62
	3	271	31.01	2.88
	4	255	30.00	4.01
	Total	769	30.56	3.54

According to Table 4, when arithmetic averages of points, which students take from the dimension of value of reading of motivation to read scale, are examined in terms of grade level; it is seen that 3rd grade students got the highest score ($\bar{X} = 31.01$), then respectively 2nd grade students ($\bar{X} = 30.66$) and 4th grade students ($\bar{X} = 30.00$) follow them. Differentiation of value parted with reading of students depending on grade level is shown in Table 5.

Table 5. ANOVA findings of value parted with reading of students depending on grade level

Dimension	Source of Variance	Sum of squares	sd	Average of squares	F	p	meaningful repency
Value of reading	Inter groups	137.63	2	68.81	5.52	004	3rd and 4th es
	Within groups	9539.29	766	12.45			
	Total	9676.93	768				

When Table 5 is examined, it is seen that there is a meaningful discrepancy between levels of value of reading of students in terms of grade level ($F(2-766) = 5.52, p < .05$). According to the results of the Tukey test, that is made to find out between which groups this differentiation is; value of reading of 3rd grade students ($\bar{X} = 31.01$) is higher than value of reading of 4th grade students ($\bar{X} = 30.00$).

Findings about comparison of value of reading of students with socio-economic level are shown in tables below.

Table 6. Average and standard deviation points of value of reading of students depending on socio-economic level

OMP Dimensions	Socio-economic Level	N	\bar{X}	SS
Value of reading	Low	249	30.33	3.05
	Medium	244	30.42	3.63
	High	276	30.89	3.86
	Total	769	30.56	3.54

According to Table 6, when arithmetic averages of points, which students take from the dimension of value of reading of motivation to read scale, are examined in terms of socio-economic level; it is seen that students who are involved in High SED got the highest score ($\bar{X} = 30.89$), then respectively Medium SED ($\bar{X} = 30.42$) and Low SED ($\bar{X} = 30.33$) follow them. Differentiation of value of reading of students depending on socio-economic level is shown in Table 7.

Table 7. ANOVA findings of value of reading of students depending on socio-economic level

Dimension	Source of Variance	Sum of squares	sd	Average of squares	F	p	Meaningful Discrepancy
Value parted with reading	Inter groups	47.64	2	23.82	1.89	.151	
	Intra groups	9629.28	766	12.57			
	Total	9676.93	768				

When Table 5 is examined, it is seen that there is no any meaningful discrepancy between levels of value of reading of students in terms of socio-economic level ($F(2-766) = 1.89, p > .05$).²

Findings about Third Research Question

Findings of t-test about comparison of self concept as a reader of students depending on gender are given in table below.

Table 8. Findings of t-test of self concept as a reader of students depending on gender

Dimension	Gender	N	\bar{X}	SS	sd	t	p
Self concept as a reader	Female	374	29.05	4.38	767	5.29	.000
	Male	395	27.44	4.05			

When Table 8 is examined, it is seen that there is a meaningful discrepancy ($t(767)= 5,29$, $p<.05$) in dimension of self concept as a reader of the motivation to read, in favor of females. It can be said that self concept as a reader of female students is higher than self concept as a reader of male students.

Findings about comparison of self concept as a reader of students depending on grade level are shown in tables below.

Table 9. Average and standard deviation points about self concept as a reader of students depending on grade level

OMP Dimensions	Grade Level	N	\bar{X}	SS
Self concept as a reader	2	243	28.48	4.05
	3	271	28.56	4.91
	4	255	27.61	3.69
	Total	769	28.22	4.28

According to Table 9, when arithmetic averages of points, which students take from the dimension of self concept as a reader of motivation to read scale, are examined in terms of grade level; it is seen that 3rd grade students got the highest score ($\bar{X}=28.56$), then respectively 2nd grade students ($\bar{X}=28.48$) and 4th grade students ($\bar{X}=27.61$) follow them. Differentiation of self concept as a reader of students depending on grade level is shown in Table 10.

Table 10. ANOVA findings of self concept as a reader of students depending on grade level

Dimension	Source of Variance	Sum of squares	sd	Average of squares	F	p	meaningful discrepancy
Self concept as a reader	Inter groups	140.01	2	70.00	3.83	.022	3rd and 4th grades
	Intra groups	13989.51	766	18.26			
	Total	14129.52	768				

When Table 10 is examined, it is seen that there is a meaningful discrepancy between levels of self concept as a reader of students in terms of grade level ($F(2- 766)= 3.83$, $p<.05$). According to the results of the Tukey test, that is made to find out between which groups this differentiation is; self concept as a reader of 3rd grade students ($\bar{X}=28.56$) is higher than self concept as a reader of 4th grade students ($\bar{X}=27.61$).

Findings about comparison of self concept as a reader of students depending on socio-economic level are shown in tables below.

Table 11. Average and standard deviation points about self concept as a reader of students depending on socio-economic level

OMP Dimensions	Socio-economic Level	N	\bar{X}	SS
Self concept as a reader	Low	249	26.93	3.64
	Medium	244	27.99	3.85
	High	276	29.58	4.77
	Total	769	28.22	4.28

According to Table 11, when arithmetic averages of points, which students take from the dimension of self concept as a reader of motivation to read scale, are examined in terms of socio-economic level; it is seen that students who are involved in High SED got the highest score (\bar{X} =29.58), then respectively Medium SED (\bar{X} =27.99) and Low SED (\bar{X} =26.93) follow them. Differentiation of self concept as a reader of students depending on socio-economic level is shown in Table 12.

Table 12. ANOVA findings of self concept as a reader of students depending on socio-economic level

Dimension	Source of Variance	Sum of squares	sd	Average of squares	F	p	Meaningful Discrepancy
Self concept as a reader	Inter groups	938.64	2	698.00	16.73	.000	A-O O-Ü A-Ü
	Intra groups	13190.88	766	41.71			
	Total	14129.52	768				

When Table 12 is examined, it is seen that there is a meaningful discrepancy between levels of self concept as a reader of students in terms of socio-economic level ($F(2-766) = 16.73, p < .05$). According to findings of Tukey test to find out between which groups this differentiation is; it is seen that there is a meaningful discrepancy between Low SED (\bar{X} =26.93) and High SED (\bar{X} =29.58) in favor of High SED, between medium SED (\bar{X} =27.99) and High SED (\bar{X} =29.58) in favor of High SED.

Findings About Forth Research Question

Findings of t-test about comparison of motivation to read of students depending on gender are given in table below.

Table 13. T-test results of motivation to read of students depending on gender

Dimension	Gender	N	\bar{X}	SS	sd	t	p
Motivation to read	Female	374	60.50	6.03	767	7.26	.000
	Male	395	57.16	6.68			

When Table 13 is examined, it is seen that there is a meaningful discrepancy ($t(767) = 7.26, p < .05$) in favor of females. Motivation to read of female students is higher than those of male students.

Findings about comparison of motivation to read of students depending on grade level are shown in tables below.

Table 14. Average and standard deviation points about motivation to read of students depending on grade level

OMP Dimensions	Grade Level	N	\bar{X}	SS
Motivation to read	2	243	59.14	6.49
	3	271	59.57	6.57
	4	255	57.61	6.55
	Total	769	58.78	6.58

According to Table 14, when arithmetic averages of total points, which students take from motivation to read scale, are examined in terms of grade level; it is seen that 3rd grade students got the highest score (\bar{X} =59.57), then respectively 2nd grade students (\bar{X} =59.14) and 4th grade students (\bar{X} =57.61) follow them. Differentiation of motivation to read of students depending on grade level is shown in Table 15.

Table 15. ANOVA findings of motivation to read depending on grade level

Dimension	Source of Variance	Sum of squares	of sd	Average of squares	F	p	Meaningful Discrepancy
Motivation to read	Inter groups	545.46	2	272.73	6.36	.002	2-4 3-4
	Intra groups	32802.40	766	42.82			
	Total	33347.873	768				

When Table 15 is examined, it is seen that there is a meaningful discrepancy between total points for motivation to read of student in terms of grade level ($F(2-766)=6.36, p<.05$). According to the results of the Tukey test, that is made to find out between which groups this differentiation is; it is seen that motivation to read of 2nd grade students (\bar{X} =59.14 is higher than motivation to read of 4th grade students (\bar{X} =57.61) and motivation to read of 3rd grade students (=59.57) is higher than motivation to read of 4th grade students (=57.61) . \bar{X} \bar{X}

Findings about comparison of motivation to read of students depending on socio-economic level are shown in tables below.

Table 16. Average and standard deviation points about motivation to read of students depending on socio-economic level

OMP Dimensions	Socio-economic Level	N	\bar{X}	SS
Motivation to read	Low	249	57.27	5.31
	Medium	244	58.42	6.28
	High	276	60.48	7.47
	Total	769	58.78	6.58

According to Table 16, when arithmetic averages of total points, which students take from motivation to read scale, are examined in terms of socio-economic level; it is seen that students who are involved in High SED (\bar{X} =60.48), got the highest score, then respectively Medium SED (\bar{X} =58.42) and Low SED (\bar{X} =57.27) students follow them. Differentiation of motivation to read of students depending on socio-economic level is shown in Table 17.

Table 17. ANOVA findings of motivation to read depending on socio-economic level

Dimension	Source of Variance	Sum of squares	sd	Average of squares	F	p	Meaningf iscrepancy
Motivation to read	Inter groups	1396.01	2	698.00	16.73	.000	A-Ü O-Ü
	Intra groups	31951.86	766	41.71			
	Total	33347.87	768				

When Table 17 is examined, it is seen that there is a meaningful discrepancy between total points for motivation to read of student in terms of socio-economic level ($F(2-766) = 16.73$, $p < .05$). According to findings of Tukey test to find out between which groups this differentiation is; it is seen that there is a meaningful discrepancy between Low SED ($\bar{X} = 57.27$) and High SED ($\bar{X} = 60.48$) in favor of High SED, between medium SED ($\bar{X} = 58.42$) and High SED ($\bar{X} = 60.48$) in favor of High SED.

Findings About Fifth Research Question

Findings gathered as a result of interviews made with students are presented in table below.

Table 18. Findings about the reading situations of students of narrative texts

Narrative texts	f
Have you read any book or a story that is interesting to you lately?	
Yes	52.
Participants reading informative books	3
I don't remember	1
No	0
How did you get information about this book?	
Classroom Library	16
Bookseller	9
Gift	7
My family	6
My classmate	4
Shopping Mall	1
Performance Homework	3
Library	2
Teacher recommendation	2
Book Fair	1
City Library	1
Myself	1
Why is this book interesting to you?	
Interesting events	17
Sudden events	10
Its topic	9
Events full of adventure	7
Main characters and their characteristics	5
One section of the book	4
Not interesting to me.	2
Cover Design	1

When students were asked whether they read an interesting book or story lately, they all answered positively. Only one student indicated that s/he doesn't remember the book s/he read. Three students mentioned that they read informative books. 16 students answered "classroom library" and 9 students answered "Bookseller" to the question of how they got information about the book they read. 17 students answered "Interesting events" to the question of why they found the book interesting.

The student, coded as Ö3, giving the answer of "Yes" about reading a narrative book lately:

"I read a book. Its name was something like "Kirpi ve Tavus Kuşu" Student, coded as Ö6:

"For example, I read a book named "Müziyen Prenses". I liked it too much. Because there was adventure. There was contest. There was passion. There was excitement. I mean, I liked it too much. I had fun while reading it. I've already finished it. I am reading its second book." Student, coded as Ö2:

"It was a book about elephants. It was telling that elephants drink water with their horns, I mean long noses." they explained. Student, coded as Ö19, explained why s/he found the book interesting as:

"Stitching the wolf's tummy..." The student, coded as Ö24:

"Talking of button..." The student, coded as Ö29:

"Wearing eyeglasses and hat of a sunflower..." explained their opinions.

Starting from this point, students tend to choose narrative books because of interesting events within them.

Findings About Sixth Research Question

Opinions of students on informative texts they read are presented in table below.

Table 19. Findings about the reading situations of students of informative texts

Informative texts	f
Have you learned any information from a book, magazine or any text lately? What was the text about?	
Yes	35
No	21
How did you get information about this book?	
Bookseller	8
Text Book (Ministry of Education gave it)	7
My family	5
Classroom Library	4
store	3
My classmate	3
Library	2
Gift	2
City Library	1
Why was that book important to you?	
Because I got information	21
Because I am curious about it	5
Because I learned new things	3
Activities inside of it	2
Because I like books	1
Because my vocabulary improves	1
Because my imagination improves	1
Values education	1

When students were asked any information they learned from a book, magazine or any text, 35 students answered positively, 21 students answered negatively. 8 students answered "Bookseller" and 7 students answered "Text Book" to the question of how they got information about the book they read. 21 students answered "Because I got information" to the question of why the books they read are important.

The student, coded as Ö18, giving the answer of "Yes" about reading an informative book lately?

"I learned generations of animals, when their species become extinct, then how they become, what they eat, if they are flesh eating or grass eating from books. Then how they make their nest..." The student, coded as Ö8:

"The hottest desert in the world is Sahara, I mean Sahara Desert." Student, coded as Ö9:

"In fact, I didn't know that Pluto is accepted as dwarf planet. I learned it. Other planets have a population of 60.000, I didn't know. I learned it." They explained. Student, coded as Ö1, explained why s/he found the book interesting as:

"I learned something about cloud..." student, coded as Ö5:

"It was like a knowledgeable friend..." Student, coded as Ö14:

"Because there was a lot of information in it..." Student, coded as Ö34;

"Learning something that I don't know cheer me up, makes me happy. And learning new things improves my mind. I mean, my information increases." they mentioned.

By looking at the answers that students gave, it can be said that they find informative books important and worth to read, because they get new information from them.

Findings About Seventh Research Question

Findings about General Readings of Students are presented in table below.

Table 20. Findings about general reading situation of students

General reading	f
Did you read any book yesterday?	
Yes	36
No	17
Yes, but I don't remember the name of it.	3
Do you have any book with you today?	
Yes	40
No	13
Yes, but I don't remember the name of it.	3
Is there any writer you like?	
Yes	27
No	10
I don't remember the writer.	10
I don't look at the writers of books.	5
I've never seen.	1
I am not interested in it.	1
I don't pay attention.	1
I don't care, There is no any writer I like.	1
What is the benefit/value/importance of reading?	
We learn information.	22
Our reading improves.	12
We become successful.	6
Our grades get better.	5

We win university entrance exam.	4
We learn new words.	2
Our intelligence improves.	2
We have a good profession.	2
I don't know.	1
Are there any other books you want to read?	
Yes	48
No	7
There is, but I don't remember	1
How did you get information about this book?	
Bookseller	14
Classroom Library	11
My friend	6
Books at home	4
School library	4
Gift	2
Back page introductions of book	1
Book Fair	1
City Library	1
Collateral kin	1
store	1
My teacher	1
Television	1
My family	1
What makes you excited about reading books?	
Adventures within the book	26
I wonder.	9
Because it is educational	7
Being funny, being entertaining	7
I learn information	6
Characters	3
I don't feel anything.	3
My reading skills improve.	1
How the writer writes	1
I don't know	1
Who motives you for reading books?	
My family members (mother-father-sister-brother)	77
My classmate	18
My teacher	17
Collateral kin (uncle-cousin-grandfather)	7
No one	4
Nobody/ myself	3
Gifted persons	1

As given in Table, 36 of 56 students answered "Yes" to the question of "Did you read any book yesterday?", 17 of 56 students answered "No", 3 of them answered "Yes, but I don't remember the name.". 40 students answered "Yes" to the question of "Is there any book with you today?", 13 students answered "No" and 3 students answered "Yes, but I don't remember the name of it". While 27 students answered "Yes" to the question of "Is there any writer you like?"; 29 students answered negatively. 22 students answered "We learn information." to the question of "What is the benefit/value/importance of reading?". "Is there any other books you want to read? 48 students answered "Yes" to the question of "How did you get information about this book?" and they mentioned that they learned the book from "Bookstore". 26 students answered "Adventures and events

inside of it" to the question of "What makes you excited about reading books?". 77 students answered "My family members (mother-father-brother-sister)" to the question of "Who motives you for reading books?".

The student, coded as Ö12, to the question of what is benefit/value/importance of reading:

"If we are good readers, we become successful. If we read book a lot of books when we grow up, it informs us. We become successful students. Then we have good professions when we grow up." Student, coded as Ö33:

"First our reading improves. We read books to satisfy our curiosity. We read books to learn information within them and to reflect that information to our daily lives. Then there is some information effective with some activities. For example to do them in Turkish grade. Then to improve our reading skill and to have a good profession in future." Student, coded as Ö37:

"If we don't read, we can't learn information. Our reading slows down. "Reading is required to have a good profession when grown up." they mentioned their opinions. When students were asked what makes them excited about reading, the student, coded as Ö9,

"For example, it is something I don't know at all. I get excited when I read it. Information, which is more interesting, not known by anybody and hidden in the books, is interesting to me." Student, coded as Ö14:

"Because the stories I read are always adventure, anything exciting or horrifying may happen anytime." Student, coded as Ö16:

"What will happen at the end, when it will finish, I wish it never ends." Student, coded as Ö33:

"Since I love adventures, I like reading books." Student, coded as Ö14:

"Because the stories I read are always adventure, anything exciting or horrifying may happen anytime." and some strange things may happen, I mean interesting. They are interesting to me." They answered. It can be said that students are influenced mostly by adventures and story line within the book.

Discussion and Results

General averages of motivation to read of students are primarily determined in research. According to the obtained results, value of reading of students is higher than self concept as a reader of students. When looked at research result in terms of variables, value of reading differs depending on gender. Value of reading of females is higher than value of reading of males. Value of reading of students change depending on grade level. When there is no any meaningful discrepancy between 2nd and 3rd grade students; value of reading of 3rd grade students is higher than value of reading of 4th grade students. Socio-economic levels of students do not affect value of reading of students.

When looked at results about self concept as a reader, there is differentiation depending on gender. Self concept as a reader of female students is higher than self concept as a reader of male students. As being in value of reading, self concept as a reader of 3rd grade students is higher than self concept as a reader of 4th grade students in terms of grade level. Socio-economic levels of students don't affect the self concept as a reader of students. Self concept as a reader of students belonging to high socio-economic level is higher than self concept as a reader of students belonging to medium or low socio-economic level.

Within the results about motivation to read, like in self concept as a reader and value of reading, motivation to read of female students is higher than motivation to read of male students. Motivation to read of 2nd and 3rd grade students is higher than motivation to read of 4th grade students in terms of grade level. Socio-economic levels of students influence motivation to read of students like it happens in self concept as a reader of students. Motivation to read of students

belonging to high socio-economic level is higher than motivation to read of students belonging to medium or low socio-economic level.

There is a meaningful discrepancy between female and male students in terms of value of reading, self concept as a reader and motivation to read of 2nd, 3rd and 4th grade primary school students who participated in research. However, value of reading, self concept as a reader and motivation to read of female students are higher than those of male students. Results, which are reached in research in terms of gender, shows similarity to research findings, in that females have more points than males in all dimensions of motivation to read (Baker and Wigfield, 1999) and females have a more positive reading attitude (Kush ve Watkins, 1996; McKenna and others, 1995), in part.

In a research that Yıldız (2010) made, as there is no any meaningful discrepancy of motivation to read levels of 5th grade students in primary school, between males and females, there is a meaningful discrepancy in favor of females in terms of exterior motivation levels. Results of research show similarity with the results of research that Sancı (2002) made.

Nurmi and Aunola (2005) mentioned in their research that motivation to read of males is lower than motivation to read of females; students with low motivation to read at the beginning of the first grade lowers their motivation to read at the end of second grade, students with low motivation to read have higher attention for school. Some of the students with low motivation to read develop interest for math in time. This situation shows that students tend to balance the decrease in motivation to read with increasing their interest in another subject, which they think they are successful at. When it is thought that reading performances of kids are related to their school success (Madden, Slavin, Karweit, Dolan and Wasik, 1993), lowness in motivation to read may be thought as a problem for males.

Wigfield, Eccles, Harold, Blumenfeld, Yoon and Freedman-Doan (1989) found in their research that self respect doesn't change depending on gender and grade level. However, it is determined that females have a higher perception of skill in musical and reading skills, comparing to males. Females care about musical and reading skills more than males, and they made activities related to these skills better than males. Kids have a more positive perception about reading and math skills in first grade. Students at first grade care about reading and math comparing to higher grades. They like reading more.

According to research results, grade levels effect value of reading, self concept as a reader and motivation to read of students. Value of reading, self concept as a reader and motivation to read of 2nd and 3rd grade students is higher comparing to 4th grade students. When it has to be contrary, desire for reading decreases when grade levels increase.

Decrease in opinions of kids about their skills in different fields in primary and secondary school period is a normal fact. (Dweck and Elliott, 1983; Eccles, Wigfield and Schiefele, 1998; Stipek and Mac Iver, 1989; Wigfield, Eccles, Schiefele, Roeser and Davis-Kean, 2006). Kids are pretty optimistic about their skills in different fields in young ages, and this optimism transform to reality in time; in most of the kids it turns to pessimism. In a research made in United States of America, they examined how opinions of kids changed about their skills in math, language and sports field. (Jacobs, Lanza, Osgood, Eccles and Wigfield, 2002; Fredricks and Eccles, 2002; Watt, 2004). As kids' perception about every field is positive in early periods; it is determined that there are decreases in the upcoming years. Strongest decreases about language happen in primary education level and smaller changes are observed in the upcoming years.

When findings, which are obtained about motivation to read in terms of socio-economic level, are evaluated, both reader's sense of self and motivation to read of Low SED students are lower than of other groups. Baker and Wigfield (1999) who enlighten this situation, indicate that insufficiency of materials and deprivation of opportunity to experience reading may result in lowliness of motivation to

read of low-income students. However, to the contrary of these findings in primary education level, there are some findings showing that interest for reading and importance they attach to reading of Low SED students in high school level are higher than those of other groups. (Dökmen, 1994) According to Dökmen (1994), Low SED high school students see reading as an important tool to improve themselves, to reach better in terms of socio-economic way and to reach better.

In research made by İleri (2011), results, which are obtained between reading levels and socio-economic levels of students, are meaningful in terms of statistics. Individuals with high socio-economic level have high reading levels. Findings obtained in a research made by Güneş (1997) supports the idea of being a meaningful discrepancy especially between motivation to read of low level students and high level students coming from schools, which have different characteristics in terms of socio-economic and cultural level.

When looked at opinions of students about narrative texts, it is determined that students read mostly narrative books. Students mentioning an interesting book for them in interview indicated that they get the book from classroom library. Least used methods as book source are shopping malls, book fairs, city library and I depending on students' answers. Starting from this point, it can be said that students don't prefer to use the city library, kids with high socio-economic level prefer places like book fair and shopping mall, and kids are not active in book choosing. In obtained answers about why they found the book interesting, they mentioned interesting events within the book. The least received answer is book cover design. Matthews (2007) examined the motivation to read of 5th and 6th grade students in his research. He searched for what they said about narrative and informative texts. 5th and 6th grade students mentioned that they got the book mostly from school library. 5th grade students explained the reasons of finding books interesting as being about fairy tales, fiction, animals and biographic information of writers. When comparing to "interesting events" answer of primary school students, being such things in fairy tales and fictional books is an indicator of interesting events get kids' attention. Answering of 5th grade students about biographic information of writers can be linked to their ages and grade levels. Differentiation of book topics, according to books that primary school students read, is natural. 6th grade students indicated that they find books interesting because they are mysterious and nail-biting.

According to the results of a study, which is conducted by Edmuns and Bauserman (2006) by using the same interview form, it is seen that the most exciting factors in narrative books for kids are personal interests, characteristics of books and choosing the books themselves. "Interesting events" answer can be linked to category of characteristics of books. This situation is an indicator of cultural similarity of some factors that motive the kids for reading.

When looked at the opinions about informative texts, it can be said that students read informative texts less. Indication of acquiring information from text books can support the idea of not preferring to read informative books else than text books. They explained why informative books are important for them, as they get information from those books. According to results of a research made by Matthews (2007), 5th and 6th grade students told that they got informative books from school library. 5th grade students told that informative books are important, because they like to read in scientific subjects and these books are useful to get a better grade from project homework given by teachers.

When looked at the results obtained by Edmuns ve Bauserman (2006), it is indicated that what make students excited about informative texts are information received from the book, choosing the books themselves, and personal interests. Likewise, students mentioned that they found this kind of texts important, because they get information from books. This situation shows that students care about getting information from books. As it was mentioned before, it is an indication of having a universal intercultural quality. But discrepancies in terms of coming across to informative texts in text books, and according to other research, choosing the books in line with their personal interests should not be ignored. Kids in Turkey mostly prefer to read narrative books.

When looked at the opinions of students about general reading, it is determined that students mostly makes reading and they carry something with them to read. Students' answers about writers are also remarkable. Even though certain groups mentioned they have favorite writers, some students mentioned that they don't care about writers and look at their names. It is observed that students who are aware of writer's name come from high socio-economic level. Students linked the importance of being a good reader to getting information. Students talked about books they plan to read, and they told that they get information about those books from booksellers. It is determined that what make excited kids are events and adventures within the book. It is seen that who motive kids for reading are members of the family. When looked at the results that Edmuns ve Bauserman (2006) obtained, what make students excited about general reading are characteristics of books and received information. In answers about the characteristics of books, books' being full of events, which are fun, horrifying, visually rich, nail-biting, are indicators of that primary school students are effected from almost same factors. This kind of factors increases motivation to read of kids.

According to the results of research, gender is a factor that effects the motivation to read. Motivation to read of female students is higher than those of male students. To increase the motivation to read of male students, some activities that may attract male students should be done.

Kids belonging to low and medium socio-economic level should be given opportunity to provide books easily. Classroom library, school library, city library, etc. Text processing methods may cause students to get bored of this class. Turkish classes should be more contentfull and qualitative.

Classified libraries where students can find different kinds of books (narrative, informative, poetry, etc.), should be formed. Even though kids read narrative books mostly, for the questions of why we should be a good reader, and why they find informative books important, they answered that they get information from books. This result lays down the importance of recommending informative books to increase their motivation to read as well as recommending narrative books.

Kids enjoy reading books depending on their interesting. It is important for teachers and families to provide books with content appealing to kids. Teachers should do their part for forming a classroom library and leading the students to school or city library for students belonging to low and medium socio-economic level. It would be useful to determine interests of kids by using reading conferences or interest inventory at the beginning of and during academic year. Teachers should motive their students to form a library with respect to a writer or a subject. Families should own a library that they can benefit with their kids, further they can buy interactive games, equipments, and activities related to books. According to research results, kids may not use city libraries. Teachers should motive families to take their kids to a library or to form a library at home.

According to interviews made with kids, it is determined that family members, particularly mothers motive the kids for reading. Teachers may recommend applications to families to increase motivation to read of their kids. These applications may be reading books to kids, sharing books with them or giving a loved book to kids as a gift.

Activities to increase motivation to read may be developed and their effects may be examined concerning future researches. Researches may be conducted related to motivation to read of dyslectic students. New scales may be developed related to emotional dimension of reading skill.

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Views of Classroom Teachers Concerning Students with Reading Difficulties

Zehra Esra Ketenoglu Kayabasiⁱ

Kastamonu University

Abstract

This study aimed to try to understand the views and attitudes of classroom teachers concerning students with reading difficulties. Data was collected using the semi-structured interview technique, which is among the qualitative data collection techniques. The researcher prepared a semi-structured interview with 5 questions to be addressed to classroom teachers. The findings were assessed under the headings “determination of reading difficulties”, “reasons for reading difficulties”, “effect of reading difficulties”, “methods used by teachers to cope with reading difficulties” and “expectations of help”. Teachers generally stated that they determined the presence of reading difficulties through knowing students’ families, their own occupational experiences, students who were behind in class and the characteristics of their students. They associated the reasons for students having reading difficulties primarily with familial problems and then mental and psychological problems. They generally cope with reading difficulties by offering extra classes and giving homework. Teachers state that it is noteworthy that families often request cooperation. Considering the findings of this study, teachers think that the parents of students are central to the reasons behind and solutions to reading difficulties. Moreover, it is seen that children with reading difficulties are exposed to bullying by peers despite all efforts to create a positive classroom environment.

Keywords: Reading difficulties, views of primary teachers, qualitative research

ⁱ **Zehra Esra Ketenoglu Kayabasi** Res. Asst., Department of Educational Sciences, Kastamonu University, Kastamonu, Turkey.

Correspondence: eketenoglu@kastamonu.edu.tr

Introduction

The process of reading is defined as following a written text with the eyes, comprehending its meaning and vocalizing it when necessary (Sidekli and Yangın, 2005). Literature involves a number of reading definitions and the ability to read is generally expressed as the ability of cognitive and motor skills to vocalize symbols by working together. When students start primary school, they are subjected to certain preparatory exercises before they learn how to read. Students are prepared for reading and writing by introducing them to their classes and the school environment, providing them with orientation and conducting look-tell, draw-paint and line exercises (Eryaman, 2008; Akyol, 2013). The process of reading preparation is followed by reading education via the sound-based sentence method. Starting with the phase of feeling and recognizing the sounds, the sound-based sentence method continues with writing and reading the letters. Reading education is completed through reading the letters, syllables, transiting from syllables to words and finally by reading sentences in free texts. Teachers should conduct the reading education by keeping in mind that the ability to read is a process of inference that is supposed to be fluent, strategic and lifelong, and that children should be motivated to read (Akyol, 2013). Reading is a complex ability and there are various factors, which might involve physiological and psychological disorders and mental malfunctions that affect the process of reading. Reading difficulties consist of the inability to read fluently, the inability to recognize words, having a limited vocabulary and failing to comprehend what is read (Rasinski, Padak and Fawcett, 2010). The Glossary for Special Education states that there may be a brain-based learning problem and that individuals display a lower reading performance than expected although they have normal intelligence levels (Sucuoğlu, Diken, Demir, Ünlü and Şen, 2010). In the Diagnostic and Statistical Manual for Mental Disorders, the concept of dyslexia is described as problems with fluent word recognition, poor decoding and poor spelling abilities under the title of with impairment in reading (DSM-5, 2013). In the Special Education Services Regulation of the Ministry of National Education in Turkey the concept of “dyslexia” is considered among the special learning disabilities and an individual with special learning disabilities is defined as

“An individual who requires special education and an educational support service due to difficulties in listening, speaking, reading, writing, syllabifying, maintaining attention or conducting mathematical procedures, which may emerge in one or more of the processes of obtaining the information that is needed for comprehending and using language either in written form or orally.” (Ministry of National Education, 2006).

