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*Full Length Research Paper*

# Investigation of the relationship between communication skills, social competence and emotion regulation skills of preschool children in Turkey

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The aim of this study is to investigate the relationship between communication skills, social competence and emotion regulation skills of preschool children. Children attending public primary schools who were 53 to 80 months old from the middle socio-economic class were chosen randomly from Istanbul City center districts for this study. They were 426 children. The average age of the children was 68.91 months. One of the three data collection tools was "Communication Skills Scale for 5 to 6 Years Old Children" with 4 subscales developed by Önder, Dağal and Şallı. The internal consistency of the scale (Communication Skills Scale for 5 to 6 Years Old Children) was .98. The second data collection tool was named SCBE-30, which evaluates symptoms of problems and quantity of social skills of preschool children, consists of 30 items and has three subscales. The internal consistency of the social competence scale was 0.88. "Emotion Regulation Checklist" was the third data collection tool, which was adapted into Turkish by Batum and Yağmurlu to measure children's ability to regulate their emotions and has two subscales. Internal consistency coefficient of the subscales was 0.73 and 0.75. The study was based on descriptive analysis and multiple regression correlation was examined. As a result of the research, it was concluded that there was not a relationship between communication skills' total score and social competence and emotion regulation skills. However, when subscales of each concepts were examined separately, it was found out that social competence and anxiety/withdrawal subscale together explained communication skills of preschool children moderately. And social competence, anxiety/withdrawal, anger/aggression and emotion regulation subscales explained active communication skills of preschool children moderately.

**Key words:** Preschool children, communication skills, social competence, emotion regulation.

## INTRODUCTION

It is known that an important part of personality is developed in the first six years of life which is considered as the early childhood period. Therefore, concepts of

communication skills, emotion regulation and social competence which can be the basis of personality development are important factors to be considered.

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Positive behaviors developed by children in early childhood period will help children to maintain a healthy way of life when they enter social life independently from their parents.

Developing proper communication skills will be the basis for children to be in harmony with their environment, establishing healthy social relationships and regulating their reactions emotionally.

As a social being an individual uses communication in every phase of his life. Even a newborn baby points out a physical need to his mother with his cry. In this way he lays the foundations of communication and produces the communication skills which will produce the form of connection with society, by the reactions received from others.

Dewey (1916) stated that social life is identified with communication (cited in Sigman, 2013). Human beings have an outstanding hardware which is skill of communication to live with other people as well as to gain rules, values and information formed by his predecessors (Önder, 2004:11).

We are trying to understand, learn or teach today like we did yesterday. We want to share, impress and change today as we did before. The main determinant of the success of these efforts is the level of communication skills that is owned. Every topic from husband and wife relationship to parent-child, teacher-student, chief-officer, employer-employee, government-society and international relations is based on the subtleties of communication. However, failures on communication are rising every day despite all these developments in the field of communication. The most effective way to reduce these negativities may be increasing communication skills (Demiray, 2008:3). At this point "What conditions related to personality can affect communication skills?" should be the question to be focused on. Concepts of social competence and emotion regulation which are considered as the factors effect personality emerge as other concepts to be considered. A baby's social relationship starts with his cry. With time, laughing and talking are added to crying. In this way a baby's way of communicating enriches. A baby who starts to react to stimulants from parents and other people from the environment learns by imitating in this process (Gülşay-Ogelman and Çiftçi-Topaloğlu, 2014:242). These first reactions are indeed the first signs of form of communication with the environment. After these basic skills, emotion regulation skills and social competence will be improved and changed by the reactions he receives.

Concept of social competence includes cognitive, emotional and social behaviors which are required to provide children's successful social adaptations (Ladd, 2005, cited in Vu, 2015). Because social competence is also related with internal responses, it is expected that competence of individual's being in positive thoughts of

himself and others and positive social behaviors are also supported. Whereas it is possible that negative thoughts affect children's self-esteem negatively and might cause social problems (Rudolph et al., 1995).

It is required for an individual to have some qualifications and skills to adapt to and live in harmony with the environment. Social competences and skills are basic self-perspectives and skills which can be improved by education to live in harmony together and which should be improved by the individual (Bacanlı, 2012; cited in Sariçam et al., 2013).

These skills of children will be shaped observing the behaviors of other people in educational and social environments throughout life and they will start to show appropriate responses to situations, events and other people. With the effort of being in a social environment, a child will learn to manage his emotions while trying to adapt to the environment by evaluating other individuals' responses. Skill of managing emotions will be used as emotion regulation.

Emotion regulation is an important component of successful emotional and social functionality (Farmer and Kashdan, 2012). Individuals feel happy when praised and feel upset when criticized. Additionally, when emotions expressed, social conditions are determinant rather than the real emotions occurred in the current situation. So, emotional expression is considered to be more social than the emotional experience. People express their emotions in line with social demands and they often hide their negative emotions and exaggerate their positive emotions according to social demands (Onat and Otrar, 2010). Emotion regulation skill is highly affected by social environment. Children learn that it is possible to regulate emotions when they see others manage their emotions successfully (Camps et al., 1989; cited in Demirkapı, 2013). Children who observe and experience the emotions of loved ones are out of control may have problems about regulating their own emotions (Reider and Cicchetti 1989 cited in Demirkapı, 2013).

Emotions do not force us to behave in an appropriate way; they increase the possibility of behaving appropriately. This gives opportunity to regulate our emotions. We can run away when we are scared, treat harshly when we are angry and smile when we are happy but do not always we act in these ways. It is important how we regulate our emotions; our well-being and our emotions are related (Gross, 2002).

Situation selection of emotion regulation includes situation modification, attentional deployment and cognitive changes. In situation selection, individual gets closer to some people and situations according to potential impacts on himself and avoid others. In situation modification, individual regulates the environment he is in, to change the situation's emotional effects. In attentional deployment, individual focuses or removes his attention from a situation to establish the effect on his



**Table 1.** Demographic data of sample groups of children and parents.

<b>Sample groups</b>		<b>f</b>	<b>%</b>
<b>Gender of children</b>	Boy	219	51.4
	Girl	207	48.6
<b>Age groups of children</b>	4.5-5.5	232	54.5
	5.5-6.5	194	45.5
<b>Education level of mother</b>	Primary School	166	39.0
	Secondary School	87	20.4
	High School	125	29.3
	Undergraduate	46	10.8
<b>Education level of father</b>	Primary School	115	27.0
	Secondary School	114	26.8
	High School	135	31.7
	Undergraduate	62	14.6

emotions. In cognitive change, individual evaluates the situation he is in and his capacity to direct the situation in order to change his emotions (Gross, 1998). Emotions are sometimes destructive and sometimes helpful. The difficulty here is to limit the destructive sides of emotions and to find the ways to use the helpful sides (John and Gross, 2004).

Preschool children are in a process of being competent socially and emotionally. Regulating, expressing and being aware of emotions and solving social problems are some sides of social and emotional competence. These skills are the tools for child's learning because it leads a child to study in the social environment of the classroom. In preschool period great importance is given to pre-literacy skills so socio-emotional skills are expected to be the basis for pre-literacy skills (Curby et al., 2015).

In childhood period any defect or deficiency in emotion regulation may cause behavioral problems and aggression (Eisenberg and Fabes, 1992; cited in Çelik and Kocabıyık, 2014). In a study conducted by Eisenberg et al. (1994) among children of 4 to 6 age groups, it was stated that individuals with low level of emotion regulation skills show high level of aggressive reactions and there is a relationship between problematic emotion regulation skills and aggression. Similarly, in a research done by O'neil et al. (1997) among preschool, first and second grade students, it was found out that there is a relationship between being socially accepted and academic achievement. When related literature is examined, it can be said that being socially accepted firstly requires establishing proper communication, social competence and emotion regulation skills at the same time. So it can be judged that as well as communication skills, social competence and emotion regulation skills are highly important in child's social, emotional and academic life.

From this point of view, the primary aim of this research is to identify the relationship between the concepts of social competence, emotion regulation skills and communication skills which are stated to be effective on development of other skills in preschool period and seen to be emphasized strongly.

## **METHODS**

### **Research method**

The research which was designed to investigate the relationship between communication skills, emotion regulation skills and social competence of preschool children was conducted using descriptive research method.

### **Sample**

This research was conducted among middle socio-economic level children of 53 to 80 months old attending public primary schools. They were chosen randomly in İstanbul City Center. 426 children participated in this research. The average age of the children was 68.91. Demographic data of sample groups of children and their parents are presented in Table 1.

### **Data collection tools**

#### **Communication skills scale for 5 to 6 years old children**

One of the data collection tools used in the research was "communication skills scale for 5 to 6 years old children" which was developed by Önder et al. (2015). The internal consistency of the scale (Cronbach alpha) was 0.98. Scale consists of four subscales called "Active Communication", "Considering Others in Communication", "Following Rules in Communication" and "Reacting Positively to Others in Communication". Cronbach alpha value of "Active Communication" subscale was 0.98, "Considering Others in Communication" subscale was 0.97, "Following Rules in

Communication” subscale was 0.97, “Reacting Positively to Others in Communication” subscale was 0.87. Children’s communication skills were evaluated by 5 point Likert type scale (1=never, 2=rarely, 3=sometimes, 4=frequently, 5=always).

### **Social competence and behavior evaluation 30**

The scale which was named as “The Social Competence and Behavior Scale - SCBE-30” was developed to evaluate the social skills by LaFreniere ve Dumas in 1996 and it was adapted to Turkish by Çorapçı et al. (2010). This scale evaluates quantity of preschool children’s symptoms of problems and social skills include three subscales each of which consists of 10 items. Social Competence (SC) subscale measures positive characteristics like children’s cooperation and problem solving efforts towards conflicts when they are with their peers. Anger/Aggression (AA) subscale evaluates symptoms of external problems like aggressive and incompatible behavior in peer relations and opposing adults. Anxiety/withdrawal (AW) subscale evaluates symptoms of internal problems like children’s timidity in groups and emotions like sadness and depression. Symptoms of children’s emotional and behavioral problems and social skills are evaluated with 6 point likert type scale (1=never, 2 or 3=sometimes, 4 or 5=frequently, 6=always). Cronbach Alpha internal consistency of SC, AA and AW subscales was 0.88, 0.87 and 0.84 respectively (Çorapçı et al., 2010).

### **Emotion regulation checklist**

The scale was developed to measure children’s emotion regulation skills by Shields and Cichetti (1997) and was adapted to Turkish by Batum and Yağmurlu (2007). Four point Likert type scale (1=never/rarely, 2=sometimes, 3=frequently, 4=almost/always) has two subscales; Liability/negativity and emotion regulation. Internal consistency coefficient of the subscales was 0.73 and 0.75, respectively (Batun and Yağmurlu, 2007).

### **Data collection process**

Permissions to get information from teachers through interviews about children were taken from the parents of the children. In addition, permission from Turkish Ministry of Education was taken to get information from teachers. Permissions were taken to use the scales before starting the research. Then scales were distributed to schools chosen by random sampling method. Data on children’s communication skills, social competence and emotion regulation skills were taken via evaluating teachers’ comments about children with the help of the scales. Knowing the students for at least two months was taken as a basis. The teacher candidates who were registered in the research project class supported the process of the collection of the data research by giving the scales to the teachers which were selected by the researcher.

### **Data analysis**

SPSS 15 statistical packet program was used for analysis of the data obtained during the research. Stepwise Regression Model was used to test the relationship between communication skills, social competence and emotion regulation skills of children. Stepwise selection alternates between forward and backward, bringing in and removing variables that meet the criteria for entry or removal, until a stable set of variables is attained (Flom and Cassell, 2007). Level of

significance was 0.05 in data analysis.

While the regression analysis was applied, the assumptions below were taken into account during and before the analysis and considered to be achieved:

1. A linear relationship between dependent and independent variables was identified.
2. It was observed that there was not a multiple correlation between independent variables (Pearson correlation coefficient between the independent variables was found smaller than 0,70)
3. It was found that the error terms were distributed normally (normality).
4. It was found that the variance of error terms was constant.
5. It was identified that there was not a relationship between error terms and was it found that the assumptions of multiple regression occurred (Sipahi et al., 2006).

### **FINDINGS**

Here, the relationship between the dependent variable; communication skills and the independent variables; social competence and emotion regulation skills were investigated. Also, communication skills subscales were examined with every independent variable subscale. In the multiple regression comparisons made, regression analysis was preferred and all dependent variables that affect communication skill dependent variable were included in the analysis. According to the stepwise model, first, the relationship between communication skills and social competence was examined. Later, communication skills and emotion regulation skills were evaluated. In the last stage, the relationship between communication skills; “Active Communication”, “Considering Others in Communication”, “Following Rules in Communication” and “Reacting Positively to Others” subscales and social competence, emotion regulation skills were explained together. In every step insignificant variables were excluded from the analysis and attention was paid to ultimate variable which affects the communication skills.

As shown in Table 2, it was found out that social competence and anxiety/withdrawal subscales of social competence moderately explained preschool children’s communication skills ( $R=0.654$ ;  $R^2=0.428$   $F=149.788$ ;  $p=0.000$ ). So it can be said that communication skills of preschool children aged five to six and social competence and introversion of these children has a moderate relationship.

As shown in Table 3, it was found out that social competence, anxiety/withdrawal, anger/aggression and emotion regulation subscales of social competence moderately explained preschool children’s active communication ( $R=0.63$ ;  $R^2=0.39$   $F=59.224$ ;  $p=0.000$ ). So it can be claimed that active communication skills of preschool children aged five to six have a moderate relationship with social competences, being angry and withdrawal.

As shown in Table 4, it was found out that social

**Table 2.** Communication skills, social competence and anxiety regression table.

<b>Dependent variable: Communication skills</b>			
<b>Independent variables</b>	<b>Beta</b>	<b>t value</b>	<b>p value</b>
Constant		15.770	0.000
Social competence	0.030	9.922	0.000
Anxiety/withdrawal	-0.018	-5.674	0.000
R=0.654	R <sup>2</sup> =0.428	F=149.788	p value=0.000

**Table 3.** “Active communication” and “social competence, anger, anxiety and emotion regulation” regression table.

<b>Dependent variable: Active communication</b>			
<b>Independent variable</b>	<b>Beta</b>	<b>t value</b>	<b>p value</b>
Constant	36.323	7.959	0.000
Social competence	0.320	4.149	0.000
Anger	0.168	2.488	0.014
Anxiety/withdrawal	-0.426	-6.320	0.000
Emotion regulation	0.484	2.458	0.004
R=0.63	R <sup>2</sup> =0.39	F=59.224	p value=0.000

**Table 4.** “Considering others in communication” and “social competence, anxiety/withdrawal” regression table.

<b>Dependent variable: Considering others in communication</b>			
<b>Independent variable</b>	<b>Beta</b>	<b>t value</b>	<b>p value</b>
Constant	30.407	10.818	0.000
Social competence	0.466	9.317	0.000
Anxiety/withdrawal	-0.187	-4.177	0.000
R=0.615	R <sup>2</sup> =0.378	F=103.071	P value=0.000

competence and anxiety/withdrawal subscales of social competence explained preschool children’s “considering others in communication” moderately (R=0.63; R<sup>2</sup>=0.39 F=59.224; p=0.000). However when the table is examined, it can be seen that there was a positive relationship with social competence subscale and a negative relationship with introversion. So it can be asserted that there is a moderate relationship between considering others in communication skills of preschool children aged five to six and social competence and anxiety/introversion.

As shown in Table 5, it was found out that social competence and anxiety/withdrawal subscales of social competence explained preschool children’s communication skill of “following rules in communication” moderately (R=0.65; R<sup>2</sup>=0.43 F=144.902; p=0.000). “Following rules in communication” subscale has a positive relationship with social competence and has a negative relationship with withdrawal. So it can be said that there is a moderate relationship between following rules in communication skills of preschool children aged

five to six and social competence, anxiety and withdrawal.

As shown in Table 6, it was found that “liability/negativity” subscale of emotion regulation and social competence and anger/aggression subscales explained “Reacting Positively to Others” skill of preschool children aged five to six in a moderate level (R=0.52; R<sup>2</sup>=0.27 F=47.023; p=0.000). “Reacting Positively to Others” had a positive relationship with social competence and “Negativity” whereas it had a negative relationship with “Anger”. So it can be claimed that there is a moderate relationship between “Reacting Positively to Others” skill of preschool children aged 5 to 6 and “Negativity” subscale of emotion regulation skills and social competence subscale.