Harris and Sipay (1990) identified reading difficulties as indicating a significantly lower reading age and learning potential than what is expected in successful reading and that it changes according to the cultural, lingual and educational experiences of students. Akyol emphasised that weak readers are individuals who fail in adapting their preliminary knowledge into reading in the process of learning of read and who use auxiliary strategies when they are unable to comprehend the texts; who read purposelessly; have no faith in the benefits of reading; fail to distinguish inconsistencies; have a lower ability to use hints and guesses; and fail in tests (Akyol, 2013). Sidekli (2010) identified that struggling readers generally made mistakes like misreading, skipping syllables/letters and adding letters, repeating words and syllabifying.

It has been emphasized that while good readers have a higher motivation and more advanced comprehension skills and vocabulary, weak readers have fewer skills and they avoid the act of reading (Cited from Stanovich by Yıldız and Akyol, 2011). Students with reading difficulties frequently make reading mistakes such as skipping words, adding words, misreading, repeating, inverting and ignoring punctuation (Akyol, 2013). As well as these mistakes, insufficient motivation and the academic failure of students decrease their reading motivation and cause a psychological and sociological regression in students with reading difficulties.

Yıldız (2013) emphasised that there is a direct proportion between the time allocated by readers for reading and the increase of the amount of reading. In order to increase the reading motivation of students, teachers are required to allocate more time for their students with reading difficulties and increase the duration of reading in general. In their study, Ateş, Yıldırım and Yıldız

(2010) concluded that teachers did not have exact information about the reasons for reading and writing difficulties and the nature of these difficulties, and they felt incompetent in terms of educating students suffering from them.

This study aimed to try to understand the views and attitudes of classroom teachers concerning students with reading difficulties. With regard to the study's objective, the attempt was made to answer the following questions:

- What might be the reasons for reading difficulties?
- How do teachers cope with reading difficulties?
- How does reading difficulties affect a child's life?

Method

This study was conducted from a qualitative perspective. The literature includes many definitions of qualitative research. In general, qualitative research can be defined as a type of research that embodies certain philosophies and approaches based on a number of areas of application such as anthropology, sociology and education (Merriam, 2013).

Study Group

The study group consisted of five classroom teachers working in the provinces of Kastamonu and Çankırı in Turkey in the fall term of the school year 2015–2016. Participants had different classroom levels and occupational experiences. They were coded as T1, T2, T3, T4 and T5.

Data Collection and Analysis

The data were collected using the semi-structured interview technique, which is among qualitative data collection techniques, and the aim was to try to understand the views of classroom teachers concerning their students with reading difficulties. The semi-structured interview technique neither provides as much independence for researchers and participants as the unstructured interview technique nor involves limited questions and clear answers like the structured interview technique. Being the middle of the three techniques, the semi-structured interview technique is a practical interview technique that is used frequently (Merriam, 2013). The researcher prepared semi-structured interview questions involving five questions to be addressed to classroom teachers. Teachers were reached via the purposeful sampling method. The reason for selecting the purposeful sampling method was that it would be able to provide rich data for the study objective (Patton, 2014). The sample was selected under the condition that teachers had a student with reading difficulties in their classrooms. Before starting the interviews, each participant was informed about the study objective, the voluntary basis of participation and that the data to be acquired from them would only be used for scientific purposes, and they were asked to sign consent forms. Individual interviews lasted for approximately 25 minutes and were recorded on tape recorders. After deciphering the data, the analysis process was begun using a strategy of inductive and comparative analysis. Similar and common concepts that occurred many times among the written documents that were read by the researcher were written on the code list and interesting pattern terms were recorded on a separate document. Categories and themes were formed by associating the concepts with each other.

Results

This part involves the assessment of the data and interpretations concerning the teachers. During the interviews each teacher was asked, 'Do you have a student with reading difficulties?', 'How did you determine this?', 'What do you think are the causes of these difficulties?', 'How does the problem of reading difficulties affect children?', 'What do you do with students with reading difficulties?' and 'What else can be done to remove this problem experienced by students?'. The answers were assessed within the context of their content and the study findings were collected under five dimensions (determination of reading difficulties, reasons for reading difficulties, effect of

reading difficulties, methods for teachers to cope with reading difficulties, expectations of help). In this part the concepts, the themes formed by the concepts and five headings associated with the themes were presented together with quotations from the participants.

Determination of Reading Difficulties

The teacher's means of determining which children had reading difficulty were separated into three different categories. These were "experience", "educational process" and "student's characteristics". Table 1 shows the data acquired.

Table 1. Teachers' views regarding the determination of reading difficulties

Categories	Determination of reading difficulty	Teacher's code
Experience	Knowledge of the environment	T1
		T1,T5
	Occupational experience	T1,T5
	Knowledge of the families	T5
	Pedagogical knowledge	
Educational process	Left behind	T2,T3,T5
	Observation	T2
	Does not put hand up	T3
	Listening to oral reading	T3,T4
	Instruction fetched	T5
Student's characteristics	Toddler	T2,T3
	Difficulty holding a pen	T2
	Reluctance to read	T3
	Irrelevant to the course	T2

Examining the table it is observed that teachers determined that students had reading difficulty under three categories. The sub-category of "knowledge of the families" under the category of "experience" involves the codes given to teachers' home visits and knowing parents at the beginning of school year. 2 out of 5 participants determined that students had reading difficulty based on their occupational experience and the opportunity to know the families. Examining the category of "educational process", while 3 out of 5 participants determined that students had reading difficulty because they were behind in the class, 2 out of 5 participants determined this while conducting oral reading in their classrooms. One of the teachers stated *"He always prefers to go more slowly because he makes mistakes, as he seems to be a bit scared. But other students get ahead of him as they are more active. He, on the other hand, remains the same. He always faces being overtaken"* (T3) to explain why the student with reading difficulty was always behind the others. In addition, the participants touched upon the emotional and physical properties of their students and 2 out of 5 participants stated that their students were toddlers: *"Both of these children are like babies. They get excessive attention at home. They are just kids; they have little daydreams and like drawing"* (T3). Another participant explained; *"He certainly had no interest in the lesson. He was entirely a play-loving child. When he came here, he was 60 months old, in other words 5 years old. I demand that children be at least 66 months old when they start school and warn families to never send their children to school unless they have received nursery class education. In my opinion, adaptation to the school culture is the most important thing. It is not that easy"* (T2).

Reasons for Reading Difficulties

Analysing the answers to the question, 'Why do you think the students with reading difficulties have this problem?' it is seen that there are five categories. These are "family", "personal differences", "education", "emotional factors" and "environmental factors". Table 2 shows the data acquired.

Table 2. Teachers' views regarding the reasons for reading difficulties

Categories	Reasons for reading difficulties	Teacher's code
Family	Familial problems	<i>T1,T2,T3,T4,T5</i>
	Insufficient cultural knowledge	<i>T1,T2,T3,T5</i>
	Wrong attitudes in families	<i>T1,T2,T3,T5</i>
	Financial problems	<i>T1, T5</i>
Individual differences	Age factor	<i>T2</i>
	Physical inadequacy	<i>T2,T4, T5</i>
	Mental factors	<i>T1,T2,T3,T4,T5</i>
Education	Failure to repeat the process of reading	<i>T1,T3,T4</i>
	Not completing homework	<i>T1</i>
	Instruction technique	<i>T1</i>
	Lack of preschool education	<i>T2,T4</i>
Emotional factors	Dislike of reading	<i>T1</i>
	Out of step with school culture	<i>T2</i>
	Not settling down to lessons	<i>T3</i>
	Attitude towards reading	<i>T3</i>
	Psychological factors	<i>T1,T3,T5</i>
Environmental factors	Lack of role models	<i>T1</i>
	Crowded classroom	<i>T2</i>
	Lack of stimulus to read	<i>T4</i>
	Living environment	<i>T5</i>

The category of family consists of the sub-categories "familial problems", "wrong attitudes within families", "insufficient cultural knowledge of families" and "financial problems". The sub-category of "familial problems" consists of the codes "family indifference", "time limitation of families" and "separated families". All the participants stated that family indifference would cause reading difficulties. The sub-category of "wrong attitudes within families" consists of the codes "intervention of older family members in children's education", "reflection of family problems on children", "wrong language training", "failure of control", "denying child's reading difficulty", and "ignorance of education". Examining the table, 4 out of 5 participants stated that students with reading difficulties had that problem due to the wrong attitudes of families and an inadequate cultural understanding among families. Regarding the intervention of older family members in the children's education, which is among the problems of extended families, one of the participants stated "*The grandmother plays a key role as protector. When my student does not do his homework, she never lets me get angry with him. If my student fights with one of his friends, she comes to the classroom to beat that child. My student is so precious to them*"(T2) which reveals one of the wrong attitudes of families. The same participant expressed the following regarding wrong language training, which is among the wrong attitudes found in families: "*The child had had a mass under his tongue when he was younger. He had had an operation. When he started primary school, I had a trouble with understanding what he said. For example, he would say 'pee-pee' in the wrong way and his parents would repeat his exact words. He also had some difficulty in talking and his parents never corrected him*" (T2). The sub-category of "insufficient cultural knowledge in families" consists of codes "lower educational level of families" and "denial of child's reading difficulty". Examining the category of "personal differences", all the participants thought that mental factors (difficulty in comprehending, misperceptions, mental deficiency, reading difficulties and intelligence type) caused reading difficulties in children. One of the participants stated "*The process of reading is a challenging process. They learn, shape and combine the sounds and give them a meaning there. However, reading alone is not enough. I ask them what they understand from texts*"(T3), which emphasizes that mental factors cause reading difficulties. Examining the category of "education", 3 out of 5 participants gave the code of "failure to repeat the process of reading" as an answer. Examining the category of "emotional factors" ("out of step with school culture", "not settling down to lessons", "dislike of reading", "attitude toward reading", "psychological factors") 3 out of 5 participants gave the sub-

category of “psychological factors” as a reason for reading difficulties. One of the participants stated *“A child’s quality of reading also matters. Some children, especially those with a mathematical intelligence, may not like to read” (T1)*, which is an example of one of the emotional factors.

Effect of Reading Difficulties

Participants were asked, ‘How does the problem of reading difficulties affect children?’ and four categories of effects were formed. These were “emotional”, “mental”, “behavioural” and “other”. Table 3 shows the data acquired.

Table 3. Teachers’ views regarding the effects of reading difficulties on the child’s life

Categories	Effects of reading difficulties	Teacher’s code
Emotional	Feeling sad	T1
	Introversion	T1,T3,T4
	Feeling of inadequacy	T3
	Disappointment	T3
	Acceptance of failure	T3
	Feeling afraid	T3
	Low self esteem	T3
Mental	Inability to perceive the whole	T1
	Difficulty in understanding	T1,T3
	Difficulty in comprehension	T1
	Academic failure	T4
Behavioural	Absence	T1
	Irresponsibility	T2,T3,T4,T5
	Extinction behaviour	T3
	Building game and inclusion	T3
	Not included in games	T4
	Causing harm	T5
	Choosing friends at their own level	T4
	Disorganized	T5
	Not getting along with others	T4
	Shy	T1
	Incompatible	T2,T5
Other	Bullied by peers/put down	T1,T3,T4
	Remaining alone	T4

Examining the table, the effects on students with reading difficulties are generally observed as introversion in terms of the emotions, misperceptions while reading in terms of intelligence and irresponsible behaviours in terms of behaviours. Moreover, 3 out of 5 participants stated that students with reading difficulties were exposed to bullying and felt put down by others. One of the participants stated, *“Children with reading difficulties are a bit introverted. They avoid everything about reading as much as possible” (T4)*. This expresses how reading difficulties emotionally affects a student. The same participant expressed the following regarding the students who would practice bullying: *“When a successful student recognizes an unsuccessful student, he might start bullying him because children are a bit cruel. They do not have much compassion. They will never accept deficiencies” (T4)*.

Methods of Coping with Reading Difficulties

Activities performed by teachers for their students with reading difficulties were separated into 4 categories. These were “additional study”, “family-teacher cooperation”, “management of learning-teaching process” and “motivation”. Table 4 shows the data acquired.

Table 4. Teachers' views regarding methods of coping with reading difficulties

Categories	Applications	Teacher's code
Additional work	Paired reading	T1,T3,T4
	Reading in unison	T1
	Summarize	T3
	Repeating	T1
	Additional courses	T1, T2,T4,T5
	Behavioural education	T1
	Instruction in classroom rules	T1
	Peer tutoring	T2,T3
	Dictation study	T2,T4
	Teaching the letters	T2
	Student-centered teaching	T3,T5
	Giving responsibility	T3,T4
	Reading time	T3
	Reading race	T4
	Memorization	T4
	Giving homework	T2,T3,T4,T5
Parent-teacher relations	Discussing with family	T1,T2,T4
	Sending note to family	T2
	Giving reading course to family	T1
Management of learning-teaching process	Disciplining	T1,T5
	Creating positive classroom environment	T3
	Asking advice from experienced colleague	T5
	Literature review	T5
	Giving feedback	T2,T4
	Assessment	T2
	Giving material	T2
Motivation	Rewarding	T1,T2,T4
	Guidance	T2,T4
	Encouragement	T2,T3,T4
	Enhancement	T2
	Teaching self-control	T3
	Setting targets	T4
	Making a sensation	T4
	Handing out books according to interest	T4
	Subscribing to library	T1

As seen in Table 4, the activities performed by teachers for their students with reading difficulties were collected under the categories of “additional study”, “parent-teacher relationship”, “management of learning-teaching process” and “motivation”. Examining the category of “additional study”, while the majority of teachers (4 out of 5 participants) stated that they gave homework and additional courses to their students with reading difficulties, 3 out of 5 participants stated that they did paired reading. Regarding the additional courses one of the participants stated: *“In addition to this, I think about this in my time off, which we all do very often. I mean, classroom teachers mostly spend their free time on their students. This is valid for normal students as well. Because we, the classroom teachers, are never at peace unless we are able to make the children successful”* (T5). This expresses the reason for extra classes. In the category of “parent-teacher relationships”, the majority of participants stated that they had discussions with the families of students with reading difficulties. One of the participants, who put family and especially the mother at the centre in terms of success, stated: *“This is a triangle. This is a tripod: Mother, student and teacher. The teacher suffices up to a certain point. I even organized an emergency meeting for my student once. Care from the family can achieve*

anything. After all, fathers in our culture do not take much responsibility. If something happens, the fathers will blame the mothers... Yes, we have a group of people who spend all their time in cafes and avoid taking responsibility" (T1). In the category of the "management of learning-teaching process", 2 out of 5 participants stated that they coped with reading difficulties by disciplining the students who had reading difficulty. Similarly, 2 out of 5 participants stated that they coped with reading difficulties by giving feedback. Examining the category of "motivation" it can be seen that 3 out of 5 participants encouraged and rewarded their students with reading difficulties. One of the participants stated: "For example, I have enrolled my students in the library. As an entire class, we have decided to read at least 30 books by the end of May and I will have dinner with the winner" (T1). This expresses the encouragement and reward given to students. Another participant stated: "For example, when you reward a class, you should reward not only the successful, but also the others. Then those children will also have a chance to succeed...Small rewards like chocolate, a pencil or stars will work well." (T4). This expresses the encouragement and reward given to students with reading difficulties.

Expectations of Help

Participants were asked, 'What else could be done to remove this problem?' and 3 different categories were created. These were "family", "school" and "educational system". Table 5 shows the data acquired.

Table 5. Teachers' views regarding expectations of help for their students with reading difficulties

Categories	What can be done	Teacher's code
Family	Parent-teacher relationship	T1,T2,T3
	Priority given to the child	T1,T3
	Family support	T1,T4
	Warm home environment	T1,T5
	Avoiding out-of-school visits	T1,T3
	Being with the child	T1
	Setting fixed hours of sleep	T1
	Protecting the child	T3
	Creating a disciplined lifestyle	T3
	Respecting the child	T4
	Quality time	T4
	Raising awareness	T4
	Buying interesting books	T4
School	School administration support	T1
	Guidance counsellor support	T1
	Other teachers' support	T2
Education system	Authority of teachers	T1
	Parents' education	T1,T3
	Objective inclusion report	T5

3 out of 5 participants gave their expectations of the families of children with reading difficulties as: Keeping in touch with teachers, supporting their children, not visiting relatives and friends during school hours, creating a warm home environment, setting their children's hours for sleeping, spending quality time with their children, being with their children, giving their children an awareness of responsibility, shaping a disciplined lifestyle for their children, respecting, prioritizing and protecting their children. Regarding the parent-teacher relationship, one of the participants stated, "If we don't have a good dialogue with parents, the children won't feel attached to us. Children of parents who have good and respectful dialogue with teachers are more disciplined, more respectful and more attached to their teachers" (T3). Another participant stated, "Have you ever noticed that children never talk about their conversations with their teachers at home? They are like grown-ups at school. Have you realized this? They talk about the familial and personal problems with their

teachers, but they never talk about them at home because they are always considered as children who wouldn't understand anything at home.” (T4). This emphasizes the necessity for parents to pay attention to their children. The expectation of the participants in the category “school” was determined as having guidance counsellors who would enable students with reading difficulties to repeat reading in Turkish lessons and help them with this. In the category of “education”, on the other hand, 1 of the 5 participants emphasized the necessity for teachers to have authority and 2 out of 5 participants emphasized the necessity of organizing family seminars. Participants expected the school administration to offer cooperation between school, family and teacher.

Discussion and Conclusion

This study aimed to try to understand the views and attitudes of classroom teachers concerning students with reading difficulties. Thus, the discussion will be shaped around this objective. The classroom interviewed expressed their views concerning students with reading difficulties. In accordance with the findings of the study, the interview data were collected under five dimensions. These were “the determination of reading difficulties”, “reasons for reading difficulties”, “effect of reading difficulties on children”, “methods used by teachers to cope with reading difficulties” and “expectations of help”. Participants determined that reading difficulties was present with the help of their experiences, based on the characteristics of students in the specific phase of education. Among the participants 6 stated that they determined reading difficulties based on experience, 8 based their determination on the educational process and 5 based it on the characteristics of students. Teachers also stated that they determined that reading difficulties was present as their students were behind in the class in the educational process. Students with reading difficulties fall behind their peers and they have a lower level of academic achievement. In his study, Yıldız (2013) concluded that there was a very strong connection between academic achievement and the components of reading. The result of this study parallels the views of the participants in this study. Participants stated that they determined reading difficulty was present while conducting oral reading with students during the educational process. During oral reading, children with reading difficulties may read incorrectly, by inverting, skipping, adding and repeating words (Akyol, 2013). There are many studies aimed at finding and removing these mistakes during oral reading (Dündar and Akyol, 2014; Yüksel, 2010; Çaycı and Demir, 2006; Duran and Sezgin, 2012; Taşkaya, 2010; Çeliktürk, Sezgin and Akyol, 2015; Özkara, 2010). Among the participating teachers, only one participant stated that he determined the presence of reading difficulties with the help of his pedagogical knowledge. Accordingly, it could be suggested that the teachers participating in the study had too insufficient pedagogical knowledge to determine the presence of reading difficulties.

Among the participants 15 associated the reason for reading difficulties with families, 9 with personal differences, 7 with educational and emotional factors, and 4 with environmental factors. It was emphasized that the family was the biggest reason for reading difficulties and participants generally mentioned familial problems. Based on this result it could be suggested that families have a great effect on the reading difficulty of their children. Familial problems are followed by an insufficient cultural awareness and misguided attitudes in families. Familial problems consist of family indifference, time limitations in families and separated families. This finding runs parallel with the study of Altun, Ekiz and Odabaşı (2010).

With regard to “family”, participants related the reason for reading difficulties to mental factors, which are personal differences between individuals. Mental factors may consist of mental deficiency, intelligence types, as well as comprehension, perception and reading disorder; these mental factors cause reading difficulties and this problem may be removed by suitable intervention methods (Kurtdele, Fidan and Akyol, 2011). Whether emotional factors cause reading difficulties or reading difficulties emotionally affects children remains a mystery (Razon, 1982). 15 participants stated that reading difficulties affected the behaviours of children and children with reading difficulties displayed irresponsible behaviours. According to this study finding; it could be suggested that children with reading difficulties may display irresponsible behaviours. 9 participants also stated that children were emotionally affected and became introverted.

Among the teachers, 28 participants stated that they coped with reading difficulties by giving extra classes and 5 participants stated that they coped with this problem through cooperation between families and teachers. This finding shows that teachers arrange extra classes to tackle the reading difficulties of students by giving up their free time and thereby try to overcome this difficulty. In their study concerning the difficulties experienced by classroom teachers Altun et al. (2010) stated that teachers generally coped with reading difficulty through reading hours and rewards, whereas in this study, teachers were observed to cope with reading difficulty through giving homework and behavioural training. On the other hand, Cooper, Civey and Patall (2006) suggested that giving homework to primary school students would not affect their academic achievement.

Among the participants 19 stated that students with reading difficulties generally expected help from their families and 3 from school. It was concluded that even though teachers mostly desired to cooperate with families, they kept family-teacher cooperation at a minimum. According to the statements of the participants, it is seen that they variously felt themselves to be insufficient, oppressive, uneasy and devoted individuals. However, they wanted to use all opportunities, to be a role model, to raise awareness, motivate and guide others, to communicate with families, to feel responsible and not to be academically inadequate. Based on the findings of the study, it is recommended that seminars on reading difficulties could be specifically organized for teachers and parents. Teachers could organize daily reading hours and oral reading not only in the first grade, but also throughout primary school. They could also teach, especially to their students with reading difficulties, self-regulation strategies and give them the motivation to read. In addition, it is recommended that reading specialists be trained and employed for developing the academic skills of students with reading difficulties.

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Policy Debate in Ethiopian Teacher Education: Retrospection and Future Direction

Aweke Shishiguⁱ

Wachemo University

Eyasu Gemechuⁱⁱ

Wolkite University

Kassa Michaelⁱⁱⁱ

Addis Ababa University

Mulugeta Atnafu^{iv}

Addis Ababa University

Yenealem Ayalew^v

Dire-Dawa University

Abstract

Though, Ethiopia registered an extraordinary achievement in terms of increasing student enrolment, still quality of education remains a challenge and is becoming a bottleneck. One of the problems might be the structure and nature of teacher education itself. The purpose of this study therefore was to critically examine the existing literature and policy documents and come up with effective as well as valuable modality of teacher education which will be workable in Ethiopian context. In Ethiopia, there are two extreme views that can be taken as challenges for teacher education program: pedagogical knowledge vs. subject matter knowledge. There is also contention on the modality of teacher education: concurrent vs. consecutive. The study show that the greatest ever challenge in teacher education is registered during the Post-TESO period. The program is troubled. Based on the results of this study, imperative implications for practice are forwarded.

Key terms: teacher education, concurrent model, consecutive model, driving force, curriculum structure

ⁱ **Aweke Shishigu** Res. Asst., Wachemo University, Ethiopia

Correspondence: awekeu@gmail.com

ⁱⁱ **Eyasu Gemechu** Res. Asst., Wolkite University, Ethiopia

ⁱⁱⁱ **Kassa Michael** Assist. Prof. Dr., Addis Ababa University, Ethiopia

^{iv} **Mulugeta Atnafu** Assoc. Prof. Dr., Addis Ababa University, Ethiopia

^v **Yenealem Ayalew** Res. Asst., Dire-Dawa University, Ethiopia

Introduction

In the Ethiopian context, formal schooling is largely organized and controlled by the government. For instance issues such as the goal of schooling and how these goals will be measured, what textbooks are used? and so on is directly considered to be the mandate of the government. These issues are the values imbedded in individuals and wider society (Apple, 2003). It is policy that directs such values or it is through these values that policy develops. Policy can be taken as the collection of laws and rules that govern the operation of a given programs. This conception of policy seeks to reflect the complexity of the policy development process (Bell& Stevenson, 2006). Despite issues of policy conception, implementation of policy directives varies among interpretation groups and does not warrant unique action. This leads into various approaches that ultimately guide varying reform initiatives. The purpose of this article is not directed towards the policy development process, but to understand policy reforms in Ethiopian teacher education from 1991 to date and to investigate the merit and demerits of the reforms for the betterment and improvement of current and future teacher education policy in general.

Among the human elements involved in the execution of educational policy, teachers would be regarded as having the most significant role to play in the learning process. In the Ethiopian context, the policy on teacher education and training emphasizes on basic knowledge, professional code of ethics, methodology and practical trainings in such a way that teachers are endowed with the necessary teaching qualification and competency through pre-service and in-service training (ETP, 1994). The policy also confirmed that teachers have to be certified before assigned to teach at any level of education.

Despite the policy statements experience has shown that in Ethiopia varying reforms have been performed. This raises then questions such as: How does teacher education program change in Ethiopia over years? What are the limitations of teacher education policies introduced after 1991? How does the current status of teacher education be improved? To get a comprehensible answer to these questions, the following section discusses policy issues in the global scenario, and based on the available secondary sources, this study tried to investigate teacher education in retrospection and provide way forward.

Teacher Education Modalities across the World

Though scholars suggest varying conceptions, one of the factors that determine the modality of teacher education is the structural arrangement of the subject matter and pedagogical courses in the curriculum. This issue produces a debate globally regarding the balance between the subject matter and the pedagogy for teaching (Brown, 2011; Eryaman & Riedler 2010). Despite the disagreements, knowledge of the learning process, pedagogy and academic content are all important components of good teaching (Eryaman & Riedler 2009). There is also a debate between the campus-based course work and the school-based field experience (Brown, 2011).Because of this debate, teacher education experiences different reforms.

There are many modalities of teacher education in the world, among the most common ones are concurrent/ blended (the B.ED program in Ethiopia) and the consecutive /end-on/add-on model (called PGDT in Ethiopia currently underway). In the case of concurrent model subject matter, pedagogical and educational courses are given at the same time, whereas in the case of consecutive model subject matter courses are first given and an individual is certified for that followed by pedagogical and educational training. Some countries use both models side by side. For instance: Malaysia, India (UNESCO, 1990) and also countries like China, South Korea, Taiwan, Hong-Kong, Japan, Gorgia and Singapore (Schwille, et al.,2013) adopt both concurrent and consecutive modalities.

In Canada, there are two routes to graduation at teacher education institutions. The first one is the concurrent/blended and the second is consecutive/ PGDT (CME, 2008). Consecutive programs require candidates to first obtain an academic degree in order to be accepted into a program of studies

in education. The consecutive program is concentrated in one or two years (two to four semesters). The duration is related to certification requirements; for example, a two-year program following a first degree is the minimum requirement for certification in Nova Scotia, while a one-year program is required for certification in Ontario (CME, 2008). According to the Council of Ministry of Education (CME), in Canada, some institutions offer only one route, while others offer both routes. The general trend across most provinces is toward consecutive programs. The exception is Quebec, where almost all programs offer concurrent studies. There is a strong incentive for upgrading academic credentials built into their salary scales; because of this most teachers continue their academic education beyond the first degree. For this reason, it is common for teachers to possess two undergraduate degrees. In any event, two degrees is the normal outcome of consecutive teacher education programs.

There is a general agreement that during their study, pre-service teachers need to know about the subject matter and the way of delivering it in the classroom and also the nature of students. Researchers identified the following as a course requirement in teacher education (Aklilu, Alemayehu & Mekasha, 2008):

- + General education
- + Teaching specialization
- + Educational foundations: history of education, philosophy, sociology, anthropology, educational psychology, learning theories, measurement and evaluation
- + General and special methods of teaching
- + Field experience (practicum)

Particularly in Ethiopia, the ministry of education outlined seven national standards for teachers (MOE, 2012):

- 1. Know students and how they learn** **professional knowledge**
- 2. Know the content and how to teach it**
- 3. Plan for and implement effective teaching and learning**
- 4. Create and maintain supportive and safe learning environments**
- 5. Assess, provide feedback and report on student learning** **professional practice**
- 6. Engage in professional learning**
- 7. Engage professionally with colleagues, parents/care givers and the community** **professional engagement**

However, there is a controversy on the degree of mix between subject matter and pedagogy that should make up the curriculum for teacher education program. This usually results as a consequence of the attempts to ensure ownership and meet personal benefits among teacher educators. In Ethiopia, there are two extreme positions that can be taken as challenges for teacher education program. One extreme hold that the program should be directed towards equipping prospective teachers with strong subject matter knowledge. The other extreme hold that the program should be directed towards equipping prospective teachers mostly with knowledge of pedagogy and general education. This extreme view undermines or neglects the role of subject matter knowledge, because lack of understanding of the principles of the subject matter impede good teaching especially in mathematics (Mulkeen, DeJaeghere, Leu & Bryner, 2005). So the pedagogical knowledge should be blended with subject matter knowledge.

One of the famous scholars to introduce the notion of pedagogical content knowledge (PCK) is Lee Shulman. In 1986 he created increased attention to subject matter knowledge unique to teaching. Shulman reframed the study of teacher knowledge in ways that attend to the role of content in teaching. He specified seven categories of a knowledge base for teaching (1987): knowledge of content, knowledge of curriculum, pedagogical content knowledge, knowledge of pedagogy,

knowledge of learners and learning, knowledge of contexts of schooling, and knowledge of educational philosophies, goals and objectives. Shulman's content knowledge component includes both the amount of the subject knowledge as well as the organizing structure of the subject (Shulman, 1987), "it is beyond knowledge of the facts or concepts of a domain" (p. 9).

Hence, teachers must know and be able to explain under what conditions a particular proposition can hold true. According to Shulman, teachers should have knowledge of the substantive structures of a discipline, the variety of ways in which the basic concepts and principles of the discipline are organized to incorporate its facts and of the syntactic structure, which is "the set of ways in which truth or falsehood, validity or invalidity are established" (Shulman, 1986, p. 9). The third category, pedagogical content knowledge, is the category most likely to distinguish the understanding of the content specialist from that of the pedagogue (Shulman, 1987, p. 8). It comprises the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations and demonstrations.

Pedagogical content knowledge also includes an understanding of what makes the learning of specific topics easy or difficult: the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons (Eryaman & Genc, 2010). However, with the emergence of technology, there is also a remarkable progress in improving students' achievement. Mishra & Koehler (2006) argues that technologies have come to the forefront of educational discourse primarily because of the availability of a range of new, primarily digital, technologies and requirements for learning how to apply them in the classroom teaching. Thus they proposed the necessity for the integration of technology with PCK and named the resulting amalgam knowledge as technological pedagogical content knowledge (TPCK). Kassa in his study also entitled Integrating Content, Pedagogy and Technology for Enhancing Quality of Education affirmed that the proper usage of TPCK helps fill gaps during instructional process and empowers the visualization ability of learners by reducing effect of abstractions (Kassa, 2015). In spite of those arguments, teacher education in Ethiopia has been reformed a number of times where the reform effects were largely on credit hour rearrangement between subject matter and pedagogy focus (Azeb, 1990; Aklilu et al 2008) and on structural modality as concurrent or add on. The following section presents the structure and nature of teacher education in Ethiopia at different times during post 1991.

The Structure of Teacher Education Program in Ethiopia during Post 1991

The notion of teacher education in Ethiopia was started after the Italian occupation in 1944 at Menelik II School. This is the first teacher education program in the history of modern education in Ethiopia which was suggested by the British council to establish an institution for the training of teachers.

After the dawn fall of the Derg and the emergence of the Federal Democratic Republic of Ethiopia (FDRE) in 1991, teacher education comprises three forms: certificate and diploma given by both private and government colleges and bachelor degree given by government universities. After facing quality problems at private level, currently teacher education by private institutions is totally closed. The certificate level trainings were also closed for the sake of upgrading teachers' profile (ESDP IV, 2010) and were transformed to host diploma programs. Hence currently, the minimum teacher qualification in Ethiopia is diploma. Thus currently, it is evident that teacher education is undertaken only in government institutions. Accordingly, there are 36 Colleges of teacher education that offer diploma program and 33 Universities offering a bachelor degree programs. But the post graduate diploma program in teaching (PGDT) a sequential/add on form of teacher education program is being conducted in twenty selected universities in Ethiopia after the issuance of the framework in 2009 (MoE, 2009).

Selection requirements for primary school teaching at college level include a minimum of 2.00 in the grade 10 national examinations ((EGSSLE), no "F" grades in mathematics or English and a minimum of "C" in special subjects. Applicants are also required to take entrance exam and are given

interview to assess interpersonal skills and motivation. There are two types of training in the diploma program. The first one is cluster training for grades 1 to 4 and the second is a linear training for grades 5 to 8. Teacher training for kindergarten school which was given only by Kotebe University College (currently upgraded to Metropolitan University) is newly launched at all colleges of teacher education.

The reforms that were implemented between 1995 and 2002 focused on incremental changes including revision of curricula according to the views of the existing government, introduction of local languages as a medium of instruction (for primary school teacher preparation), and modification of recruitment criteria for teacher candidates. The teacher education reforms made by this government can be categorized as Pre-TESO (1991-2002), TESO (2003-2009) and Post-TESO (2010 onwards). It is evident that teacher education in Ethiopia after 1991 has shown remarkable introductions and revisions largely TESO and PGDT. The following presents some of the backgrounds, developments and associated views on each of these reforms.

The Emergence of Teacher Education System Overhaul (TESO)

As a consequence of the study conducted with a title “The Quality and Effectiveness of the Teacher Education System in Ethiopia” (MoE, 2002), this system of teacher education was introduced in 2003/2004. One of the findings of the study was, unprofessionalism of teachers (MOE, 2002) and (Dahlström, 2007), which forces the introduction of TESO and its nature to focus on the integration of pedagogical training with the subject matter. The length of the training was reduced from 4 to 3 (Aklilu, et al., 2008). The core issue of the reform revolved around the reduction of the training duration of secondary teacher preparation (the BEd program) and admission requirements of certificate and diploma programs (primary teacher preparation) (Tefaye, 2014). Still the candidates entitled to join the diploma programs are those who earned very low GPAs (in the EGSLE) and were unable to join the preparatory school.

TESO was introduced by arguing that the old system was entangled with multiple drawbacks (MOE, 2003). According to this study the following factors necessitated the introduction of a paradigm shift in Ethiopian education system:

- The professional competence of teachers is deficient
- Inability of existing teacher educators to become professional teacher educator
- Absence of a link between teacher educator and schools. Educators didn't know the school situation
- The recruitment of teacher educators for secondary education was not based on interest
- The content knowledge of teachers is unsatisfactory
- The training was not school and community based
- Lack of commitment and interest of educators to the teaching profession
- The curriculum was irrelevant and the teaching-learning process was teacher-centered and undemocratic
- The Practicum receives inadequate emphasis and is inefficiently implemented at all levels of teacher education
- Reflective teaching was totally absent
- Teaching profession was undermined
- Teacher education colleges were not well organized to meet objectives
- Action research was given little or no attention at all levels of teacher education

Hence TESO was introduced to solve all the above issues by educating teachers in a holistic process that connects ideas and disciplines to each other and to personal experiences, environment and communities of students (MOE, 2003). The main goal of this integrated program was creating teachers who extend their roles beyond the classroom. In this type of training, prospective teachers are endowed with pedagogical content knowledge (PCK) which is a blend of both pedagogy and content knowledge. According to Shulman (1987) this type of knowledge is a particular form of content

knowledge that is useful for teaching specific subject. However the TESO program faced a great challenge in some universities by the fact that subject knowledge is the responsibility of one faculty and pedagogical issues for other faculty (Aklilu, et al., 2008). Of all the above identified weaknesses to justify the introduction of TESO were the same old problems that persisted and again were the reason for the demise of the TESO program. Hence we agree with the conclusion of (Tesfaye, 2014) that there is no continuity between the new and previous policies of teacher education.

After six years of actual implementation, it has been decided to totally close the program using the same drawbacks as the previous program. The main reason for this repeated problem is that the absence of pilot study and the top down policy formulation process. The reforms can be taken as a driving force triggered to initiate the required change. According to Lewin (1951) this force creates increased antagonism and unwillingness to do in the required direction unless the power of the restraining force is reduced. Similarly, Sarson (1990) argues that if educational reform elements are addressed in isolation, while some are changed and others not, the success of the reform is undermined. That is significant a change in policy is unlikely to be successful unless attention is also paid to teacher development and societal needs. So, creating consensus among educators as to why the existing way of doing things cannot continue is the forefront issue for the issuance of the new reform. However in Ethiopian teacher education, similar problems persist in the implementation of the new reform which diminishes quality of education from time to time. Some of the problems in the reform were lack of emphasis on local conditions, provide insufficient time and resource, ignoring teacher involvement (Tesfaye, 2014; Kedir, 2007), non involvement of professional associations and communities (Kedir, 2007) and also failure to conduct pilot study.

Recent Reform in Secondary School Teacher Education Program

The replacement of TESO by Post-graduate Diploma in Teaching (PGDT) initially faced a lot of resistance from faculty members (Koye & Yonas, 2013; Tesfaye, 2014). According to the curriculum framework for secondary school teacher education program (MoE, 2009), till recently, it hasn't had strong policy. Even after having the needed policy, according to the document, the program has been in trouble. The same document further explains that the teacher education in the country is still straggling to produce teachers who are competent in subject areas and can effectively promote the learning of students in schools. Thus, it is evident that the academic tradition focuses on the importance of disciplinary knowledge for prospective teachers, gained through a classical liberal arts education combined with an apprenticeship in schools.

The framework states that the very intension of the new teacher training program (PGDT) is to alleviate the problems that appeared in the previous teacher training system (TESO). The major problems in secondary teachers' capacity and performance identified in 2008 by Ministry of Education were:

- ✓ Teachers' subject matter competence is inadequate,
- ✓ Active learning methods are not properly and sufficiently employed,
- ✓ Professional commitment and work ethics are not demonstrated as desired,
- ✓ Teachers' interest to follow up and assist students is low.
- ✓ According to the framework, the admission criteria to the PGDT are as follows:
- ✓ B.Sc or B.A in areas directly related to secondary school subjects,
- ✓ Teaching profession ethical standards,
- ✓ Interview and Entrance Examination (Subject matter, English language and aptitude).

This is conducted to:

- Assess students' readiness, disposition and motivation to become secondary school teachers.
- Assess students' language and communication skills.
- Assess any previous engagement with children or school

PGDT program was supposed to be given in regular program consisting of three terms. Unfortunately, it was started in 2011 in summer modality for the first time. This is because of the fact that there were no bachelor of education graduates in 2011 throughout the country and because of that regional education bureaus faced shortage of teachers in the 2011/2012 academic year (Koye & Yonas, 2013). The summer basis continues till the end of 2014/2015 academic year. But the situation was ruined and the regular basis started in 2015/2016 academic year in addition to the situated summer program. Thus it is evident that the program faced a challenge from the begging.

The reasons listed above for the issuance of the PGDT are not clear enough to totally close the previous TESO program. For instance, teachers' interest is considered as one of the criteria to select or admit applicants to the PGDT program and it is believed that the PGDT student teachers joined the profession because they love it as to solve the previous problems. But, research shows that student teachers who joined the PGDT program were not totally motivated and committed enough for their leanings and the profession (Koye, 2014; Tesfaye, 2014, Kassa, 2014). Worku (2015) also found that the mentoring process of PGDT is problematic. That is the mentees were overloaded; appropriate mentors were not assigned by schools (assigning mentors disregarding their field of study), mentees were assigned at primary schools (the level which they were not supposed to work at nor prepared and trained for). Thus, the program is entangled with the problem of inefficiency in attracting motivated and committed students. The problem seems much stronger than the previous program.

The current PGDT students believe that teachers and teaching profession receive low social respect by other professionals and they joined the teaching profession because of lack of other options, but not because they love it. This may indicate that they are living in the profession till they get other options and using teaching as a spring board to look for other profession and may not exert their maximum effort (Koye, 2014). This situation is now common in Ethiopia. For instance the study conducted by Aweke (2015) shows that teachers are working with poor motivation and they don't want to remain as a teacher for one day if they get the chance to leave the profession. Hence the teaching profession is associated with high quit intention and turn over, low motivation and inefficient teacher preparation. To help infer implication for policy makers the following paragraph will discuss about the advantage and disadvantage of the two modalities, though (Tefaye, 2014) believes the challenge surrounding teacher education is the poor attraction of teaching as a career rather than the modality.

It is clear that there is no absolutely effective teacher education model. Both the concurrent and consecutive models have their own strength and weaknesses. the advantages of the concurrent/ blended modality is that the duration is relatively shorter, Pre-service teachers get a chance to integrate pedagogy with subject matter (PCK) (Shulman, 1987) which is a basic skill needed in the teaching profession. On the other hand the consecutive/add-on/ PGDT model is assumed to be problematic since it recruits candidate who already had bachelor degree and also it is time consuming (Tefaye, 2008). The basic limitation is that it does not allow students to integrate content and pedagogy, particularly in Ethiopia where there is absence of wages for the additional one year training and professionally untrained individuals are recruited as teachers. On the other hand an advantage of it is that it gives chance to join the profession for those working in other sector and who may decide and love to be a teacher. It also insures adequate subject matter knowledge (Tefaye, 2008). The points discussed above entail the need for careful move towards reforming teacher education. In support of this the College of Education of Addis Ababa University published a paper entitled Teacher Education System in Ethiopia: A Need for an Informed Decision (CoE, 2008) which is a useful guide in this endeavor.

Conclusion and Policy Implication

One of the policy debates in Ethiopia during post 1991 emanated due to two extreme views. That is equipping prospective teachers with strong subject matter knowledge and equipping prospective teachers mostly with knowledge of pedagogy and general education. These extreme views produce contention on the modality of teacher education. But, each reforms are associated with lack of

emphasis on local conditions, insufficient time and resource, ignorance of teacher and student involvement (Tesfaye, 2014; Kedir, 2007), non involvement of professional associations and communities (Kedir, 2007) and also failure to conduct pilot study. Due to this and other pitfalls teacher education in Ethiopia and education in general are compromised of quality problems.

Regarding the modality of teacher education, graduates of the concurrent and consecutive model perform nearly the same (CME, 2008). But in Ethiopia, research shows that graduates of consecutive model/PGDT are underrepresented both in pedagogical skill, subject matter and professional commitment (Dejene, 2015; Koye & Yonas, 2013). For instance, though the PGDT program is assumed to assure good subject matter knowledge, students fail to score the minimum requirement 50% on the entrance examination for PGDT (Koye & Yonas, 2013). Thus the program is not on the way of achieving its goal. This in turn implies the decline of teacher quality. Thus it is evident to say that Ethiopia is on a crisis regarding the education system, suffering of poor teacher preparation. It is common to hear that achievement of students and their engagement is poor. Therefore, teacher education is associated with many problems starting from those low performing student joining the profession who are unwilling and with poor motivation and commitment.

Several studies made to reveal the situation of teacher turnover and high quit intention (Aweke, 2015, Koye, 2014; Tesfaye, 2008; Tesfaye, 2014;) calls for the improvement of both financial incentives and working conditions so as to attract high caliber students to the teaching profession. Teachers suffer by the low amount of salary and because of that they are undermined in the society. Thus the current status of teachers need improvement and this should not be left aside since teachers are the main role player in the education system.

As the teaching profession is a key in the human capital accumulation, there should be a fully fledged well designed structure to train teachers. In the current scenario students just join the profession temporarily as a transition for any other profession. This deficit is leading the country into crisis in the history of modern education. Thus it is strongly suggested that Ethiopia quickly adapt the concurrent/ blended modality into the system and give the responsibility for some universities with legal and full autonomy to evolve as a university of education with the aim of training teachers accordingly. This does not mean that the consecutive/ PGDT modality should be ignored. This modality is good to attract candidates from other faculty who really love the profession. Hence both the concurrent and the consecutive modalities are equally important and should evolve together.

Another important implication is to make the consecutive program attractive by instilling incentives on it. This is to attract candidates and for the reason that this study is a post-graduate study and so students must gain comparatively more incentives to join this program. Countries like Canada benefits more on this regard and students inclined towards this program in general due to the attractive salary built into their salary scale. It is clear that the Ethiopian people rely on the economic return of education. Thus salaries and benefits should not be ignored in developing a new policy that increase study years to some extent.

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Leadership in Academic Institutions; Preparing Students Holistically for Life: Matters of the Heart and Mind

Alessandra Saxⁱ

American Community Schools Of Athens

Stefanos Gialamasⁱⁱ

American Community Schools Of Athens

Abstract

Students spend most hours of their day within Academic Institutions in their classrooms and/or after school and weekend activities. They are able to acquire knowledge and skills needed to be academically, socially, emotionally and physically well. All of these factors contribute to holistic growth and development. However, social and emotional intelligence are key ingredients to an individual's ability to adjust and interact with others in rapidly changing societies. Therefore, the experiences that students have with their administrators, teachers, peers and parents, while at school are essential to the holistic development of one's academic, social, emotional skills and interpersonal relations. The authors define *holistically*, as the development and growth of students: intellectually, socially, emotionally, physically and ethically. The following discussion points to the importance in fostering social-emotional intelligence in all stakeholders alike, in the school-setting and in finding an equilibrium in authentic leadership by demonstrating agility with school policies and processes when one's wisdom and genuine care can prevail; thus referring to matters of the heart and mind. Therefore, the authors are addressing the fundamental question, What type of institutional leadership does an academic institution need in order to prepare students holistically for life and to develop them to become tomorrow's leaders?

Keywords: international schools, globalization, change facilitators, school principals, leadership styles, emotional intelligence, DiSC Model of Behavior, holistic development

“Kindness is the ultimate gift, in like it fits all and everybody loves it when we exchange it”-

ⁱ **Alessandra Sax** Dr., Counselling Psychology, American Community Schools Of Athens, Greece

Correspondence: saxlanea@acs.gr

ⁱⁱ **Stefanos Gialamas** Dr., Counselling Psychology, American Community Schools Of Athens, Greece,
E-mail: gialamas@acs.gr

Introduction

“You can never be great at anything unless you love it”- Angelou

“Education is the kindling of a flame not the filling of a vessel” –Socrates

“We must prepare our students to navigate their life ship in the ocean of future uncertainties” -Gialamas

In an ever-changing world, with globalization on the rise, human beings endure more and more stress in their work, family and everyday life experiences. As individuals progressively have less and less time to spend and interact with others personally. Additionally, due to external stressors, the need to feel connected, valued and supported holistically (i.e. cognitively, physically, socially and emotionally) is great and thus individuals must be nurtured in professional settings, particularly in academic environments.

International academic institutions must value the diversity of culture and should be respected by all stakeholders. However, regardless of the differences in how one understands his or her experiences and values, the uniqueness of every individual must be solidified with one universal element that unites us all: genuine caring and love. Professional boundaries among administrators, school leaders, faculty, parents and students must be authentic and provided with genuine care and love; where one's wisdom may bi-pass processes and policies (Gialamas, 2014).

By providing firm boundaries with care, and appropriate guidance, Greenberg et al. (2003) suggested that students accomplish meaningful results in their academic progress. Social-emotional learning engulfs the process of developing fundamental social and emotional competencies or skills (Zins & Elias, 2006). These skills enable children to manage their emotions, experience empathy, develop positive relationships, make good decisions, and conduct their own behaviour ethically and responsibly (Collaborative for Academic, Social and Emotional Learning, 2003).

Greenberg et al. (2003) also suggested that children who are socially and emotionally competent tend to be more happy, confident and equipped with strong interpersonal skills across various contexts and roles. Hence: support the importance of social and emotional learning, as an intrinsic aspect of children's academic learning and performance, motivation to achieve and overall holistic well-being.

Academic institutions that practice fostering holistic development (social, emotional, physical and cognitive balance): 1) enhance children's meaningful connections to others in the school environment, 2) enhance children's sense of competence as learners and 3) promote a sense of autonomy and self-direction that are associated with positive school attitudes and overall healthy functioning both in school and society (Baker, Dilly, Auperlee & Patil, 2003).

Gialamas (2014) stated “we need to engage the minds of students, staff, faulty administration, parents and friends of an academic institution with the underlying commitment to serve the family, community, the nation and the world”. “Innovation and authentic leadership approaches are the enabling objectives to provide students with a unique, meaningful, high-quality, holistic educational experience. Students will then use their academic knowledge to exercise wisdom in their decision making as they become the keepers of the future of the planet”. Furthermore, Gialamas (2014) stated “that if educational institutions are to teach and inspire students to develop wisdom to transform static academic knowledge into social, ethical, economic, environmental intelligence, then the sustainability of quality of life can be greatly improved for people around the globe”.

Emotional Intelligence

“One has to work with love and love one’s work”-Sax

“The most precious gift we can offer to anyone is our attention”-Thich Nhat Hanh

“Educators every day, guided by wisdom, must travel often the 16 inch

Journey, from their mind to their soul”-Gialamas

Early attachment theories postulated that safe and secure attachments of the infant with his/her caregiver, fosters healthy interpersonal relationships all throughout the life cycle. Bowlby’s (1969) attachment theory suggested that when a mother nurses/breast feeds her baby and has other intimate interactions with the infant, her system becomes flooded with oxytocin, a calming feel-good hormone. This exact hormone counterbalances cortisol (a stress hormone). Oxytocin being essential to bonding between caregiver as the infant’s behaviour causes oxytocin to be released in the verbal “Aah” moments of the adult. This is miraculous behaviour on part of the infant, in having the innate ability to seek out adults who will be their nurturers in order to survive (Bennis & Thomas, 2011 as cited in the Harvard Press).

If we make the parallel assumption for students; if their teachers and administrators can be connected to one another by something so beautiful and simple as a “feel-good” hormone (oxytocin), the will to go on in life during trials and tribulations, to find a meaning, balance and pride in one’s achievements, personally and professionally will thus take precedent. So how can parents, teachers, administrators and students foster a relationship/bond full of oxytocin?

Research refers to Emotional Intelligence (EQ) as playing a central role in nurturing personal and professional relationships. Three major clusters of skills are described: 1) individual character skills, 2) emotional skills and 3) social skills. Goleman (2011) and his colleagues researched how emotional intelligence operates in the work setting and examined its affect on effective work performance, specifically in leaders (Goleman as cited in the Harvard Business Review on Leadership, 2011). Furthermore, Goleman stated (2011) that great leaders are distinguished from good ones in that they entail five essential skills of emotional intelligence. These skills include: 1) self-awareness (awareness of one’s strengths and weaknesses, drives, values and impact on others), 2) self-regulation (the ability to control and redirect disruptive impulses and moods), 3) motivation (accomplished achievements), 4) empathy (the understanding of others personal and emotional life experiences) and 5) social skills (the building of rapport with others in order to guide them in the desired directions (Goleman as cited in the Harvard Business Review On Leadership, 2011).

Moreover, the hallmarks of the above mentioned EQ skills are outlined by Goleman (2011) as the following: a) self-awareness; self-confidence, realistic self-assessment, self-deprecating sense of humor, b) self-regulation; trustworthiness and integrity, comfort with ambiguity, openness to change, c) motivation; strong drive to achieve, optimism and commitment to one’s organization, d) empathy; expertise in building and retaining talent, sensitivity to cross-cultural issues, service to clients/customers, e) social skill; effectiveness in leading change, persuasive, expertise in leading teams (Goleman, 2011, as cited in the Harvard Business Review On Leadership).

Leadership Styles

“The positive mindset is the foundation of an authentic, and innovative leadership” – Gialamas

As George, Sims, McLean and Mayer (2011) stated, authentic leadership begins with a journey of understanding one’s self and that it is the individual’s experiences that ground a context of one’s life story providing inspiration to have an impact in the world. Authentic leaders exemplify their passions, practice values consistently and most of all, lead not only with their cognitive abilities

but also with their hearts. By doing so, authentic leaders are able to establish long-term, meaningful relationships and through self-discipline are able to achieve results; they truly know who they are (Sims et al. 2011, as cited in the Harvard Business Review on Leadership).

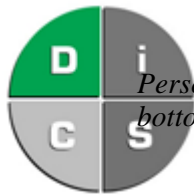
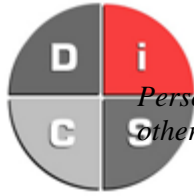

According to Hall & Hord (2011) effective leaders acknowledge that their individual behaviors are important factors to the formation of their overall styles. Behaviors can be described as a leader's everyday actions, as style represents the overall tone and pattern of a leader (Hall & Hord, 2011).

The DiSC Model of Behavior first proposed by Marston (1928), stems from his original theory on how normal human emotions lead to behavioral differences among groups of people and how an individual's behavior may change over time (www.discprofile.com). Marston's (1928) deep understanding of the interaction between individuals and their environment emphasized his model for human behavior which has been followed ever since in professional leadership settings (Source: "The DiSC® Indra® Research Report," published by Inscape Publishing, 2003).

Furthermore, Marston (1928) theorized that the behavioral expression of emotions could be categorized into four primary types, stemming from the person's perceptions of self in relationship to his or her environment. These four types of behavior were coined by Marston (1928) as: 1) Dominance (D), 2) Inducement (I), 3) Submission (S), and 4) Compliance (C) within a two-axis plane framework (Source: "The DiSC® Indra® Research Report," published by Inscape Publishing, 2003).

Then first dimension of the two-axis plane refers to a person's perception of the environment; specifically, whether it is perceived as favorable or unfavorable. The second dimension refers to the person's perception of his or her own power within the environment; specifically, whether they view themselves as more powerful or less powerful than the environment. Masterson's model progressively developed over time and resulted in referring to the four types of behavior as: 1) Dominance (D), 2) influence (i), 3) Steadiness (S), and 4) Conscientiousness (C) (www.resourceunlited.com). See below the following description of each of the four behavioral types (www.discprofile.com).

Figure 1: DiSC Explanations

	<p>Dominance <i>Person places emphasis on accomplishing results, the bottom line, confidence</i></p>	<p>Behaviors</p> <ul style="list-style-type: none"> - Sees the big picture - Can be blunt - Accepts challenges - Gets straight to the point
	<p>Influence <i>Person places emphasis on influencing or persuading others, openness, relationships</i></p>	<p>Behaviors</p> <ul style="list-style-type: none"> - Shows enthusiasm - Is optimistic - Likes to collaborate - Dislikes being ignored
	<p>Steadiness <i>Person places emphasis on cooperation, sincerity, dependability</i></p>	<p>Behaviors</p> <ul style="list-style-type: none"> - Doesn't like to be rushed - Calm manner - Calm approach - Supportive actions - Humility



Conscientiousness

Person places emphasis on quality and accuracy, expertise, competency

Behaviors

- Enjoys independence
- Objective reasoning
- Wants the details
- Fears being wrong

Change Facilitator Styles of Academic Institution Leaders

“The institution’s leader defines and establishes the routines, opportunities, interactions, expectations, language, vision and the cultural forces of the institution he leads”-Gialamas

“Calling- people view their work as an end in itself, their work is fulfilling not because of external reward but because they feel it contributes to the greater good, draws on their personal strengths and gives them meaning and purpose. Unsurprisingly, people with a calling orientation find their work more rewarding and that is why they are generally more likely to make a difference in their organizations, in the community and society in general”-Gialamas

Literature indicated in studies on school principals’ three distinct styles of change facilitators. These styles are: a) the initiator, b) the manager and c) the responder (Hall & Hord, 2011). Leaders who are initiators have clear and strong held visions about their schools and how they should be. These types of leaders are passionate about their schools, are motivated to make their schools better and make decisions based on what they think will be best for students, by listening to all parties involved (Hall & Hord, 2011).

Initiator leaders push their teachers, students, parents and personnel to support the things they believe will help students learn, teachers teach and move the school forward. Although these leaders may push their faculty, they also listen, question and analyse what they and others do. This way, initiator leaders can reflect on what others have told them in regards to emerging issues or tasks and are focused on curriculum, instruction and assessment. These leaders are prepared to anticipate alternative responses in what may need to be employed (Hall & Hord, 2011).

The second leadership style is the manager approach. These types of leaders are organized and efficient and skilled in the way they run their schools. They focus on formal policies, rules, and procedures (Hall & Hord, 2011). Manager leaders are not quick to respond to change initiatives as this allows time for the principal and teachers to learn about the proposed change and to prepare for efficient implementation (Hall & Hord, 2011). They are organized and provide resources to the staff. Manager leaders do many things by themselves rather than delegating tasks to others. They are also more demanding of themselves than others, as they rather do the bulk of the work correctly, as to avoid having to make corrections at a later date (Hall & Hord, 2011).

Lastly, the responders approach to leadership focuses on what is happening in the present in their schools. They do not have visions of what schools should be like in the future. Instead their attention is on present concerns, feelings, and perceptions. Responder leaders spend time on the phone and e-mailing other administrators. Their pattern of talking is chatty, social and they want everyone to be happy. Responder leaders are open to others taking the lead and delay making decisions on their own (Hall & Hord, 2011).

Gialamas (2014) suggested that leadership approaches should be described as meaningful and holistic. This type of leader is committed to serving mankind with compassion, is emotionally and

socially competent and guided by ethics, principals and values (Gialamas, 2014). Additionally, Gialamas (2016) has further postulated another type of leadership referred to as “Aristeia” which is defined by three essential components: 1) the establishment of an Authentic Leadership Identity (ALI), 2) the Creation of a Collective Leadership Partnership Approach (CPA) and 3) Serving Humanity. In the first component, Authentic Leadership Identity (ALI) Gialamas (2009) points to the importance of “knowing oneself” dating back to Socrates (469-399 B.C.) and more recently, Adler (1870-1935) (Gialamas & Pelonis, 2009).

It is the process of understanding one’s world view; origins, experiences, attitudes and beliefs that assist in developing not only life choices and approaches to living but also for defining a leadership identity (Gialamas & Pelonis, 2009). Gialamas (2009) further stated that by “knowing one”, the creation of a leadership vision and definition of its educational philosophy would guide and fuel holistically, healthy leaders thriving to serve humanity.

Parallel to one’s holistic health, Gialamas (2009) stated that one’s principles (specific ways of behaving) and values (standards of actions and attitudes deep in one’s heart and mind that shape our world view and interactions with others) must also be identified in order to ensure that one’s vision is attained by aligning both personal and professional goals through the holistic approach (Gialamas & Pelonis, 2009).

In the second component, Collective Leadership Partnership Approach (CPA), Gialamas (2009) suggested the establishment of this type of leadership includes six components. These six components are the following: 1) a partnership based on common principles and values that are both personal and professional, 2) a distribution of authority and decision making, 3) an outline of the type, magnitude and areas of authority, 4) a plan providing support and encouragement of team members in using their decision making authority, 5) a commitment to continuously reflect on components of the partnership, in order to adjust them, and 6) a dedication to inspiring the members of the leadership team to replicate this model within their teams. With this component of leadership (CPA), a comprehensive support system is in place to ensure that the institution is functioning at its’ highest level of achievement and that members of the leadership partnership share the vision of the institution and are committed to striving towards reaching common goals (Gialamas & Pelonis, 2009).

In the final component, Serving Humanity, Gialamas (as cited in Gialamas & Avgerinou, 2016) discussed the importance of leaders’ commitment to social change. Such social change is fundamental in that human welfare needs are at the forefront for implementing practices in both small and large communities, that make a difference socially, economically and environmentally (IISD, 2014). Additionally, we would like to believe that by being committed to such change as described above, leaders are also contributing to improved mental health of human beings as well, as relational connections are developed through the provisions of such social service.

As George, Sims, McLean and Mayer (2011) stated, authentic leadership begins with a journey of understanding one’s self and that it is the individual’s experiences that ground a context of one’s life story providing inspiration to have an impact in the world. Authentic leaders exemplify their passions, practice values consistently and most of all, lead not only with their cognitive abilities but also with their hearts. By doing so, authentic leaders are able to establish long-term, meaningful relationships and through self-discipline are able to achieve results; they truly know who they are (Sims et al. 2011, as cited in the Harvard Business Review on Leadership).