## RESULTS AND DISCUSSION

After the multiple regression analysis was done in the research it was concluded that children’s total scores of

**Table 5.** “Following rules in communication” and “social competence, anxiety/withdrawal” regression table.

<b>Dependent variable: Following rules in communication</b>			
<b>Independent variables</b>	<b>Beta</b>	<b>t value</b>	<b>p value</b>
Constant	41.158	14.338	0.000
Social competence	0.564	11.398	0.000
Anxiety/withdrawal	-0.183	-3.634	0.000
R=0.65	R <sup>2</sup> =0.43	F=144.902	p value=0.000

**Table 6.** “Reacting positively to others” and “negativity, social competence and anger/aggression” regression table.

<b>Dependent variable: Reacting positively to others</b>			
<b>Independent variables</b>	<b>Beta</b>	<b>t value</b>	<b>p value</b>
Constant	3.131	4.497	0.000
Negativity	0.43	2.258	0.025
Social competence	0.87	9.229	0.000
Anger	-0.35	-2.629	0.009
R=0.520	R <sup>2</sup> =0.270	F=47.023	p value=0.000

social competence and emotion regulation skills are not related to children’s total scores of communication skills. However when the analysis was repeated with subscales it was found out that social competency and anxiety/withdrawal together moderately explained preschool children’s communication skills. Social competence, anxiety/withdrawal, anger/aggression and emotion regulation subscales explained “Active Communication” skills moderately; social competence and “anxiety/withdrawal” explained children’s “Considering Others in Communication” skill in a moderate level; social competence and “anxiety/withdrawal” explained children’s “Following Rules in Communication” skill in a moderate level; “Liability/Negativity” subscale of emotion regulation, social competence and anger/aggression explained “Reacting Positively to Others” skill in a moderate level.

In this instance, when evaluated in terms of total points there is not a relationship between children’s being socially competent and regulating their emotions with communication skills. However, a positive relationship between children’s social competence and communication skills and a negative relationship between being withdrawn and communication skills were detected. Because individuals with high communication skills have contact more with the environment they are in, it is an expected outcome that they have higher level of social competence. This research put forth that there is a relationship between 5 and 6 years old children’s communication skills and social competence. Although this research does not cover language skills it can be said that the detected relationship between social

competence, emotion regulation skills and language skills in Monopoli and Kingston’s research (2012) done with second grade students also supports this research, as communication skills cannot exist without language skills (Önder, 2004).

The longitudinal study conducted among 5 years old children with low socio-economic level by Izard et al. (2001) stated that children’ verbal skills are affected by being aware of their own emotions. They also claimed in their research that ability to understand their own emotions makes their social communications easier. It can be said that this argument of Izard et al. (2001) explains the relationship between active communication and emotion regulation. Awareness of one’s own emotions is only one part of giving emotional reactions. However, individual differences in individual’s emotional awareness are related to their using of emotion regulation skills (Eastabrook and Flynn, 2014). Awareness provides accepting unwanted emotions and increases the capacity of tolerance for negative emotions (Çatak and Ögel, 2010).

At this point it can be thought that individuals who are aware of their own emotions can use their emotion regulation skills better than the others. For this reason, they can understand others better and communicate in a more reasonable way. Thus, in Kuyucu and Tepeli (2013) research conducted among 60 to 72 months old children, it was shown that children’s emotional and behavioral reactions shown to peers differ according to their emotion comprehension skills. In Garner and Waajid (2012), research it was stated that knowing the emotion indicates cognitive and social skills.

Also it was pointed out by Martinez et al. (2011) that inner talk which has an important role in language development suggested by Vygotsky and quiet thinking (Yeşilyaprak and Uçar, 2012) have important regulating roles in communication. Besides inner talk being effective in establishing a dialog with others, it has a special place on emotion regulation skills. With the help of inner talk children control their sadness and anger better (Day and Smith, 2013). Inner talk which is one of the important points of communication has a significant role in controlling emotions. So from this point of view, in both this study and other studies it was emphasized that emotion regulation skills have an important role in children's active communication.

In their research held among 43 to 66 months old children, Hazen and Black (1989) stated that consistent expression in communication increases social interaction and at the same time it provides acceptance by peers. In this research, it was found that following the rules in communication skills is related to children's social competence. Accordingly, it can be said that the social interaction of preschool children may have relation with the other dimensions of communication like consistent expressions and "Following the Rules". The finding of Hazel and Black supports the relationship between following rules in communication (forming eye contact in communication, complying with the rules of courtesy, complying with the order of speech etc; Önder et al., 2015) subscale and social competence. Thus, in another research on 6 years old children's peer selection done by Akman et al.,(2011), it was underlined that in terms of social skills, following courtesy rules is significant in peer selection. It can be said that this research also supports the relationship between social competence and following rules in communication. Gerther et al. (1994) stated in their research conducted among preschool children that limits of forming mutual communication affect social interaction.

It is stated that showing negative reactions and anger can be problematic in social communication, based on the findings of various researchers like Denham et al. (1990), Rubin and Clark (1983) and Rubin and Daniells-Byrness (1983). It can be argued that the mentioned findings can explain the detected relationship between active communication, reacting positively to others and anger in this research.

When the results are examined in general, after considering together all the skills which affect communication skills, abilities or situations that affect communication skills can be identified individually or separately. Thus, as shown in this research, communication skill is not a unilateral skill. It consists of many sub factors and there are different variables that affect these sub factors. In this instance, discovering factors that affect children's communication skills and establishing programs that can develop these factors

together, as well as researching the effectiveness of these programs and sharing the effective ones and the results in in-service programs; training teacher candidates about the field as well as researching the effectiveness of these trainings can be offered to researchers and implementers.

According to the results of the study it was found that communication skill was related to social competence. Since social competence is considered rather central in preschool children's development the preschool programs should include more activities related to communication skills. In addition to placing more communicational activities in preschool education curriculum, the preschool teachers and children's parents should also be aware of the importance of the communication skills. Preschool teachers and parents may also gain more abilities through courses, seminars to gain more skills in communicating effectively with their children.

## Notes

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## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

# A glimpse of challenges and benefits associated with collaborative postgraduate programmes in Sub-Saharan African Universities

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The paper presents empirical findings on the potential benefits and challenges associated with collaborative postgraduate programs between African universities. It reflects the empirical benefits and challenges towards a collaborative master in the fields of Earth Observation, Geographical Information Science (GIS) and Remote Sensing. The research applied a combination of approaches that include desktop study, consultative meetings and round table meetings with experts in universities operating partnership. Positive and negative effects of collaborative degree programs were equally collected and the results were verified. The research established that although collaborative degree programs are more favorable around the world, a number of administrative issues hamper the system. These are lack of funding and inconsistent accreditations among country universities. Key recommendations include inclusive administration, proper funding for higher institutions and consistent accreditations among universities. This paper presents a glimpse of the challenges and benefits associated with collaborative postgraduate programs between African universities'.

**Key words:** Collaborative degree programs, challenges, benefits, universities, Namibia; Sub-Sahara Africa.

## INTRODUCTION

Collaborative degree programs have become a popular form of higher education internationalization around the world. However, there still complex challenges to full implementation. National and international organizations, higher education associations, and funding agencies have undertaken efforts to study the dynamics and frameworks of collaborative degree programs, both joint and double degree programs, in their particular contexts. Some of these efforts have culminated in full-fledged studies, some have led to the formulation of best

practices, and yet others have produced overviews that assess specific regional or national collaborative degree landscapes (Kuder et al., 2013). This paper presents empirical findings on the challenges and benefits associated with collaborative postgraduate degree programs in higher education.

The study area is Sub-Saharan Africa, as depicted on Figure 1, with practical inputs gathered from Namibia, South Africa, Zambia, Botswana and Angola. Africa is the world's second-largest and second-most-populous

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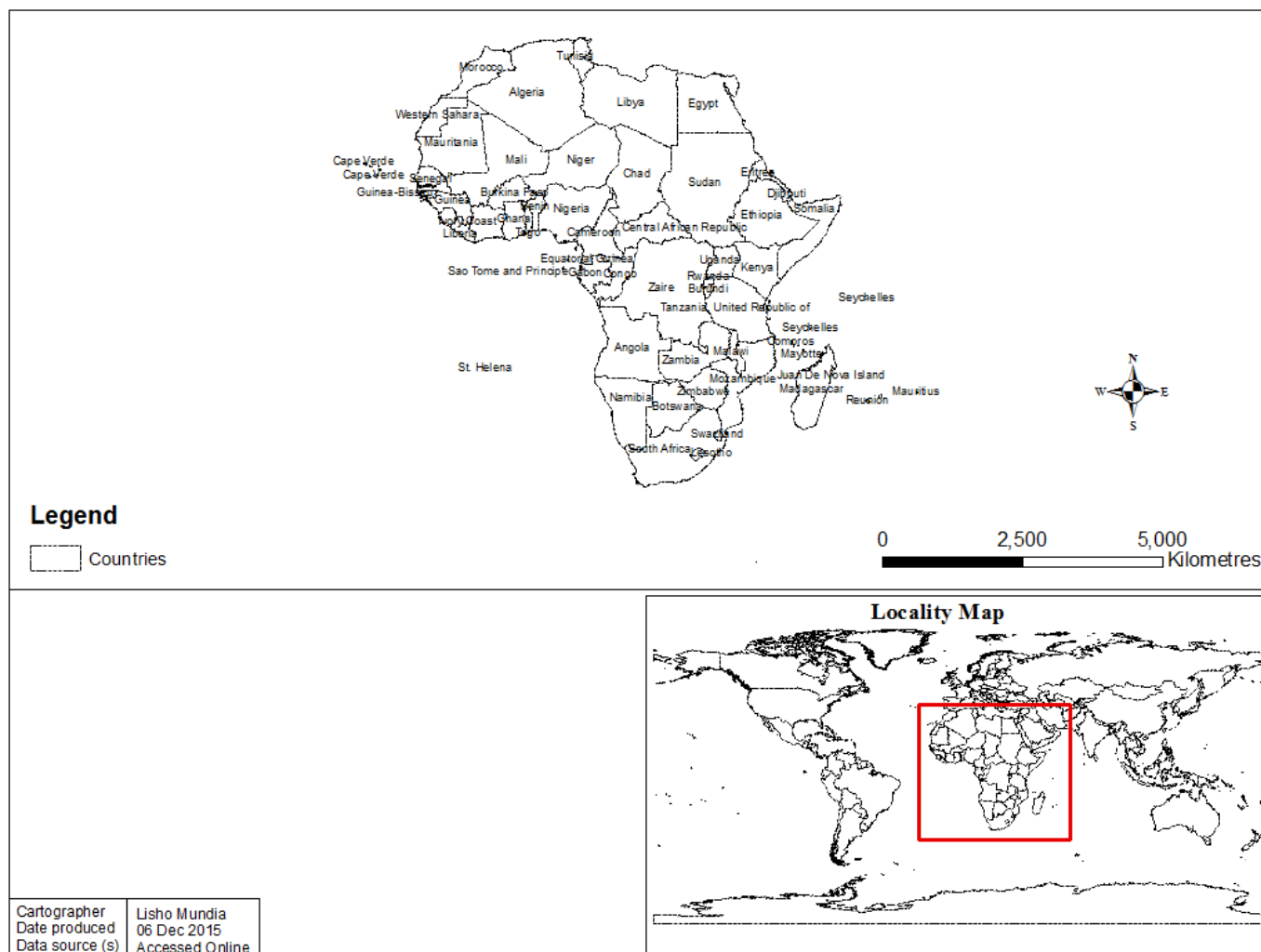


Figure 1. Study area.

continent. University enrolment rates in sub-Saharan Africa are among the lowest in the world, averaging 5%. The correlation between university enrolment rates and national income is strong. No high-income country (other than Switzerland) has university enrolment less than 50%.

Recent graduates of universities all over Africa, surveyed in 2006, described exploding demand for higher education in most African countries, with overflowing classrooms and families pooling money to send one child to college. Rising demand means that students come from a wide range of family backgrounds and incomes. Universities in Africa, as anywhere, can be engines of social mobility.

Just over 30 million square kilometers including adjacent islands cover six percent of earth's total surface area and 20.4% of its total land area. Africa accounts for about 15% of the world human population with 1.1 billion people as of 2013. The continent is surrounded by the

Mediterranean Sea to the north, the Suez Canal and the Red Sea along the Sinai Peninsula to the northeast, the Indian Ocean to the southeast, and the Atlantic Ocean to the west. The continent includes Madagascar and various archipelagos. It has 54 fully recognized sovereign states (countries), nine territories and 2 de facto independent states with limit or no recognition.

## LITERATURE REVIEW

The growing number of international associations, including the International Association of Universities, now includes collaborative degree programs in their frequent efforts to map internationalization (International Association of Universities, 2010; cited in Kuder et al., 2013). Increasing interest in collaborative degree programs is also seen on the agendas of international



higher education conferences, working groups, and expert seminars specifically devoted to this format of internationalization.

These developments clearly illustrate the need for reflection on these complex forms of international collaboration. Kuder et al. (2013) formulate a plea for a more strategic approach to developing joint and double degree programs. Addressing a selected set of challenges, they argued that they often result from a mix of unbalanced expectations and underdeveloped institutional policies.

Several North-South initiatives focus on the development of higher education and research partnerships. Examples are the European Commission's cooperation programs, such as the Erasmus Mundus external cooperation window, which aims to build capacity in the area of establishing and managing international partnerships and increasing student and staff mobility between the European Union (EU) and the South. Another example is the European Commission's Alpha Program, which helps to develop partnerships between EU and Latin American higher education institutions.

International organizations, such as United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Bank are also major players in the development and internationalization of higher education in the South. Many nations, such as Ethiopia, have benefitted from World Bank funding in support of quality assurance initiatives, research projects, and the development of a national higher education strategy. In another example, UNESCO and the New Partnership for African Development, initiated in 2001 by five African Heads of State agreed to strengthen Africa's research capacity by establishing regional networks of up to 30 'centers of excellence' in science and technology in Africa by 2015 at a projected cost of USD 3 billion (Teferra and Knight, 2008). Many international organizations, including UNESCO's International Institute for Capacity Building in Africa, the Commonwealth of Learning and the African Development Bank are also running projects to support open and distance learning offered by institutions in the South (Teferra and Knight, 2008).

US-based foundations, such as the Carnegie Corporation of New York, fund other regional higher education initiatives in the South. From 2000 to 2010, several of these foundations collaborated under a consortium called the Partnership for Higher Education in Africa. The partnership focused on projects that would influence higher education across the continent, such as improving access to information and communication technologies, strengthening higher education research, the creation of regional networks for research and postgraduate training, and the creation of a university leaders' forum. Following the end of the partnership in 2010, the foundations continued their initiatives separately.

Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) is a Regional Science Service Centre in Southern Africa funded through the Federal Ministry of Education and Research of Germany. SASSCAL is a joint initiative of Angola, Botswana, Namibia, South Africa, Zambia, and Germany, responding to the challenges of global change. The establishment of a SASSCAL created benefit for the completely southern African region. It was conceptualized and operationalized to complement the existing outstanding research and capacity development infrastructures and research initiatives in the region. It is an embedded initiative for regional and national research. Among other projects, there is the development of a collaborative postgraduate program in Earth Observation, GIS and Remote Sensing.

Through integration of application-oriented research, policy consultations and capacity development, SASSCAL will contribute substantially towards strengthening and further developing an African knowledge society and, thus, prevent brain drain by creating attractive research facilities in the region. This is to be accomplished by:

1. facilitating academic education and training of African scientists (PhD programs, Graduate Schools, fellowships, among others, in cooperation with existing programs and institutions).
2. specific capacity building (for example seminars, workshops; training of local experts and disseminators including training of non-academic partners).

## MATERIALS AND METHODS

The qualitative research methodology implies the real world of programs, organizations, neighborhoods, street corners and getting close to the people and circumstances to capture what is happening (Patton, 2002). This brings closeness to the subjects which is essential as action can best be understood when it is observed in the setting in which it occurs. Qualitative research explores attitudes, behaviors and experiences through methods such as desktop study and consultations. This research methodology is employed in this study because it provides results that are descriptive in nature. The research methodology was used to get opinions and experiences from participants of different universities in Africa.

Desktop studies have traditionally been used in the collection of secondary data for benchmarking and monitoring progress in different fields of study. The method was used in this study to gather existing secondary data on the challenges and benefits associated with collaborative postgraduate programs in Sub-Saharan African universities. Through desktop study, it was found that very limited literatures exist on collaborative programs.

In this study, consultative meetings were used as a tool to achieve the research objectives of producing challenges and benefits associated with collaborative postgraduate programs in Sub-Saharan African universities. The consultative meetings were held with 16 experts from different countries and various backgrounds such as academic staff members, research fund sponsors, project management, degree programs coordination,

registration and accreditations. The method helped to complement the desktop study method applied in the study and to gather existing information and knowledge relevant to the study.

Six consultative meetings were held, two in Namibia, two in South Africa and two in Zambia with representatives from South Africa, Namibia, Botswana, Angola, Ethiopia and Zimbabwe in most meetings. The consultative meetings also helped the participants acquire more knowledge from the researcher on how to avoid and minimize challenges and benefits associated with collaborative postgraduate programs in Sub-Saharan African universities.

## **FINDINGS, RESULTS AND DISCUSSIONS**

### **Disadvantages and challenges**

Many of the reported challenges point to accreditation. This challenges point to lack of an internationally recognized accreditation system and the burden of bureaucracy. In addition, local laws and governance were also cited as barriers to the accreditation process (Obst et al., 2011).

A number of challenges were unfolded from the experts and desktop study with regard to collaborative degree programs. These challenges evolve around inconsistency administration and management, poor communication, difference in legal systems, lack of funds, difficult to recruitments students and differences in official language.

Inconsistency administration and management were deemed as challenges to likely hinder sustainability, support from national or international organizations, academic calendar, institutional support, negotiating collaborative agreement between partner universities and the duration of the degree program. Main experts raised poor communication between partner universities during consultation meeting. Many cited difference in structure of reporting as the main course of poor communication.