Conclusion

“A leader must be the source of kindness, ethos, authenticity, intelligence, creativity, wisdom and happiness” –Gialamas

If a meaningful and holistic leadership, defined by Gialamas (2009) as ‘Aristeia’, is to be implemented in a school system, all members should feel supported that they can express their concerns and ideas freely and that decisions are made carefully in ample time. Leaders promoting educational change respond to the human as well as the tasks aspects of their schools, with emotional competence. Being visionary, believing that schools are for learning, valuing human resources, communicating and listening to personnel, being proactive and taking risks are common to successful leaders of educational change.

Taking all of these aspects into consideration, school leaders can continue to progress and develop individual leadership styles, as well cultivate their team members into becoming the best professionals that they can be. Additionally, all stakeholders of the institution granted they internalize meaningful and holistic leadership, will be better equipped to cope with continuous changes in life during times of increased globalization; socially, emotionally, physically and cognitively (<http://www.sedl.org/change/leadership/character.html>).

“Our prime purpose in life is to help others and if you cannot help them, at least do not hurt them”-Dalai Lama

“The calling for leading in education is to prepare tomorrow’s leaders with ethos, and to make the world a better place to live- in particular for less fortunate people”-Gialamas

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The Effect of Teacher and Student Characteristics on TIMSS 2011 Mathematics Achievement of Fourth-and Eighth-Grade Students in Turkey*

Seher Yalcinⁱ

Ankara University

Rahime Nükhet Demirtasliⁱⁱ

Ankara University

Munevver Ilgun Dibekⁱⁱⁱ

Ankara University

Hatice Cigdem Yavuz^{iv}

Ankara University

Abstract

This study investigated effect of student- and school-level variables on mathematics achievement of fourth- and eighth-grade students using the Trends in International Mathematics and Science Study (TIMSS) 2011 data of Turkey. The common variables addressed in student and school questionnaires were compared. Due to nested structure of the TIMSS data, hierarchical linear modeling analysis was performed. According to findings of the study, for both grade levels, of all teacher-related variables, only school emphasis on academic success were discovered to have statistically significant impact on schools' mean mathematics achievements. Moreover, concerning student-level variables, being bullied at school, confidence in mathematics, being engaged in mathematics and parental involvement had statistically significant effect on students' mathematics achievement for both grade levels. It is considered that students that hold more positive perceptions of their school and have teachers that are willing to improve themselves in their career tend to have higher performance in TIMSS.

Keywords: Student characteristics • HLM • Mathematics achievement • TIMSS • Teacher characteristics

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ⁱ **Seher Yalcin** Res. Asst. Dr., Faculty of Educational Science, Department of Measurement and Evaluation, Ankara University, Turkey

Correspondence: yalcins@ankara.edu.tr

ⁱⁱ **Rahime Nükhet Demirtasli** Prof. Dr., Faculty Of Educational Science, Department Of Measurement and Evaluation, Ankara University, Turkey, E-mail: ndemirtasli@ankara.edu.tr

ⁱⁱⁱ **Munevver Ilgun Dibek** Res. Asst., Faculty Of Educational Science, Department Of Measurement and Evaluation, Ankara University, Turkey, E-mail: milgun@ankara.edu.tr

^{iv} **Hatice Cigdem Yavuz** Res. Asst., Faculty Of Educational Science, Department Of Measurement and Evaluation, Ankara University, Turkey, E-mail: hcyavuz@ankara.edu.tr

Introduction

Many countries consider students' academic achievement to be a significant indicator of the quality of the education system. Therefore, studies have been undertaken to determine the inadequate aspects and constituents of the education system and amend them through decisions with respect to the discovery of the impartial instruments of measurement (Ministry of National Education-MoNE, 2010). As part of this process, within the last two decades, several countries have participated in international educational assessment studies to monitor their quality of education. An example is the Trends in International Mathematics and Science Study (TIMSS), which was first established in 1995 to collect data from fourth- and eighth-grade students every four years to determine the trends in mathematics and science achievement of these students at the international level.

According to the TIMSS report (Mullis, Martin, Foy & Arora, 2012), a significant percentage of Asian students achieved the advanced international benchmark level. Moreover, for more than a decade and a half, East Asian jurisdictions regularly hold the top positions with high performance against their Western competitors. Furthermore, there is a considerably large gap between the East and the West in terms of student achievement according to Program for International Student Assessment (PISA) 2012 and TIMSS reports (Jerrim, 2014).

As the case for the education ministries of several other countries, the Ministry of National Education (MoNE) in Turkey also uses TIMSS results to evaluate student achievement and compare the Turkish education system with that of other countries. Several researchers have also conducted research based on this data. For example, Büyüköztürk, Çakan, Tan and Atar (2014a) showed that Turkish students have difficulty keeping pace with their peers from other countries regarding mathematics achievement. For example, compared to the Asian pupils, Turkish students' performance is rather poor. Therefore, the reasons behind this poor performance should be examined in detail. There are several factors affecting students' mathematics achievement. In this regard, in this study, the effect of several characteristics and different experiences of students and teachers on the mathematics achievement of fourth- and eighth-grade students were investigated using the data from TIMSS 2011 for Turkey.

MoNE has a major responsibility and control over the whole structure of the educational system in Turkey. In 2005, MoNe introduced a new teaching program to be practiced across the country, which focuses on the student and his/her cognitive skills. However, contrary to the expectations, the new approach did not result in an increase in the academic achievement of students (Education & Science Workers' Union, 2010). In 2011, MoNE used TIMSS for the first time as a large-scale assessment tool to evaluate the outcomes of the curriculum change in 2005 for both fourth- and eighth-grade students. Therefore, it is considered that the results and implications of this study will greatly contribute to the literature. In this context, the findings regarding the differences between fourth- and eighth-grade students in Turkey, who participated in TIMSS 2011 will also help us make important inferences about the national education system (Büyüköztürk et al., 2014a).

Mathematics is one of the several subjects covered in TIMSS. It is necessary to learn mathematics in order to learn interdisciplinary areas such as science, technology and engineering. At the same time, mathematics is an important asset for a country for the innovation and creation of new scientific- technological professions (Ker, 2013). Mathematics achievement of students have been considered to be connected with a country's future economic well-being and competitive power against other countries. Thus, it is a common objective of the national policy makers and educators worldwide to understand and identify factors that have a significant and consistent relationship with mathematics achievement (Wagemaker, 2003). According to the results of TIMSS 2011, the Turkish students were behind their peers from other countries with Turkey ranking 35 among more than 50 countries in terms of the average mathematics score of the fourth-grade students (469). Furthermore, the percentage of Turkish students included in the advanced, high, intermediate and low benchmarks were 4, 17, 29, and 26, respectively with the remaining 24% not even being able to reach the low level. Concerning the eighth-grade students in Turkey, the average mathematics score was 452 and

Turkey ranked 24 among 42 countries. The percentage of Turkish students in the high, intermediate and low benchmarks were 13, 20 and 27, respectively. However, similar to the fourth-graders, a significant number of Turkish eighth-grade students (33%) did not even achieve the low level (Büyükoztürk et al., 2014b). These results demonstrate the low performance of Turkish students in mathematics and science.

In TIMSS, in addition to cognitive skills, certain educational and affective characteristics of students are surveyed. This means that the cross-sectional data obtained from TIMSS can be used to investigate the variables that play a role in student achievement at different grades in different years. The present study utilized the 2011 TIMSS data to examine the student- and school-level variables to explore their effect on the mathematics achievement of fourth- and eighth-grade students in Turkey. The common variables addressed in both fourth- and eighth-grade student and school questionnaires were compared. Student-related variables were being bullied at school, being engaged in mathematics, confidence in mathematics, enjoying learning mathematics, sense of belonging to school and parental involvement in student learning. The variables related to teachers consisted of confidence in teaching mathematics, teachers' working conditions, schools' emphasis on academic success, teacher career satisfaction, collaboration to improve teaching and instruction to engage students in learning.

The first student-level variable examined in this study was students' confidence in mathematics. In the literature, researchers (e.g. Arıkan, van de Vijver & Yagmur, 2016; Chen, 2014) have stated that self-confidence is positively related to mathematics success of students. According to the longitudinal study by Hannula, Majjala, and Pehkonen (2004), students' confidence in mathematics is the most important variable among students' mathematics-related attributes. It has also been recommended in the literature that enjoying learning mathematics and academic achievement are positively related (Güzeller, Eser & Aksu, 2016; Yavuz, Demirtaşlı, Yalçın & İlgin Dibek, 2017).

Being bullied at school is another variable affecting students' academic achievement. Olweus (1993) described the negative outcomes of this experience as follows, "a student is being bullied or victimized when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other students" (p. 9). The related literature supports this idea demonstrating that being bullied in school reduces student academic performance (e.g., Ponzo, 2013). Therefore, in this study, it was considered necessary to investigate the effect of bullying in the achievement of Turkish students.

Research into student engagement has mainly and historically concentrate on increasing achievement, a sense of belonging so that students remain in school (Taylor & Parsons, 2011). A positive relationship between students engaged in mathematics lessons and mathematics achievement (Park, 2005; Tavşancıl & Yalçın, 2015) has been found to increase students' sense of belonging to schools and other social institutions (Willms, 2003).

The concept that parental involvement has a positive impact on students' academic achievement is so heuristically attractive that society in general, and educators in particular, have thought about parental involvement an substantial component for the way for many problems in education (Fan & Chen, 2001). Most empirical evidence suggests that parental involvement is positively correlated with students' performance in school (Shute, Hansen, Underwood & Razzouk, 2011; Topor, Keane, Shelton & Calkins, 2010). However, a negative significant relation has been reported between parents' involvement in Turkish students learning and the mathematics achievement of these students (Tavşancıl & Yalçın, 2015).

It has been suggested in the literature that students' belonging to school and academic achievement are positively related (Appleton, Christenson & Furlong, 2008). Having been considered to be related to the motivation theory, individuals' belonging to a community has long been seen as a basic human need. Some studies have explained the sense of belonging to school with student engagement and participation (e.g., Rooser, Midgley & Urban, 1996). However, it was emphasized in the longitudinal study of Anderman (2003) that this sense of belonging loses its effect as the time passes. Since students' perceptions of their school are reflected on their sense of belonging

(Organisation for Economic Co-operation and Development- OECD, 2003), the findings of the study may have been affected by the exam-oriented education system in Turkey.

Confidence in teaching mathematics is one of the school-level variables addressed in the study. The role of teachers' confidence in students' achievement has been demonstrated in recent studies (Liang & Jea, 2015). Burton (2004, p. 360) defined the concept of confidence as "a label for a confluence of feelings relating to beliefs about the self, and about one's efficacy to act within a social setting, in this case the mathematics classroom". Graven (2004) theorized confidence not only as a consequence of learning but also as a process. Graven (2004) also suggested that confidence is associated with teachers' ability to reach resources, join in mathematical event, and consider themselves as qualified mathematics teachers with a confidence that is enough to consider the possibility of having much to learn. Teachers' satisfaction with their career is another factor that positively affects students' mathematics achievement (e.g., Liang & Jea, 2015). In his literature review on teacher job satisfaction, Leithwood (2007) found a strong relationship between teacher satisfaction and motivation and commitment. Career satisfaction and motivation are two significant elements that have a crucial role in long-term growth in any education system. Their importance is equivalent to that of professional knowledge, instruction skills and reach to educational resources (Oloube, 2005). Dinham (1993) suggested that the most important factors affecting teachers' satisfaction with their career are intrinsic including students' achievement and positive attitudes towards learning, self-growth, positive relationships with students and peers, mastery of professional skills and the presence of a supportive environment.

Working conditions for teachers include the physical characteristics of the workplace, the psychological, cultural and educational characteristics of the work setting (Johnson, 2006). The conditions of work are significant in terms of teacher retention and also an substantial issue for students in relation to the continuity of teaching (Hirsch & Church, 2009). The working conditions of the teachers is closely correlated to the motivation of both teachers and students and in turn this affects student achievement (Marcondes, 1999).

In this study, school's emphasis on academic achievement was chosen as another school level variable since it can raise awareness of students' academic life and aims. In fact, it has been demonstrated that this variable is positively correlated with students' mathematics achievement (Tavşancıl & Yalçın, 2015). Therefore, it is considered necessary to examine the role of school's emphasis on academic success in relation to Turkish students.

The last school-level variable examined in this study was level of collaboration to improve teaching. In the literature, the importance of the collaboration to improve teaching for student achievement has been emphasized (McLaughlin & Talbert, 2006; Pang, 2006). The more the teachers cooperative, the more they are able to knowledgeable converse about methods, operations of teaching and learning, and therefore develop their instruction (Goddard, Goddard & Tschannen-Moran, 2007).

In brief, many studies have shown that the chosen variables are important determinants of student achievement. The review of the literature demonstrates that studies investigating both student- and school-level variables for eighth graders are limited in number, especially in Turkey (Tavşancıl & Yalçın, 2015). Therefore, the current study aimed to fill a gap in the literature. In addition, to our knowledge, no studies have taken into consideration the common variables for fourth-grade and eighth-grade students or interaction between these variables to predict mathematics success in the context of a large-scale dataset that would allow results to be generalized to the entire Turkey. In accordance with the purpose of the study, the following research questions were formulated: (i) Does mathematics achievement of fourth- and eighth-grade students differ according to the schools?; (ii) Which characteristics or experiences of students are related to their mathematics achievement?; (iii) Which characteristics of teachers are related to students' mathematics achievement?; (iv) Which school features that clarify the significant difference between the mathematics achievements of the fourth- and eighth-grade students have a significant relation with the achievements of the fourth- and eighth-grade students that participated in TIMSS 2011?

Method

Sample

In the selection of the sample, a two-stage stratified cluster sampling design was used, in which the schools and classrooms were selected in the first and second stages in proportional to their sizes. The population and sample that participated in the TIMSS 2011 in Turkey were as follows (Joncas, 2012):

Table 1. *Population and Sample*

Grade	Population		Sample	
	Schools	Students	Schools	Students
4th grade	26247	1 301 460	257	7479
8th grade	17621	1198697	239	6928

Instruments

The data were retrieved from the official web site of TIMSS (<http://timssandpirls.bc.edu/>). The common variables measured in both grade levels were obtained from two questionnaires, one for students and the other for teachers. In addition, all the plausible values were used as the true representation of mathematics scores of the students. These scores were obtained from the mathematics achievement test. In TIMSS 2011, mathematics achievement test has two main domains, content and cognitive domain. The former differs between the grade levels while the latter (knowing, applying and reasoning) are the same for both grades. Specifically, the mathematics achievement test for fourth-grade students comprises items related to number, geometric shapes and data display while for eighth-grade students, the items contained numbers, algebra, geometry, data and chance.

Data Analysis

The analysis was performed after the indices of the corresponding variables were created. At this point, since the variables parental involvement and students' belonging to school had no index values, the national indices for all variables were computed to validate the results obtained from this study. An index formula was used to generate all indices (see, OECD, 2014, p. 352)

Two-level hierarchical linear modeling (HLM) was performed to analyze the data. The HLM analysis is used for analyzing data in a clustered or nested structure. With hierarchical linear models, each level is formally represented by its own sub-model. It is possible to test hypotheses about relations occurring at each level and across levels and also to examine the variability at each level (Raudenbush & Bryk, 2002). Moreover, considering the independence and homoscedasticity assumptions, the HLM analysis allows determining standard errors and thus provides more reliable results. In this study, the following four models were developed to analyze the data for both grade levels:

Random effects one way ANOVA model. Concerning the first research question, random effects one way ANOVA models were developed for both the fourth- and eighth-grade students to determine whether there was a difference in the mathematics achievement of the schools that join in TIMSS 2011.

Means-as-outcomes model. To determine which of the school-level variables explained the variability in TIMSS mathematics scores, means as outcomes models were developed for students from both grades. In this regard, to address the second research question of this study, the effects of school-level variables on students mathematics achievements were analyzed using these models.

Random coefficient regression model. Two models were developed for students in both grades to address the third research question of the current study by investigating the student-level

variables and clarify the individual differences in the variability of students' mathematics achievement scores.

Intercepts- and slopes-as-outcomes model. This model was the combination of all the models developed previously and aimed to simultaneously examine the influence of student- and school level variables. In this process, only the variables that had a statistically significant effect on students' mathematics achievement were added to the intercepts and slopes-as-outcomes model for fourth- and eighth-grade students to address the fourth research question of this study.

After the analyses were conducted, the assumptions of HLM were tested using HLM 7 and SPSS-20 programs and it was found that none of the assumptions were violated.

Results

Random Effects One-Way ANOVA

According to the results of this analysis, the mathematics scores of the fourth-grade students was significantly varied according to schools ($\chi^2_{230}=4005.25$, $p<.05$) with the mean score being 475.52. The variability within the school and between the schools were estimated to be 5794.04 and 3463.81, respectively. In this regard, intraclass correlation was calculated as 0.37, which indicates that 37% of the variability in the mathematics scores of the fourth-grade students was explained by the mean mathematics achievement of the school.

Concerning the results obtained from the analysis of the random effects one-way ANOVA model developed for the eighth-grade students, the mathematics achievement scores eighth also significantly differed between the schools ($\chi^2_{218}=3073.82$, $p<.05$) with the mean being calculated as 450.79. Within-school variability and between-school variability were estimated as 8403.57 and 3928.74, respectively. The intraclass correlation was calculated as 0.32, which means that 32% of variability in mathematics scores resulted from the differences in the mean mathematics achievement of schools.

Means-as-Outcomes Models

The results obtained from the analysis means-as-outcomes models are presented in Table 2.

Table 2. Results Obtained from Analysis of Means as Outcomes Model

Fixed Effect	Grade	Coefficient	S.E	t-ratio	df	Effect
Average mathematics achievement, γ_{00}	4th	475.57	3.56	133.77*	224	-
	8th	450.88	3.87	116.43*	212	-
Confidence in teaching Mathematics, γ_{01}	4th	11.98	9.02	1.33	224	.23
	8th	4.22	2.78	1.52	212	.08
Teacher working conditions, γ_{02}	4th	7.45	3.90	1.92	224	.14
	8th	1.19	4.28	.28	212	.02
Emphasis on academic success, γ_{03}	4th	20.10	6.08	3.31*	224	.38
	8th	35.03	5.31	6.60*	212	.65
Teacher career satisfaction, γ_{04}	4th	12.22	6.08	2.01*	224	.23
	8th	3.68	5.64	.65	212	.07
Collaboration to improving teaching, γ_{05}	4th	7.67	3.70	2.07*	224	.15
	8th	3.96	5.42	.73	212	.07

Instruction to engage students, γ_{06}	4th	7.25	4.80	1.51	224	.14
	8th	0.45	6.54	.07	212	.008
Random Effect		sd	variance	d.f.	χ^2	
School level, u_0	4th	52.43	2748.35	224	3136.58*	
	8th	53.68	2881.88	212	2267.37*	
level-1, r	4th	76.12	5794.46			
	8th	91.67	8403.60			

*Variable was statistically significant at $p < .05$

According to these results, among the school-level variables, the variables teacher career satisfaction, schools' emphasis on academic achievement and collaboration to improve teaching were found to have a statistically significant positive effect on the success of the fourth-grade students. On the other hand, for the eighth-grade students, except for school's emphasis on academic success, none of these variables were found to have a significantly positive impact. Furthermore, school's emphasis on academic success had a statistically significant negative impact on the mathematics success of the eighth-grade students' ($\gamma_{03} = -35.03$, $p < .05$). The school-level variables that did not have any significant effect on the mathematics achievement of the fourth- and eighth-grade students were removed from the models. To explain the variance of the remaining variables, their effects were controlled and according to the result, the three significant variables explained 21% of variability in the mathematics scores of the fourth-grade students while one significant variable explained 27% of the variability in the eighth-grade students' mathematics scores.

A large sample size may yield a statistically significant relationship (Fishman and Galguera, 2003). Therefore, in this study, when the practical significance of the variables was analyzed, the fourth-grade students and eighth-grade students were taken into consideration separately.

School's emphasis on academic success was found to have the highest effect on the mathematics success of both fourth- and eighth-grade students. That is, the effect size of this variable showed that an increase of one standard deviation in this variable would result in an increase of .38 and .65 standard deviation in the mean mathematics achievement of the fourth- eighth-grade students, respectively. Although among the school-level variables, confidence in teaching mathematics, teachers' working conditions and instruction to engage students in learning did not have a statistically significant impact on the mathematics success of the fourth-grade students, they were found to have a practical significance.

Random Coefficient Regression Model

The results of the random coefficient regression models were presented in Table 3.

Table 3. Results Obtained from Analysis of Random-Coefficients Regression Model

Fixed Effect	Grade	Coefficient	S.E	t-ratio	df	Effect size
Average mathematics achievement, γ_{00}	4th	475.50	4.01	118.51*	230	-
	8th	450.80	4.49	100.34*	218	-
Being bullied at school, γ_{10}	4th	-11.15	1.29	-8.66*	46	-.19
	8th	-6.86	1.46	-4.69*	42	-.11
Students' like learning mathematics, γ_{20}	4th	6.94	2.09	3.32*	47	.12
	8th	2.36	1.59	1.48	1386	.04

Students' confident in mathematics, γ_{30}	4th	28.62	1.50	19.08*	50	.48
	8th	62.76	2.38	-26.32*	6183	.99
Students' engagement in mathematics, γ_{40}	4th	7.24	1.54	4.70*	268	.12
	8th	6.46	2.01	-3.22*	91	.10
Students' belonging to school, γ_{50}	4th	7.65	2.55	3.00*	33	.13
	8th	4.04	2.23	1.81	18	.06
Parental involvement, γ_{60}	4th	-8.55	1.66	-5.16*	87	-.14
	8th	-8.18	1.23	-6.67*	451	-.13
Random Effect		sd	Variance	d.f.	χ^2	
INTRCPT1, u0	4th	59.26	3511.94	230	4994.08*	
	8th	63.38	4017.32	218	4172.11*	
level-1, r	4th	68.17	4646.73			
	8th	78.69	6191.78			

*Variable was statistically significant at $p < .05$

At student-level, the corresponding p values of all variables indicated that the effect of the variables on mathematics achievement were statistically significant for the fourth-grade students. Adding these variables into student-level HLM analysis reduced within-school variability from 5794.04 to 4646.73, which indicates that these variables explained 19.8% of within school variability in the mathematics scores of the fourth-grade students.

Concerning the results for the eighth-grade students, the effects of the variables being bullied at school, being engaged in mathematics, confidence in mathematics and parental involvement were found to have significant effect. The remaining variables were removed from the model. At the student-level, there was also a negative significant relationship between being bullied at school and the mathematics success of the eighth-grade students ($\gamma_{10} = -6.86$, $p < .05$). Similarly, parental involvement was found to be negatively correlated with eighth-grade students' achievement ($\gamma_{60} = -8.18$, $p < .05$). On the other hand, a positive relationship was found between eighth-grade students' engagement in mathematics and their achievement ($\gamma_{40} = 6.46$, $p < .05$). Another positive relationship was found between these students' confidence in mathematics and their achievement ($\gamma_{30} = 62.76$, $p < .05$). Adding these variables into student-level reduced within-school variability from 8403.57 to 6191.78, which indicates that these variables explain 26 % of within-school variability in students' mathematics scores.

Considering the effect size of all variables, the fourth-grade students' like and students engaged in mathematics were found to have the lowest effect on their mathematics success. Specifically, an increase of one standard deviation in these variables would result in an increase of .12 standard deviation in their mean scores. On the other hand, the fourth-grade students' confidence in mathematics had the highest impact on their mathematics achievement. More precisely, an increase of one standard deviation in this variable would increase the mean scores by .48 standard deviation. Concerning the results related to the practical significance of the effect of the variables on the mathematics success of the eighth-grade students, their like learning mathematics was found to have the lowest effect on their achievement. That is, an increase of one standard deviation in this variable would result in an increase of .04 standard deviation in the mean achievement of these students. On the other hand, the eighth-grade students' confidence in mathematics was found to have the highest effect on their mathematics achievement. Demonstrating that an increase of one standard deviation would provide an increase of .99 standard deviation in their mean scores.

Intercepts- and Slopes-as-Outcomes Model

When the significant student- and school-level variables were added to the same model, two of the school-level variables, teacher career satisfaction and collaboration to improve teaching, were no longer significant for the fourth-grade students as shown in Table 4.

Table 4. *Results Obtained from Analysis of Intercepts-and-Slopes-as-Outcomes Model*

Fixed Effect			Grade	Coefficient	S.E	t-ratio	d.f.	Effect Size
Average school achievement, γ_{00}	mean	4th		475.51	3.63	131.06*	227	-
			8th	450.86	3.91	115.35*	217	-
School emphasis on academic success, γ_{01}		4th		26.14	5.64	4.63*	227	.49
		8th		36.45	5.35	6.81*	217	.67
Teacher career satisfaction, γ_{02}		4th		11.63	6.14	1.90	227	.22
		8th		-	-	-	-	-
Collaboration to improving teaching, γ_{03}		4th		5.82	3.65	1.59	227	.11
		8th		-	-	-	-	-
Being bullied at school, γ_{10}		4th		-11.00	1.25	-8.78*	52	-.21
		8th		-6.38	1.34	-4.76*	86	-.12
Students' like learning Mathematics, γ_{20}		4th		6.67	2.14	3.12*	38	.13
		8th		-	-	-	-	-
Students' confident in mathematics, γ_{30}		4th		28.83	1.47	19.55*	49	.54
		8th		61.05	1.88	-32.49*	2251	1.12
Students' engagement in mathematics, γ_{40}		4th		7.40	1.52	4.88*	222	.14
		8th		4.51	1.74	2.58*	395	.08
Students' belonging to school, γ_{50}		4th		7.98	2.59	3.08*	29	.15
		8th		-	-	-	-	-
Parental involvement, γ_{60}		4th		-8.87	1.70	-5.22*	102	-.17
		8th		-9.12	1.26	-7.22*	174	-.17
Random Effect				sd	Variance	d.f.	χ^2	
INTRCPT1, u0			4th	53.59	2871.78	227	4024.86*	
			8th	54.32	2950.60	217	3130.56*	
level-1, r			4th	68.08	463.52			
			8th	78.64	6183.73			

*Variable was statistically significant at $p < .05$

Additionally, all the student-level variables were still significant predictors of the fourth grade students' mathematics achievement. Adding these variables to student-level reduced between the school variability from 3511.94 to 2871.78, which indicates that these variables explained 18% of within school variability in the students' mathematics scores. Concerning the results for the eighth-grade students, the effects of the student-level variables being bullied at school, being engaged in mathematics, confidence in mathematics and parental involvement were significant on the achievement of the eighth-grade students. At the student-level, there was also a negative significant relationship between eighth-grade students' being bullied at school and their mathematics achievement ($\gamma_{10} = -6.86$, $p < .05$). Similarly, parental involvement was found to be negatively correlated with the

eighth-grade students' achievement ($\gamma_{60} = -8.18, p < .05$). On the other hand, a positive relationship was found between these students' engagement in mathematics and their achievement ($\gamma_{40} = 6.46, p < .05$) as well as between their confidence in mathematics and achievement ($\gamma_{30} = 62.76, p < .05$). Adding these variables to the student level reduced the within-school variability from 4017.32 to 2950.60, indicating that these variables accounted for 26% of the within-school variability in the students' mathematics scores.

When the practical significance of the effects of the student-level variables was considered for both grades, it was found that students' confidence in mathematics had the highest effect. Specifically, the effect size of this variable showed that an increase of one standard deviation in this variable would increase of the standard deviation of mathematics scores by .54 and 1.12 for fourth- and eighth-grade students, respectively. On the other hand, of all the student-level variables, enjoying learning mathematics had the lowest effect on the fourth-grade students' mathematics achievement and being engaged in mathematics had the lowest effect on the eighth-grade students' achievement.

Discussion

In this study, the effects of student-level variables and school-level variables on the mathematics achievement of the fourth- and eighth-grade students in Turkey were examined. Parental involvement and being bullied at school had a negative effect on both fourth- and eighth-grade students' mathematics achievement. In addition, schools' emphasis on academic success, students' confidence in mathematics and students engaged in mathematics were found to be highly important for promoting mathematics achievement in both grades. The findings also showed that student-level variables had a higher impact for both grades than the school-level variables. Another important finding of the study was that among the school level variables, only collaboration to improve teaching and school's emphasis on academic success had a significant effect on the fourth- and eighth-grade students' mathematics achievement.

Studies in the related literature have reported similar results. For example, researchers have found that being bullied in school reduces student performance (Ponzo, 2013), which is expected considering the negative outcomes of this experience for both academic and social lives of students (Cowie, 2013). According to a meta-analysis based on research with students aged between 7 and 14 (Hawker & Boulton, 2000), regardless of the students' age and ethnicity, being bullied creates several risk factors and outcomes for these students. The results of cross-sectional studies have also shown that students being bullied result in these students creating a negative self-image. Children who experience bullying in school develop negative attitudes towards the school, teachers and their classmates (Lai, Ye & Chang, 2008). In this sense, teachers, administrators and policy-makers should consider the crucial importance of identifying and taking action to prevent bullying in all grades.

In several studies (e.g., Shute et al., 2011; Topor et al., 2010), parental involvement has been found correlated with students' achievement. However, as in this study, this effect has been reported to be negative in other studies conducted with Turkish students (e.g., Tavşancıl & Yalçın, 2015) and South African students (Wang, Osterlind & Bergin, 2011). It should be noted that in this study, parental involvement was assessed according to students' responses in TIMSS. Therefore, students' perceptions about their families' involvement may play a role in this finding. As reported by Kilic and Askin (2013), the Turkish and Singaporean students had lower academic performance, which can be attributed to the families in these countries tending to be strict about checking their children's homework on a daily basis. On the other hand, the students from Republic of Korea and Chinese Taipei who were not frequently monitored by their parents were reported to have a higher performance. However, this result can also be due to the different understanding of the concept of parental involvement in different cultures. According to Erdogan and Demirkasimoğlu (2010), Turkish families consider parental involvement solely as participating in meetings organized by schools and obtaining information and recommendations from teachers about their children. According to the longitudinal study by Hoge, Smit, and Crist (1997), parents' high expectations have a higher positive effect on students' achievement than parents' interest in students' grades, involvement in school and good

communication with their children. Since in this study, parental involvement did not include parental expectations about student achievement, the negative relationship between parental involvement and mathematics achievement can be interpreted as being meaningful. On the other hand, the reason why parental involvement did not have a positive effect on students' academic success in this study can be due to the generally lower socioeconomic background of Turkish families. For example, according to the TIMSS 2011 data on eighth-grade students (Büyüköztürk et al., 2014a), while the percent of students from the lowest socioeconomic level was 59 in Turkey, the percent of Korean students with high performance in TIMSS was 32. Hill and Taylor (2004, p. 162) explained this as follows, "parents from lower socioeconomic backgrounds face many more barriers to involvement, including nonflexible work schedules, lack of resources, transportation problems, and stress due to residing in disadvantaged neighborhoods." In the literature, parental involvement may be considered as a remedy for many problems in education (Fan & Chen, 2001). For example, in the meta-analysis of Jeynes (2012), parental involvement was found to have a high correlation with academic success. Therefore, the factors affecting this finding should be investigated in a further study focusing on parents' involvement with students coming from different socioeconomic backgrounds.

In this study, similar results were obtained from fourth- and eighth-grade students in terms of the positive relationship between being engaged in mathematics and mathematics achievement. This finding is consistent with those reported in different countries (Tavşancıl & Yalçın, 2015; Zhu & Leung, 2010). Therefore, the positive effect of this variable on mathematics achievement is expected. From this point of view, it can be stated that students' engagement has an important role in students' academic achievement in general (Park, 2005) and mathematics achievement in particular.

In this study, students' confidence in mathematics was found to be positively related with their mathematics success. This is consistent with the results reported by previous research (e.g. Chen 2014). Considering the positive outcomes of confidence in academic achievement (e.g., Al-Hebaish, 2012), it is not surprising that in a subject like mathematics, confidence has an important role in increasing achievement. According to Hannula et al. (2004)'s longitudinal study, self-confidence in mathematics is the most important variable among the students' beliefs concerning mathematics. Since students' beliefs about mathematics have an impact on their mathematics achievement, this finding supports the importance of self-confidence for the fourth- and eighth-grade students in Turkey.

According to the findings of this study, the eighth-grade students' belonging to school had no significant impact on their mathematics performance; however, it was significant for fourth-grade students. In the literature, a positive relationship has been reported between this variable and school and academic achievement (Appleton et al., 2008). This can be explained by the results of earlier studies that the effect of school belonging decreases by age (Bernard, 2004) and loses its impact over time (Anderman, 2003). Since school belonging refers to students' perceptions about their school (OECD, 2003), the finding of the present study may have been affected by the exam-oriented education system in Turkey, where all eighth-grade students have to take a test called the Placement Test for Secondary Education in order to continue their education. The compelling preparation for this exam negatively affects these students' perception towards school resulting in a decrease in their sense of school belonging compared to the fourth-grade students. Moreover, the mean mathematics score of the eighth-grade students in Turkey were found to be considerably lower than those of the fourth-grade students. Similarly, Sarı (2012) reported a significant difference between low and high achieving students in terms of school belonging. In this sense, the lower academic achievement of the Turkish students may be another reason for their less positive perceptions about school belonging.

Schools' emphasis on academic achievement was also found to have a positive effect on student success since it helps students develop positive attitudes concerning school. It also raises students' awareness about their academic life and aims. Similar to the previous TIMSS, a positive significant relationship was found between schools' emphasis on academic success and students' actual mathematics achievement (Tavşancıl & Yalçın, 2015).

The importance of teachers' collaboration to improve teaching for student achievement has been previously emphasized in the related studies (McLaughlin & Talbert, 2006; Pang, 2006). In this study, this variable did not have a significantly positive impact on the mathematics performance of the eighth-grade students whereas its effect was significant for fourth-grade students. Similar results have been reported in the literature (e.g., Thomson, Hillman & Wernert, 2012). This may have resulted from the fact that in Turkey, in the fourth grade, mathematics is taught by the class teachers whereas in the eighth grade, subject teachers are responsible for teaching mathematics. Therefore, the level and characteristics of teachers' collaboration tend to change over time. On the other hand, the OECD Teaching and Learning International Survey (TALIS) data indicated that Turkish teachers' collaboration rate was lower than that of many participating countries (OECD, 2009) and therefore, it may be the reason why students' achievement is not significantly affected by teachers' collaboration.

In this study, teachers' confidence in teaching mathematics was found to have no significant effect on student success. However, in the literature, some research has revealed that teachers' confidence in teaching mathematics increased students' achievement (Liang & Jea, 2015). The reason why in this study confidence in teaching mathematics did not have a significant effect on success may be due to different characteristics of the Turkish mathematics teachers such as their anxiety about teaching, self-efficacy, practices, earlier beliefs and experiences. In addition, teachers' collaboration with others has a positive effect on their level of confidence in teaching (OECD, 2009). This was also supported by Aslan (2015), who based on TALIS data concluded that teachers in South Korea where academic achievement level is higher than most OECD countries exhibited much better professional collaboration than Turkish teachers.

Teachers' career satisfaction was another variable with no significant effect on eighth-grade students' mathematics achievement. Similar findings have been reported for teachers in England, where a higher level of career satisfaction was not found associated with increased pupil achievement (Sturman, Burge, Cook & Weaving, 2012). However, there is also research that showed that career satisfaction was positively related to mathematics achievement (Liang & Jea, 2015; Yildirim & Demir-Bilican, 2014). The TALIS data also indicated that teachers' career satisfaction was highly correlated with their professional collaboration with their colleagues (OECD, 2009). According to Burns and Darling-Hammond (2014), the individual and collective capabilities of teachers are improved through participation in collaborative activities since such activities increase teachers' self-confidence about teaching and managing the class as well as helping them take greater pleasure from their work. Taking into consideration Turkish teachers' lower levels of collaboration and career satisfaction compared to OECD countries, the findings of the presents study were expected.

Conclusion

This study identified several implications for Turkish students' mathematics achievement. In general, it seemed that the student-level variables had a more important role than teacher-level variables for both fourth- and eighth-grade students. Taken together, the findings suggest that investing in students and enhancing their affective factors would be beneficial to students' achievement. Students that hold more positive perceptions of their school and have teachers that are willing to improve themselves in their career tend to have a higher performance in TIMSS. Moreover, the results of this study also have implications for teacher educators. Developing teacher education and their features should be considered by education stakeholders.

Being limited to the student- and school-level variables, this study lacks information regarding the effects of other important variables on mathematics achievement. In this sense, further research should be undertaken to investigate more variables to provide an insight into these students' affective factors. In addition, the sample of this study was limited to Turkish students. Future research can use samples from different countries. Furthermore, since in TIMSS, the samples are formed by selecting one class from each school, the effect of class-level variables could not be investigated. In future work, class-level variables can be explored and three-level HLM analysis can be performed.

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A Case Study of Preservice Science Teachers with Different Argumentation Understandings: Their Views and Practices of Using Representations in Argumentation

Bahadır Namdarⁱ

Recep Tayyip Erdogan University,

Abstract

Representations are fundamental tools to support argumentation in science learning. However, little is known about how preservice science teachers (PSTs) with different argumentation understandings view and use representations in argumentation. Therefore, the purpose of this case study was to explore the views and practices of PSTs' use of representations for argumentation purposes. The participants were six graduate students enrolled in an argumentation course in a northeastern university in Turkey. Data was collected through videotaped lessons, the PSTs' artifacts and semi-structured interviews. Video analysis and content analysis were used to investigate research questions. Results indicated that with the increased argumentation understandings the PSTs showed a sophisticated understanding of using representations for argumentation. Moreover, with the increased argumentation understanding the PSTs used representations for multiple purposes during argumentation and used visual-graphical representations as rebuttals and counterarguments. Implications include the explicit teaching of the purpose of multiple representations in argumentation, integration of representational and argumentation practices in teacher education programs, and enriching argumentation experiences by providing learners with multiple representations.

Keywords: science education; argumentation; multiple representations

Bahadır Namdarⁱ Assist. Prof. Dr., Department Of Mathematics And Science Education, Faculty Of Education, Recep Tayyip Erdogan University, Rize, Turkey

Correspondence: bahanamdar@gmail.com

Introduction

In an effort to make learning more meaningful, research and practice in school science education has long been concerned with engaging students in similar contexts and authentic practices of scientists (Bricker & Bell, 2008). Argumentation, one of the core epistemic practices in science, has received an increasing amount of attention from science education research community (Lin, Lin, & Tsai, 2013). It has been widely used as an instructional approach (Osborne, Erduran, & Simon, 2004; Sampson, Grooms, & Walker, 2011) and found to be an effective tool to enhance students' conceptual understanding (Aydeniz & Dogan, 2016; Eryaman & Genc, 2010; Zohar & Nemet, 2002), nature of science understanding (Bell & Linn, 2000; Yerrick, 2000) and problem solving (Cho & Jonassen, 2002). Not surprisingly it has become an important component of science curricula across the globe for the last decade (Australian Curriculum, Assessment and Reporting Authority, 2012; Milli Eğitim Bakanlığı, 2013; NGSS Leads States, 2013).

Development of science and scientific knowledge can be characterized as the advancement and the use of multimodal discourse (Oliveira, Justi, & Mendonça, 2015). Using representations (often in different modalities such as in text, graphs, diagrams and models) scientists propose their claims, justify their ideas and share their findings. Suggested by both empirical and theoretical research, using more than one representation (i.e. multiple representations) have potential to support discourse and argumentation (Ainsworth, 1999; Kozma, 2003; Pallant & Lee, 2015). Recent empirical research in science education also suggest that argumentation leads further use of representations for organizing knowledge in argumentation contexts (Namdar, 2015; Namdar & Shen, 2016). However, most studies neglect the influence of learners' scientific argumentation understandings when they utilize representations for argumentation. Hence, the purpose of this study was to explore preservice teachers' (PSTs) views of using representations for argumentation when they hold different argumentation understandings. Research questions investigated in this inquiry are: (a) What do PSTs know about argumentation? (b) What are PSTs' views of using representation in argumentation? c) How do PSTs use representations in their socioscientific arguments about alternative energy?

Theoretical Perspectives

Argumentation

In a broad definition "an argument consists of either assertions or conclusions and of their justifications, or of reasons or supports" (Zohar & Nemet, 2002, p. 38). According to Toulmin's (1958) model of argumentation components *claims* are assertions, conclusions, hypothesis or beliefs; *data* are evidence that supports a claim; *warrants* are links between data and a relevant claim; *qualifiers* indicate the strength of warrants to a claim; *backings* refer to underlying assumptions which strengthen the acceptability of a claim or justify the warrants; and *rebuttals* are statements that contradict other presented evidence. Argumentation, on the other hand, is creating arguments, which can enable arguers to use scientific data and evidence while proposing claims or opposing counterarguments (Simon, Erduran, & Osborne, 2006).

Argumentation gives students ample opportunities to extend their knowledge, communicate their ideas and remediate their misconceptions (Newton, Driver, & Osborne, 1999). However, researchers indicate that argumentation opportunities are still missing in science classrooms (Osborne, 2010). Therefore, incorporation of socioscientific issues in science education curricula has been advocated. Socioscientific issues are complex, controversial and ill structured problems with ties to science and society (Sadler, 2004). These issues involve diverse social, economic, ethical, ecological and political perspectives. Therefore, there are no clear-cut solutions (Zohar & Nemet, 2002).

Making well-informed decisions about socioscientific issues require individuals to use reasoning strategies. However, reasoning strategies differ in scientific and socioscientific contexts. Scientific problems, which are well structured, require arguers to use formal reasoning that is ruled by logic and mathematics (Sadler, 2004). The premises reached at the end are fixed and away from personal ideas (Evans & Thompson, 2004). On the contrary, arguing on socioscientific issues require

arguers to use informal reasoning as the premises reached are subject to be changed with additional data and evidence (Kuhn, 1991; Means & Voss, 1996). Today's democratic societies increasingly require their citizens to employ informal reasoning skills to formulate positions and argue about these planetary issues (Sadler, 2004). Therefore, in this study the participants were provided with a socioscientific issue of energy as the context of the study.

Argumentation in Science Teacher Education

Argumentation has been widely studied in terms of student learning. Empirical results indicated that argumentation increase learners' conceptual science understanding (Bell & Linn, 2000; Yeşildağ-Hasançebi & Günel, 2013), attitudes towards science (Günel, Memiş, & Büyükkasap, 2010) and nature of science understandings (Bell & Linn, 2000; Yerrick, 2000). Although given the known benefits and its place in school science curricula, researchers indicate that science teachers still lack pedagogical skills to incorporate argumentation in their classrooms (Driver, Newton, & Osborne, 2000; Simon et al., 2006). Teachers are more likely to incorporate this core practice in their classroom when they had prior experiences (Zohar, 2008). Therefore, it becomes an important agenda in science teacher education programs to incorporate argumentation-based pedagogical learning and teaching experiences for teachers of the future (Kaya, 2013).

P PSTs' argumentation has been a growing research interest in science education. Recent studies investigated the effect of argumentation practices on PST's conceptual science understanding (e.g. Cetin, Erduran, & Kaya, 2010; Ozdem, Ertepinar, Cakiroglu, & Erduran, 2011), self-efficacy (e.g. Ogan-Bekiroğlu & Aydeniz, 2013), the relationship between PST's epistemic belief levels and argumentation qualities (e.g. Isbilir, Cakiroglu, & Ertepinar, 2014), and PST's teaching strategies of argumentation (e.g. Erduran, Ardac, & Yakmaci-Guzel, 2006).

Although there are new curriculum initiatives, technology environments and instructional strategies, a skilled teachers who understand scientific knowledge is still need to successfully implement argumentation innovations (Sampson & Blanchard, 2012). Therefore, it becomes important to have well-informed teachers who value argumentation as well as the argumentation structure. Investigating 30 inservice secondary science teachers' evaluation of alternative explanations, generation of arguments to support explanations and views about using argumentation as part of the teaching and learning of science, Sampson and Blanchard (2012) found that the teachers failed to provide a support for an explanation and used prior knowledge to validate their arguments rather than using available data. Teachers also held views about integration of argumentation based on students' ability levels. However, it is evident from the literature that limited number of studies investigate PSTs' understandings of argumentation. However, PST's argumentation understandings remain as a relatively unexplored area. However, there still little studies exist investigating PSTs' argumentation understandings, whom will be the effective mediums for future change in the classrooms (American Association for the Advancement of Science, 1993; Aydeniz & Dogan, 2016). A recent study on PSTs' views on argumentation Aydeniz and Ozdilek (2015) investigated 40 preservice elementary science teachers' views on argumentation. Results indicated that the PSTs lacked proper understanding of scientific argumentation.

Representations in Argumentation

Representations refer to a "range of transformations that conceptualize, visualize, or materialize an entity into another format or mode" (Wu & Puntambekar, 2012, p. 755). According to Wu and Puntambekar (2012) representations can be classified in four categories: verbal-textual (metaphors, oral propositions and written text), symbolic-mathematical (equations, formulas, structures), visual-graphical (animations, simulations, diagrams, graphs, tables), and actional-operational (demonstrations, gestures, manipulatives, physical models).

Scientists use multiple representations (e.g., tables, graphs, models, simulations, formulas) in their inquiry to construct their individual understanding, communicate their ideas and advance science. Therefore, science as an enterprise develops as a multimodal discourse through (multiple and

multimodal) representations (Kozma, 2003). In other words, scientists intersect argumentation and representational practices to generate knowledge. Recently, studies in science education also highlight this important relationship. According to Ainsworth (Ainsworth, 1999, 2006) there are three key functions of using multiple representations: (a) complementary functions: different representations includes different information and they complement each other; (b) constraining functions: certain combinations can help learning when one representation constraints interpretation of a second representation, (c) constructing functions: multiple representations support the construction of deeper understanding. Research indicates that learners use multiple representations as evidence to support their arguments (e.g. Namdar & Shen, 2016; Pallant & Lee, 2014) and recite their claims and reflect on their ideas (e.g. Hand & Choi, 2010). Furthermore, through argumentation and discourse, learners revise representations (e.g. Namdar & Shen, 2016; Hogan & Thomas, 2001).

In recent years, the advent of information communication technologies changed the ways people work, communicate and even argue about local and global issues that the world face. In today's information era, citizens of democratic societies are exposed to immense data, evidence and ideas about socioscientific issues. This demands learners to search, cluster, and organize knowledge to make sound arguments (Namdar & Shen, 2016). As data about these complex issues are in multiple format and modalities; learners need to know how to use them effectively to communicate their ideas and construct well-informed arguments. In PST education particularly, this is more demanding as college years are critical for the teachers of future as they could potentially bring those pedagogical experiences in their future classrooms (American Association for the Advancement of Science, 1993). However, still little is known about how PSTs perceive the use of representations in argumentation.

Method

General Background of Research and Participants

This study was conducted in a mid-sized public university in northeastern Turkey in 2015-2016 fall semester. There were only eight PSTs who enrolled in a graduate level argumentation course and six PSTs (three male and three female, pseudonyms are used, names starting with M presents male, with F presents female students) consented to participate in the study, completed all the assignments, and participated in the final interview. Although the six participants already completed their undergraduate middle school science education program and enrolled in a master's program in science education, the participants were identified as pre-service teachers in this paper for two reasons. First, these participants were neither appointed to work as science teachers by the ministry of education nor had a formal teaching experience at private or public schools. Second, at the beginning of the course, all participants indicated being an appointed science teacher as their primary career goals in an online course survey. The participants completed courses in all areas of science and pedagogy during their undergraduate programs. The participants' ages ranged between 23-26. The author of this study was the course instructor and necessary permission were obtained from the college to conduct the study.

Procedures

The argumentation course met once a week for three hours over 14 weeks during a fall semester. Before the implementation of this study the participants were introduced to argumentation theory including rhetorical and dialogical argumentation, decision making and socioscientific issues topics. In the current study, the PSTs were given an article about the hydroelectric power plant construction where this study took place. The article states the number of hydroelectric power plant construction in the city as well as positive economic and negative environmental impacts of hydroelectric power plants. This topic was chosen because there is still an ongoing debate about the issue, especially with the increased numbers of hydroelectric power plant construction where this study took place. The PSTs were asked which energy type we should rely on as an alternative energy source. Choosing one alternative energy type, each participant was asked to collect data in multiple formats such as in graphs, tables and texts and then prepare a research brief. The research briefs had to include at least 10 resources. On each single page, the participants had to summarize the data and rate

how reliable they thought the source was. The participants were given 3 weeks to complete this task. The PSTs were asked to prepare a poster reflecting their final argument. Finally, they had 20 minutes to present their posters and 10 minutes to answer their peers' questions in the classroom. At the end of the presentations the participants were involved in a whole class level argumentation where they discussed the issue.

After in class sessions, an hour long individual semi-structured interviews were conducted. The interview included two sections: the PSTs' argumentation understandings and their views of using representations in argumentation. The first part of the questionnaire, the PSTs' argumentation understandings, included three questions, and was adapted from a previous study (Aydeniz & Ozdilek, 2015). The second part of the questionnaire was developed by the author and another science education researcher. Then, two different experts who were faculties in a science education department and had qualitative research experience, evaluated the form. Then, the interviews were conducted with two preservice teachers in an undergraduate science education program to identify the inconsistencies in the form. The final version of the questionnaire included six questions to identify PSTs' views of using representations in argumentation (e.g. which representational mode do you think better/worse support argumentation, in the study which representational types do you think better supported your argumentation process and why?). Finally, individual interviews were conducted by the author after the implementation of the study. During audiotaped interviews the participants were given their research briefs and posters and reminded that they can use their briefs and posters to answer any questions.

Data Analysis

In this research, case study approach was used to have in depth understanding of the PSTs' views and practices of using representations in argumentation, when these PSTs hold different argumentation understandings (Yin, 1994). First, all audio and video recordings were transcribed verbatim by a professional company and checked for second time by the author. Then, the first part of the questionnaire was analyzed employing content analysis which was influenced by a previous research that investigated PSTs' argumentation understandings (Aydeniz & Ozdilek, 2015). This part of the questionnaire investigated the PSTs' argumentation understandings and included three questions: (a) What is scientific argumentation? (b) What are the core elements of a scientific argumentation? and (c) What is the purpose of scientific argumentation? Each question was assessed as informed (3 points), transitional (2 points) and naïve (1 point) based on open coding (Corbin & Strauss, 2008). Then each PST's total mean score to this part of the interview was calculated. Finally, their argumentation understandings were categorized using same categories. To establish trustworthiness the PSTs' responses were read and assessed independently by two researchers (Gibbs, 2007). After individual coding researchers met and discussed their evaluations until the disagreements were resolved.

Second, the video-records of the PSTs' presentations were analyzed by adopting an analytical model suggested by Powell, Francisco, and Maher (2003). Video data was analyzed following the steps: (a) The video data was viewed attentively, (b) the transcriptions of the video recordings were checked, (c) critical events were identified. Critical events refer to the participants' actions of showing representations in their posters while talking in one turn and noted in the transcripts; (d) coding: Coding was conducted in three stages: Identifying the purpose of using multiple representations, argument components, and representation modalities. *The purpose of using multiple representations* based on Ainsworth's (1999) categorization as mentioned in the theoretical framework were also coded. *Argument components*: each turn was coded based on Toulmin's (1958) argument components model. However, to give condensed view of the results data, warrant and backings were categorized as justifications. A turn consisted of a speech sequence when one person completely presented an idea. On the other hand, each turn's argumentation component was compared with the component of the representations in the posters. In order to give an overview of the posters created by the participants, *types of representations* included in the poster were also identified (Wu & Puntambekar, 2012) and number of representations in each participant's posters was reported.

Third, employing open coding (Corbin & Strauss, 2008) two researchers independently analyzed the PSTs' answers to the questions regarding the PSTs' views of using representations in argumentation. Based on the PSTs' argumentation understandings cases constantly compared to identify similarities and differences (Glaser & Strauss, 1967). Researchers regularly met to discuss their coding and resolved all inconsistencies (Gibbs, 2007).

Results

PSTs' Argumentation Understandings

Based on the participants' answers to the first part of the interview, results indicated that the participants had different levels of argumentation understandings including the structure and the purpose of argumentation. In total, there were two PSTs with naïve, three PSTs with transitional, and one PST with informed argumentation understanding (Table1).

Table 1: *The Participants' Argumentation Understandings*

PST	Argumentation			Structure of argumentation			Purpose of argumentation			Level
	N	T	I	N	T	I	N	T	I	
Mehmet		✓			✓			✓		T
Filiz	✓			✓			✓			N
Fatma		✓				✓		✓		T
Fulya	✓			✓				✓		N
Mert			✓			✓			✓	I
Mustafa		✓			✓			✓		T

N: Naïve T: Transitional I: Informed

PSTs' views about argumentation. First question asked students about their views of argumentation. Filiz and Fulya indicated naïve, Mehmet, Fatma and Mustafa indicated transitional, and Mert showed informed views of argumentation. Those who held naïve views either frame argumentation as a general discussion between multiple individuals with no reference to the importance of scientific evidence or justification or provide non-normative ideas about argumentation. For instance, Filiz indicated that "Scientific argumentation can be changed by collecting more data but eventually we all reach the same argument and conclusions" (Filiz, Interview). Fulya on the other hand, mentioned that argumentation help arguers to convince their audience about the claims that they have. Those with transitional views, on the other hand, focus on the role of scientific evidence and justification but fail to effectively elaborate on the argumentation structure with also no reference to competing claims.

Argumentation is the process of supporting and proving claims with evidence. It is a type of scientific discourse. For instance, we have a claim and data. It is not a simple discussion but instead argumentation is the stage of supporting it [the claim] with evidence. Hence, argumentation is a process and the argument is a product that has been produced through this process. (Fatma, Interview).

The results indicated that Mert showed informed views of argumentation. Mert focused on the roles of claim and evidence, competing claims regarding defending and justifying claims. He further mentioned the structure of arguments.

PTs' views about structure of argumentation. The PSTs were asked to identify the core elements of an argument. Filiz and Fulya expressed naïve, Mehmet and Mustafa expressed transitional, and Mert and Fatma expressed informed views about structure of argumentation. The PSTs who had naïve views failed to name the presence of justifications, competing theories, warrants, evidence and rebuttals. For instance, Fulya said that "Let's say I have a claim that I support and I need to prove it. I need to prove my case to my audience" (Fulya, Interview). On the contrary, those with transitional views state the components of arguments but fail to elaborate on them. Mustafa who had transitional understanding said the following:

Claims are assertions that we put forward about an idea. Data could be in any form, those could be based on observation or research, and these are the data that we collect to support our claims. Again, these could be in the forms of graphs or pictures. For instance, I inserted a table here to support my claim about the cleanliness of solar energy (Figure 2). These could be used as warrants. Because, if the additional data supports our claim and our initial data sources we call them warrants, I guess. Rebuttal is, well there is a thing called counter argument. It is against what we initially claim. Then, to rebut this you use rebuttal and again support your initial claim and support ourselves [claim]. In other words, rebuttal is the statement that rebuts the counterargument, right? (Mustafa, Interview).

Mert showed informed views about the structure of argumentation. Different from the participants' views in other two categories Mert's views included the place of an interlocutor as well as the alternative hypothesis in argumentation. Different from naïve and transitional views, the participants with informed understanding fully elaborated on each argumentation component based on the Toulmin's model of argumentation.

PTs' views about the purpose of argumentation. The PSTs were finally asked to identify the purposes of scientific argumentation. The results indicated that four participants showed transitional understanding. Filiz who had naïve views about the purpose of argumentation failed to capture the purpose of using argumentation as a scientific practice for advancement of knowledge and had no reference to justifying claims.

...scientific explanation sounds like a distant concept for public. Normally, general public also creates explanations for a given problem. It is embedded in daily life but you need to attribute it to a specific structure or subject and then create arguments. I also believe it is not only useful for making explanations but also exchanging ideas. (Fulya, Interview).

Those holding transitional views emphasized the notion of persuading others by justifying claims and the importance of scientific evidence.

Argumentation is an effective way to propose your ideas, your claims to whomever you are talking. You might have evidence to support your ideas while talking to the other person because one thing in your mind is to make sure that you support what you say. The more reliable the sources of your data are more solidly you can defend your position. (Mustafa, Interview).

The participants in this category, however, failed to indicate the place of counterarguments and improving validity of a claim. Mert, who had informed view, emphasized the importance of establishing, supporting, refuting or improving the validity of a claim and emphasized the creation of scientific knowledge through using scientific evidence. Mert also indicated the importance of persuading others' using evidence.

PSTs' Views about Using Multiple Representations in Argumentation

PSTs' views about the purpose of using representations in argumentation. The PSTs with naïve argumentation understanding indicated that they used different modalities of representations to draw attention to the arguments they presented. "I did a research in this project and I wanted to present my argument. I did not want to have just textual representations I also wanted to appeal people who have different intelligences. I want to have something more visual". (Fulya, Interview). Fulya's poster included more visual-graphical representations (Figure 1). She said:

"First, I might have explained my problem statement, I mean my claim [shows the written statement on the right corner of her poster, Figure 1]. My audience could be interested in to see the picture on the top of this poster right below the heading and could be curious to hear about my argument. For example, a student might be interested in to see whether this represents an explosion. In fact, this is a picture showing a water source that comes out of the ground which is heated by the magma and pressured out by the heat [shows the picture again]" (Fulya, Interview).

Fulya further indicated that her "explanation cards" [written cards in the middle of the poster, Figure 1] also drew more attention because those cards were "visually appealing" (Fulya, interview). Interestingly, Filiz who also had naïve argumentation understanding said that utilizing representations in argumentation can help arguers to draw more attention. She said:

I think representations are used to draw attention to your argument. For instance, my poster includes my argument about relying on solar energy. Here I put a lot of pictures in the middle of my poster and I think those representations were the best to appeal my friends' attention to my argument during our presentation (Filiz, Interview).

Both Filiz and Fulya's interviews indicated that they failed to understand the purpose of using representations for justifying claims. Filiz and Fulya's views of argumentation also failed to recognize the importance of argumentation to justify claims.

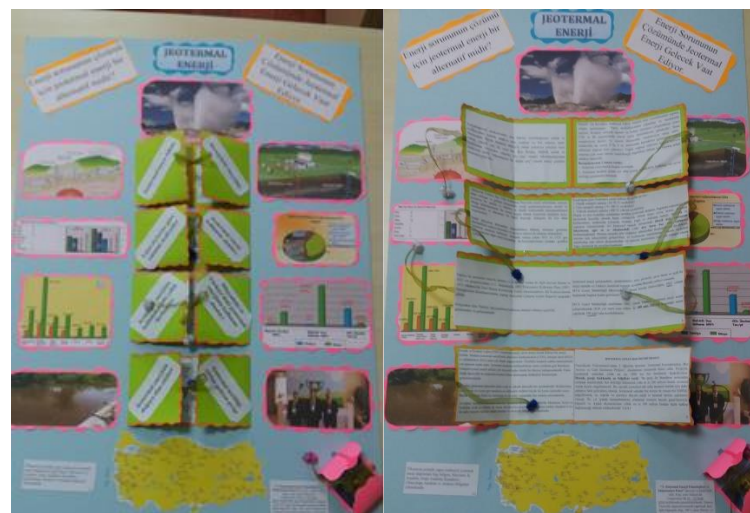


Figure 1. Fulya's poster on geothermal energy

However, the PSTs with transitional and informed argumentation understanding indicated that utilizing representation in argumentation helped them to merge different information sources to build a better justified argument because different representations had different affordances. For example, Mehmet said

For example, this graphic [shows the pie chart on the bottom right corner that includes information about the energy types, Figure 2] includes information about hydroelectric plants. Next to it I put a picture representing it. Here, I imagine that an interlocutor could make connections and check the reliability of sources. Then they help me to make my overall argument about the hydroelectric power. (Mehmet, Interview).