The difference in legal systems also was cited as a challenge. This challenge was cited as critical because some universities in Sub-Saharan Africa were afraid to bid to cumbersome legal systems. Restrictions of funding utilization between countries, limited knowledge to secure adequate funding and inconsistency fee structure between universities were part of the challenges facing the Sub-Saharan African universities for collaborative degree programs.

Difficulty to recruitments students into collaborative master degrees is one of the challenges. This is because of different rules and legislations pertaining to professional boards of the respective degree programs. The language barrier also deprives prospect students to be recruited into the collaborative master's degrees. In few cases, the differences of official languages in Sub-Saharan Africa restrict and delay the willingness to collaborate between universities. This was the case with Angola under SASSCAL task 303 project. Due to language barrier, the project timeframe to identify suitable

universities between Namibia, South Africa, Angola and Botswana elapsed before a university could be identified in Angola.

A number of challenges pertaining to curriculum issues were discussed. It was found that common challenges exist in almost every country with regard to collaborative master degrees. This was a major challenge especially with course-based Masters Degrees. The challenges begins at the curriculum design stage, into accreditation of the program, then credit transfer agreement to the double counting of credits issue of respective universities.

In addition to the challenges, the experts also suggest that collaborative degree programs have disadvantages such as high expensive to maintain and can be cumbersome to maintain as partners universities has different credits and enrolment circles.

### **Advantages and benefits**

A number of benefits were unfolded during the consultation meeting and desktop study. The experts revealed that collaborative degree programs bring out the greater collaboration between faculties and help universities in developing strategic partnership with partner institution.

The study proved that collaborative degree programs increase international visibility of the institution. Furthermore, the programs contribute to improved recruitment of more international students and bring out additional research projects (Obst et al., 2011).

A unique aspect of the collaborative degree programs is the involvement of different faculties and departments that contribute courses and faculty members who will participate in the teaching and co-supervision of students. Students and staff members are exposed to different studying and working environments respectively to get more experience.

### **Suggestions to alleviate the disadvantages and challenges**

Dealing with collaborative degree programs requires consistent participatory techniques. Different experts consulted during the study believes that there is a need for a process that should meet multiple and mutually exclusive objectives. Among the exclusive objectives are that there is a need to increase the strategic alignment of individual university initiatives with the priorities of the involved universities (Chevallier, 2013). Maintaining shared governance between universities and reducing unnecessary administrative work in the program implementation phase are some of the objectives for suggestion. There is also a need for increasing buy-in between involved universities, and reducing program

setup time.

Some of the suggestions to avoid many challenges during collaborative degree programs are that the degree programs should be accredited in both countries and a coordination office at each university are established. The experts revealed that the collaborative universities should ensure to implement flexible teaching and learning environment, such as block release teaching. Other suggestions are that the universities should strengthen the staffs and students mobility as much as possible to allow diverse knowledge exchange and acquisition. In addition, it is important to lobby support from both national and international stakeholders and to ensure that the program have sponsors at least for the first cohort.

### Conclusion

Sponsored collaborative postgraduate programs have a number of advantages. In addition to financing the program, the sponsor(s) facilitates curriculum development, joint enforcement of standards, and movements of student and staff members. It also provides support for improved teaching facilities, library services, and general management for the joint administration of the program.

Collaborative postgraduate programs are highly supported by the findings of this study as there provide opportunities to international students' communities beyond the host nations. Collaborative postgraduate programs attract international prospective students to study-abroad.

### CONFLICT OF INTERESTS

The author has not declared any conflicts of interest.

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*Full Length Research Paper*

# The problem-based learning process: Reflections of pre-service elementary school teachers

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This study aims to identify the benefits acquired by third-year pre-service elementary school teachers participating in a problem-based learning process in social studies education, the issues they encountered in that process and those they are likely to encounter, and their feelings about the process. Semi-structured interviews were used as one of the qualitative research methods. During the 2014 to 2015 academic year, problem situations related to the subjects of “Historical Values” and “Being a Child in Africa” were studied for five weeks through problem-based learning in the social studies education course. At the end of the process, 16 pre-service teachers with perfect attendance and active participation were interviewed. The interviews were recorded on tape recorders. The obtained data were analyzed via content analysis. The results indicate that problem-based learning (PBL) offers positive reflections/benefits to pre-service elementary school teachers in terms of learning, democracy education, and skills acquisition in social studies education classes. Although one participant considered the course unproductive, the pre-service teachers mostly had positive opinions regarding the problem-based learning process.

**Key words:** Problem-based learning (PBL), benefits, issues, social studies, elementary school teacher.

## INTRODUCTION

Social studies is one of the most important courses used to foster the type of individuals who are equipped to meet the needs of our age. Social studies courses have been defined several times in the literature. The US National Council for the Social Studies (NCSS) defines social studies as follows: “The integrated study of the social studies and humanities to promote civic competence” (Savage and Armstrong, 1996; Öztürk, 2012).

In Turkey, social studies courses are defined as: “an elementary school course, formulated with the understanding of collective education, which embodies

such social sciences as history, geography, economics, sociology, psychology, philosophy, political studies and law as well as citizenship subjects, involves uniting all learning areas under one unit or theme, and includes the examination of humans’ interactions with their social and physical environment within the context of past, present, and future” (MoNE, 2005).

Doğanay (2004) defines social studies as “an area of study which, by utilizing the content and methods of social sciences and other humanities, handles humans’ interactions with their social and physical environment

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within the framework of time dimension and in an interdisciplinary approach in order to raise reasonable, skilled, and democratic citizens who are equipped with fundamental democratic values one needs to survive in a globalizing world.”

The common point in all these definitions is the role of social studies in raising democratic citizens. Universal goals should be attained for a democratic society. These goals are:

1. Knowledge acquisition
2. Learning how to use information analytically / processing information
3. Having proper attitudes, values, and feelings / examining beliefs and values, and
4. Taking action/playing an active role as a citizen (Barth and Demirtaş, 1997).

However, under today's conditions, knowledge acquisition cannot be considered adequate in the teaching of social studies. Indeed, socio-economic changes and developments, as well as developments and changing approaches in the educational sciences, have brought about the need for constant change and transformation of social studies curricula.

In the social studies curriculum put into practice by the Ministry of National Education in Turkey in 2005, the aim was for students to transcend knowledge, use knowledge in new settings, transform knowledge into skills, form their own values, and acquire the attitudes and behaviors of a responsible citizen (MoNE, 2005).

How can this be realized? All the practices expected to be carried out in this course aim to allow students to use knowledge, position them to think, and help them to become social and responsible students whose behaviors reflect what they have learned. Therefore, constructivist learning theory and methods, techniques, and tools that can ensure the active engagement of students have frequently been brought to the agenda. In this regard, problem-based learning (PBL) attracts the attention of educators as an approach that can be adopted in social studies education.

Problem-based learning was first developed by John Dewey in the early 1900s, and was first used in the area of medicine (Rhem, 1988; Chapin and Messick, 1992). Although PBL has a long history, it was first used at the University of McMaster in Ontario, Canada in 1969 and later on the number of universities using this method increased (Checkley, 1997). This approach, apart from in the area of medicine, also gained popularity in engineering, architecture, economics, social studies, and hence education in the 1980s (Azer, 2009; Hansen, 2006; Reynolds, 1997). PBL began to be used in elementary and secondary education in the 1990s (Sage, 1996 cited by Koçakoğlu, 2010). It has become an increasingly popular subject in the literature and has

been addressed in studies since the curriculum regulations of 2005 in Turkey.

By means of the featured PBL, students confront a complex situation or case, and they undertake or become responsible for the situation. A program is developed regarding the problem so that students engage in a proper learning process in which they can grasp correlations. Teachers select a real life problem and direct various questions to students. Then, a learning environment is created in which teachers urge students to engage in a self-struggle of learning and offer them cognitive guidance (Karen and Downing, 2013; Loyens et al., 2011; Tan, 2003; Torp and Sage, 2002).

Schuncke (1988) identifies three main problem-solving approaches: exploration, inquiry, and decision making. He puts the research model steps of these approaches in order as follows:

1. Determining the problem
2. Formulating hypotheses
3. Planning the data gathering process
4. Gathering data,
5. Examining, analyzing, and evaluating data
6. Rejection or approval of the hypotheses, and (vii) making a generalization.

The process elaborated earlier is not a process in which one needs information to define and solve the problem but is contented with the existing information. It is a process in which gathered information needs to be reorganized so that it serves the solution to the problem; that is, there is a need for thinking, planning, discussion, review, and re-informing.

Being “informed” in the information age means developing learning capacities, being able to use information, obtaining new skills, and turning this into a consistent form of behavior (Yıldırım, 2001). All the skills obtained should respond to the needs of both the individual and society. On the one hand, these skills should organize and harmonize the relationship between the individual and society; on the other hand, they should equip the individual with the cultural and psychological competence that they need in order to be at peace with themselves, with society at large, and with the universe (Balay, 2004).

Social studies classes aim not only to raise citizens of today, but to achieve this via the most effective means. Such practices as PBL can be utilized to gain the skills required in social studies classes. Teachers' and pre-service teachers' opinions about this approach appear to be important in achieving the active use of PBL in classroom settings.

The present study, in considering the social studies course content, organization, and goals, aims to identify pre-service teachers' benefits, experienced/potential issues, and feelings about problem-based learning

implemented in social studies education classes. To this end, an attempt was made to answer the questions below:

- i. What are the pre-service elementary school teachers' positive reflections/benefits concerning the PBL process conducted in social studies education classes?
- ii. What are the pre-service elementary school teachers' negative reflections/issues concerning the PBL process conducted in social studies education classes?
- iii. How do the pre-service elementary school teachers feel about the PBL process conducted in social studies education classes?

## METHODOLOGY

This is a case study. Case study, which is a qualitative research method, was employed in this study. The most prominent aspect of a case study is the thorough investigation of a single or multiple cases. The components of a new case (for example, setting, individuals, cases, processes) are explored and focus is placed on how they affect or are affected by the present situation (Yıldırım and Şimşek, 2013).

Semi-structured interviews were carried out with the pre-service teachers. In this method, interviewers prepare the questions to be asked before the interview; however, they can change the flow of the interview by asking different questions or sub-questions and they can encourage the interviewee to elaborate on or explain their answers. If the interviewee replies to certain questions within another question, then these questions can be omitted. Therefore, semi-structured interviews offer flexibility to interviewers and also enable interviewees to actively participate in the interview and give unconstrained responses (Türmüklü, 2000; Kuş, 2003).

In this study, an attempt was made to determine the pre-service social studies education teachers' opinions about the PBL process conducted in social studies education classes through semi-structured interviews.

### Study group

This study handles the PBL process conducted in social studies education classes at the Department of Elementary Education of faculty of education through a single case design. For this reason, it used convenience sampling. Convenience sampling (also known as Haphazard Sampling or Accidental Sampling) is a type of nonprobability or nonrandom sampling whereby members of the target population that meet certain practical criteria, such as easy accessibility, availability at a given time, or the willingness to participate, are included for the purpose of the study (Dörnyei, 2007).

Before the determination of the sample, 50 third-year pre-service teachers from the faculty of education were given theoretical information during the 2014 to 2015 academic year about how to use PBL in social studies education classes and they were engaged in hands-on activities. Later on, 16 voluntary pre-service teachers who actively participated in these classes formed the study group of the study and attended semi-structured interviews. Ten out of 16 members of the group were female students, while the remaining 6 were male students.

In the present study, criterion sampling, which is a purposive sampling method, was adopted. In this sampling method, the relevant criterion can be developed by the researcher (Yıldırım and

Şimşek, 2013). The criterion of the present study was taken as the active participation of pre-service teachers in both PBL processes. The sample size was kept small so that more detailed information could be obtained by using qualitative data gathering techniques more efficiently. For the sake of research ethics, the participants' names were kept confidential. Thus, the participant pre-service teachers were called Pre-service Teacher 1, Pre-service Teacher 2, Pre-service Teacher 3, and so on.

The aim of the study was not to generate general theories or generalize findings to a larger sampling. On the contrary, its aim was to reveal the opinions of the pre-service teachers from the aforementioned-mentioned department regarding the case mentioned.

### Implementation of PBL/procedure

The entire implementation process lasted for 15 h. Initially, detailed information was gathered on the issue and research was done on various sources. As social studies education is a course in which different problems/cases can be handled due to its content, two convenient problems were chosen and the steps of PBL were planned. One researcher prepared a work file to manage and evaluate the PBL session. The pre-service teachers were informed that the PBL would be held in five-week period (two different processes lasting three weeks and two weeks respectively). The pre-service teachers were given a detailed presentation about PBL. The steps and characteristics of the process were explained with the help of PowerPoint presentations. The pre-service teachers were divided into groups of five (social studies education classes last for three hours a week in higher education). Implementation was carried out in five block classes without any breaks (three + two sessions). In each process, the steps followed are presented in Table 1.

#### First PBL process

To help the students feel the problem, a PowerPoint presentation was prepared by using articles taken from newspapers at different times. Some headlines from the newspapers were: "Karun to be Robbed", "I said. They didn't Care," "A Great History Exploded," "In a Police Operation, A 3600-Year-Old Privy Seal is Found." All the news was about the failure to protect historical works in Turkey. After examining and discussing the news, the pre-service teachers defined the problem. The groups considered choices related to the problem, gathered information from different sources, and brought this information to the classroom. They prepared a report on the reasons for the failure to protect historical works in Turkey and made short oral comments. Evaluation was also made on the process. This took a total of two weeks.

#### Second PBL process

A photo titled "*Being a Child in Africa*" and sections from two reports constructed through an internet search were presented to the pre-service teachers as the problem situation so that they could feel the problem. In the photo, there was an unhappy, underweight child with no clothes on and behind the child there was a barren landscape, representing famine and poverty. After discussing the photo using the 5W1H questions, the pre-service teachers were asked to read the following reports as presented in Table 2.

The pre-service teachers tried to detect the problem by combining their inferences from the photo and reports. Meanwhile, they were asked to draw a fishbone diagram and write the

**Table 1.** Steps followed.

I	II	III	IV	V	VI	VII
Feeling the problem →	Determining the problem →	Formulating hypotheses →	Gathering data →	Data analysis →	Evaluation of the hypotheses →	Result

**Table 2.** Questions read.

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**Information report I**

**World Health Report**

Barry Mason

12 January 2004

Worldwide an estimated 10 million children are dying unnecessarily every year. Most of these preventable child deaths occur in developing countries—half in Africa. Of the 20 countries with the highest child mortality rates, 19 are in Africa, the only exception being Afghanistan.

Rates of child mortality in some countries are also increasing. While the global trend is for child mortality to decline, 16 countries, of which 14 are in Africa, have higher rates than in 1990. In nine countries, of which eight are in Africa, the child mortality rate is higher than those recorded over 20 years ago.

**Source:** <https://www.wsws.org/en/articles/2004/01/whor-j12.html> accessed on 15.09.2009

**Information report II**

Ann M. Veneman/UNICEF Executive Director

02 June 2008

“Community-level integration of essential services for mothers, newborns and young children, and sustainable improvements in national health systems can save the lives of many of the more than 26,000 children under five who die each day”.

**Source:** [http://www.unicef.org/media/media\\_42643.html](http://www.unicef.org/media/media_42643.html) accessed on 15.09.2009

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sentences they agreed upon on the head of the fish. The problem sentences of the groups were such as “What are the reasons for the rising child death rates in Africa?” First, they attempted to reply to this question themselves and took notes on the bones of the fish. After that, they conducted research on the validity of the reasons they had come up with and checked the accuracy of their predictions.

Each group prepared their own report with the help of the sources they had used. At the beginning of the process, the pre-service teachers were assigned as “United Nations Security Council Employees.” At the end, they were asked to prepare a one-paragraph message for the Secretary General of the United Nations Security Council to read to the World about the reasons for the death of African children. The groups gave presentations about the process and read their messages to the class. They also actively participated in the evaluation process through both self-evaluation and peer evaluation. The second PBL process took a total of three weeks.

**Gathering data**

Data were collected via semi-structured interviews. The best data collection method for finding answers to the research questions of the study was considered to be the interview technique. The interview technique is very useful in obtaining information regarding the experiences, attitudes, opinions, complaints, feelings, and beliefs of interviewees (Briggs, 1986).

The interviews were conducted by using the pre-defined interview form prepared for the present study. In order to check the content validity of the interview form, it was reviewed by two social studies teachers and two elementary school teachers, who were specialized in the area. In addition, pre-interviews were carried out with two pre-service teachers. In this way, it was checked whether the pre-service teachers understood the questions on the form or not.

After that, some of the interview questions were refined. Interviews were carried out with each pre-service teacher separately and were recorded on tape recorders. In this way, data loss or inaccurate data collection was prevented. An attempt was made to ensure that the pre-service teachers would not be affected by the researcher when answering questions. The interviews took 5 to 13 min. Each participant engaged in an average eight-minute-long interview. All the interviews, taking 143 minutes in total, were recorded on tape recorders. Later on, the records were transcribed and converted into Microsoft Word documents. These texts were then given to the participants for them to confirm the completeness and accuracy of the documents. In this way, data reliability was ensured.

**Data analysis**

Data were subjected to content analysis. Content analysis is described as a repeatable and systematic technique in which some words of a text are summarized under smaller content categories in

**Table 3.** Pre-service teachers' opinions about PBL.

Theme	Code	Frequency (f)	Percentage
Positive reflections	Benefits for learning	81	27.4
	Benefits for democracy education	75	25.3
	Benefits for skills acquisition	83	28.1
Negative reflections/Issues	Issues with problem situation	10	3.3
	Issues with data gathering tools	5	1.7
	Issues with group work	15	5.1
	Issues with possibilities	11	3.7
Emotional status	Positive feeling	15	5.1
	Negative feeling	1	0.3
	Total	296	100

accordance with some codes that are based on specific rules (Büyüköztürk et al., 2008).

The main procedure in content analysis is to unite the similar data in the study around certain concepts and themes, and organize them in a way readers can understand (Yıldırım and Şimşek, 2013). Raw data from the interviews were coded and categories were identified. These data were then classified and made meaningful under these categories.

Another specialist who had a PhD in elementary school education was consulted for help in coding and categorizing. Based on the research problem and purposes, unnecessary codes were omitted and new codes were added in appropriate parts. In naming the categories, the researcher cooperated with the other specialist. Conflicts were resolved by means of discussion, thereby achieving a high level of agreement on all the codes and categories (Tavşancıl and Aslan, 2001).

Defined sub- and super-categories were modeled by giving due consideration to the relationships between them. The qualitative data were made quantitative by calculating frequencies and percentages. The resultant data consisted of 41 pages. At the end of this process, three main categories, nine sub-categories under these three main categories, and 51 sub-categories under these nine sub-categories were identified. The main categories included positive reflections/benefits concerning PBL, negative reflections/issues concerning PBL, and feelings about the PBL process.

The matters of "agreement" and "disagreement" between the researcher and other specialist were identified. The percentage of agreement, which is considered to represent the reliability of the research, was found to be 90% by using the reliability formula suggested by Miles and Huberman (1994).

## FINDINGS

In this section, the findings of the research are organized based on the order of questions in the sub-purposes of the study. The participating pre-service teachers' opinions fell under three titles: positive reflections/benefits concerning PBL, negative reflections/issues concerning PBL, feelings about the PBL process. These titles are presented one by one in

the table below and some quotes are also given from the pre-service teachers' comments so that the (internal) reliability of the study is ensured and readers can better comprehend the quantitative data.

It is seen that all the participant pre-service teachers mentioned the positive aspects of PBL. As shown in Table 3, the pre-service teachers' positive reflections fall under three titles: benefits for learning, benefits for democracy education, and benefits for skills acquisition.

### Positive reflections/benefits

Those who mentioned the benefits of PBL for learning, as shown in Table 4, stated that their motivation/interest/curiosity grew (16 participants); they learned through hands-on/active engagement (16 participants); they gained consciousness on the issues (12 participants); they learned by making connections to real life (11 participants); they gained enduring knowledge (10 participants); they exchanged information (10 participants); they gained concrete knowledge (2 participants); they engaged in interdisciplinary learning (2 participants); they learned how to solve their problems (2 participants). In the table below, some quotes are given from the pre-service teachers' answers. All the pre-service teachers stated that their eagerness for learning increased during the PBL process. For example, one of them uttered the following sentences regarding how this process enhanced their motivation:

*"... as one explores, his sensitivity increases and also the eagerness for learning, interest, and motivation increase. As a result, the class environment changes. One desires to learn and dependence on the teacher declines."* [Pre-service Teacher 12].



**Table 4.** The pre-service teachers' benefits in terms of learning in the PBL process.

Benefits of PBL for learning	Frequency (f)	Percentage
My motivation/interest/curiosity grew.	16	19.8
I learned through hands-on/active engagement.	16	19.8
I gained consciousness about the issues.	12	14.8
I learned by making connections to real life.	11	13.5
I gained enduring knowledge.	10	12.3
I exchanged information.	10	12.3
I gained concrete knowledge	2	2.5
I engaged in interdisciplinary learning.	2	2.5
I learned how to solve my problems.	2	2.5
Total	81	100

**Table 5.** The pre-service teachers' benefits in terms of democracy acquisition in the PBL process.

Benefits for democracy acquisition	Frequency (f)	Percentage
Respect	16	18.8
Collaboration	16	18.8
Equality	16	18.8
Tolerance	15	17.6
Responsibility	9	10.6
Justice	6	7.1
Honesty	4	4.7
Freedom	2	2.4
Rule of law	1	1.2
Total	85	100

The pre-service teachers often emphasized that they achieved enduring learning. For instance, one of them made the following remarks about the endurance of the process when compared to traditional methods:

*"In traditional methods, students have nothing. We are given both the causes and effects. Nobody encourages thinking. During the exam season, we just study questions. There is no benefit or endurance. In this approach, however, as I previously said, we handle the problem as a problem of our own and so gain more benefits (Pre-service Teacher 5).*

Another frequent answer of the pre-service teachers related to the exchange of information with one another. One of the teachers said:

*"We did research, made observations, and through group work exchanged information with our colleagues" (Pre-service Teacher 3)*

In addition, two pre-service teachers expressed that they

learned how to solve their problems. One regarded this as the most important benefit of the process:

*"To me, the most important benefit of the process is that students are able to offer alternatives on daily life cases and situations and they are also able to solve their problems on their own" (Pre-service Teacher 13)*

The participants deemed the benefits of democracy acquisition as: respect (16 participants), collaboration (16 participants), equality (16 participants), tolerance (15 participants), responsibility (9 participants), justice (6 participants), honesty (4 participants), freedom (2 participants), and rule of law (1 participant). Some quotes from the pre-service teachers' answers are presented in Table 5.

As shown in Table 5, all the pre-service teachers participating in the study agreed that the process contributed to the development of respect, a value of democracy. The participants were of the opinion that PBL would develop respect for different opinions, human rights, the environment, and individual differences. One

of the participants added in their remarks that they came to realize the differences in points of view from region to region, and that they had to show respect for this:

*"...one notices something, oh, how different his point of view is with respect to mine, but anyway I have to respect him; because, although we live in the same country, we are from different regions. Really, East and North... for example, I'm from the Black Sea region. I saw how different the Black Sea and Central Anatolian aspect to the issue was. I said oh, there is nothing I can do about it; this is the way he has grown up, I have to respect that"* (Pre-service Teacher 14).

The pre-service teachers said that they acted fairly throughout the process, and that the process encouraged just behavior. One of the participants' remarks in which they emphasized justice, tolerance, respect, and collaboration is worthy of attention:

*"We gave rights to everyone, this was a just behavior. Our colleagues shared their comments all the time. We were expected to select a leader. Everyone used their right to vote and we selected a leader. This was also a just act. There was tolerance. Nobody broke the heart of another. We all worked for the solution to the problem and nobody broke the heart of another. This was a very important point. Everyone respected each other. We collaborated because we worked together as a group to solve a problem. We had to do this together. And there was collaboration"* (Pre-service Teacher 4).

A pre-service teacher said that the issue had an aspect related to the rule of law:

*"... as it is a matter about our cultural values, it is associated with respect for the environment and rule of law. As it involved smuggling, justice was neglected. In other words, it was something that was done in illegal ways; therefore, it was also about justice..."* (Pre-service Teacher 1).

The participants thought that the benefits related to knowledge acquisition were as follows: research (14 participants), communication (13 participants), problem solving (9 participants), critical thinking (8 participants), decision making (7 participants), empathy (6 participants), creative thinking (6 participants), social participation (5 participants), self-confidence (3 participants), planning (2 participants), expressing oneself freely (2 participants), language skills (2 participants), using time effectively (1 participant), entrepreneurship (1 participant), making inferences (1 participant), predicting the future (1 participant), understanding time and chronology (1 participant), and consistency (1 participant). Some quotes from the pre-

service teachers' answers are presented in Table 6.

According to Table 6, the most frequently mentioned skill that the pre-service teachers believed to be developed by the process was research skills. For example, a participant's statement that it was the first time they had done research willingly is worthy of attention:

*"... I did research for the first time. I was really curious, that is my curiosity arose. I went and did research, came back, and shared my findings with my friends. I prepared a text here and we formulated the hypotheses together. And, in fact, I warned friends who did not want to contribute, saying 'we should try to do something together'"* (Pre-service Teacher 4).

The pre-service teachers also often stated that their empathy skills flourished in the process. One said that they put themselves in the shoes of an individual who was to deal with a problem:

*"When I think about the process, I feel like my empathy skills have flourished"* [Pre-service Teacher 1]. One of the participant pre-service teachers said that the process also enhanced consistency: *"...consistency, there is also consistency: as you research, you also gain proof and it becomes consistent with your opinion"* (Pre-service Teacher 16)

### **Negative reflections/issues**

Negative reflections concerning the PBL process fell under four categories. These issues were related to the problem situation, gathering data, group work, and possibilities. Regarding the problem situation, the most frequent answer was that it might not be applicable to all subjects (4 participants), and the least frequent answer was that the scope of the subject was too large to handle (1 participant). Regarding the gathering of data, the most frequent answer was that information sources might not be found (3 participants) and the least frequent answer was that the scope of the subject was too large to handle (1 participant). Regarding group work, the most frequent answer was that not all group members would fulfill their own duties (5 participants) and the least frequent answer was that teachers might not be successful in guidance (2 participants). Regarding the possibilities, the most frequent answer was that school facilities might not be sufficient (9 participants) and the least frequent answer was that the class size might be too large (1 participant) and that a time shortage might occur (1 participant) (Table 7). The most frequently discussed challenge among pre-service teachers was that PBL might not be applicable to all subjects (4 participants). For example, one participant regarded this as the biggest challenge of PBL:

**Table 6.** The pre-service teachers' benefits in terms of skills acquisition in the PBL process.

<b>Benefits of skills acquisition</b>	<b>Frequency (f)</b>	<b>Percentage</b>
Research	14	16.9
Communication	13	15.7
Problem solving	9	10.8
Critical thinking	8	9.6
Decision making	7	8.5
Empathy	6	7.2
Critical thinking	6	7.2
Social participation	5	6.1
Self-confidence	3	3.6
Planning	2	2.4
Expressing oneself freely	2	2.4
Language skills	2	2.4
Using time effectively	2	2.4
Entrepreneurship	1	1.2
Making inferences	1	1.2
Predicting the future	1	1.2
Consistency	1	1.2
<b>Total</b>	<b>83</b>	<b>100</b>

**Table 7.** The pre-service teachers' negative reflections/limitations concerning the PBL process.

<b>Negative reflections/ limitations</b>	<b>Frequency (f)</b>	<b>Percentage</b>	
Issues with the problem situation	It might not be applicable to all subjects	4	9.5
	Not everyone might be interested in the problem	3	7.1
	The problem might not be appropriate for students' levels.	1	2.4
	Everyone might have a different understanding of the problem	1	2.4
	The scope of the subject was too large to handle	1	2.4
Issues with gathering data	Information sources might not be found	3	7.1
	Methods of research might not be known	1	2.4
	It may not be possible to do sufficient research	1	2.4
Issues with group work	Not all group members would fulfill their duties	5	11.9
	There might be too much noise	5	11.9
	Each individual has a different point of view/inference can cause problems	3	7.1
	Teachers might not be successful in guidance	2	4.8
Issues with possibilities	Families might not be good at guidance	1	2.4
	School facilities might not be sufficient	9	21.4
	Class size might be too large	1	2.4
	Time shortage might occur	1	2.4
<b>Total</b>	<b>42</b>	<b>100</b>	

"...we may not be able to directly adapt it to all subjects. I mean, we cannot tailor it in accordance with all subjects. This is the biggest problem..." (Pre-service Teacher 3).

The only pre-service teacher who was of the opinion that the large scope of the subject matter might be a challenge expressed his opinion as follows:

*“(the) limits of the subject should be defined; otherwise the subject could drift away from its core and therefore it is important to set the limits of the subject. Limiting the scope of the subject is important in reaching information”* (Pre-service Teacher 12).

The pre-service teachers also stated that there might be some issues in gathering data. The most frequent issue expressed by the pre-service teachers was that information resources might not be found (3 participants). For example, one participant said:

*“We couldn’t find much information about the subject matter because, you know, there weren’t many books on the subject. There’re only newspaper articles and only some old pieces of news online; laws are not enough. So we were so limited, but, I mean it was because of the subject. If it had been another subject, we could have done more research”* (Pre-service Teacher 14)

Regarding group work, the most frequently articulated issue was that not all group members would fulfill their duties (5 participants). For example, one participant stated the following:

*“... from the perspective of group work, some members of the group might be more dominant and some might be more passive and some might not have fulfilled their own duties...”* (Pre-service Teacher 2).

The least frequently mentioned issues were teachers’ (2 participants) and families’ (1 participants) failure to provide guidance. For example, one of the pre-service teachers expressed the teacher-related guidance issue as follows:

*“... it cannot be achieved without a good teacher. Friends would be disconnected. In this case, as there would be no classroom management, I don’t think it would be a productive process”* (Pre-service Teacher 4).

A pre-service teacher, on the other hand, mentioned the family-related aspect:

*“Only in families... in the new education system, teachers are just guides. Similarly, parents should also only be guides. They should not carry out the whole task themselves”* (Pre-service Teacher 6)

Nine pre-service teachers indicated that schools in which PBL practice is conducted might lack proper facilities. One of them said:

*“Possibilities, school facilities, and classroom facilities can be added. If students, perhaps, are not, at that time, in a good condition either financially or psychologically,*

**Table 8.** The pre-service teachers’ feelings regarding the PBL process.

Feelings	Frequency (f)	Percentage
Positive feeling	15	93.8
Negative feeling	1	6.2
Total	16	100

*we then may not be able to achieve the desired productivity”* (Pre-service Teacher 4).

Regarding possibilities, one participant thought shortage of time might pose a challenge. Both large classroom size and shortage of time were regarded as issues (1 participant):

*“For example, some classes are too crowded. I mean, if the class size is like 60 people, it is not really possible to apply this. I mean, we may run short of time. There are 40 minutes, but 60 students. It is not applicable”* (Pre-service Teacher 1).

## Feelings

The reflections of the PBL process on feelings fall under two categories. It is seen that most of the participant teachers had positive feelings (15 participants). There was only one participant who, in addition to positive feelings, had some negative feelings. Table 8 presents the findings concerning feelings. As shown in Table 8, the pre-service teachers reported finding PBL fun, liked the group work, felt curious when doing research, and were happy. For example, one participant made the following statement about the process:

*“Yes, certainly, about pleasure, I can say as it is group work, one is not overloaded with excess information, but instead collaborates. This is the enjoyable part of it...”* (Pre-service Teacher 8).

One participant, on the other hand, expressed her negative feelings due to leaving all responsibility to the students, the group work, and noise as follows:

*“I feel it is like the teacher isn’t there and as if nobody learned anything..., ... I mean, it is a little bit frivolous, I feel...Leaving all the classwork to students does not feel, I don’t know, right. It is like wasting the class time”* (Pre-service Teacher 8).

The fact that only one participant had negative feelings shows us that most of the time pre-service teachers enjoyed PBL and had positive feelings.

## CONCLUSION AND RECOMMENDATIONS

The pre-service teachers' reflections on the PBL process in social studies education appeared in three main categories: positive reflections/benefits, negative reflections/issues, and feelings.

Their positive reflections on the process fell under the categories of learning, democracy education, and skills acquisition. Their reflections on learning were increased motivation/interest/curiosity, learning through hands-on/active engagement, gaining consciousness about the issues, learning by making connections to real life, gaining enduring knowledge, exchanging information, gaining concrete knowledge, engaging in interdisciplinary learning, and learning to solve problems. Their reflections on democracy education focused on the development of respect, collaboration, equality, tolerance, responsibility, justice, honesty, freedom, and rule of law. Their reflections on skills acquisition, on the other hand, concentrated on the acquisition of skills concerning research, communication, problem solving, critical thinking, decision making, empathy, critical thinking, social participation, self-confidence, planning, expressing oneself freely, language skills, using time effectively, entrepreneurship, making inferences, predicting the future, and consistency.

The present study indicates that many pre-service teachers consider PBL useful. The findings of the study show that PBL also influences learning, democracy education, and skills acquisition. The fact that the findings of the study are positive in general is also compatible with the results of other studies carried out in Turkey on social studies (Baysal et al., 2011; Deveci, 2002), science (Akinoğlu and Özkardeş-Tandoğan, 2006; Bayrak, 2007; Gök and Silay, 2008; Tatar et al., 2009), and mathematics (Biberici and Başer, 2012), reporting that PBL arouses positive feelings in students.

The related literature in Turkey and PBL studies worldwide reports that skills are developed in PBL; however, in each study it was seen that one or more skills are developed through PBL. For example, there is a wide range of research proving that PBL has positive effects on the following skills: collaboration skills (Akpınar and Ergin, 2005), collaboration and critical thinking skills (Cantürk-Günhan and Başer, 2009b), collaboration, communication, and problem solving skills (Sümbül et al., 2007; Tatar et al., 2009), communication skills (Budak et al., 2009), research skills (Uluyol, 2009), communication, research, problem solving, and self-management/self-efficacy skills (Cantürk-Günhan and Başer, 2009a), problem solving skills (İnce-Aka et al., 2010; İnel and Balım, 2010), critical and creative thinking skills (Yenilmez and İşgüden, 2007), creative thinking skills (Yaman and Yalçın, 2005a), self-management/self-efficacy skills (Kaptan and Korkmaz, 2002; Yaman and Yalçın, 2005b).