What separates these answers from the PSTs with naïve argumentation understanding is that these participants explicitly reference justifying claims through scientific evidence. Different from the participants with naïve argumentation understanding these participants also mentioned justifying claims and importance of evidence when they were asked to identify the purpose of argumentation.

PSTs' views about the purpose of using multiple representations in argumentation. The PSTs with naïve argumentation understanding believed that using multiple representations in argumentation helps for knowledge retention.

Filiz: "Those [multiple representations] help for knowledge to stick for a longer time. What I mean here is that for instance text can reflect my claim but if I, as a teacher for instance, bring a model or a graph to the class that includes information about solar energy this could make the knowledge stay in their mind for a long time. Therefore, in my poster, for example, I put [counting the pictures in the poster] 6 pictures right in the middle of it"

Researcher: How about these text boxes over here?

Filiz: Well again as I said, they all explain what I tried to imply in the pictures. For my audience, it would be hard to forget my claim about the solar energy [laughter].

Although Filiz used a textual representation to help readers to interpret pictorial representations, she failed to identify it. Fulya and Filiz, on the other hand, both mentioned the benefits using multiple representations for presentation purposes. However, these students failed to recognize the roles of multiple representations in terms of knowledge construction through/for argumentation. One thing to note that these participants did not mention the importance of justifying claims as the purpose of argumentation in the first part of the interview.

On the contrary, the participants with transitional understanding mentioned that one representation can help explain another representation.

These altogether represent more coherent information. For instance, tables summarize graphics, those graphics (Figure 2) in my poster for instance more abstract ideas in it. If I put only a table, it could not be very prone to be explained, I mean, tables, well as you indicated having multiple representations, helps us better explain another representation. At least that's what I did in my poster. This way, I believe I can better support my argument, because I make my evidence easy to understand for the audience and I can easily convince them (Mehmet, interview).

These participants' views of the purpose of argumentation included the importance of evidence to persuade others. The participants with transitional understanding value the place of multiple representations as evidence to support claims to convince others. Mert, who had an informed argumentation understanding, indicated different purposes of using argumentation.

First, as they have visual diversity using multiple representations in an argument makes it more appealing for the audience. Second, since different data sources can explain different facets of one common phenomenon that is argued, if I have more than one representation I can explain my claim better. On the other hand, one representation can help the other representation to be understood. If we have a table in a text, text could explain what is included in that table. For sure, it could help people with different age levels and

background. Another important aspect of having multiple representations is that they may contain different information and overall you may want to connect those data sources to argue about something. The different information will, well, make your argument or overall representation more appealing, but for the most part it helps you to structure a better argument. That's what I did in my poster (Mert, interview).

Mert focuses on the roles of multiple representations as data to construct a sound argument. He also mentions the constructing functions of multiple representations. His interview indicates that he also views using multiple representations as to enhance the quality of arguments.

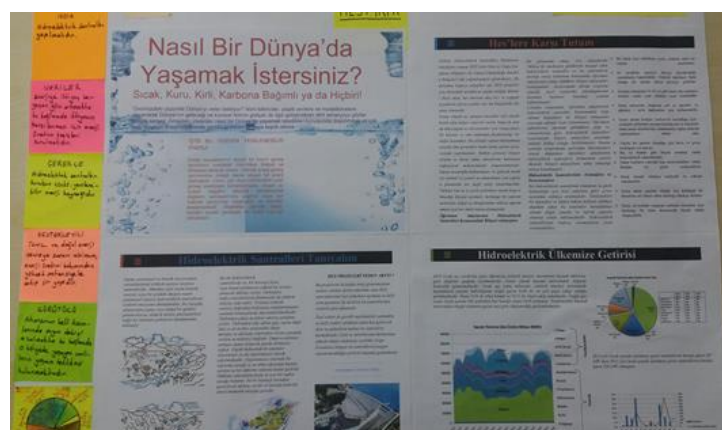


Figure 2. Mehmet's poster on hydroelectric power

PSTs' Use of Representations in Argumentation

Although the interview indicated how the PSTs view the use of representation in argumentation, it does not indicate how the PSTs use representations in an actual argumentation setting. Therefore, utilizing video analysis suggested by Powell et al. (2003) the PSTs' use of representation in argumentation were analyzed. Each participant created a poster reflecting their overall argument about the energy issue. Employing content analysis, it is found that the PSTs' posters included mostly textual representations. On the other hand, among visual-graphical representations they relied on graphs and pictures (Table 2).

Table 2.: Representation Modalities Used Across the PSTs' Posters

	Modality	Mehmet	Filiz	Fatma	Fulya	Mert	Mustafa
Verbal-textual	Text	6	11	7	10	9	10
	Equations/Formulas	0	0	0	0	0	0
Visual-graphical	Diagram	3	1	1	2	3	2
	Graph	4	0	1	4	0	2
	Tables	1	1	1	1	0	4
	Models	0	0	0	0	0	0
	Pictures	2	6	5	4	6	13

PST's use of representational modalities for argumentation. Video analysis indicated that the PSTs used textual representations when they initially presented their claims to their peers. All participants who started to present their claims directly read their claims from their posters.

Here I put my research question: Should we rely on solar energy? My claim, which I wrote here [shows the writing at top of the poster is] "Yes, we should make the solar energy

use more common. And now I will explain why we exactly need to do that” (Mustafa, poster presentation)

The participants who had naïve argumentation understandings failed to use visual representational modalities to rebut or counterargue their points. These participants used textual and visual graphical representations to justify their claims. Different from the participants with naïve argumentation understandings, the participants holding transitional views used diagrams, graphs and tables as rebuttals.

Mehmet: Well, I think we should build hydroelectric power plants. Now, let me explain why I think this way. First, in my poster I put this graph which compares the energy production levels of each energy types [shows the graphic at the bottom center]. Let’s see the other energy types used in Turkey. You see recent numbers for 2015 here. Filiz talked about the wind power and said it is very clean but it is as you can see here only 5.7 % but it is not enough for the country’s energy need but hydroelectric power plants produce 35% of the energy need (Points to the graph, Counterargument).

Fulya: But the construction cost is very high.

Mehmet: Yes, it is. It is a disadvantage. There needs to be magnificent investments. One can say that the construction cost is high but it can be neglected because in return it provides a source for you for the next 30-40 years (rebuttal). This can be tolerated because Turkey as a land raised in the fourth geological area completely and therefore it increased the water flow regime. Therefore, our potential [for hydroelectric power] is very high (counterargument). (Mehmet poster presentation, video recording)

Mert, who had informed argumentation understanding, used both representational modalities to justify their claims. Furthermore, he used pictures and texts and synthesized counterarguments using pictures embedded in his poster.

Table 3.: The Number of Turns Different Representational Modalities were Used to Support Argumentation Components

	Modality	Mehmet	Filiz	Fatma	Fulya	Mert	Mustafa
Claim	Text	1	1	1	1	1	1
	Diagram	0	0	0	0	0	0
	Graph	0	0	0	0	0	0
	Table	0	0	0	0	0	0
	Picture	0	0	0	0	0	0
Justification	Text	8	9	3	8	7	6
	Diagram	3	1	1	3	2	0
	Graph	2	0	0	2	0	1
	Table	3	3	1	1	0	0
	Picture	1	2	1	2	2	1
Rebuttal	Text	1	0	2	0	3	2
	Diagram	0	0	0	0	2	0
	Graph	1	0	1	0	0	0
	Table	2	0	0	0	0	2
	Picture	1	0	2	0	1	0
Counter argument	Text	0	0	3	0	1	1
	Diagram	0	0	1	0	1	0
	Graph	1	0	0	0	0	1
	Table	1	0	0	0	0	0
	Picture	0	0	2	0	1	3

PST's use of multiple representations for argumentation. Investigating the ways the participants used multiple representations changed in two ways. First, those who had naïve and transitional understandings used more than one representation to recite the same information. In other words, their use of representations included constraining functions of multiple representations. It was evident from the posters that these participants often used verbal-textual representations to explain in detail what the visual-graphical representations represented.

In this table I want to show Germany's wind turbine system export. Directly next to it there is a written part. Maybe you don't see it. But it shows that the Japan, USA, France, Ireland are one of the most important energy export markets. In 2006, with almost 25 million dollars of export, Turkey comes in the 7th place in the German export markets (Filiz, Poster presentation, video recording).

Here you see the bar graph of Turkey's Electricity Generation Based on Different Resources in 2000, 2001, 2002, 2003 and 2004. It indicates that Turkey's current electricity is generated from fossil fuels. On the contrary, except 26% share of hydroelectricity; renewable energy resources such as geothermal, solar and wind has only 1% share (Filiz, Poster presentation, video recording)

However, the participants who had transitional and informed understandings used more than one representations to explain in detail what one representation indicated: constraining functions and to show different information sources to warrant two data sources to justify their claim: complementary functions.

Mustafa, for instance, had multiple sources of data in visual graphical representations. He first indicated Turkey's use of multiple energy sources and its dependency on fossil fuels. Then, he rebutted that these fossil fuels' environmental harms, fatal accidents occurred during fossil fuel transportation. Finally, he indicated the potential of Turkey on the solar energy use in a bar graph and a table.

When we look at the energy sources' share in total energy consumptions; fossil fuels come in the first place [shows the table]. However, think about this, fossil fuels generation speed is 300.000 times slower than its consumptions. So, well, it shows that in the near future the sources of fossil fuels will be run out. But, look at this table here on the right. It shows how many hours the sun reaches in Turkey in each month. Well, each year in average it is 1311kwh/m² and this for the year 1996 is 11000 times... Comparing it [Turkey's solar energy potential] with the world, this bar graph, 1994-2007 data shows that Turkey itself has a big potential of photovoltaic energy. On the other hand, these pictures I put up here shows the solar panels. You can argue that the dirt on the panels reduce the electricity generation potential of these panels but they are easily washed out by the rain (Mustafa poster presentation, video recording)

It is evident from Mehmet's argument that he reads the text about the contamination of solar panels while showing the pictures which indicates the constraining functions of using multiple representations. On the other hand, he uses a table and a bar graph together to justify (construct) his argument about the Turkey's potential of solar energy which indicates the constructing functions of multiple representations.

Discussion and Conclusion

Scientists move between different representations for argumentation purposes in their daily practice. However, research suggests that PSTs do not fully engage in representational practices as scientists do in their daily practices (Roth, McGinn, & Bowen, 1998). One such reason might be PSTs' limited meta-representational competence, which refers to the ability of selecting, creating and using

representations (diSessa, 2004). Findings of this current study further suggest that PSTs' argumentation understandings might be another reason for such limited representational practice.

First, the results suggested that the PSTs with naïve argumentation understanding failed to recognize the place of justifying claims in argumentation. This result is consistent with the findings of a previous study (Aydeniz & Ozdilek, 2015). Because students experience significant challenges to support their arguments with evidence (Sandoval & Millwood, 2005), it becomes critical to support this skills in science classrooms. One such practice is to incorporate representational practices to support argumentation. Studies suggest that when provided with representations students use evidence from representations to justify their claims (Mendonça & Justi, 2013; Pallant & Lee, 2015). Therefore, if the students understand argumentation, they might understand the importance of justifying claims and in return might use representations to support their claims.

Second, with the increased argumentation understanding the PSTs used multiple functions of multiple representations in their argumentation. The PSTs with increased argumentation understandings acknowledged the importance of justifying and validating the claims. Justifying and validating claims might require a learner to utilize multiple data sources to construct a sound argument. Some representations require individuals to utilize other types of representations to be interpreted. Visual graphical representations for instance involves a level of abstraction and might need to be complemented with information from other modalities of representations (Ainsworth, 1999; Wu & Puntambekar, 2012). This can be attributed to construction function of multiple representations (Ainsworth, 1999). Therefore, with the increased level of argumentation understanding, PSTs use multiple representations to create sound arguments rather than repeating the same information from different representations.

Third, the use of multimodal representations differed regarding the PSTs' argumentation understandings. It was evident from the results that the PSTs used textual representations to recite their claims when they started presenting their arguments. This is similar to the results of previous studies where textual representation found to be an effective medium to recite claims (Hand & Choi, 2010). An expected reason might be that the text can be easily read off. Results also suggested that visual graphical representations helped the participants to rebut their points and synthesize counterarguments. Literature indicates that synthesizing counterarguments indicates sophisticated argumentation skills (Evagorou & Osborne, 2013). The participants with increased argumentation understandings could synthesize counterarguments based on the data in visual graphical representations. If we expect students to achieve such argumentation quality through the construction of rebuttals and counterarguments, we need to increase teachers understanding of utilizing visual graphical representations in argumentation through explicit teaching.

Literature indicates that argumentation opportunities for learners in science classes are rare (Osborne, 2010). To overcome this barrier, in recent years, scholars focused on developing new curricula (Sampson et al., 2011) and technology environments (Evagorou & Osborne, 2013). Using these new tools however, requires science teachers to have related prior experiences with argumentation. This further demands science teachers to value and understand the importance of argumentation in scientific inquiry and in science teaching (Sampson & Blanchard, 2012). Research suggest that teacher education programs should attend PSTs' knowledge of argumentation (Zemba-Saul, Munford, Crawford, Friedrichsen, & Land, 2002). Although the participants in this case study received formal training in science education, they failed to identify the roles of representations in argumentation.

Science methods courses can be effective means to enhance PSTs' pedagogical content knowledge skills (Avraamidou & Zemba-Saul, 2005). However, as Zohar (2008) argues teacher education programs, beyond focusing on specific elements of teaching argumentation, should "also address more fundamental issues pertain to pedagogy of knowledge construction" (p. 264). As the literature indicates that representations are fundamental tools for knowledge construction (DiSessa, 2004; Kozma, 2003), science teacher education programs should find ways to integrate argumentation

and representational practices, in addition to explicit teaching of these two fundamental scientific practices. Although, the results might show some promise in uncovering the PSTs' views and practices of using representation in argumentation, the results should not be generalized beyond these participants.

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An Examination of the Epistemological Views and Learning Styles of Pre-Service Teachers

Gökhan Günesⁱ

Hakkari University

Kaan Batiⁱⁱ

Hacettepe University

Mehmet Katranciⁱⁱⁱ

Kirikkale University

Abstract:

Epistemology is the branch of philosophy that investigates human knowledge, in particular its source, nature, limitations, system, and accuracy. The most critical issues in epistemology are considered to be belief in the nature of knowledge and belief in the nature of knowing. Since epistemology involves the structuring processes of knowledge, it assumed to be associated with individual differences, which are influential in determining an individual's ability to organize their thoughts and behaviors as well as personal choices. In addition, the most typical reflections of individual differences are observed in learning styles. Therefore, in this research, we aimed to examine the relationship between the epistemological views and learning styles of pre-service teachers. The study was based on a quantitative design and the epistemological views of the pre-service teachers were determined using the Scientific Epistemological Beliefs Scale developed by Elder (2002) and adapted to Turkish by Acat, Tüken and Karadağ (2010). In addition, the index of learning styles developed by Felder and Soloman (1996) and adapted to Turkish by Samanci and Keskin (2007) was used to identify the participants' learning styles. A total of 698 pre-service teachers from two state universities in Turkey constituted the sample of the research. According to the overall results, the pre-service teachers adopted philosophical skepticism and were inclined towards an active/sensing/visual/sequential learning style. Furthermore, a statistically significant relationship was found between the participants' learning styles and their epistemological views.

Keywords: Pre-service teachers, epistemological views, learning styles

ⁱ **Gökhan Günes** Assist. Prof. Dr., Elementary Education, Hakkari University Turkey
Hakkari University

Correspondence: gokhangunes@hakkari.edu.tr

ⁱⁱ **Kaan Bati** Dr., Mathematics and Science Education, Hacettepe University, Ankara, Turkey E-mail: kaanbati@hacettepe.edu.tr

ⁱⁱⁱ **Mehmet Katranci** Assoc. Prof. Dr., Elementary Education, Kirikkale University, Turkey E-mail: mtkatranci@gmail.com

Introduction

Locke is one of the founders of knowledge theory, which investigates the origin, accuracy, and limits of knowledge, and thus, the degrees and basis of beliefs, opinions, and judgments (as cited in Kale, 2009). Knowledge is a general conceptualization and can be explained as the comprehension of something as something (Topdemir, 2011). Epistemology is the branch of philosophy that examines knowledge. Hofer and Pintrich (2002) defined epistemology as the investigation of the source, nature, limitations, system, and accuracy of human knowledge. According to Perry (1999), King and Kitchener (1994), and Hofer and Pintrich (2002), the most critical issues in epistemology are belief in the nature of knowledge and belief in the nature of knowing.

Epistemological views can be regarded as knowing, knowledge, and the answers sought in response to the questions of ‘what is knowledge’, ‘how is knowledge acquired’, ‘what is the degree of the certainty of knowledge’, “what are the limits of and criteria for knowledge”, and “is the knowledge transferred by authorities (experts) of a discipline to the student as a process external to the latter or is it acquired through the interaction of different disciplines” (Brownlee, Purdie and Boulton-Lewis, 2001; Eryaman and Riedler, 2009; Hofer and Pintrich, 1997; Ravindran, Greene and DeBacker, 2005). Schommer (1990) described epistemological belief as an individual’s opinion about what knowledge is and how knowing and learning take place. Epistemology contains fundamental questions and various propositions regarding these questions (Topdemir, 2011; Sönmez, 2010; Kale, 2009; Sözer, 2009; Bochenski, 2009; Hofer and Pintrich, 2002). These propositions can generally be reviewed under the categories of limits, certainty, accuracy, development, and change of knowledge. Table 1 presents the propositions offered by Hofer and Pintrich (1997) concerning the domains, sub-dimensions, and definitions of epistemology.

Table 1. *Domains, Sub-Dimensions, and Definitions of Epistemological Belief (Hofer and Pintrich, 1997, p. 113)*

Domain	Sub-dimension	Definition
Epistemology	Source of knowledge	Knowledge is determined by an external authority (<i>Dogmatic</i>)
		Knowledge is structured by the person that knows (<i>Skeptical</i>)
	Confirmation of knowledge	Knowledge is accepted as defined by others without the need for confirmation (<i>Dogmatic</i>)
		Knowledge is based on the evidence and evaluation of experts (<i>Skeptical</i>)
	Development of knowledge	Knowledge is unchanging and is absolute (<i>Dogmatic</i>)
		Knowledge is changing and is not absolute (<i>Skeptical</i>)
Nature of knowing	Certainty of knowledge	There is only a single truth (<i>Dogmatic</i>)
		There is more than one truth (<i>Skeptical</i>)

As shown in Table 1, Hofer and Pintrich (1997) examined epistemology under two domains; the nature of knowing and the nature of knowledge. According to the sub-dimensions under these domains, the external development of knowledge and act of knowing dependent on authority and free from questioning is considered to reflect dogmatic philosophical thinking whereas the development of authority-free knowledge based on individual structuring and questioning indicates skeptical thinking. Similarly, Perry (1981) stated that epistemological views shifted from absolute/unchanging knowledge to changing/uncertain knowledge.

Particularly with the development of modern medicine and the advancement of technology, in addition to socio-cultural and environmental dynamics, mental processes such as thinking, understanding, and exploration have become widely investigated topics in brain research. Giedd et al. (1996) reported that the development of brain continued until the last stages of adolescence, as opposed to what was previously known, and that the most critical stage was early childhood. According to the results of their research, the cerebral cortex, which is the center of control for vital capacities (thinking, perception, and language skills) and constitutes two-thirds of the brain, develops

rapidly in early childhood, during which mental processes such as recognition, understanding, and problem solving also actively take place (Giedd et al., 1996). Confirming the results of Giedd et al.'s study, Reiss et al. reported that the human brain underwent an extensive development in the first three years and approached the completion of this development around the ages of 5-7; however, this process continued until adolescence albeit at a lower level (Reiss, Abrams, Singer, Ross, Denckla, 1996).

Experimental studies have shown that all the mental skills such as thinking, understanding, and problem solving are shaped by the functioning of the brain and the developmental process (Giedd et al., 1996; Reiss et al., 1996). Thus, it is considered that an individual's ability to process, acquire, and transform knowledge differs according to their environment, culture, and educational opportunities. Adler, a personality theorist, argued that learning was shaped by thoughts and that personality was formed based on the way of thinking. Adler further explained this by stating that human beings were born with a social interest and their personal interests based on their thoughts were influential factors for the individualization of their areas of interest and interactions (as cited in Passer & Smith, 2008). Another theorist, Jung, referred to personality typologies suggesting that the origin of our actions and learning had a different and complex structure (Wilson, Robeck, & Michael, 1974). Jung (1927) argued that personality types were related to learning styles and were basically divided into the two classes of introverted and extraverted, and that the way of thinking had a similar structure (Passer, Smith, 2008). Based on the studies on learning, it can be stated that learning styles resulting from personality traits are influential in the construction of individual knowledge. This argument is supported by the definition of learning style by Dunn (1960). According to Dunn, a student uses different and distinctive ways to prepare to learn, learn or remember something new or difficult (Dunn, Griggs, Olson, & Beasley, 1995). This indicates that not only the physiological structure of the brain but also learning styles that form and shape learning have an effect on the ability to think.

The ability to organize one's thoughts and behaviors differs from person to person and these individual differences have an impact on personal choices (Miyake & Friedman, 2012). Individual differences play an important role not only in intelligence, cognitive styles, and behaviors, but also in learning and teaching processes (Jonassen & Grabowski, 1993). Considering the influence of individual differences on learning, it is believed that each individual has their own learning strategies and styles (Dunn, 1986; Dunn & Dunn, 1992, Felder & Silverman, 1988; Gregorc, 1979; Kolb, 1976). In the literature, there are various definitions of learning styles and models. Gregorc (1979) suggested that learning styles were distinctive and observable behaviors that provided information about an individual's capabilities, thoughts about the world, and how they learned. According to Grasha (1996), learning styles are personal qualities that influence the student's ability to learn, interact with their friends and teachers, and participate in the learning process. Kolb (1984), on the other hand, suggested that the learning-style model indicated a process of transforming knowledge from production to experience and described learning styles through a cycle of four learning concepts; diverging, assimilating, converging, and accommodating. Keefe (1979) considered learning styles to be cognitive, emotional, and psychological behaviors that reflected learners' perception, interactions, and reactions in learning environments. According to Fleming (2001), learning styles concern the acquisition and organization of information based on individual characteristics as well as thoughts about knowledge. Felder & Brent (2005), on the other hand, suggested that learning styles referred to the process of taking in and processing information.

A review of the literature on learning styles (Dunn & Dunn, 1992, Eryaman and Genc, 2010; Felder & Silverman, 1988; Fleming, 2011; Gregorc, 1979; Kolb, 1976; Leite, Svinicki & Shi, 2010) shows that rather than considering them as standards, researchers have addressed the cognitive (Gregorc, 1979; Kolb & Kolb, 2005), affective, and physiological dimensions of learning styles (Dunn & Dunn, 1992).

An example of sensory models is the VARK model, which was developed by Fleming (2001) to measure visual (V), auditory (A), reading-writing (R), and kinesthetic (K) skills. In addition, learning style measurement tools (Gregorc, 1979; Felder & Silverman, 1988; Dunn & Dunn, 1992,

Kolb & Kolb, 2005) are influenced by various factors such as the level of development and cultural differences. Felder and Soloman (1994) developed an index of learning styles to determine the participants' learning styles based on their choice to complete the presented items using one of the two options representing two extreme poles. This index was based on the four dimensions of active-reflective, sensing-intuitive, visual-verbal, and sequential-global. Active learners learn more by doing something active, experimenting, and utilizing their experience whereas reflective learners tend to think and make connections between events. Sensing learning involves the active use of the five senses and concrete learning is based on perception while intuitive learning refers to a more abstract approach to learning in which intuitions, emotions, feelings, and value judgments play a role. In an individual with a visual learning style, learning is facilitated by pictorial materials, tables, and graphs whereas verbal learners prefer plain texts and listening to explanations. Lastly, sequential learning refers to paying attention to detail and using inductive reasoning whereas global learning involves grasping the whole picture and adopting deductive reasoning.

Significance and aim of the research:

Considering the argument presented by Brunsell and Marcks (2005) that teachers' scientific perceptions influence their students' understanding of science, it is considered that the determination of the epistemological views of teacher candidates would provide an insight into their prospective students' views on knowledge and science. Furthermore, a teacher's attitude towards learning would also shed light on their approach to teaching. The relationship between knowledge and information during mental processes can reveal how pre-service teachers define and create knowledge. The examination of the relationship between the epistemological views of pre-service teachers and their learning styles would also help in determining the role of learning styles (learning tendencies/preferences) in the process of defining and conceptualizing knowledge.

For the reasons presented above, this study aimed to examine the epistemological views and learning styles of pre-service teachers, and for this purpose, the following research questions were formulated:

- 1- What are the epistemological views of pre-service teachers?
- 2- What are the learning styles of pre-service teachers?
- 3- Does the variable of the undergraduate program of pre-service teachers have a statistically significant effect on their epistemological views and learning styles?
- 4- Do the learning styles of pre-service teachers significantly affect their epistemological views?
- 5- Is there a significant relationship between the epistemological views and learning styles of pre-service teachers?

Method

The study was based on a descriptive-correlational design (Büyüköztürk, 2007). A quantitative research method was chosen due to its advantages of allowing the collection of data in a short time without interfering with, or changing the research environment, simultaneous comparison of multiple factors, and accessibility to participant groups (Creswell, 2007).

Sample

The study was conducted in the 2016-2017 academic year with the students enrolled in the undergraduate programs of early childhood education (ECE), classroom teaching (CT), engineering and science education (ESE), and elementary mathematics education (EME) at two state universities operating under the Council of Higher Education in Turkey. The convenience sampling technique was

used to determine the sample. In this technique, the participants are chosen based on their availability, voluntariness, ease of accessibility, and willingness to participate in the research (Johnson & Christensen, 2014). Table 2 presents the distribution of participants by undergraduate program and gender.

Table 2: Distribution of the participant students by undergraduate program and gender

	ECE	CT	ESE	EME	Total
Female	183	258	97	43	581
Male	12	76	17	12	117
Total	195	334	114	55	698

The unequal proportions of the female and male participants resulted from the significantly lower number of male students being enrolled in the education undergraduate programs compared to the female students.

Data collection tools

Scientific Epistemological Beliefs Scale (SEBS) This scale was developed by Elder (2002) and adapted to Turkish by Acat, Tüken and Karadağ in 2010. SEBS consists of a total of 25 items under the following five sub-dimensions; authority/accuracy (9 items), knowledge production process (6 items), source of knowledge (4 items), hypothesizing (3 items), and change of knowledge (3 items). In the current study, Cronbach's alpha for SEBS was found to be 0.888.

Table 3. Distribution of SEBS Items by Sub-Dimension

<i>Sub-Dimensions</i>	<i>Items</i>									
<i>Authority / Accuracy</i>	1*	5*	12*	15*	16*	20*	23*	24*	25*	
<i>Knowledge Production Process</i>	3*	4	7*	8	11	18				
<i>Source of Knowledge</i>	6*	10*	13*	14*						
<i>Hypothesizing</i>	2	21	22							
<i>Change of Knowledge</i>	9	17	19							

*indicates reverse coded items.

The Index of Learning Styles (ILS) Developed by Felder and Soloman (1994) and adapted to Turkish by Samancı and Keskin (2007), ILS classifies learning styles under the four dimensions of active-reflective, sensing-intuitive, visual-verbal, and sequential-global. The index has a total of 44 items with 11 items in each dimension. To determine their learning style for each item, the participants are presented with two options representing the two extreme poles. In ILS, Cronbach's alpha is calculated separately for each dimension. According to the results of previous validity and reliability studies, Cronbach's alpha of the dimensions ranges from 0.50 to 0.75 (Felder, Soloman, 1994; Felkel, Gosky 2012; Samancı, Keskin, 2007; Litzinger, Lee, Wise, Felder, 2005; Zywno, 2003; Livesay, Dee, Nauman, Hites, 2002; Van Zwanberg, Wilkinson, 2000). Similarly, in the current study, Cronbach's alpha was calculated as 0.653, 0.515, 0.614, and 0.549 for the active-reflective, sensing-intuitive, visual-verbal, and sequential-global dimensions, respectively. . These values indicate that ILS is a reliable scale that can be used in this research.

Administration of the Scales

SEBS and ILS were simultaneously administered to the participants in the fall semester of the 2016-2017 academic year. The participants were given 40 minutes to complete the scales. Participation was voluntary.

Data Analysis

The descriptive analysis of the SEBS scores was performed using Tekin's (1993) formula for scale interval (sequence range / number of groups [$4 / 5 \approx 0.80$]). According to this formula, the ranges of 1.00-1.80 (I strongly disagree) and 1.81-2.60 (I do not agree) indicate dogmatic approaches whereas the ranges of 2.61-3.40 (I am undecided), 3.41-4.20 (I agree), and 4.21-5.00 (strongly agree) represent skeptical approaches.

Since SEBS contains learning styles representing opposite poles, the symbols of '+' and '-' were used for each preference of the active/sensing/visual/sequential set and the reflective/intuitive/verbal/global set, respectively. The symbolic values were then coded as 1 point '-' and 2 points for '+'. The learning style in the index was determined by descriptively interpreting the frequencies of the symbols used for sub-dimensions.

The point biserial correlation coefficient was used to determine the relationship between epistemological views and learning styles. This coefficient is employed to describe the linear relationship between a continuous-level variable (SEBS in this study) and a binary, non-continuous variable (ILS in this study). (Köklü, Büyüköztürk and Çokluk Bökeoğlu, 2006). Furthermore, to determine whether the variable of undergraduate program resulted in a significant difference, the Bonferroni method was utilized since it allows for multiple (post hoc) comparisons without requiring equal sample sizes considering that in this study, the sample sizes differed between the undergraduate programs (Miller, 1969).

Results and Discussion

Results on the Epistemological Views of Prospective Teachers

Table 4 presents the descriptive statistical values indicating the epistemological views of the pre-service teachers that participated in this study.