In addition, Norman and Schmidt (1992) and Haron and Major (2004), dealing with students' perspectives on PBL, revealed that this process develops the problem-solving, research, and collaboration skills of students. Boud and Feletti (1997) discovered that PBL boosts students' skills in communication, accessing and using research sources, and engaging in group work. Hendry et al. (2003) as well as Chin and Chia (2004) also achieved similar results in their studies. Shepherd (1998) in an empirical study, detected that PBL increased creative thinking skills in his experiment group.

In this sense, the present study yielded worthwhile results in that it brought together the findings of many different studies. Using PBL in social studies education is useful as it can enable most of the benefits that are desired to be taught in the curriculum to be achieved simultaneously. In social studies classes, the acquisition of democratic values is important. In Turkey, the acquisition of citizenship values is ensured through social studies education. It is important that social studies classes help raise democratic individuals.

The pre-service teachers had negative reflections on PBL related to the problem situation, gathering of data, group work, and possibilities. According to them, the following can be regarded as problems of the PBL process: PBL might not be applicable to all subjects, not everyone might be interested in the problem, the problem might not be appropriate for students' levels, everyone might have a different understanding of the problem, the scope of the subject might be too large to handle. As to the gathering of data, that information sources might not be found, that methods of research might not be known, and that it may not be possible to do sufficient research can be deemed as issues, according to the pre-service teachers. When it comes to group work, they think the fact that not all group members fulfill their own duties, that there might be too much noise, that each individual has a different point of view/inference, that teachers might not be successful in providing guidance, and that parents might not be good at providing guidance could be regarded as issues. In regard to possibilities, the pre-service teachers noted the following issues: school facilities might not be sufficient; class size might be too large; time shortages might occur.

In their study titled "A Qualitative Evaluation of the Problem-based Learning," Biberici and Başer (2012) aimed to define the opinions of education directors and students regarding the process at faculties where problem-based learning was used in mathematics classes. At the end of the study, it was found that the PBL process enhances collaboration, communication, problem solving, and research skills. Their findings are compatible with the findings of the current study in that they concluded that the process would involve such problems as poorly-prepared scenarios, lack of research competence, lack of group harmony, lack of expert

education directors, and shortage of time as its negative reflections.

In their study titled “*PBL in the Era of Reform Standards: Challenges and Benefits Perceived by Teachers in One Elementary School*,” Nariman and Chrispeels (2015) attempted to explain the benefits and challenges of a PBL-based program they had implemented in a summer school for three weeks. According to the results of that study, although the students helped each other and learned from each other through collaborative group work, there occurred some challenges.

In some classes, it was seen that all the responsibility was undertaken by just one or two students, and not all students took on the research duty. Hence, there was no equality in roles and responsibilities. Moreover, it was seen that the teachers lacked proper strategies to overcome such challenges. They complained about the high levels of noise, while the students had difficulty listening to their group mates. It was also stressed that there might also be some difficulties in finding an appropriate problem.

Therefore, the findings of the present study are consistent with the study described, as it concluded: “*Not all group members would fulfill their own duties*” and “*there might be too much noise.*” Participants’ feelings about PBL fell under two categories. The pre-service teachers were seen to have positive feelings most of the time. İnel and Balım (2010) report that the participants of the PBL process enjoy themselves a lot, and take pleasure in participating in the process.

Again, Uluyol (2009) concluded that learners enjoy learning in this approach. Two limitations of the study can be mentioned. The fact that the participant pre-service teachers did not have prior PBL experience can be considered the first limitation of the study. The second limitation, on the other hand, is the fact that interviews with the pre-service teachers were quite short in duration (5 to 13 min.). In light of the findings of the present study, the following recommendations can be suggested:

1. In view of the positive results about learning, PBL practices can be employed more frequently in order for pre-service teachers to participate eagerly in classes, learn in connection with current problems and thus real life, experience problem solving, and enhance their skills.
2. PBL can be used as frequently as possible to build positive attitudes towards social studies education classes.
3. In view of the negative findings of the research, PBL practitioners can be recommended to be sensitive in finding a suitable problem that is related to real life, check the sources where data can be gathered beforehand, and take challenges and possibilities into consideration as much as possible so that the program becomes more successful.

4. In the present study, although the participant pre-service teachers were informed about PBL before the process began, they were not experienced in PBL use. Thus, it can be recommended for similar research to be conducted with experienced pre-service teachers and the results compared with the present study.

5. As the present study was conducted in two processes that lasted five weeks, it can be recommended for similar research to be conducted over a semester-long or year-long time period. Then, it can be checked whether the results are the same or not.

6. The researchers, who want to work on PBL, can analyze the development level of other skills, which are not included in this study, as metacognition and reflective thinking on this approach.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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*Full Length Research Paper*

# Quality of literature review and discussion of findings in selected papers on integration of ICT in teaching, role of mentors, and teaching science through science, technology, engineering, and mathematics (STEM)

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The purposes of this study were to examine the extent to which literature was used to discuss findings in selected papers from Zimbabwe Journal, and to compare the quality of reviews in this journal with other international journals. The study was largely qualitative in nature and used convenient sampling. In the study, the Zimbabwe Journal was chosen because of easy access. Three papers were conveniently selected based on personal interest and areas previously studied. Content analysis was used to compare the quality of discussion of literature in the sampled papers. Findings suggest that authors cite relevant literature extensively in the background to the study but use the same literature sparingly in the discussion of their results. Further, in the discussion of findings, the use of literature was limited to confirming what was already known, and does not show how the new studies reported contribute to knowledge. The study concluded that the journal studied was failing to attract authors who write high quality papers. Perhaps the journal should broaden its brief and target an international audience, because at present as evident in the three cases cited, the journal can only reach out to practitioners within (Southern) Africa.

**Key words:** Literature review, information and communications technology (ICT), mentoring, science, technology, engineering, and mathematics (STEM).

## INTRODUCTION

Literature reviews are important in dissertations and journal articles. In dissertations candidates are expected to demonstrate a formal understanding of literature in their field, intellectual independence, information fluency, and ability to continually reappraise ideas and practices (Boote and Beile, 2006). The same is expected in journal articles. Researchers' aim of presenting a literature review is to show that he or she has read, and understood the

main published work concerning a particular topic ([www.library.bcu.ac.uk/learner/writingguides/1.04.htm](http://www.library.bcu.ac.uk/learner/writingguides/1.04.htm)). Critics agreed that most literature reviews are inadequate but differ on why this was the case. They agree that researchers cannot perform effective studies without an adequate grasp of literature on the topic of interest. One group of critics is for a scholarly understanding of literature whereas the other group argues that at times

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only an understanding of relevant literature was important. These views are on two ends of the same continuum; one end, a comprehensive literature review and the other end a narrower more focused discussion of relevant literature.

For example, Maxwell (2006) argues that literature review required in articles for publication is different from that required for dissertations (conceptual framework that discusses relevant literature), Boote and Beile (2006) are in favour of a thorough and sophisticated literature (scholarship). Further, there is a lack of published information on how to write a literature review (Randolph, 2009; Boote and Beile, 2005). The purposes of this paper were to examine the extent to which literature was used to discuss findings in selected papers from Zimbabwe Journal, and to compare the quality of reviews in this journal with other international journals.

### WHAT IS 'REVIEW OF RELATED LITERATURE'?

In its simplest form review of literature is a description of what others have published presented in the form of summary(ies). For example, Younger et al. (2004: 247) point out that previous studies on teacher education in the United Kingdom focused on "factors which attracted or alienated potential recruits and those already in training". Studies cited suggest that trainee teachers were attracted to teaching largely for perceived intrinsic reasons related to the profession and by the positive experiences of schools, classrooms, and teachers (Younger et al., 2004). However, a simple description of what others have published in the form of a set of summaries is considered inadequate (Boote and Beile, 2005). A more complete review of related literature should take the form of a critical discussion, showing insight and an awareness of differing arguments, theories, and approaches (Boote and Beile, 2005). It should be a synthesis and analysis of the relevant published work, linked at all times to own research purpose and rationale.

Literature review is therefore the selection of available documents (both published and unpublished) on the topic, which contain information, ideas, data and evidence written from a particular standpoint to fulfil certain aims or express certain views on the nature of the topic and how it is to be investigated, and the effective evaluation of these documents in relation to the research being proposed

([www.sagepub.com/upmdata/28728\\_LitReview\\_hart\\_Chapter\\_1.pdf](http://www.sagepub.com/upmdata/28728_LitReview_hart_Chapter_1.pdf)).

### Purposes of review of literature

The goal of review of literature is to provide a justification

of the proposed research and this can be achieved through four main objectives. These are to review published literature (to identify and summarise relevant theories and researches), to critique the literature (identify arguments for and against theories, assess value of research claims, and identify limitations in previous research), to identify gaps in literature (to identify the gap in knowledge and areas that have only been partially researched) and to inform proposed research (provide a rationale, background/context for proposed research and guide selection for an appropriate design and methodology). The aims and objectives of literature review can be stated as questions:

1. What are the key sources?
  2. What are the key theories and ideas?
  3. What are the main questions and problems that have been addressed to date?
  4. How is knowledge on the topic structured and organised?
  5. What are the origins and definitions of the topic?
  6. What are the political standpoints?
  7. What are the major issues and debates about the topic?
  8. How have approaches to these questions increased our understanding and knowledge?
- ([www.sagepub.com/upmdata/28728\\_LitReview\\_hart\\_Chapter\\_1.pdf](http://www.sagepub.com/upmdata/28728_LitReview_hart_Chapter_1.pdf)).

By explaining what has been done and what has not been done the researcher gives a justification of own contribution. In the discussion section, literature is used to support and criticise the findings of others in light of new findings. In the case of Younger et al. (2004: 248) findings show similarities to earlier studies and further to that "a complexity of constructions of subject and teaching". Some trainees were attracted to teaching by the perceived intrinsic value of the subject itself, and the opportunity to continue within the subject area and others by their own positive schooling experiences (Younger et al., 2004).

Research papers begin with an introduction in which literature is cited to introduce the problem, establish its importance, provide an overview of the relevant literature, show how current study will advance knowledge in the area, and describe the researcher's specific questions (Pyrzacak, 1999). Review of related literature plays a crucial role in formulation of research problem and the whole process of research. It is often argued those research problems not grounded in current literature are weak. Of interest in this paper is using literature to discuss research findings, and answer the following questions:

1. To what extent is literature used to discuss research findings in papers published in Zimbabwe Journal?

2. How good is quality of papers published in Zimbabwe Journal compared to other international journals?

### Literature search and review

One assumption made in this study is that sources used in literature review are an indicator of the quality of paper being evaluated. Literature reviews use a combination of primary, secondary and tertiary sources to document and analyse what has been published on any given topic through time. Academic research is based on primary sources whereas literature review is based on secondary sources.

Ideally a researcher uses tertiary sources to develop a general concept of the topic, then consults secondary sources to see what has been already written on the topic, at different times and from different points of view, by other scholars (review of the literature). Then, the researcher, being guided by review of what already exists, consults primary sources to develop his/her own view of the topic. Tertiary sources are rarely used in academic writing because they only provide general and simplified background to the topic.

Literature search is the systematic process of identifying potentially relevant studies to review academic databases and websites using keywords and phrases. The process may require delimiting timeframe and geographical coverage. Once potentially relevant literature has been identified the next step is screening, that is, applying predetermined inclusion and exclusion criteria that have been derived from the research/review question and sub-questions. This paper is more interested in the steps like: data-extraction, synthesis, and reporting. Data-extraction is the examination of studies to assess the quality of the study and extract evidence in support of the in-depth review. Synthesis involves data analysis and identification of key themes. Systematic review process provides a sound framework for undertaking a comprehensive and transparent assessment of available research (Bimrose et al., 2005).

Cooper's (1988) taxonomy is a coding system that uses six characteristics (and over 20 categories) to evaluate the quality of literature reviews. The six characteristics are focus, goal, perspective, coverage, organization, and audience. Others, like Boote and Beile (2005) used Hart's (1999) criteria to develop a framework from which to analyse literature reviews. Hart's (1999) criteria and Boote and Beile's (2005) 12-item scoring rubric are similar in that they are all based on Cooper's (1998) taxonomy.

### METHODOLOGY

My study though not based on any literature review approach, was

largely qualitative in nature and guided by themes emerging in the papers examined. Content analysis was used to compare the quality of discussion of literature in the various papers.

### Selection of papers to review

There are numerous educational journals published by universities in Zimbabwe, for example, Zimbabwe Journal (ZJ), not real name. The volume ZJ xx(x) mmyy is a publication with 7 papers and was conveniently selected. For purposes of the review, the author decided to look at three papers namely: 'Integration of information and communications technology (ICT) in teaching and learning' (Paper\_1); 'role of mentors' (Paper\_2); and 'teaching science' (Paper\_3). My selection was based on personal interest in the three areas studied; educational technology, mentoring and teaching science.

Further, to determine the quality of discussion in ZJ papers comparisons and contrasts were made with four papers from other journals, namely British Journal of Educational Psychology (BJEP), Eurasia Journal of Mathematics, Science and Technology Education (EJMSTE), European Journal of Teacher Education (EJTE), and Journal of Technology and Teacher Education (JTATE). The papers were selected on the basis that they addressed research problems or topics in the following areas educational technology, mentoring, motives and STEM, similar to the three ZJ papers cited previously.

### INTEGRATION OF ICT IN TEACHING AND LEARNING (PAPER\_1)

The authors of Paper\_1 (mmyy) discuss introduction of computers in the school system, justifying investment in ICTs on the basis of the potential inherent in improving the quality of teaching and learning. The authors of Paper\_1 (mmyy) delimit themselves to studying barriers and ways of overcoming or reducing impact of the impediments. Perhaps, there are two assumptions here; first the teachers were willing to integrate ICTs in teaching and learning science and mathematics, but were hindered by the presence of barriers; and second that if such impediments were removed or attenuated there were high chances of teachers successfully integrating ICTs in their lessons. Studies evaluating barriers to ICTs integration were likely to appeal to policymakers, administrators and practitioners interested in successful implementation of the innovation.

In their review of related literature, the authors of Paper\_1 (mmyy) look at studies supporting teaching ICT skills because they prepare pupils for the world of work (Yelled, 2001; Grimus, 2000; Bransford et al., 2000) as well as studies supporting the argument that ICTs increase efficiency in teaching and learning in general (Wong et al., 2006; Grabe and Grabe, 2007) and more specifically as a resource and tool in learning science and mathematics (Gillespie, 2006; Murphy, 2006; Newton and Rogers, 2003; Pickergill, 2003; Kelleher, 2000) and increasing motivation (Osborne and Collins, 2000). The

authors of Paper\_1 (mmyy) also discuss literature revealing factors influencing successful implementation of ICTs and realization of the pedagogical benefits (BECTA, 2003; Gomes, 2005). The authors looked at relevant literature justifying the place of ICTs in teaching and learning of science and mathematics. However, the authors' literature about factors that influence successful adoption of ICTs suggests that they already knew barriers to ICT integration before conducting the study, for example, teachers fail to adopt ICTs in the classroom because of lack of training as supported by the quote below;

Correspondingly, recent research by Gomes (2005) relating to science education concluded that lack of training in digital literacy, lack of pedagogic and didactic training in how to use ICT in the classroom, and lack of training concerning the use of technologies in science specific areas were obstacles to using new technologies in classroom practice (The authors of Paper\_1, mmyy, p. 226).

The authors of Paper\_1 (mmyy) used a survey to study 56 postgraduate students. The data collection instrument was a questionnaire administered at the beginning and again at the end of a compulsory ICT course "to determine (their) knowledge, attitudes and skills in the subject area" (p. 226). They reported seeking "differences in knowledge before and after training" (The authors of Paper\_1, mmyy, p. 226) using means and standard deviations, yet the sample items on page 227 do not seek knowledge of the students, rather seek 'views'. For this reason this study argues that it is not clear whether the authors of Paper\_1 (mmyy) surveyed perceptions of their students or measured students' knowledge or confidence levels of integrating ICTs in science education.

Researchers listed barriers and asked students to choose those they thought were present in their work places namely "lack of ICT resources, lack of interest, lack of teacher confidence, resistance to change, lack of appropriate skills and insufficient time" (The authors of Paper\_1, mmyy, p. 228). In the findings and discussion section the authors of Paper\_1 (mmyy) examine "relationships between accessibility and competence and other factors such as time, funding, training and technical support" (p. 228). The list of barriers in the table differs from the barriers discussed; accessibility, funding, training and technical support were not included in the list on the questionnaire. Possibly there were open ended items used to collect such data, but how would a reader know this in the absence of sign posting.

The authors of Paper\_1 (mmyy) explain the relationships between factors and how these impede successful implementation and integration of ICTs in teaching and learning science on pages 228 to 231. They conclude the paper by using their explanations of

relationships between factors as basis for recommendations (p. 232). A novice researcher wanting to learn how to write a good discussion section is likely to be left no enlightened after reading this paper. On pages 228 to 232 the authors of Paper\_1 (mmyy) do not refer to any literature at all. There is no single citation. An obvious purpose of using literature in the discussion section of a research paper is to establish whether findings were consistent with or show a departure from the literature cited at the beginning of the paper (pp. 223-226). The paper ends with three pages listing references, and one section where the literature is required was the discussion.

The study found this paper to be interesting paper and that it came from a more extensive research study. In abridging the study for purposes of publication a lot of useful information may have been left out. However, three questions remain unanswered: Considering that the researchers were lecturers studying their own students does the study fit with the notion of survey? If not a survey what can be a better description of the study? If barriers highlighted in the conclusion and recommendations were things readily available in literature, what new things were coming from the study? The idea of administering questionnaire at the beginning of the course on ICTs and at the end looks attractive in studies seeking developmental changes. Unfortunately, in the discussion differences between views/opinions/perceptions at the start and end of the course were not examined, perhaps as a way of showing that the course made an impact. One of the important factors the authors needed to consider was political will in the form of an educational policy supported by government commitment in financing integration of ICTs in teaching science and mathematics (if not across the national curriculum).

## **ROLE OF MENTORS (MMYY)**

The authors of Paper\_2 (mmyy) studied student teachers' perceptions of mentoring, mentors and relationships. The students studied were training to become primary school teachers. The authors of Paper\_2 (mmyy) begin by citing literature on purposes of teaching practice (Walters, 1994) and teaching as a practical activity (Maynard and Furlong, 1995). The researchers trace changes in teaching practice witnessed in Zimbabwe between 1980 and present day; from one term before 1982, then 3 terms between 1982 and 1984, and 2 years from 1985 to 1994. They cite literature discussing how teacher shortage determined the nature of teaching practice, that is, whether student teachers were assigned a full teaching load or not (Zvobgo, 1986; Taruvunga and Museva, 2003).

The authors of Paper\_2 (mmyy) use literature on symbolic interactionism (Kirby et al., 1997; Giddens, 1997; Haralambos and Holborn, 1985; Ritzer, 1992; Levin and Spates, 1990) as a conceptual framework. They define supervision using literature (Wiles and Bondi, 1996; Taruvinga and Museva, 2003; Sergiovanni, 1982) and mentoring (Maynard and Hagger, 1994) as the key terms. At face value the authors of Paper\_2 (mmyy) cite extensively when discussing mentor's role (Taruvinga and Museva, 2003; Hawkey, 1998; Maynard, 1997; Hapanyengwi, 2003; Yeomans and Simpson [1994] in Taruvinga and Museva, 2003; Haberman and Harris in Hapenyegwi, 2003; Sergiovanni, 1982; Sergiovanni and Starratt, 1993; Furlong and Maynard, 1995; Stones, 1984; Hawkey, 1998). However, on close scrutiny it appears the authors of Paper\_2 (mmyy) cite mainly Taruvinga and Museva (2003) and Hapanyengwi (2003), and the rest being indirect quotations found in these two sources. Pyrzczak (1999) describes such literature review as a "series of annotations that are strung together" (p. 33). The major weakness being that authors of Paper\_2 (mmyy) fail to guide readers through their literature because they do not show how the references relate to each other and mean (Pyrzczak, 1999). This review argues that it would have been more worthwhile to locate literature cited by others and make direct quotations. In fact this is one purpose of review of literature; it directs you to more literature.

The authors of Paper\_2 (mmyy) investigated students' perceptions of mentoring (role of classroom teacher, effectiveness, advantages and disadvantages, awareness of roles, opportunity to experiment and relationships). They described their research methodology as descriptive survey method (Mushoriwa, 1998) and used questionnaire, interviews, and focus group discussions to collect data. The authors of Paper\_2 (mmyy) do not make it clear how many students were in the final year at college when the study was carried out. Such information would help any reader to determine adequacy of sample size used. They used simple random sampling to select 80 students but no details of the selection procedure were given. The authors of Paper\_2 (mmyy) do not describe data analysis beyond mentioning that it was done "quantitatively and qualitatively". Findings would seem to suggest that they used frequency counts of agreeing and disagreeing with statements in the questionnaire; and as for qualitative analysis it appears the researchers cite what participants said in interviews. Perhaps they could have used coding to explicate meanings of their data. In the findings section data was presented under 14 headings but any reader is left guessing whether these were the emerging themes and codes.

The authors of Paper\_2 (mmyy) made deliberate efforts

to go back to the literature they had cited at the beginning and used the literature to discuss their findings. The authors provide novices with an important lesson of how to use literature in the discussion of findings. Though, a closer look at how literature was used in the discussion of findings suggests that in most cases the researchers were forcing literature onto their findings. For example, on pages 244 and 245 the authors of Paper\_2 (mmyy) found out that when there were no trained teachers in schools, student teachers were left alone yet discussed this finding using literature on purposes of teaching practice (Maynard and Furlong, 1995; Taruvinga and Museva, 2003; Hapanyengwi, 2003).

Two occasions stand out as examples of good discussion of findings because direct links between findings and literature were stated. At the bottom of page 246, the authors of Paper\_2 (mmyy) point out that their findings contradict observations by Hapanyengwi (2003). Again, on page 255, they report that findings were consistent with "the view that teaching is a practical activity" (Walters, 1994; Maynard and Furlong, 1995). In the next few paragraphs this review looks at instances where the authors of Paper\_2 (mmyy) did not use literature they cited to illuminate their findings – what can be described as forcing literature onto findings. Specifically, the review looks at the discussion of findings on advantages and disadvantages of mentoring, value of skills imparted by mentor, and assessment of students by mentors.

The authors of Paper\_2 (mmyy) found out that student teachers perceived "advantages associated with the mentorship programme" (p. 247). In the discussion, they write about role played by mentors and importance of learning through participation. They write about "equipping student teachers with relevant skills" (p. 247). The following literature was cited: Walters (1994), Maynard and Furlong (1995), Sergiovanni (1982), Lave and Wenger (1995) and Hawkey (1998). After reading the discussion it appears that 'advantages of mentoring' and 'roles of mentor' and 'teaching skills' are different issues which must have been examined separately. Either the authors were not able to articulate the advantages clearly or they failed to locate literature reporting advantages of the kind of mentoring studied over other models of mentoring. This could also be an example of poorly conceptualised literature (Boote and Beile, 2006).

The authors of Paper\_2 (mmyy) reported that conflict between student teacher and classroom teacher was a significant disadvantage. The authors did not fully explore the view that "there is need for mentors and student teachers to improve their relationships" (p. 248). It would be more fruitful to examine what happens when conflicts between mentees (student teachers) and mentors (classroom teachers) are not resolved. The authors did

not cite studies reporting similar interpersonal relationships. Further, it is not clear whether literature on symbolic interaction cited was used at the right place (Kirby et al., 1997; Haralambos and Holborn, 1985; Rotzer, 1992; Levin and Spates, 1990). The authors seem to mix discussion and recommendations when they write “mentors need to re-examine their roles...” (p. 248) and go on to cite literature on roles of mentors (Yeomans and Sampson, 1994; Tarvinga and Museva, 2003; Maynard, 1997; Maynard and Furlong, 1995). The authors made an unsubstantiated conclusion, and this would rather be stated as a possible way forward.

On page 248 the authors of Paper\_2 (mmyy) discuss “values of skills imparted by mentor”. Data presented suggest that students thought that they were learning through socialization and observing how classroom teachers were doing things e.g. being resourceful, treating pupils as individuals, behaviour management and flexibility. The other views sought were about the skills demonstrated by the classroom teacher; drilling, interpreting syllabus and keeping records. Again, authors cite the wrong literature; they use literature summarizing the role of mentor and school in initial teacher education (Hawkey, 1998; Maynard, 1997; Hapanyengwi, 2003; Maynard and Furlong, 1995). The authors of Paper\_2 (mmyy) neither cited studies done elsewhere which report that this was what students thought about mentoring nor point out if their own study was the first. The authors do not state whether their findings were consistent or different with those from studies by others.

The authors of Paper\_2 (mmyy) discuss “assessment of students by mentors” (p. 251). In the discussion, they chose to focus attention on a minority who for one reason or another reported that mentors did not assess them. The authors did not tease out reasons why classroom teachers or mentors were not able to assess student teachers. They write that “feedback ... is an important component of supervision” (p. 251) and cite literature on importance of supervision; why mentors were not able to assess student teachers remains a secret.

## TEACHING SCIENCE (MYY)

The review of the paper is based on what the author of Paper\_3 (mmyy) wrote as an abridged version, and not the full study. At the beginning the author of Paper\_3 (mmyy) looks at several concepts, for example, “educated illiterates”, “science technology society”, “scientific socialism”, “scientific and technological literacy”, and “curriculum”. After reading the paper, it remains unclear why these concepts were introduced in the first place. Perhaps one of the points is that de-contextualised learning like what happens in the classroom or laboratory

was divorced from the real life, and when students get into the real world they show ignorance of phenomena. If this was the purpose of citing Orr (1990) at the beginning, then it did not come out clearly. The notion of ‘science, technology and society’ was introduced as a curriculum; yet this is not the only way to view Science, Technology and Society (STS). There is also STEM (science, technology, engineering, and mathematics). The thrust of STS (and/or STEM) is to develop students’ interest in the subjects, to identify and use resources in the community, and to encourage collaboration among teachers and other professions all being aimed at enhancing learning of the subjects. The author introduces the term scientific socialism as if it were a teaching subject. The correct way of looking at scientific socialism is as political ideology or philosophy. Then what is important would be to show how an education system of a country can be shaped when the government’s political ideology is scientific socialism. The author made efforts to explain scientific and technological literacy, but still could have done more.

The author of Paper\_3 (mmyy) uses National Science Teachers Association (NSTA) handbook to examine the goals of STS, and uses these to justify inclusion of STS approaches in the curriculum. Handbooks are classed as tertiary sources and not recommended in academic papers ([www.uta.fi/FAST/FIN/RESEARCH/sources.html](http://www.uta.fi/FAST/FIN/RESEARCH/sources.html)). In the research question, general science is introduced as a curriculum; this is understandable if looked at as a form of micro-level curriculum otherwise a broader and more embracing definition of curriculum could have been used.

The population was not defined as stratified and this makes it difficult for any reader to follow stratified random sampling suggested, perhaps convenient sampling.

On pages 325 to 345 there was no reference to literature made. There is no citation made. Findings were presented on pages 328 to 345. The discussion was weak because there was neither interrogation of the different factors and how they related with each other nor reference to literature to show whether findings were consistent or different from studies made elsewhere.

## AUDIENCE AND READERSHIP

Some questions to ask are who the audience of ZJ are and what the readership is. In the call for papers, The Editor of ZJ invites “research papers on any educational topics written in English”, and considering that most articles published target local community, ZJ is a journal likely to draw attention of teachers and those interested in educational research in Zimbabwe. Teachers, most probably, look for findings likely to impact positively on their practices, that is, ‘here and now’ knowledge. On the

other hand, those interested in educational research were likely to look for exemplary research papers, from which they could learn such skills as writing review of related literature, and writing a discussion section. It appears the three examples examined offer limited insights or new knowledge to practitioners, and little to help improve researching and writing skills.

### COMPARISONS WITH OTHER PAPERS IN SEARCH OF EXEMPLARY DISCUSSION

This study selected four papers to use for making comparisons and contrasts with articles from ZJ namely; “Barriers to the successful integration of ICT in teaching and learning environments: a review of the literature” by Bingimlas (2009); “Student teachers’ beliefs about mentoring and learning to teach during teaching practice” by Zantig and Verloop (2001); “Starting points; teachers’ reasons for becoming teachers and their perceptions of what this will mean” by Younger et al. (2004); and “Instrument for assessing interest in STEM content and careers” by Tyler-Wood et al. (2010).

As shown in Table 1, some indicators of quality, e.g. impact factor, are used to compare the journals. Citation analysis is widely used in research evaluation systems (González-Pereira, Guerrero-Bote and Moya-Anegón, 2010). The impact of scholarly journals is measured using, for example, the impact factor and is based on citation counts, and shows whose work gets cited in other research. Examples of databases of scholarly literature that provide citation analyses are the Thomson Institute of Scientific Information (ISI), Science Citation Index (SCI), Social Science Citation Index (SSCI), Arts and Humanities Citation Index (AHCI) (Klein and Chiang, 2004). In universities, the tradition has been that “academic success depends chiefly on getting published in ‘the good journals’” and for this reason “peers, administrators and grant-makers regard citation counts as a key measure of recognition and importance” (Klein and Chiang, 2004:135). Table 1 therefore shows that in terms of impact factor, ranking and briefing it is easier to publish in ZJ than other journals cited, and therefore this review ranks it lowest being cognisant of the fact that meaningful comparisons and contrasts come from a combination of quantity and quality, and not just the quantity of citations received (González-Pereira et al., 2010).

#### Comparing Paper\_1 with Bingimlas (2009)

It appears the two papers examined in this section share a lot in common, and demonstrate duplication as supported by evidence provided in the next paragraphs. First, the authors use similar words and expressions to

justify use of ICT in the classroom and why it is important to study obstacles.

The use of ICT in the classroom is very important for providing opportunities for students to learn to operate in the information age. Studying obstacles to the use of ICT in education may help educators to overcome these barriers and become successful technology adopters in the future (Bingimlas, 2009:235).

Although you cannot find the exact quotation in the abstract written by the authors of Paper\_1 (mmyy) the match appears in the introduction on page 222. Further, the rest of the introduction matches word to word with the one written by Bingimlas (2009). It seems necessary for the authors of Paper\_1 (mmyy) to acknowledge Bingimlas (2009), lest they be accused of plagiarism.

Bingimlas (2009) states that:

The findings indicate that teachers had a strong desire for to integrate ICT in education; but that, they encountered many barriers. The major barriers were lack of confidence, lack of competence, and lack of access to resources. Since confidence, competence and accessibility have been found to be the critical components of technology integration in schools, ICT resources including software and hardware, effective professional development, sufficient time, and technical support need to be provided to teachers. However, the presence of all components increases the possibility of excellent integration of ICT in learning and teaching opportunities (p. 235)

Bingimlas (2009) uses the same words again on page 241 when discussing “the relationship between the barriers”. The authors of Paper\_1 (mmyy) used the same words in their conclusion:

The findings of *this study* indicate that teachers had a strong desire for to integrate ICT in education, *but they encountered many barriers to it*. The major barriers were lack of confidence, lack of competence, and lack of access to resources. Since confidence, competence and accessibility have been found to be the critical components of technology integration in schools, ICT resources including software and hardware, effective professional development, sufficient time, and technical support need to be provided to teachers. However, the presence of all components increases the *likelihood* of excellent integration of ICT in learning and teaching opportunities (p. 231)

The minor differences between the two quotes are the

**Table 1.** Comparisons and contrasts of journals using some quality indicators.

Indicator	BJEP	EJMSTE	EJTE	ZJ
2011 impact factor	1.423	0.032	0.566	----
2011 Ranking	20/51 (Psychology Educational)	(SCImago Journal and Country Rank)	119/203 (Education and Educational Research)	(Library Congress)
Publisher	Wiley-Blackwell	Moment publication www.ejmste.com	Thomson Reuters	A university in Zimbabwe, Human Resources Research Centre
Frequency	4 issues per year	4 issues per year	4 issues per year	3 numbers per year
Brief	Psychological research	Mathematics, Science and Technology Education	Theory, policy and practice in teacher education	Any educational topics
Evaluation	Psychology Educational	SCImago Journal and Country Rank	Education and Educational Research	Quarterly Index of African Periodical Literature. Ended 2011
Editorial Board	International	International	International	Local
Editorial Advisory Board	International	International	International	International
Editors	Harriet Tenebaum and Andrew Tolmie	Mehmet Fatih Tasar (Editor-in-Chief) Muhammet Usak (Executive Editor) Annette Gough (Associate Editor)	Kay Livingston Geri Smith	EEEEEE (Editor-in-Chief)

words in the above quote from Paper\_1 (mmyy) that have been crossed out and replaced by words in italics.

The two papers show numerous matches, which have not been extensively cited to save space, for example, description of the purpose of the study see the authors; literature review, importance of ICT in education in the future and science education and ICT; findings and discussion; implementation; and conclusion. For this reason, this study concludes that close to 100% of what was published by the authors of Paper\_1 (mmyy) matches what appears in Bingimlas (2009). The

lists of references are similar and differ because Bingimlas (2009) gives a longer list, and correctly spells Yelland (2001) whereas the authors of Paper\_1 (mmyy) used the spelling (Yelled, 2001), which is also absent in their list of references. The main difference noted is that between pages 237 and 241, Bingimlas (2009), unlike the authors of Paper\_1 (mmyy), examines extensively “barriers to integration of ICT in education” under the themes “classification of the barriers”, “teacher level barriers (lack of confidence, lack of teacher competence, resistance to change and negative attitudes), “school-level barriers (lack of time, lack of

effective training, lack of accessibility, and lack of technical support”.

It might be difficult to pin point the paper that was submitted for publication first. First, ZJ tends to have a backlog. One possible explanation is that funding has been problematic particularly 2008 when Zimbabwe’s economy almost collapsed, and papers that had been accepted for publication stayed on the queue until funds were available. Second, ZJ does not have online publications making it difficult to spot cases of wording matching what has been published elsewhere early in the editorial review process.