Table 4. *Descriptive Statistics and Ranges for the SEBS Scores of the Participants*

Sub-Dimension	Min.	Max.	SD	S	\bar{X}	Range
Authority/Accuracy	11.00	45.00	6.51	42.37	34.68	3.85 = Skeptical Thinking
Knowledge Production Process	11.00	30.00	2.83	7.99	21.29	3.55 = Skeptical Thinking
Source of Knowledge	4.00	20.00	3.07	9.41	14.00	3.50 = Skeptical Thinking
Hypothesizing	3.00	15.00	2.37	5.40	12.12	4.03 = Skeptical Thinking
Change of Knowledge	3.00	15.00	2.30	5.27	12.04	4.01 = Skeptical Thinking
Total SEBS	43.00	125.00	13.46	181.21	94.12	3.77 = Skeptical Thinking

Table 4 shows that the epistemological views of the pre-service teachers were inclined towards skeptical philosophical thinking. In particular, the scores in the sub-dimensions of hypothesizing and change of knowledge were found to be high, indicating skeptical thoughts. However, the participants scored lower in knowledge production process and source of knowledge compared to the remaining sub-dimensions of epistemological beliefs. This indicates that the pre-service teachers were almost undecided about the production process and source of knowledge. In this context, it may be necessary for pre-service teachers to adopt more skeptical approaches in these two sub-dimensions. The general skeptical approach of pre-service teachers is considered to be a positive

result for their students. This result is also in agreement with previous research on pre-service teachers' beliefs reporting that learning is more dependent on effort than ability and that knowledge is changing (Chai, Khine, Teo, 2006; Cheng, Chan, Tang, & Cheng, 2009).

Results concerning the learning styles of pre-service teachers

Table 5 shows the descriptive statistics for the results on the learning styles of the pre-service teachers that participated in this study.

Table 5. *The Frequency Values of ILS and Results on Learning Styles*

ILS Sub-Dimensions	f values	% distribution	General preference
Active / Reflective	4072/3606	.53/.47	Active
Sensing / Intuitive	4955/2723	.65/.35	Sensing
Visual / Verbal	5901/1777	.77/.23	Visual
Sequential / Global	3900/3778	.51/.49	Sequential

As shown in Table 5, the pre-service teachers mostly preferred active, sensing, visual or sequential learning styles. This is consistent with the results reported by Slaats, Lodewijks, Van der Sanden (1999) in relation to the students enrolled in the undergraduate programs of the social sciences. It was observed that the learning preferences of the pre-service teachers were concentrated under the sensing and visual sub-dimensions whereas the active/reflective and sequential/global sub-dimensions had a more equal distribution. Although the results of the descriptive analysis provided information on learning preferences through the frequency distributions of the participants' responses, they did not clearly demonstrate which learning style the participants were inclined towards based on the participants' overall responses; therefore, it was necessary to calculate the distribution of the participants' learning styles taking critical value points as references. In other words, for each participant, it was determined whether there was an equal distribution among the active/sensing/visual/sequential or the reflective/intuitive/verbal/global sets or all the sub-dimensions in the scale. The critical threshold values were calculated as 16 points (6 items * 1 point + 5 items * 2 points) for the set of active/sensing/visual/sequential sub-dimensions and 18 points (6 items * 2 points + 5 points * 1 point) for the set of reflective/intuitive/verbal/global sub-dimensions. For the overall scale, 64 and 68 points represented the former and latter sets, respectively, and the participants who scored 65 to 67 in total were found to prefer two sub-dimensions from each of the two sets and were coded in this way. As a result of these analyses, three groups emerged concerning their learning styles (active/sensing/visual/sequential, reflective/intuitive/verbal/global, and a group with a balanced distribution). Table 6 shows the descriptive statistics for the learning styles preferred by the pre-service teachers.

Table 6. *Descriptive Statistics for the Learning Styles Preferred by the Prospective Teachers*

Groups of Learning Styles	f	%
Active/Sensing/Visual/Sequential	455	65.00
Reflective/Intuitive/Verbal/Global	57	8.00
Balanced distribution	186	27.00
Total	698	100.00

An examination of Table 6 reveals that 65% of the participants were located in the active/sensing/visual/sequential group and 27% exhibited a balanced distribution in terms of the sub-dimension of learning styles. Although a balanced distribution of learning styles is considered to be important for an effective process of learning (Healy, 2004; De Bello, 1990; Felder, 1996), there was only a small percentage of the participants (8%) in the reflective/intuitive/verbal/global group. It has been reported that children generally prefer active, sensing, and visual learning styles (Dunn, Griggs, Olson, & Beasley, 1995); therefore, it can be stated that the pre-service teachers' preferences regarding learning styles would be appropriate for their prospective students. Although it has been

reported that the majority of the children are global learners (Dunn, et, al., 1995), some of the recent studies have also shown that children can think analytically (Arnup, Murrihy, Roodenburg, & McLean, 2013; Koyré, 2004). However, considering the argument that for effective learning, both poles of learning styles should be efficiently utilized (Healy, 2004; De Bello, 1990; Felder, 1996), pre-service teachers should adopt a more balanced learning approach rather than concentrating on a single dimension.

A comparison of the results concerning the epistemological views and learning styles of pre-service teachers in relation to the variable of undergraduate program

A one-way variance analysis (ANOVA) was used to determine the differences in the epistemological views of the pre-service teachers based on the undergraduate program in which they were enrolled. The results of the analysis are given in Table 7.

Table 7. The Results of ANOVA Analysis on the Epistemological Views of the Prospective Teachers Based on Their Undergraduate program

	<i>Source of Variance</i>	<i>Sum of Squares</i>	<i>df</i>	<i>Mean Squares</i>	<i>F</i>	<i>p</i>
Authority Accuracy	Inter-group	259.314	3	86.438	2.049	.106
	Intra-group	29275.512	694	42.184		
	Total	29534.825	697			
Knowledge Production Process	Inter-group	143.726	3	47.909	6.126	.000
	Intra-group	5427.393	694	7.820		
	Total	5571.119	697			
Source of Knowledge	Inter-group	46.034	3	15.345	1.636	.180
	Intra-group	6510.953	694	9.382		
	Total	6556.987	697			
Hypothesizing	Inter-group	35.505	3	11.835	2.202	.087
	Intra-group	3729.625	694	5.374		
	Total	3765.130	697			
Change of Knowledge	Inter-group	29.058	3	9.686	1.846	.137
	Intra-group	3640.737	694	5.246		
	Total	3669.795	697			
Total SEBS	Inter-group	1900.350	3	633.450	3.534	.015
	Intra-group	124405.54	694	179.259		
	Total	126305.89	697			

As shown in Table 7, there was a significant difference between the pre-service teachers in terms of their epistemological views; however, an examination of the sub-dimensions of the epistemological views shows that the only significant difference was observed in the sub-dimension of knowledge production process but the remaining sub-dimensions did not significantly differ. A Bonferroni post hoc analysis was performed to identify the undergraduate programs that caused the significant difference. The results of this analysis are given in Table 8.

Table 8. Results of the Bonferroni (Post Hoc) Analysis on the Epistemological Views of the Pre-Service Teachers Based on Their Undergraduate programs

BEİÖ	Undergraduate program (I)	Undergraduate program (J)	Mean Difference (I-J)	Standard Error
Knowledge Production Process	ESE	ECE	1.11619*	.32970
		CT	1.08966*	.30334
		EME	.13158	.45912
Overall SEBS	ESE	ECE	3,52753	1.57852
		CT	3.92877*	1.45229
		EME	-,15359	2.19811

*p ≤ .05

According to the post hoc analysis, there was no significant difference between the ESE and EME students in terms of the sub-dimension of the knowledge production process; however, for the same sub-dimension, the score of the remaining participants from the other undergraduate programs differed. This may be due to the ESE and EME programs including courses on the nature of science, which aim to provide students with an understanding of the changing nature of scientific knowledge.

A second one-way ANOVA was performed to determine whether the learning styles of the pre-service teachers differed according to their undergraduate program. The results of this analysis are given in Table 9.

Table 9. The Results of ANOVA Analysis on the Learning Styles of the Pre-Service Teachers Based on Their Undergraduate program

ILS Sub-Dimensions	Source of Variance	Sum of Squares	df	Mean Squares	F	p
Active / Reflective	Inter-group	9.871	3	3.290	.806	.491
	Intra-group	2832.851	694	4.082		
	Total	2842.722	697			
Sensing / Intuitive	Inter-group	9.282	3	3.094	.772	.510
	Intra-group	2780.897	694	4.007		
	Total	2790.179	697			
Visual / Verbal	Inter-group	10.008	3	3.336	.806	.491
	Intra-group	2871.025	694	4.137		
	Total	2881.033	697			
Sequential / Global	Inter-group	12.666	3	4.222	1.198	.310
	Intra-group	2446.503	694	3.525		
	Total	2459.169	697			

Table 9 shows that there was no significant difference between the learning styles of the pre-service teachers based on the undergraduate program variable. It is noteworthy that the results concerning learning styles were similar to those obtained in relation to the epistemological views (Table 8). The similar learning styles of the pre-service teachers attending different undergraduate programs may be explained by the similarity of their scores in the university entrance test in Turkey that affected their choice of undergraduate program. In addition, this result is meaningful when interpreted together with the descriptive statistics presented in Table 6. Furthermore, 65% of the pre-service teachers were found to prefer an active/sensing/visual/sequential learning style whereas for 27%, the distribution of the learning style preferences was balanced. These percentages reveal that the vast majority (92%) of the pre-service teachers participating in this research were open to adopting an active/sensing/visual/sequential learning style and that the undergraduate program variable did not affect this distribution.

A third ANOVA was conducted to determine the variances in the epistemological views of the pre-service teachers based on their learning styles. Table 10 presents the results of this analysis.

Table 10. The Results of ANOVA on the Epistemological Views of the Pre-Service Teachers Based on Their Learning Styles

	Source of Variance	Sum of Squares	df	Mean Squares	F	p
Authority / Accuracy	Inter-group	334.025	2	167.012	3.975	.019
	Intra-group	29200.801	695	42.016		
	Total	29534.825	697			
Knowledge Production Process	Inter-group	10.180	2	5.090	.636	.530
	Intra-group	5560.939	695	8.001		
	Total	5571.119	697			
Source of Knowledge	Inter-group	53.174	2	26.587	2.841	.059
	Intra-group	6503.813	695	9.358		
	Total	6556.987	697			
Hypothesizing	Inter-group	4.431	2	2.215	.409	.664
	Intra-group	3760.700	695	5.411		
	Total	3765.130	697			
Change of Knowledge	Inter-group	27.310	2	13.655	2.605	.075
	Intra-group	3642.486	695	5.241		
	Total	3669.795	697			
Total SEBS	Inter-group	1187.712	2	593.856	3.299	.038
	Intra-group	125118.179	695	180.026		
	Total	126305.891	697			

An examination of the variations in the epistemological views of the pre-service teachers based on their learning styles showed a significant difference only in the authority/accuracy sub-dimension and the remaining sub-dimensions did not significantly differ. This is in agreement with the results reported by previous studies. The results given in Table 10 were expected since earlier in the research, it was observed that the undergraduate program of the pre-service teachers did not cause a significant difference in terms of their epistemological views and learning styles. However, a Bonferroni (post hoc) test was necessary to determine which sub-dimension(s) of ILS resulted in the significant variation in the authority/accuracy sub-dimension of SEBS. The results of this analysis are given in Table 11.

Table 11. The Results of the Bonferroni (Post Hoc) Analysis on the Epistemological Views of the Pre-Service Teachers Based on Their Learning Styles

SEBS	(I) ILS	(J) SEBS	Mean Difference	Std. Error
Authority / Accuracy	Active/Sensing/ Visual/Sequential	Reflective/Intuitive/ Verbal/Global	-2.56715*	.91075
		Balanced Distribution	-.32408	.56412
Overall SEBS	Active/Sensing/ Visual/Sequential	Reflective/Intuitive/ Verbal/Global	-4.84087*	1.88521
		Balanced Distribution	-.60941	1.16771

*p ≤ .05

Table 9 reveals the significant difference between the active/sensing/visual/sequential and reflective/intuitive/verbal/global groups in terms of the scores in the authority/accuracy sub-dimension of SEBS. Based on this result, it can be stated that the pre-service teachers with a preference for an active/sensing/visual/sequential learning style considered knowledge as an authority and believed that

it was absolute/unchanging. In contrast, according to the participants preferring a reflective/intuitive/verbal/global learning style, knowledge represented authority. When interpreted together with the results presented above, it can be concluded that 65% of the pre-service teachers accepted knowledge as an authority.

Relationship between the epistemological views and learning styles of the pre-service teachers

The relationship between the SEBS and ILS scores of the participants was analyzed using the point biserial correlation coefficient formulated as follows:

$$r_{nc} = \frac{\bar{x}_p - \bar{x}_q}{SD} * \sqrt{p \cdot q}$$

r_{nc}	The point biserial correlation coefficient
\bar{x}_p	The mean ILS score for the sub-dimension set of active/sensing/visual/sequential
\bar{x}_q	The mean ILS score for the sub-dimension set of reflective/intuitive/verbal/global
SD	Standard deviation of the total ILS score (13.29)
p	The frequency of active/sensing/visual/sequential within ILS
q	The frequency of reflective/intuitive/verbal/global within ILS

SEBS X (score)	ILS
$\bar{x}_{p1}=70.00$	Active/Sensing/Visual/Sequential
$\bar{x}_{p2}=88.00$	Active/Sensing/Visual/Sequential
$\bar{x}_{q1}=101.00$	Reflective/Intuitive/Verbal/Global
$\bar{x}_{p3}=118.00$	Active/Sensing/Visual/Sequential
$\bar{x}_{q2}=43.00$	Reflective/Intuitive/Verbal/Global
$\bar{x}_{p455}=94.00$	Active/Sensing/Visual/Sequential (1)
$\bar{x}_{q57}=61.00$	Reflective/Intuitive/Verbal/Global (2)

$$\bar{x}_p = \frac{70 + 88 + 118 + \dots + 94}{455} = 93.562$$

$$\bar{x}_q = \frac{101 + 43 + \dots + 61}{57} = 98.403$$

$$p = \frac{455}{512} * 100 = 0.89$$

$$q = \frac{57}{512} * 100 = 0.11$$

$$r_{n\zeta} = \frac{\bar{x}_p - \bar{x}_q}{SS} * \sqrt{p \cdot q}$$

$$r_{n\zeta} = \frac{93.562 - 98.403}{13.29} * \sqrt{0.89 * 0.11} = -0.113$$

The negative value does not indicate a direction.

The equation used to calculate the significance of the correlation is given below:

$$t = \frac{r_{n\zeta} \sqrt{N-2}}{\sqrt{1 - (r_{\zeta n})^2}}$$

For $N = 512 - 2$ (after subtracting the degree of freedom), the t value ($p_{.05:510}$) would be 1.96.

$$t = \frac{r_{n\zeta} \sqrt{N-2}}{\sqrt{1 - (r_{\zeta n})^2}} = \frac{0.113 \sqrt{512-2}}{\sqrt{1 - (0.113)^2}} = 2.58$$

$$p_{.05:510} = 1.96;$$

$$2.58 > 1.96 \rightarrow p < .05$$

Based on the calculated value, it was concluded that the correlation between the epistemological views and learning styles was significant. In other words, there was a significant relationship between the epistemological views of the pre-service teachers that preferred a reflective/intuitive/verbal/global learning style. However, as mentioned above, the percentage of participants in the active/sensing/visual/sequential group was found to be very low (8%); therefore, this learning style affected the epistemological views of only 8% of this sample.

Conclusion and Recommendations

This study investigated the epistemological views and learning styles of pre-service teachers enrolled in four different undergraduate programs of the faculty of education at two state universities in Turkey. For this purpose, the epistemological views and learning styles of the pre-service teachers were examined in terms of the sub-dimensions under which they emerged and it was determined whether there was a significant relationship between their learning styles and epistemological views. Each of the four undergraduate programs have different student profiles, represent different student groups in terms of their achievement in the Turkish university entrance test, and offer different undergraduate courses. Therefore, the interpretation of the data in the light of this information would be more meaningful.

One of the most noteworthy findings of this research was that the majority of the participant pre-service teachers tended to have a skeptical approach regardless of their undergraduate program. Considering the role of teachers in the development and shaping of the epistemological beliefs of children the skeptical approach of the pre-service teachers can be viewed as a positive outcome.

The second important finding in the research was that a considerable percentage of pre-service teachers had an active/sensing/visual/sequential learning style. Here, the first notable point is that they

had similar learning styles despite having being placed in different undergraduate programs based on their achievement in different areas. The analyses showed that learning styles did not differ according to the undergraduate programs. Secondly, only 27% of the pre-service teachers were found to have a balanced distribution in terms of their preference of learning styles despite the anticipation that this percentage would be higher. This anticipation also resulted from the previous researchers' suggestions that for effective learning, a balanced distribution of learning styles is necessary. Considering that the pre-service teachers were placed in their respective undergraduate programs after achieving a certain score in the central examination, we expected that a higher percentage of the participants would have a more balanced distribution concerning their preferred learning styles. From one perspective, this can be interpreted positively in that as stated above, most children have an active/sensing/visual/sequential learning style. Therefore, the pre-service teachers have chosen a learning style that is appropriate for the profile of students with whom they will interact during their teaching.

One of the hypotheses of the study concerning the possible effect of learning styles on epistemological views was partially confirmed through analyses. The results of the analyses revealed a relationship between learning styles and epistemological views in the sub-dimension of authority/accuracy. To clarify, a significant relationship was found between the reflective/intuitive/verbal/global learning style and the epistemological views of the participants. However, there was a limitation concerning the very low percentage of pre-service teachers (8%) that preferred a reflective/intuitive/verbal/global learning style. In other words, the relationship that was observed had a low practical benefit.

In conclusion, the learning style preferences of the pre-service teachers were mostly concentrated at one end of the spectrum. It was also found that the learning styles had an effect on the epistemological views of the participants. Considering that the epistemological views of the teachers have an impact on those of their students, we believe that through undergraduate courses that support abstract thinking, the pre-service teachers should be encouraged to adopt a variety of learning styles, which will in turn increase their ability to construct effective learning environments for their students.

Since this research was conducted with pre-service teachers enrolled in four different teaching programs in the education faculties of two different state universities in Turkey, this may be considered as a limitation. Therefore, future studies can be undertaken with larger samples including different teaching programs to determine the scientific epistemological views of pre-service teachers.

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Teaching Controversial Issues in the JLL Classroom for Chinese Students

Yasuko Shimojimaⁱ

Tokyo Gakugei University

Abstract

This paper discusses how teachers explore teaching controversial issues in the Japanese language classroom to Japanese language learner (JLL) or culturally and linguistically diverse (CLD) students who have different cultural and political backgrounds. Assuring educational opportunities with consideration of JLLs' background is important especially in this globalized world. Students who spent several years in their home countries had missed the earlier part of the culture in the host countries, and they do not internalize host culture fully. Lack of cultural knowledge or literacy would lead to inequality of attainment. The research was conducted in a Japanese language classroom for Chinese from People's Republic of China (ROC) newcomer students in a commercial night public high school in Japan.

This study examines how a Japanese teacher were aware of the cultural aspects of students, searched for appropriate methods to teach controversial issues. The research methods are participatory observations and semi-structured interviews with teachers. Through interaction with Chinese newcomer students, the Japanese teacher's cultural and political awareness and political correctness was induced as he observed what the students needed to know and experience. The teacher tried to infuse students with global awareness in his hybrid history embedded Japanese language class. The concept which were not relevant to the political status of the country of origin, neutrality between the country of origin and Japan, were explored during the lessons.

Keywords: controversial issues, Japanese language learner (JLL) students, culturally and linguistically diverse (CLD) students, culturally responsiveness, cultural literacy

ⁱ**Yasuko Shimojima** Instructor, Research Organization For Next-Generation Education, Tokyo Gakugei University, Tokyo, Japan

Correspondence: simojima@u-gakugei.ac.jp

Introduction

Japanese population has been becoming more diverse than before. Since the end of the World War II, there have been “old comers” ethnic Chinese and ethnic Koreans in Japan. As “newcomers,” Indo-Chinese refugees came to Japan from 1970s to the 1980s. War-displaced Japanese orphans or women in China came back to Japan from 1980s to 1990s and second and third generation were allowed to live in Japan.

With the implementation of the revised Immigration Control and Refugee Recognition Act in 1990, the South American of Japanese descent, especially Japanese-Brazilians, increased as foreign laborers, and their children started to emerge in Japanese public schools. The number of South Americans of Japanese descent had been increased until 2008 of bankruptcy of Lehman Brothers.

However Japanese public schools are still not ready for accepting and educating pupils/students with culturally and linguistically diverse background. The public schools in Japan are sometimes overwhelmed by the students who cannot speak Japanese and have different cultural background.

The number of foreign students who enroll in Japanese public schools (elementary, junior high, and high school) is 73,289 (Ministry of Education, Sports and Science, 2014). The number of Japanese language learners within the foreign students is 29,198 in 2014. Japanese JLLs are not included in the data above. The number of foreign high school students is 8,584 and the Japanese language learners 2,272 in 2014.

Japanese language learner (JLL) high school students need Japanese language and content to be able to participate fully in the classroom, and in the mainstream society in the future. However, on the high school level, students are sometimes regarded as almost competent in language and content as mainstream students because they passed the high school entrance exam. In reality, JLLs still face the challenges of language and cultural barriers and only a few enjoy school success.

Earlier studies have suggested that the major cause of underachievement was culture issues; cultural incongruences between home and school. In the 1960s, in the inner cities of the United States, underachievement of lower socio-economic status students were regarded as “culturally deprived,” and lower economic status was thought to cause school failure. Nieto (1996) called the cultural incongruencies, cultural incompatibility, and cultural discontinuity as “deficit theories,” and challenged the viewpoint of cultural inferiority in CLD students. Later in 1970s to 1980s, deficit theories declined, and “cultural differences” theories took the place.

After 1990s to present, “culturally responsive” or “culturally relevant” pedagogy has been considered as a new framework for teaching CLD students (Gay 2010, Ladson-Billings 1994, Nieto 1996, Villegas & Lucas, 2007). Villegas & Lucas (2007) defined “culturally responsiveness” as “more than just applying specialized teaching techniques.” They stressed the significance of “the role of culture and language” and the possibility as “a coherent framework for professional development initiatives in schools.”

This paper explores how teachers perceive the challenges of CLD students who missed earlier part of their lives as Japanese residents; Japanese culture and ideology, and how teachers explore content and materials about teaching controversial issues between Japanese and Chinese history which are relevant to the Chinese newcomer students living in Japan.

Research method

1. Participants:

A Japanese high school teacher and a Chinese speaking Japanese teacher. They both taught in a Japanese language class for Chinese-origin newcomer high school students; the classes are offered three times a week from 4:30 to 5:15 p.m. (50 minutes each) “before school,” not after school because the school is a commercial night high school which starts at 5:30 p.m. The school is located in a suburban city in Kanto area near Tokyo. Students’ age ranges from 15 to 17, and one student, who missed high school education, is 23 year old. The Japanese language class is only for the 1st graders (grade 10), and class size is from 4 to 10 students each year.

2. Method:

Participatory observation of the Japanese language (studying Chinese characters and *hiragana*) classroom for 1st graders. The name of the class is called “Japanese and Chinese Culture Study.” Semi-structured interview with a Japanese high school teacher (twice, 50 minutes each), a Chinese-speaking educator from Taiwan, Republic of China (once, 50 minutes).

Teaching controversial issues with CLDs in Japanese context

One of the author’s friends used to recall on a history class during her elementary school days in the United States. “I felt I was bullied when my classmates pronounced ‘Pearl Harbor’ in front of me.” It is controversial for teachers to teach historical units with CLDs in the same class.

As an international cooperation organization based in the UK, Oxfam (2006) defined “controversial issues” as “issues that are likely to be sensitive or controversial are those that have a political, social or personal impact and arouse feeling and/or deal with questions of value or belief.” Teaching the themes such as holocaust, homophobia, and religion would be difficult and controversial when students related in the topic were in the same class (Strike & Soltis 1998, Mitchell, 2010, Short 2012, van Driel & Kahn 2012). After 9.11, teaching about Islamophobia has become an issue (Smyth 2012, Kawasaki 2011).

Japan and China has a long controversial historical relationships. Culturally responsive teachers should be sensitive to CLD students from China in the classroom. Recently, not only historical relationships, issues in current China, such as air pollution and food contamination, have become controversial issues. Around 2010, food safety issues became an object of public concern in Japan. There were news that both domestic and imported food contained undesirable materials which deceived consumers. Tsuji (2010) suggested several lesson plans to teachers who concerned bullying among children in the classroom. The lesson was classroom discussion on food safety. There were two newspaper articles; one was about agricultural chemical residues in vegetables imported from China, and another was mislabeling of food or food fraud in Japanese companies. Tsuji called this lesson a problem solving lesson which enabled students to overcome stereotypes and prejudices toward different cultures, and to have wider perspectives.

As a social studies teacher who taught CLD students, Minamiura (2013) divided three types of lessons for cultural understanding before and after students came to Japan.

Table 1. *Three types of social studies pedagogies for CLD students (based on p.42 Minamiura 2013)*

Aims of lessons	Content
1. Understanding mainstream culture	Understanding Japanese society
2. Understanding mainstream culture based on home culture	Activating prior knowledge of home country and understanding mainstream culture
3. Interrelated understanding of both mainstream culture and home culture	Relating home culture and mainstream culture and promoting understanding on Japanese society

Minamiura introduced a history lesson plan as #2 by Ministry of Education, Science, Culture and Sports (MEXT, 2007) for CLD students from Latin America whose native languages are Spanish or Portuguese. During 15th to 16th century was the Age of Exploration in Europe, and the Age of Civil War in Japan. It is meaningful for the Spanish or Portuguese speaking students to know that Spanish and Portuguese vocabularies were imported to Japan during the period.

Minamiura designed a history lesson plan for Chinese students at elementary school as #3. It was a lesson on Japanese mission to Sui China during 7th to 9th century; exploration of the reasons why this mission was successful in the eyes of the Japanese envoy Ono no Imoko and Chinese Emperor Yang.

Studying history of home country in relation to the history of host country would secure identities of CLD students and it would lead to deepen their understanding.

In quest of Japanese culture and history

In the X commercial night high school in Kanto district in Japan, the Japanese language class for newcomer students was initially taught by the Chinese-speaking educator from Taiwan alone because most of the newcomers at the school are from China. The Japanese teacher, who was originally a commercial teacher, started to teach Japanese culture in the class when the educator asked him to teach Japanese culture while he was patrolling around classes.

The educator became conscious of Chinese students' needs to learn Japanese culture from a mainstream teacher. The Japanese teacher was asked to join the class and elaborated on *samurai* history dramas and *hara-kiri*. Both educator and Chinese students were interested and asked him to teach regularly (Shimajima, 2014). He started to teach three times a week; two team-taught lessons on *kanji* Chinese characters with Chinese-speaking educator and a traditional single-teacher lesson on Japanese culture.

The Japanese language class mainly had 10th grade JLL Chinese students teaching basic *kanji* Chinese characters because Chinese characters in China and Japan were different in character and sound. As the main Japanese language teacher, Chinese-speaking teacher conducted bilingual lessons mainly in Japanese, used Chinese when students needed help. Chinese students solved the problems on characters, pronunciation, meanings and context used in the sentences.

The Japanese teacher elaborated on the meaning of the characters using gestures or illustrations. Students asked him questions in Japanese, and asked the bilingual teacher in Chinese when they did not understand well. Gradually the Japanese teacher realized that Chinese students were interested in learning about Japanese culture, and also wanted to understand the news on TV and newspapers.

As a commercial teacher at the commercial night high school, the Japanese teacher did not teach Japanese history as a content teacher, however, he studied history at university and well versed in history. He noticed that lack of knowledge on Japanese history and culture would hinder newcomer Chinese students to understand social studies, Japanese language arts and classics. One day a female

student asked the teacher that she should do to understand Japanese news on TV. If students do not understand what is going on in the host country, they would not have a better communication with their peers. The teacher suggested to her that she should watch a TV news program for children which were popular even among adults.

The Japanese teacher started to search for materials relevant to Chinese students. He recalled: “Teaching culture and history in the language class was a series of struggles and exploration.” Later he explored themes on international relations between China, Japan, and other countries including East Asia and Europe.

Hybrid history embedded Japanese language lessons

Table 2. *Lessons on East Asian history*

Phase	Aims of Lessons	Content	Materials
1) 2009-2011	*Reading a Japanese map in relation to East Asia *Identifying the locations of China (Jilin Province), Russia, South and North Korea	How China interfered in the division of the Korean Peninsula	*World map in Japanese *A song lyrics “ <i>Imjin River</i> ”
2) 2010-	*Understanding international relations during 19 th century: China and England, Japan and England	*the Opium War during Qing dynasty *the cession of the Hong Kong Island and Kowloon Peninsula in 1842, being transferred to China in 1997	The <i>kanji</i> Chinese characters on the textbook
3) 2010	*The relation between China and Japan *The definition of “democracy”	Senkaku Island Disputes	N.A.
4) 2011-	*Understanding the “reverse import” of Chinese characters from Japan to China *Chinese history of Qing Dynasty 17 th to 18 th century and Xinhai Revolution in 1911	The Chinese character meaning “communism” was imported from Japan	The <i>kanji</i> Chinese characters on the textbook

1) Teaching about Chinese interference in division of Korean Peninsula

The Japanese teacher designed a lesson on a political song by the Japanese artist group Folk Crusaders “*Imjin River*,” which was released in Japan in 1967. The original song lyric was written by a poet in North Korea. The song is about the division of South and North Korea, and it was banned to sell because of the political consideration. In 2005, the song was used in the Japanese movie of Korean residents in Japan “*Patchigi*,” and it came to be well-known (Shimajima 2014).

The teacher infused a language lesson with social studies. Geography: the aim of the lesson was to teach geographical location of Russia, South and North Korea together with China. History: division of Korean Peninsula and Chinese interference. The language lesson was rather a Language Arts lesson: reading a song lyrics of a political song, and interpretation of poet’s intentions and emotions. During the lesson the teacher explained:

“From the North land to the South sky,” this means that the writer wants to convey his feelings to the South. This phrase seems to express his frustration. “

2) Teaching about international relationships between China and England, Japan and England

The teacher taught Chinese students that Japan had learned a bitter lesson on Imperialism from the Opium war between China and England. The teacher recalled that he tried to teach the content in an “inoffensive, less controversial ways.”

3) Teaching about “democracy,” in a controversial situation

In 2010 the Senkaku Islands disputes occurred between Japan and China. Chinese Students were excited to talk with the Chinese-speaking educator, and asked her if they should join the political demonstration in Japan. Most of the students were from People’s Republic of China (ROC), and the educator was from Taiwan, Republic of China (RC). The Japanese teacher recalled: “I was at a loss what to talk about.” Then he talked to the students, “When there was a conflict between Japan and China, Japanese shops were attacked in China. How about in Japan? The reaction during conflict reflects the attitude of each country. Do you think Japanese are more democratic?” He insisted that people in each country should be on good terms even if two countries had conflicts.

The students had an opportunity to realize what it was to be “democratic” during the conversation with the Japanese teacher and the Chinese-speaking educator. Internalizing ideology and culture is a part of acculturation and socialization, and it is significant that their acculturation process is based on the hybrid “knowledge construction” (Banks 2012) between home country and host country.

4) Teaching about the “reverse import” of Chinese characters in political context

It is needless to say that Chinese characters were originally exported from China to Japan. During Meiji Restoration, after the feudal period ended in 19th century in Japan, it was an urgent mission to translate Western ideas and notions, however, there were few appropriate set of words in Japanese. As medical terms were already translated from Dutch, some words in daily commodities were imported and translated from Portuguese, researchers during Meiji period “invented” terms to describe new ideas or notions in international laws in English and other European languages.

The word “*kyosan-shugi*” was translated and invented from “communism.” Later it was said that this term was exported to China.

Excerpts of the lesson on Chinese characters Dec.21, 2011. 4 boys (JT: Japanese teacher, S1: student 1)

JT: Do you now that *kanji* characters were imported from China to Japan, don’t you? But you know what? There were some *kanji* characters which were exported to China.

S1: Oh, I don’t know that.

JT: For example, you may know that there is a word “communism.” China is a communist country. The words such as *kyosan* “communism” or *shugi* “policy” were born in Japan, and went to China. During 19th century to 20th century, up to 1950, China had been at war. Chiang Kai-shek, Mao Zedong.

Later in this lesson, the Japanese teacher posed a question: “Why do you think this character meaning communism was not invented in China?” He explained the reasons that the political situations were not stable during the period in China. He presumed that it was easier for China to import the word from Japan.

Table 3. *Lessons on contemporary China*

Phase	Aims of Lessons	Content	Materials
2010-	Understanding notions: <i>Kenri ishiki</i> “Right consciousness”	Current Chinese issues about foreign affiliated company	A newspaper article from <i>Japan Economic Newspapers</i>

Teaching controversial issues using newspaper articles

June 28, 2010, 5 boys and 3 girls, a Japanese teacher (JT) and a Chinese-speaking Educator (CE)

JT: Today we are going to study about China on a newspaper article. *Japan Economic Newspaper*. Here it says “Editorial,” where editors review news. Editorial in each newspapers has a unique character reflecting their policy on newspapers. (JT reads the article.) “In a Chinese foreign affiliated firm.... Editorial, *Taigu-kaizen* (improvement of labor condition), *Kenri-ishiki* (right consciousness).

CE: (Explains in Chinese)

JT: Do you understand? (JT & CE confirm the progress)

CE: *Chin-age* (wage increase). (CE explains in Chinese)

CE to JT: Up to now, students don’t seem to understand. I will explain in Chinese. (Explains in Chinese.)

CE: *Dekasegi* (Expatriate workers.) (Explains in Chinese).

JT: *Onsha* (Your company, in a polite way).

CE: (Explains in Chinese). Someone else’s company in a polite colloquial phrase. In written form, you have to write “*Onchu*.” (CE writes on the blackboard) *Yusen-jun-i* (Priority).

JT: Up to now, China’s target has been economic development, but now there are riots because of disparity.

CE: (Reading Chinese characters) “*Hosei-gyo* (Sewing business).” Now it is a major industry in Vietnam.

JT: “Right consciousness.” Do you know what the Chinese government are afraid of? It is the political right consciousness. Chinese government will never allow people to have it. The government is afraid of labor unions because they might destroy communism.

CE: Do you understand what it means? If you grow up, you will understand. Working people can understand, but you still are students.

JT: It is said that there are one hundred million very rich people in China. How about the others?

B1: What happens if everyone becomes rich?

CE: (Answer in Chinese)

(Boys and girls give opinions in Chinese.)

CE: Now there are some rich villages in the farms, but women won't agree to get married easily. Chinese boys are worried about that when they are still very young.

JT: Good luck, and try harder, Chinese young men!

(The whole class talk about marriage both in Japanese and Chinese.)

It is difficult for JLL students who are in the process of learning *kanji* Chinese characters for 1st and 2nd grade of elementary school. However, according to Input Hypothesis by Krashen (1985), "it is necessary for the learners to understand input which contains items that are slightly beyond the learners' present linguistic competence." Japanese language classes for secondary students often discourage students as the lessons offer them the contents that do not match the developmental stage of secondary students.

In this context, the Japanese teacher's effort in implementing economic and political notions in Japanese language class was meaningful. As the Chinese educator has knowledge on Business Japanese and experience in working for a Japanese company in both Taiwan and Japan, she included several vocabularies on business Japanese. She also elaborated on Chinese contemporary issues in economy and marriage.

Even though the ideas behind the vocabularies appeared on the newspaper article were difficult, the topic itself was relevant to students. The lesson and the article enabled students to look at their home country from outside their country.

Table 4. Lesson on a famous incident in Japanese history

Phase	Aims of Lessons	Content	Materials
2009-2011	Understanding Japanese spirits and culture	<i>Chushin Gura</i> "The Loyal 47 Ronin"	Materials taken from the internet sites

A lesson on The Loyal 47 Ronin

The Japanese teacher just explained the reason why he taught about the Loyal 47 *Ronin* because "it was December, December 14th." The day was when 47 *ronins* took a revenge on Kira, a *samurai* who was in charge of ceremonies as *hatamoto*, in the direct service of the Tokugawa shogunate of feudal Japan.

The teacher explained the main reason to choose The Loyal 47 Ronin to teach because "It is said that the story based on the real bloodshed was used as an occupation policy reference by the occupation forces after the war." He might have thought that knowing about the 47 *ronins* would be "cultural literacy every Japanese needs to know" (Hirsch 1988).

Discussion

In the Japanese language and culture lessons, the Japanese teacher taught international relations between China and Japan, South and North Korea, and England in historical context. In the *Imjin* River lesson, the teacher taught the controversial relationship between China and Korean Peninsula.

If the Chinese students did not have opportunities to learn this part of history in their home country, this experience would open doors to outside world. In the Opium War lesson, the teacher tried to teach the relationship not only China and England but also Japan and England, and the fact that Japan had learned from China.

The relationship between Japan and China, there are a lot of issues to cover, however, teaching the fact that Chinese characters were exported to Japan in the earlier period of history and the kanji Chinese characters were exported from Japan to China in 19th century would strengthen and develop identities of Chinese students growing up in Japan in terms of understanding both home and host countries.

Teaching controversial issues with CLDs and/or JLLs in the Japanese language classroom is different from teaching CLDs in the mainstream classroom which has peers of mainstream culture. However, in the classroom, it is not simple structure of a Japanese teacher and Chinese students. Chinese students are from different provinces, and the Chinese speaking educator is not from mainland China. Even though their background was different, students and the educator seemed to share same language and culture, and were interested in learning about Japanese language and culture.

The Japanese teacher and Chinese-speaking educator also shared common interest. In the commercial high school, the Japanese teacher taught commerce and computer as a content teacher for mainstream students, and the Chinese-speaking educator had worked in companies and she included business manners and *keigo* polite way of speaking especially at the office in her lesson. Reading a newspaper article on a Chinese company and work-related vocabularies was necessary for the students.

Dealing with the political ideology is a controversial matter. When the Japanese teacher taught the *kanji* Chinese character of *kyo-san shugi* (communism) and read a newspaper article about a Chinese company, labor union and right consciousness, he referred to Chinese government. He recalled that some students thought about Japan and China relationships without losing equilibrium and more flexible but other students were not.

Teaching “loyalty to master” in Japanese historical context in reading 47 *ronins* would be a new lesson for CLD students. The story based on the fact is controversial in different sense, whether it is desirable or not to revenge on the master’s opponent. When the students learned about Japanese class system during feudal period, students told the teacher, “Oh, Japan also has a dark history.”

Learning about Japanese history and culture, and learning about home history and culture in relation to Japan would transform students growing up in cultural transition.

Conclusion

In the globalized world, people get information much easier than before, and grasp what it is like to hear and pronounce foreign language. It is, however, difficult to internalize other cultures or ideologies different from their own home country.

Teachers at school tend to think teaching the language should be put utmost priority. In order for the newcomer CLD students to participate fully in Japanese society, teachers would need to realize that “culture matters” for students who are in the cultural transition in their formative years.

Students in this globalized world need new competencies. Fadel (2009) stressed the importance of 21st century skills that include knowledge, skills, and attitude or values. The teacher in this research aimed at teaching cultural literacy of Japanese culture and society, and the attitude of viewing the world neutrally and think critically with their own mind. The teachers in this study realized what was necessary for the CLD Chinese students and support and scaffold acculturation process in view of the new set of skills and values. The teacher empowered CLD Chinese students in

stressing the great value of Chinese influence over Japan by teaching that Japan as a nation respected China as a nation.

In Japanese course of study by the Ministry of Education advocates to foster “Japanese citizens” which do not include students with different nationalities or cultural backgrounds. There are no official curriculum in teaching controversial issues in social studies or other subjects, some culturally responsive teachers explore content and materials, devise lesson plans to maintain cultural identities of origin and acquire knowledge of mainstream culture. It is an urgent requirement to incorporate curriculum to teach culturally responsive content for students with CLD background.

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An Examination of Pre-Service Primary School Teachers' Comprehension of The Concept of Physics Through Metaphors

Işıl Aykutluⁱ
Hacettepe University

Abstract

The aim of this study is to lay bare pre-service primary school teachers' perception of "physics" through metaphors. The study was realized with the participation of 38 freshmen pre-service teachers taking General Physics at a public university. Data of the study were obtained with participants filling the blanks in the following sentence: "In my opinion physics is like a/an ... because ...". The study was designed in phenomenological method, which is one of the qualitative research methods. In the analysis of data, content analysis method was used. As a result of the obtained data, it was determined that pre-service primary school teachers constructed 31 valid metaphors in relation to the concept of physics. It was determined that the highest frequency among these metaphors belongs to the "nightmare". Metaphors generated by the pre-service teachers were grouped under seven different conceptual categories in terms of the meanings they contain. As a result of the study, it was determined that most of the metaphors generated by the pre-service teachers consist of a negative perception.

Key words: Pre-service primary school teachers, physics, metaphor.

ⁱ **Işıl Aykutlu** Dr., Physics Education Department at The Department of Mathematics and Science Education, Hacettepe University, Ankara, Turkey

Correspondence: aykutlu@hacettepe.edu.tr

Introduction

Metaphor etymologically comes from the Greek word “*metapherein*,” and it is formed by the combination of *meta* (to change) and *pherein* (to bear) (Levine, 2005). Metaphors, which are linguistic tools that combine two objects or concepts, are accepted as a symbolic language structure that can be used to combine two different ideas or concepts in order to compare or transit from one life to another. Metaphors are presented as words, verbs, or adjectives in daily language (Palmquist, 2001). Enabling a new phenomenon to be understood or explained by transferring a known case to a case whose meaning is unknown, metaphors are one of the most powerful mental tools that shape, direct, and control our thoughts (Morgan, 1980; Oxford et al., 1998; Saban, 2004; Yob, 2003). Used to define unclear or difficult to understand thoughts besides making thought open, comprehensible, and enlightening, metaphors can be defined as comparing different things for different reasons and effects (Çelikten, 2006) or understanding or experiencing one thing through another (Lakoff & Johnson, 2005). Metaphors enable individuals to reflect their thoughts and expectations regarding the present and the future, and they not only reveal thoughts but also construct perception and comprehension, and they make it easier for individuals to comprehend and understand events better (Arslan and Bayrakçı, 2006; Lakoff and Johnson, 2003; Levine, 2005). Having a significant place in learning process, metaphors play an important role in understanding difficult to understand topics and keeping them in mind (Altıntaş, Kahraman, Ülger and Altıntaş, 2014; Arslan & Bayrakçı, 2006; Çelikten, 2006; Fretzin, 2001; Goldstein, 2005; Hanson, 1993; İbret & Aydınözü, 2011). Just as in analogies, metaphors denote a way of thinking of and seeing the world, helping us comprehend the world as they try to explain a concept by using another that has a similarity to that one (Çelikten, 2006). The difference between analogy and metaphor is that the way they use the emphasis in comparison differently. Analogies openly compare to different field and express the qualities of these structures. On the other hand, metaphors make an indirect comparison between two different fields and they emphasize the unrelated or relative qualities of two different fields in a closed manner (Duit, 1991). In order for a phenomenon to be accepted as metaphor, it should have a topic, a source, and qualities that can be attributed to the topic of the metaphor from the source of the metaphor (Forceville, 2002). In a metaphorical relationship, the *source* of the metaphor functions as a filter in explaining or comprehending the *topic* of the metaphor in a different way. For instance, in the expression “A teacher is like a gardener because just as a gardener deals one by one with the young plants he is growing a teacher should take into consideration individual differences in a class,” the topic of the metaphor is “the teacher” and the source is “the gardener.” The quality attributed to the topic from the source is put forth in the following expression “just as a gardener deals one by one with the young plants he is growing a teacher should take into consideration individual differences in a class” (Saban, 2004).

Metaphors can be abstract or concrete just as they can be positive or negative (Semerci, 2007). Students’ reluctance towards school or their fear of school can be overcome by using metaphors in education (Osborn, 1997). Teachers can create creative and explorative learning environments by using metaphors; this would improve students’ imagination and they can even use metaphors to determine their thoughts about concepts (Saban, 2004; Sanchez, Barrerio & Maojo, 2000). Students’ personal perception related to phenomena can also be revealed by using the metaphors students come up with (Saban, 2004).

It is seen that there have been numerous studies on metaphors in various fields since the 1980s. Some of these studies are related to education. It has been expressed in various studies (Aydın & Pehlivan, 2010; Şengül, Katrancı & Cantimer, 2014) that metaphors can be used in planning, education, program designing, promoting learning, and in improving creative thinking. Moreover, it can be seen that metaphor is frequently used in education research in determining perceptions of teachers, pre-service teachers and students (Altıntaş, Kahraman, Ülger & Altıntaş, 2013; Arslan & Bayrakçı, 2006; Cerit, 2006; Bahadır & Özdemir, 2012; Clarken, 1997; Ocak & Gündüz, 2006; Saban, 2004; Saban, 2008; Saban, 2009; Saban, Koçbeker, & Saban, 2006; Sadoğlu & Uzun, 2014; Şengül, Katrancı & Cantimer, 2014; Usta & Ültay, 2015; Vadeboncoeur, & Torres, 2003; Yalmancı & Aydın, 2013; Yücel, Koçak & Cula, 2010). However, there is no study in literature that examines pre-service teachers’ perception of the concept of physics with the help of metaphors. A positive science that

examines matter, energy, and the reciprocal effects of matter, physics focuses on principal laws of the universe and is based on experimental observation and qualitative measurements in order to understand natural phenomena (Ertaş, 1993; Serway, 1995). Physics has a significant place in our lives because it enables us to explore known and unknown phenomena, draws students to scientific thinking and research (Nuhoglu & Yalçın, 2004; Sarı, 2013). Students usually consider physics classes to be difficult, boring, uninteresting, and full of unnecessary information (Angel, Guttersrud, Henriksen & Isnes, 2004; Baubeng, Conner & Winter, 2015; Reid & Skryabina, 2002; Tekbıyık & Akdeniz, 2012; Whitelegg & Perry, 1999). It is seen that students gain their first knowledge of concepts related to physics during their formal education with their primary school teacher. It is believed that teachers' perception of the classes they teach play an important role in the design of the teaching environment. No matter what the course is, teachers have the responsibility to make sure students love the course, learn it, and understand its importance. Negative perception against a course would significantly affect success in that particular course (Şahin, 2013). Taking all of these into consideration, it is believed that laying bare pre-service primary school teachers' perception of the concept of physics will contribute to the field.

This study was realized in order to lay bare pre-service primary school teachers' perception of the concept of "physics" through metaphors. Within this general framework, answers were sought for the following sub problems:

- What are the metaphors pre-service primary school teachers construct related to the concept of physics?
- Under what categories can these metaphors be grouped in terms of their similarities?

Methodology

Research Design and Participants

The study was designed in phenomenological method, which is one of the qualitative research methods. Phenomenology pattern focuses on phenomena which exist in various forms such as experience, perception, and concepts that we are aware of but cannot fully comprehend in detail (Yıldırım & Şimşek, 2013). In this particular study, pre-service primary school teachers' perception of the concept of physics was tried to be determined under conceptual categories.

The study was realized with the participation of 38 freshmen pre-service teachers taking General Physics at a public university. Metaphors of two pre-service teachers were discarded on the grounds that the explanations were insufficient. Thus, answers of 36 pre-service teachers were taken into account. In phenomenological studies, the aim is not to reach a great number of people but the focus on the quality of information obtained from individuals (Baş & Akturan, 2008). In this respect, instead of making sure many people participated in the study, voluntary participation was encouraged and prioritized.

Research Instrument

In determining the data gathering tool, national and international literature was reviewed in order to see how metaphors are used in determining perception. Perception of the participating pre-service primary teachers was gathered by using a metaphor form. Whether this metaphor form, which consists of the following expression, "In my opinion physics is like a/an ... because ..." meets the criteria was checked by getting opinion from two experts from the field of physics education. Then, a pilot study was conducted with the participation of 10 pre-service teachers. As a result of this pilot study, it was determined that pre-service teachers have no problem generating metaphors, and it was decided that metaphor form should be used in the study.

Application

Application was done at the end of the “General Physics” course that pre-service primary school teachers take during their freshman year. First of all, they were given information about the application, and then metaphor examples on different topics were introduced; they were also given information as to how they can construct metaphors. Pre-service teachers were given one class hour to complete the task. Pre-service teachers were asked to explain their thoughts by using the sentence given in the form and focusing on one single metaphor. At the end of the application, metaphors and explanations that form the data of this study were obtained.

Data Analysis

In the study, metaphors obtained with the data gathering tool were analyzed through content analysis. In content analysis data are processed thoroughly so that unnoticed concepts or themes would be revealed; first of all data are conceptualized, then these are organized in a meaningful and logical way, and thus themes explaining the data are determined (Yıldırım & Şimşek, 2013).

Metaphors about the concept of physics formulated by pre-service teachers were analyzed in five stages (Saban, 2009). All operations done during analysis are given in detail below

1. **Coding and Sorting:** In the analysis of data, firstly a tentative alphabetical list was done with the metaphors formulated by pre-service teachers. Then, these metaphors were coded and checked whether they are expressed properly and whether the explanations are done properly. For example, punishment, torture, nightmare, magic box, etc. At this stage, metaphors of two pre-service teachers were not taken into consideration as they did not include the necessary explanation.

2. **Picking Sample Metaphor Image:** Revising the valid metaphors, a sample metaphor list was formed in order to gather metaphors under a certain category and make the data analysis process and interpretations valid.

3. **Developing Categories:** Metaphors formed by pre-service teachers were examined taking into consideration the explanations they provided; and they were tried to be gathered under a category by grouping common ones. To this end, each metaphor formed by pre-service teachers was analyzed in terms of the theme of the metaphor (physics), the source of the metaphor, and the relationship between the source of the metaphor and its theme. Conceptual categories which were formed by the classification of the metaphors were named under themes by the researcher.

4. **Validity and Reliability:** In qualitative studies, the most important indicator of validity is a detailed report of the data and reached conclusions (Yıldırım & Şimşek, 2013). In this study, too, data analysis process was explained in detail in order to provide validity. In order to secure the validity of the study, the first three steps of data analysis were repeated at two different intervals by the researcher and these were compared to the metaphors. Then, two experts on physics education were consulted as to whether the metaphors within the conceptual categories represent these categories. Reliability of the study was calculated by using reliability formula ($\text{Reliability} = \frac{\text{consensus}}{\text{consensus} + \text{dissensus}}$) developed by Miles & Huberman (1994), and it was found to be 0.90.

5. **Transferring Data to Digital Environment:** At this stage, metaphors formed by pre-service teachers and their conceptual categories were transferred to digital media, and their frequency and percentages were calculated.

Findings

When the findings of this study, in which pre-service primary school teachers' perception of "physics" were examined through metaphors, were examined, it was seen that pre-service teachers generated 31 different and valid metaphors concerning the concept of physics. These metaphors were grouped under seven different conceptual categories according to their meanings (Table 1).

Table 1. Conceptual categories of pre-service physics teachers' metaphors for the concept of physics

Conceptual Categories	Total number of metaphors in category f (%)
Difficult Physics	9 (29%)
Horrible Physics	7 (22,6%)
Painful Physics	5 (16,1%)
Mysterious Physics	5 (16,1%)
Useful Physics	4 (12,9%)
Impossible Physics	4 (12,9%)
Disliked Physics	2 (6,5%)

When Table 1 is examined, it can be seen that five of the conceptual categories consist negative perception (Table 2). Pre-service teachers' metaphors with negative perception (74.2%) were gathered under the following conceptual categories: *difficult physics* (29%), *horrible physics* (22.6%), *painful physics* (16.1%), *impossible physics* (12.9%), and *disliked physics* (6.5%). When the conceptual categories containing negative perceptions were examined, it was seen that the category with the most metaphors is *difficult physics* (29%). When the metaphors in this category were examined, it was determined that pre-service teachers tried to express their perception with such metaphorical images as *unknown language* (1, 3,2%), *a deep well* (1, 3,2%), *a complex world* (1,3,2%), *a complex yarn* (1, 3,2%), *a labyrinth* (1, 3,2%), *a discordant picture* (1, 3,2%), *an intense mixture* (1, 3,2%), and *a tough climb* (1, 3,2%).

Table 2. Pre-service teachers' metaphors containing negative perception and the categories

Conceptual Categories	Name of metaphor	Number of metaphors f (%)	Total number of metaphors in category f (%)
Difficult Physics	Unattainable task	1 (3,2%)	9 (% 29)
	Unknown language	1 (3,2%)	
	Bottomless pit	1 (3,2%)	
	Complex world	1 (3,2%)	
	Tangled yarn	1 (3,2%)	
	Labyrinth	1 (3,2%)	
	Discordant Picture	1 (3,2%)	
	A dense mixture	1 (3,2%)	
	Steep climb	1 (3,2%)	

Horrible Physics	A drowning pool	1 (3,2%)	7 (%22,6)
	Nightmare	5 (16,1%)	
	Horror movie	1 (3,2%)	
Painful Physics	Cayenne pepper	1 (3,2%)	5 (16,1%)
	Punishment	1 (3,2%)	
	Toothache	1 (3,2%)	
	Torture	1 (3,2%)	
	Cactus	1 (3,2%)	
Impossible Physics	A fast flowing river that one wants to pass without a bridge	1 (3,2%)	4 (12,9%)
	Wasteland	1 (3,2%)	
	A road full of impossibilities	1 (3,2%)	
	Behind closed doors	1 (3,2%)	
Disliked Physics	A disliked friend	1 (3,2%)	2 (6,5%)
	A poor orphan	1 (3,2%)	
Total		23 (74,2%)	

Some of the metaphors with negative perceptions and explanations by pre-service teachers are given below (S:Student, #: student number)

S18: *“To me, physics is like a nightmare, because just like a nightmare, topics of physics bother and overwhelm you.”*

S6: *“To me physics is like cactus because whenever I think of something related to physics I feel like being needled by the thorns of a cactus.”*

S16: *“In my opinion, physics is like a road full of impossibilities, because it deals with problems that seem hard or impossible to solve.”*

S27: *“For me, physics is like a waste land because no matter how hard I study, I never get it nor can I succeed.”*

S38: *“For me, physics is like an orphan because it is a complete torture; there is no way to understand it. Even mathematics can be liked but not physics. You wouldn’t love it even if it were your child.”*

When pre-service teachers’ metaphors containing a negative perception towards physics, categories related to these metaphors, and the necessary explanations were examined, it can be said that they consider physics to be a field that is hard, difficult to understand, scary, painful, and disliked.

When findings were examined, it was seen that pre-service teachers’ metaphors containing a positive perception were gathered under the categories mysterious physics 5 (16,1%) and useful physics 4 (12,9%) (Table 3). It was determined that the most metaphors containing a positive reception towards physics were under the mysterious physics category (16,1%). It was also determined that the most frequently repeated metaphor in this category is puzzle 2 (6,4%).

Table 3. Pre-service teachers' metaphors containing a positive perception and the categories

Categories	Name of metaphor	Number of metaphors f (%)	Total number of metaphors in category f (%)
Mysterious physics	Puzzle	2 (6,4%)	5 (16,1%)
	Endless tunnel	1 (3,2%)	
	Bottomless pit	1 (3,2%)	
	Magic box	1 (3,2%)	
Useful Physics	Water in the desert	1 (3,2%)	4 (12,9%)
	Understanding the world	1 (3,2%)	
	Broccoli	1 (3,2%)	
Total		7 (22,6%)	

It was determined that pre-service teachers used *puzzle* (2, 6,4%), *endless tunnel* (1, 3,2%), *bottomless pit* (1, 3,2%), and *magic box* (1, 3,2%). It can also be seen that under the “useful physics” category, they used *water in the desert* (1, 3,2%), *understanding the world* (1, 3,2%), and *broccoli* (1, 3,2%).

Some of the metaphors with positive perceptions and explanations by pre-service teachers are given below (S:Student, #: student number)

S3: “*For me physics is like a bottomless pit because the more you get into it, the more it draws you in. It always consists something new, and it always has something mysterious.*”

S17: “*For me physics is like a magic box because just like a magic box it deals with things that surprise people.*”

S1: “*To me, physics is like broccoli because although it is not liked by many people it is highly useful.*”

When pre-service teachers' metaphors containing a positive perception and their explanations were examined, it was seen that pre-service teachers find physics useful although they do not like it, they believe that physics can reveal the unknown, and that they perceive of it as a mysterious field.

Discussion and Conclusion

In this study, it was determined that pre-service teachers generated 31 different metaphors related to physics. 24 of these metaphors consisted of a negative perception, and only seven of them consisted of a positive perception. In a similar study about pre-service science teachers by Sadoğlu & Uzun (2014), it was also determined pre-service had a negative perception against physics. It can be seen that pre-service teachers' metaphors with negative perception are gathered under such categories as difficult physics, horrible physics, painful physics, impossible physics, and disliked physics. It was revealed that the number of metaphors with negative perception in the difficult physics category is higher compared to other conceptual categories. This result can show that pre-service teacher consider physics to be a difficult concept. Another result obtained in the study is that “nightmare” as a metaphor was the most frequently repeated one within conceptual categories. All these results show that pre-service teachers perceive physics as a difficult to succeed in, difficult to understand, complex, scary, painful, and dislike field. In the studies conducted on this topic, it was determined that pre-service teachers do not like physics in which scientific knowledge is taught (Kapucu, 2014). Moreover, many studies also reveal that physics is considered to be a difficult to understand, boring,

and disliked as a class (Ornek, Robinson & Haugan, 2008; Redish, 1994). The reasons for this may be the fact that students have difficulty drawing relations between concepts, that they have deficiency in mathematical operations, and that physics mainly consists of abstract concepts (Aycan & Yumuşak, 2003; Gill, 1999; Ornek, Robinson & Haugan, 2008; Orton and Roper, 2000; Şahin & Yağbasan, 2012). It is believed that students must have had negative experience related to physics since metaphors reflect people's experience and their conditions (Lakoff & Johnson, 2003). It was seen that pre-service teachers who participated in this study were given physics course in the spring semester of their freshman year and only for two hours. Moreover, it was determined that there are too many learning outcomes in the curriculum. It is believed that revising the curriculum and providing exercises that are related to daily life would help students develop a more positive attitude towards physics as well as enable a meaningful learning (Usta & Ültay, 2015). When the conceptual categories in which metaphors of pre-service teachers with positive perception are given were examined, it was also determined that pre-service teachers think of physics as useful although they dislike it, that they see it as a mysterious field, and that they believe that it would reveal the unknown. This result shows that some of the pre-service teachers may have a positive attitude towards physics. In other studies, it was indicated that metaphors can be used to determine the thoughts and attitudes towards a concept (Doğan, 2014; Soysal & Afacan, 2012).

This study tried to describe pre-service primary school teachers' perceptions of physics through metaphors. As a result of the research done, it was determined in this study also that metaphors could be used in determining pre-service teachers' perceptions. It's been believed that primary school teachers play a significant role during formal education in shaping students' knowledge of physics and helping them develop a positive attitude towards physics. Therefore, similar studies on different topics may be done with pre-service primary school teachers. It is also believed that metaphors that are formed to describe perceptions of physics, can be guides for physics teachers in showing them what to do for a better physics education.

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Miscellany

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International Journal of Progressive Education (IJPE) (ISSN 1554-5210) is a peer reviewed journal sponsored by the International Association of Educators and in part by the Graduate School of Library and Information Science at the University of Illinois at Urbana-Champaign. IJPE is a core partner of the Community Informatics Initiative and a major user/developer of the Community Inquiry Laboratories. IJPE takes an interdisciplinary approach to its general aim of promoting an open and continuing dialogue about the current educational issues and future conceptions of educational theory and practice in an international context. In order to achieve that aim, IJPE seeks to publish thoughtful articles that present empirical research, theoretical statements, and philosophical arguments on the issues of educational theory, policy, and practice. IJPE is published three times a year in four different languages; Chinese, Turkish, Spanish and English.

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c/o: Dr. Alex Jean-Charles
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