The Eurasia Journal of Mathematics, Science and Technology Education is an online journal with open access (www.ejmste.com). Bingimlas's paper was received on 17<sup>th</sup> July 2008 and accepted on the 24<sup>th</sup> March 2009. Such information is absent in the print ZJ journal. Third, Bingimlas (2009) states that "the paper is part of PhD thesis which is currently being conducted by the author" (p. 243) making it possible to verify authenticity through contacting RMIT University, Bandoora, VIC, Australia. From Paper\_1 (mmyy) one can only deduce from the description of the methodology that the authors were lecturers at a university in Zimbabwe, who studied their students. The authors appear on the editorial board of ZJ such that it is possible to seek verification from the publisher of the journal. Though it may seem difficult to check for similarities between an online publication and a print publication, there are opportunities of verification offered by the visibility of the editorial board in the form of contact details.

### **Comparing Paper\_2 (mmyy) with Zantig and Verloop (2001)**

While there is a gap of 10 years between publications of the two papers, a close examination of literature cited in the later paper by the authors of Paper\_2 shows that most if not all was published before 2000; as such paper by Zantig and Verloop (2001) provides a fitting comparison with the authors of Paper\_2 (mmyy). It is clear to any reader that Zantig and Verloop (2001) distinguish literature on researchers', teacher educators' and mentors' perceptions of mentoring (Hawkey, 1997; 1998) and literature on student teachers' perceptions of mentoring (Booth, 1993; Brown, 1995; Grimmatt and Razlaff, 1988). Further, Zantig and Verloop (2001) distinguish literature on how mentors interpret their roles (Elliot and Calderhead, 1994), on that mentor role depends on assumptions about teachers' learning (Maynard and Furlong, 1994), literature on pitfalls and challenges (Feinman-Nemser and Parker, 1993), and accessing practical knowledge (Brown and McIntyre, 1995; Tomlinson, 1995). Zantig and Verloop (2001) categorize literature on student teachers' beliefs about mentoring into expectations and beliefs about good mentoring, literature on beliefs about learning to teach (Vermunt, 1996; Vermunt and Verloop, 1999), and literature on regulation of learning (Vermunt, 1996; Entwistle, 1988). Categorization of literature is missing in the paper by the authors of Paper\_2 (mmyy). The discussion of literature by Zantig and Verloop (2001) appears easy to follow in the formulation of the problem.

In the discussion of findings, Zantig and Verloop (2001) clearly state similarities between their findings and

literature e.g. on page 75 they write that "the students' expectations of their mentors were very similar to mentors' role expectations themselves, teacher educators and educational researchers that were described in the introduction". Student teachers in study reported by Zantig and Verloop (2001) "perceived 'good mentoring' as the fulfilment of several functions", and to show that this was not completely new they cited literature (Wright and Bottery; 1997; Anderson and Shannon, 1988; Tomlinson, 1995). Further Zantig and Verloop (2001) found out that some student teachers "wished to discover themselves" indicating and "initiating role" (p. 76), and acknowledge that this was missing in literature where mentors got stuck in evaluating teaching performance rather than stressing reflection on teaching (Ben-Peretz and Rumney, 1991; Feinman-Nemser and Parker, 1993).

On the basis that the paper by Zantig and Verloop (2001) was published in one of the top journals and by The British Psychological Society it is justifiable to rate it as a better paper. The *British Journal of Educational Psychology* is listed on Social Sciences Citation Index (SSCI) whereas ZJ is not. The 2011 impact factor of 1.423 is high on Psychological Research Index. The brief is psychology, that is, 'The *British Journal of Educational Psychology* is prepared to consider for publication reports on empirical studies of likely to further our understanding of psychology'. The rejection rate was most likely to be higher than that of ZJ, which accepts 'research articles on any educational topics'.

### **Using paper by Younger et al. (2004)**

Here, paper by Younger et al. (2004) has been examined more extensively, to illustrate how review of related literature, data and findings, and discussions can be linked. Younger et al. (2004) studied student teachers' reasons for becoming teachers. The aim here is to provide what can be considered an exemplary discussion of findings. In the first snapshot (Appendix) "coming to terms with teaching: why teach?" Younger et al. (2004: 247) discuss literature (Reid and Caudwell, 1997; Haydn et al., 2001; Edmonds et al., 2002) prior to data presentation. They argue that in the 1990s and early 21<sup>st</sup> century research focused on factors that attract teachers and findings suggested intrinsic motivations and positive experiences of schooling and teaching as the most important determinants of joining teaching. This is critical to provide a historical and developmental account of motives for becoming a teacher. In the second snapshot, direct reference to data within the DEBT research is given (Younger et al., 2004). Further, the authors make direct links between literature (Edmonds et al., 2002) and



their data and findings and point out what their study revealed and how that differs with literature used. The potential for extending knowledge of motives for becoming a teacher is evident. The authors argue that motives are complex, for example, candidates choose teaching to continue learning subjects of interest and to share enthusiasm of learning the subject with others. Finally, the third snapshot “reasons for becoming a teacher” Younger et al. (2004: 258) distance themselves from their data and literature to tease contrasts between their findings and literature (Reid and Caudwell, 1997; Haydn et al., 2001) and at the same time propose an explanation. The authors show contradictions between trainee teachers’ motives and views of TTA and DfES, e.g., that trainee teachers think it is morally right to join teaching, whereas TTA and DfES think number of potential candidates can be increased by making the profession more attractive. Younger et al. (2004) are able to go beyond re-inventing the motives and suggest new ways of looking at how the motives relate and counteract what discourage them from becoming teachers. The authors deepen our understanding of trainee teachers’ motives, more than reported in previous research studies.

### **Paper\_3 (mmyy) compared and contrasted with Tyler-Wood et al. (2010)**

Tyler-Wood et al. (2010) analysed two instruments created to assess perceptions of Science, Technology, Engineering and Mathematics (STEM) disciplines (or content) and careers. Their paper “describes internal consistency reliability, as well as the content, construct and discriminant validity for each of the instruments” (p. 342). From the onset, Tyler-Wood et al. (2010) make it clear that professional development programmes were initiated for teachers aimed at an outcome of changes in students’ STEM career interest. Such a clarification is missing from Paper\_3 (mmyy). For example, “The Middle Schoolers Out to Save the World (MSOSW)” was part of “Innovative Technology Experiences for Students and Teachers program (ITEST)” established in response to shortages of Information Technology workers in the United States. They cite National Science Foundation NSF (2009) and point out that the two instruments were aimed at “assess[ing] and predict[ing] inclination to participate in the STEM fields and... measure[ing] and study[ing] the impact of various models to encourage that participation”. Further they show awareness of using tracking to determine effectiveness of ITEST initiative by measuring interest and mastery in STEM content and careers, and suggest that where tracking was not possible seeking perceptions was appropriate using STEM Semantic Survey and the Career Interest

Questionnaire.

In their review of related literature, Tyler-Wood et al. (2010) examine the literature on need for highly capable scientists in the technology-oriented market (Lubinski and Benbow, 2006), and literature on shortage of STEM workers (Workforce, 2002). They argue that some ways of determining career interests (Whitfield et al., 2008) focussed on “general career interest not specific to STEM careers” (Tyler-Wood et al., 2010: 333). Other instruments examined were The Scientific Orientation (1995) which could be outdated (Rogers, 2002), Novodvorsky’s (1993) interest used by Oinstein (2006), and Teachers’ Attitude Towards Information Technology Questionnaire (TAT) by Knezek and Christensen (1998). Their discussion reveals how the study reported resembles and differs from previous research. Tyler-Wood et al. (2010) give details of their instruments, data collection and analysis. Considering that their aim was to use statistical tools to determine reliability and validity of the two instruments in question, in the discussion section it is understandable that they refer to literature sparingly.

### **Conclusion**

In the review reported here it appears that authors cite relevant literature extensively in the background to the study and literature sections, but use literature sparingly in the discussion of findings, e.g. Paper\_1 (mmyy). Further, when literature is used in discussion of findings often it was used to confirm what was already known, and not to show how studies reported contribute to knowledge e.g. Paper\_2 (mmyy). In conclusion, the discussion of literature in most of the papers published in one Zimbabwe Journal were not critical enough and could be rated as low quality papers in such areas as theory, methodology and discussion of findings when compared with papers in other international journals. If quality articles are not published editors, reviewers and authors stand to lose credibility.

It seems the Zimbabwe Journal studied was failing to attract authors who write high quality papers. Perhaps the journal should widen its focus and target international readership because at present, as revealed in the study, the quality of discussion of literature reviewed appears too low to reach out to high calibre academics. It could be that the journal lacks sponsorship, and considering the economic situation in Zimbabwe, relies on publishing papers originating from those who can pay for their papers to be published.

Therefore, this study recommends that the Zimbabwe Journal should focus on publishing papers of immediate relevance to teachers and educators. Further, editors are recommended to embark on an aggressive marketing

strategy of the journal so that readership can be increased to the point where revenue generated can sustain further publications.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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## APPENDIX

### First snapshot

#### Coming to terms with teaching: why teach?

Studies on teacher recruitment and retention in the UK, partly in response to the apparent 'crisis' in teacher supply experienced throughout the 1990s and the early years of the 21st century, focused attention upon a wide variety of factors which either attracted or alienated potential recruits and those already in training (Reid & Caudwell, 1997; Reid & Thornton, 2000; Whitehead & Postlethwaite, 2000; Chambers *et al.*, 2001; Haydn *et al.*, 2001; Moran *et al.*, 2001; Edmonds *et al.*, 2002; Thornton *et al.*, 2002). Consensual conclusions from these studies have suggested that trainee teachers are attracted to the profession 'largely for intrinsic reasons ... (related) to the profession itself and to personal fulfilment' (Edmonds *et al.*, 2002, p. 9) and that trainees were led into teaching by 'the positive experiences of schools, classrooms and teachers' (Thornton *et al.*, 2002, p. 41) which they had encountered during the course of their own education.

### Second snapshot

schooling, the intrinsic reasons identified by Edmonds *et al.* were centrally linked to trainees' desire to continue to work with their subject. Indeed, our research revealed that 88% of the trainees identified 'subject' as a major factor in their decision to follow a PGCE course. However, this apparent homogeneity of response carries with it a complexity of constructions of subject and teaching. For some trainees it was the perceived intrinsic value of the subject itself, and the opportunity to continue working within the subject area, which drew them to teaching:

I love the subject (mathematics). I think it's fascinating ... I also think it's such a beautiful subject. There is so much symmetry and pattern and everything else that a lot of people miss because they see it as copying out of textbooks and doing boring questions. But there is so much to it and I just love it and find it a really fascinating subject.

For others, however, an additional dimension to the 'love of the subject' was the desire to share their own enthusiasm and pleasure in the area with others, to communicate ways of seeing the world through different lenses:

I've just always loved reading ... and if I can foster that same sort of love in other people, children, that will be great.

### Third snapshot

#### *Reasons for becoming a teacher*

In their rationalizations of their reasons for becoming teachers, there is a significant mismatch between the aspirations and notions of our trainees and some of the current views of the Teacher Training Agency (TTA) and Department for Education and Skills (DfES). Some of the views espoused by the TTA suggest that teaching might be a career to be entered, left and re-entered at different times, and these are supported by DfES notions that the motive for *entering* the profession is salary, fast tracking of career and early promotion to positions of power outside the classroom. This is in direct contrast to the views expressed here by our trainees, which place emphasis on teachers making a valuable contribution to society and having certain essential qualities and attributes as role models, views which make implicit the notion of vocation and a moral imperative to make a positive and principled contribution to society.

At this stage of their proposed career trainees construct their career choice not in terms of career progression (Reid & Caudwell, 1997) nor in terms of salary opportunities (Haydn *et al.*, 2001), but in terms of intellectual challenge and a commitment to transforming opportunities for children, both in the classroom and in wider societal contexts. Trainees are strongly motivated towards a career in teaching and have sustained this despite strong discouragement both from within and outside the profession; in so doing, they frequently appear to draw on a strongly moralistic positioning in order to withstand this discouragement.

*Full Length Research Paper*

# Evaluation of the changes in the regulation of secondary education institutions according to teachers' viewpoints (Turkey)

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The purpose of this study is to evaluate teachers' viewpoints about the changes made in the regulation of passing lesson at schools, which became active in 2013 to 2014 academic year. The pass grade applied depends on this regulation, common exams, shortening of the absenteeism durations, and assigning students with performance tasks according to some variables. The development and application of the measurement tool of the study were performed with the high school teachers working in Düzce. Quantitative research methods were used in the study, and the screening model was applied. The SPSS 20.0 statistical package program was used in analyzing the data. Frequency values, percentages, and average values were used to analyze the data. One-Way Variance Analysis (ANOVA) and the t-test were used for unrelated sampling. The sampling of the study consisted of 323 teachers who were selected randomly from among those who worked at various high schools in Düzce in 2013 to 2014 academic year. The teachers' viewpoints about the regulation of passing a lesson at schools were evaluated with the statement, "I am indefinite"; the viewpoints on the regulation of the right to absenteeism were evaluated with the statement, "I agree"; and the viewpoints on the assigning performance tasks were evaluated with the statement, "I do not agree". At the end of the study, no significant differences were found in the data according to gender, educational status, and classroom population variables. Significant difference was detected between the regulation of passing a lesson at school and assigning performance tasks dimensions in favor of the physical sciences and foreign language fields. The teachers who worked at vocational high schools evaluated the regulation of passing a lesson at school in a more positive manner. The teachers' viewpoints on the regulation of passing a lesson at school were determined to differ significantly for those between 20 and over service years in teachers who were assigned in the group "1 to 5 and 20 and over service years".

**Key words:** Common exam, performance tasks, the regulation on passing a lesson at school, teacher viewpoint, Turkey.

## INTRODUCTION

The Ministry of National Education (MoNE) started a new construction in secondary school institutions as at 2002.

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New educational programs were prepared on this subject in various topics, and new secondary school class programs were applied in 2005. Within this process, the course books were distributed as free of charge to students. The programs gained an acquisition-based and smaller structure. The approach of these new programs shifted towards a cause and multiple result-based constructive learning approaches instead of behavioristic learning approach based merely on action-reaction, cause-effect explanations (MoNE, 2005).

The functioning of the MoNE is ensured with laws and regulations. The rules and regulations must agree with the requirements of the modern age by changing through time. The regulation on passing a lesson at schools, which was released on the Official Gazette on 07-09-2013 with the number 28758, brought important changes with it. The 36th item of this regulation organized the absenteeism right again and decreased this right to 10 days from 20 days, and the right of excused absence to 45 days from 54 days. Item 44 also renewed the passing grade as 50, which was formerly 45. Item 45 brought the obligation of common exams. Item 50 made it compulsory to submit at least one performance task in each semester. As of 2013, important changes that would affect students were observed in the regulation on passing a lesson (that is, the pass grade) at schools.

There are several studies conducted on educational programs, the changes in them and on performance tasks; however, there are no studies on passing a lesson at schools. Tüysüz et al. (2010), Güven and Demirçelik (2013), Coşkun et al. (2009), Palaz et al. (2015), Yiğit and Kırımlı (2014), Çepni and Çoruhlu (2010), Gülbahar and Büyüköztürk (2008), Arı (2010), Eraslan and Algün (2005), and Çiftçi (2010) worked on alternative evaluation methods and performance evaluation techniques.

### **The purpose of the study**

The purpose of this study is to determine teachers' viewpoints on the regulation of pass grade at schools, which became active in 2013 to 2014 academic year. The pass grade applied as 50 depends on this regulation, common exams, shortening of the absenteeism durations; and assigning the students with performance tasks according to some variables. In addition, in this context, it also aims to determine whether or not the viewpoints of the teachers change according to gender, branch, school type, educational status, seniority years and the populations of the classrooms. For this purpose, the following questions, problem statement, and sub-problems were formed.

### **Problem statement**

What are teachers' viewpoints on the changes made in

the regulation of pass grade at secondary education schools, which became active in 2013 to 2014 academic year?

### **Sub-problems**

- (1) What are the teachers' viewpoints on the common exams and on the pass grade becoming 50 at secondary schools in 2013 to 2014 academic year?
- (2) What are the teachers' viewpoints on decreasing the right for absenteeism at secondary schools in 2013 to 2014 academic year?
- (3) What are the teachers' viewpoints on assigning performance tasks at secondary schools in 2013 to 2014 academic year?
- (4) Do the teachers' viewpoints on the regulation of passing a lesson at school, which became active in 2013 to 2014 academic year, differ according to the pass grade applied depending on this regulation, common exams, shortening of the absenteeism durations, and assigning the students with performance tasks according to some variables at a statistical level?

## **METHODOLOGY**

### **The study model**

This study was conducted with the Survey Model. The Survey Model is performed with questionnaires, and is based on describing a situation as it is (Karasar, 1994: 77). It is also preferred in social science studies, which are field studies in nature (Borg and Gall, 1971). For this reason, the data were collected by receiving the viewpoints of the teachers on the changes made in secondary school institutions' regulation and on performance tasks given to students. For this reason, questionnaires were used in this study to receive statistical data. Quantitative Research Method was preferred in the present study; and a scale that was suitable for the study was prepared and applied to the high school teachers. The relevant field and literature review was performed for the scale. When the scale was being prepared, the viewpoints of the high school teachers were received, and the viewpoints of the experts in the field were also made use of. Before the scale was prepared, it was applied on a sample group, and the reliability findings were obtained. The reliability findings were explained in detail in the data collection tool section of the study.

### **The study population and the sampling**

The study population consisted of the high school teachers who were working at secondary school institutions in Turkey, and the sampling of the study consisted of 323 high school teachers selected randomly from the study population working in the city of Düzce. The demographic characteristics of the study group are shown in Tables 1, 2, 3, 4, 5, and 6. The teachers participated in the study on a voluntary basis. It was facilitated for the teachers to fill in the scale of the study and do possible corrections whenever and wherever they wanted. Since the teachers participated voluntarily in the study, it is expected that the results of the study

**Table 1.** Distribution of the participant teachers according to their genders.

<b>Gender</b>	<b>n</b>	<b>%</b>
Female	141	44
Male	182	56
Total	323	100.0

**Table 2.** Distribution of the participant teachers according to their branches.

<b>Branch</b>	<b>N</b>	<b>%</b>
Physical sciences	94	29
Verbal sciences	126	39
Vocational classes	42	13
Ability	30	9
Foreign language	31	10
Total	323	100.0

**Table 3.** Distribution of the participant teachers according to their school types.

<b>School type</b>	<b>N</b>	<b>%</b>
Anatolian High School	156	48
Science and Teacher Training High School	55	17
Vocational High School	112	35
Total	323	100.0

**Table 4.** Distribution of the participant teachers according to their educational status.

<b>Educational status</b>	<b>N</b>	<b>%</b>
Undergraduate	41	13
Science education	89	27
Educational faculty	136	42
Post-graduate	57	18
Total	323	100.0

**Table 5.** Distribution of the participant teachers according to their seniority at service.

<b>Seniority (Years)</b>	<b>N</b>	<b>%</b>
1-5	39	12
6-10	53	16
11-15	93	29
16-20	63	20
21- and over	75	23
Total	323	100.0

**Table 6.** Distribution of the participant teachers according to the class populations.

Class population	n	%
1-25	57	18
26-30	152	47
31 and over	114	35
Total	323	100.0

are more reliable (Kerski, 2000: 81, 86). It may be claimed that the questionnaires that are applied in an official manner are less reliable than the ones that are filled voluntarily because the teachers who want to improve themselves are interested in filling them.

The gender distribution of the teachers who participated in the study is given in Table 1. In this context, we can see that 44% of the teachers who participated in the study ( $n=141$ ) were females and 56% ( $n=182$ ) were males. The number of the male teachers who participated in the study is more than the female ones. However, the distribution of the gender is balanced.

The distribution of the participant teachers according to their branches is shown in Table 2. Twenty-nine percent of the teachers, who participated in the study ( $n=94$ ) were from physical sciences field; 39% ( $n=126$ ) were from verbal field, 13% ( $n=42$ ) were from vocational training field; 9% ( $n=30$ ) were from skills field, and 10% ( $n=31$ ) were from foreign languages field. The number of the teachers who worked in the verbal field was more. This situation is related to the general distribution.

The distribution of the participant teachers according to their school types is shown in Table 3. Forty-eight percent of the teachers, who participated in the study ( $n=156$ ) were working at Anatolian high schools, 17% of the teachers, who participated in the study ( $n=55$ ) were working at science and teacher training high schools, 35% of the teachers, who participated in the study ( $n=112$ ) were working at vocational high schools. The number of the teachers working at Anatolian High Schools was more. This situation has emerged with the restructuring of the secondary education institutions in Turkey in recent years. Since plain high schools were accepted as Anatolian High Schools, this group shows a more participation.

The distribution of the participant teachers according to their educational status is shown in Table 4. Thirteen percent of the teachers who participated in the study ( $n=41$ ) had first degrees, 27% of the teachers who participated in the study ( $n=89$ ) were from science-literature faculties, 42% of the teachers who participated in the study ( $n=136$ ) graduated from educational faculties, and 18% of the teachers who participated in the study ( $n=57$ ) had post-graduate degrees. The number of the teachers who graduated from educational faculties was more.

The distribution of the participant teachers according to their seniority at service is shown in Table 5. Twelve percent of the teachers, who participated in the study ( $n=39$ ) had 1 to 5 years' experience, 16% of the teachers who participated in the study ( $n=53$ ) had 6 to 10 years' experience, 29% of the teachers, who participated in the study ( $n=93$ ) had 11 to 15 years' seniority, 20% of the teachers, who participated in the study ( $n=63$ ) had 16 to 20 years' seniority, and 23% of the teachers who participated in the study ( $n=75$ ) had 21 years and above seniority. It may be claimed that the majority of the teachers are experienced in their professions.

The distribution of the participant teachers according to the average class populations is given in Table 6. Eighteen percent of

the teachers, who participated in the study ( $n=57$ ) worked in classes with 1 to 25 students, 47% of the teachers, who participated in the study ( $n=152$ ) worked in classes with 26 to 30 students; 35% of the teachers, who participated in the study ( $n=104$ ) worked in classes with 31 and over students. When the populations of the classes in the schools where the study was conducted were examined it was observed that the classes where there were 26 to 30 students constituted the majority. This situation also reflects the overall status of the distribution in classes in the country.

#### Data collection tool

In order to determine the teachers' viewpoints on the changes made in pass grade regulation, which became active in 2013 to 2014 academic year in secondary education institutions, a 5-Point Likert Scale was developed by the author of the study. The scale consisted of 19 items and 3 factors. In addition, aside from these 3 factors, there are questions on the personal information of the teachers who participated in the study in the first section of the scale. This section consists of 6 items on demographic variables. This section was formed as personal information and includes some variables like the gender, branch, school type, educational status (graduation), seniority years and average population of the classes of the teachers. In the 3 dimensions of the scale, the performance task dimension consisted of 7 items; the pass grade regulation dimension consisted of 7 items, and the absenteeism dimension consisted of 5 items.

The scale was presented for the experts' opinions and evaluations. Necessary corrections were made on the scale in the light of the viewpoints and critics of the experts, and it was made proper for the pre-application. Then, this scale was applied to 113 secondary education teachers for reliability analyses. This application was performed as face-to-face interviews with the teachers. The items on the content dimension that had low values in the pilot application were removed from the scale. The scale was applied after the reliability studies of the items. If the KMO value in such scales is over 0.60, the scale is considered as being proper for factor analysis (Büyükoztürk, 2013). The KMO value of the scale was found as 0.897. This is a value that is proper for analysis. In addition, the item load values of the scale are shown in Table 7.

The rate of explaining the total variance by the 5-factor structure is 76.6%. Çokluk et al. (2010) reported that 40 to 60% was the ideal rate in multifactorial structures. The factor load values of 5 factors were not observed to be close to each other, and their contributions to the total variance were more than the other factors. After the Vertical Spinning (*Varimax*), the items of the 5-factor structure that overlapped with each other and that had item load values below .32 were removed from the scale, and it was given the latest form for application. The numbers given earlier about the dimensions were obtained after the items with low values were removed. After the reliability analysis, the Cronbach Alpha Coefficient of the scale,



**Table 7.** The sub-dimensions and item load values after the explanatory factor analysis of the teacher viewpoints of the change in the regulation.

Item numbers	Components		
	Factor 1 (Smart Board)	Factor 2 (Tablet)	Factor 3 (Course Book)
M1	941		
M2	933		
M3	917		
M4	916		
M5	915		
M6	904		
M7	754		
M8		894	
M9		891	
M10		890	
M11		889	
M12		883	
M13		848	
M14		762	
M15			882
M16			854
M17			852
M18			820
M19			551

which consisted of 19 items, was found to be 0.90. As a result, the scale is reliable. In addition, the ranges of the points are given subsequently in agreement with the Likert Scale Table 8.

#### Data analysis

The statistical analyses in the study were made by using the SPSS 20.0 Program. In the analyses of the problem statement and sub-problems, the descriptive statistics method was used; the t-test and One-Way Variable Analysis (ANOVA) tests were used for irrelevant sampling. The Tukey test was used for intergroup comparisons. The significance level was taken as 0.05.

#### FINDINGS

The frequency values, percentages, arithmetic averages and similar statistical values were used to find out which answers of the teachers given to the questions in the questionnaire were more intense (by using the 5-Point Likert Scale). The unrelated sampling t-test was performed in order to determine whether there were significant differences between the teachers' viewpoints in terms of two-group variables (like gender). The ANOVA was used in order to determine whether there were significant differences between the teachers' viewpoints in three or more group variables ("the branch, school type, graduation, seniority year, class population").

In case, differences were determined, the Tukey Multiple Comparison test was made in order to determine between which groups the differences were. The significance level was taken as 0.05. The options and their points given in the scale across the sentences are as the following.

The t-test results of the scale are shown in Table 9. When Table 6 is examined, it is observed that the teachers' viewpoints on the changes in pass grade and common exam regulation [ $t(321) = -1.30; p > 0.05$ ], the right of absenteeism [ $t(321) = -0.21; p > 0.05$ ] and performance tasks [ $t(321) = -0.39; p > 0.05$ ] did not vary at a significant level according to gender variable. In other words, gender does not seem to be a determinant variable in the viewpoints of teachers in these dimensions. In addition, when Table 9 is examined, it is observed that the average of the teachers' viewpoints on the changes in the pass grade and common exam regulation were stated as "I am indecisive"; the teacher viewpoints on the changes on absenteeism right were stated as, "I agree"; and the teachers' viewpoints on the changes in the performance tasks were stated as, "I do not agree". In general, the teachers did not consider the changes in the regulations in a positive manner. It may be considered as the necessity for common exams, the pass grade being increased to 50, and assigning students with performance tests were not considered to be much beneficial by the teachers. However, the right of

**Table 8.** The ranges of the points of the items in the questionnaire with Likert-Scale.

I do not agree at all	1	1.00-1.80
I do not agree	2	1.81-2.60
I am indefinite	3	2.61-3.40
I agree	4	3.41-4.20
I totally agree	5	4.21-5.00

**Table 9.** The t-test results of the teacher viewpoints on the changes in the regulation in secondary education institutions according to the gender.

Dimensions	Gender	n	$\bar{X}$	S	sd	T	p
Pass grade in classes and common exam	Female	141	2.81	0.99	321	-1.30	0.19
	Male	182	2.96	1.07			
Absenteeism	Female	141	3.56	0.79	321	-0.21	0.84
	Male	182	3.58	0.90			
Performance	Female	141	2.13	0.85	321	-0.39	0.70
	Male	182	2.17	1.00			

**Table 10.** One Way ANOVA results of the teacher viewpoints on the changes in the regulation on secondary education institutions according to branches of the teachers.

Dimensions	School type	n	$\bar{X}$	S	sd	F	p	Different Tukey
Pass grade and common exam	Verbal	94	2.80	1.01	4; 318; 322	3.127	0.01	2-3; 3-5
	Physical science	126	3.02	1.10				
	Vocation	42	2.48	1.04				
	Skills	30	2.99	0.98				
	Foreign language	31	3.19	0.71				
Absenteeism	Verbal	94	3.57	0.88	4; 318; 322	1.388	0.23	
	Physical science	126	3.56	0.90				
	Vocation	42	3.39	0.68				
	Skills	30	3.63	0.78				
	Foreign language	31	3.85	0.81				
Performance	Verbal	94	2.04	0.85	4; 318; 322	3.062	0.01	1-5; 2-5
	Physical science	126	2.09	0.97				
	Vocation	42	2.15	0.87				
	Skills	30	2.22	1.00				
	Foreign language	31	2.68	0.99				

absenteeism was reduced, which means that the students would be present at schools more than before, and this was considered as a positive action by the teachers.

According to Table 10, there is a significant difference between the teachers' viewpoints on pass grade and

common exam according to their branches [ $F(4-318)=3.12$ ;  $p<0.05$ ]. It was determined that this difference was in favor of the physical sciences teachers in the analysis between the physical science teachers and vocational classes teachers; and in favor of the foreign

**Table 11.** One Way ANOVA results of the teacher viewpoints on the changes in the regulation on secondary education institutions according to school types of the teachers.

Dimensions	School type	N	$\bar{X}$	S	sd	F	p	Difference Tukey
Pass grade and common exam	Anatolian High School	156	2.76	1.15	2;	3,805	0.02	1-3
	Science-Teacher Training High School	55	2.88	0.84	320;			
	Vocation High School	112	3.11	0.92	322			
Absenteeism	Anatolian High School	156	3.55	0.96	2;	0.30	0.74	
	Science-Teacher Training High School	55	3.53	0.71	320;			
	Vocation High School	112	3.62	0.75	322			
Performance	Anatolian High School	156	2.12	0.93	2;	0.28	0.76	
	Science-Teacher Training High School	55	2.13	0.91	320;			
	Vocation High School	112	2.20	0.97	322			

language teachers in the analyses between the foreign language teachers and vocational class teachers. It may be claimed that the physical science and foreign language teachers consider the pass grade being increased and the compulsory exams as a beneficial change. In addition, the teachers' viewpoints on the changes in pass grade and common exam were determined as "I am indecisive".

According to Table 10, it is observed that the teachers' viewpoints on the changes in absenteeism right did not differ at a significant level according to the branches of the teachers [ $F(4-318) = 0.23$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on the changes in absenteeism right were determined as "I agree" in general.

According to Table 10, there is a significant difference between the teachers' viewpoints according to performance task dimension according to teacher's branches [ $F(4-318) = 3.06$ ;  $p < 0.05$ ]. This difference is in favor of the foreign language teachers in the analyses between the teachers from verbal branches and foreign language teachers; and in favor of the foreign language teachers in the analyses between the physical science teachers and foreign language teachers. It is possible to claim that foreign language teachers consider the performance task in a more beneficial manner. In addition, the teachers' viewpoints on performance task were determined as "I do not agree".

According to Table 11, it is observed that there is a significant difference between the teachers' viewpoints on the changes in pass grade and common exam according to school type variable [ $F(2-320) = 3.80$ ;  $p < 0.05$ ]. It is determined that this difference is in favor of the teachers working at vocational high schools in the analyses between Anatolian High School and Vocational High School teachers. The teachers working at vocational high schools consider the increase in pass grade and

compulsory common exams as a positive development. In addition, the teachers' viewpoints on the changes in pass grade and common exam were determined as "I am indecisive".

According to Table 11, the teachers' viewpoints on the changes in absenteeism right did not differ at a significant level according to school type variable [ $F(2-320) = 0.30$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on absenteeism right were determined as "I agree".

According to Table 11, the teachers' viewpoints on performance task dimension did not differ at a significant level according to school type variable [ $F(2-320) = 0.28$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints were determined as "I do not agree" on performance task dimension.

According to Table 12, it is observed that the teachers' viewpoints on pass grade and common exam dimension do not differ at a significant level according to educational status (graduation) variable [ $F(3-319) = 1.42$ ;  $p > 0.05$ ]. In addition, it is also observed that the teachers' viewpoints according to school type on pass grade and common exam were determined as "I am indecisive" on performance task.

According to Table 12, it is observed that the teachers' viewpoints on absenteeism right do not differ at significant level according to educational status (graduation) variable [ $F(3-319) = 1.77$ ;  $p > 0.05$ ]. In addition, it is also observed that the teachers' viewpoints according to school type were determined as "I agree" on absenteeism right dimension.

According to Table 12, it is observed that the teachers' viewpoints on performance task dimension do not differ according to educational status (graduation) variable at a significant level [ $F(3-319) = 1.49$ ;  $p > 0.05$ ]. In addition, it is also observed that the teachers' viewpoints were determined as "I do not agree" on performance task.

**Table 12.** One Way ANOVA results of the teacher viewpoints on the changes in the regulation on secondary education institutions according to educational status.

Dimensions	Educational status	n	$\bar{X}$	S	sd	F	p
Pass grade and common exam	Undergraduate	41	2.56	0.83	3; 319; 322	1.42	0.24
	Science-literature	89	2.74	0.70			
	Educational faculty	136	2.56	0.72			
	Post-graduate	57	2.54	0.70			
Absenteeism	Undergraduate.	41	3.68	0.74	3; 319; 322	1.77	0.15
	Science-literature	89	3.50	0.96			
	Educational faculty	136	3.66	0.76			
	Post-graduate	57	3.40	0.93			
Performance	Undergraduate.	41	2.13	0.97	3; 319; 322	1.49	0.22
	Science-literature	89	2.00	0.93			
	Educational faculty	136	2.27	0.99			
	Post-graduate	57	2.12	0.76			

**Table 13.** One Way ANOVA results of the teacher viewpoints on the changes in the regulation on secondary education institutions according to the seniority of the teachers.

Dimensions	Seniority (Years)	n	$\bar{X}$	S	sd	F	P	Significant difference
Pass grade and common exam	1-5	39	2.34	0.69	4; 318; 322	3.28	0.01	1-5 to 20 years and more*
	6-10	53	2.51	0.73				
	11-15	93	2.61	0.65				
	16-20	63	2.59	0.82				
	21 and over	75	2.82	0.70				
Absenteeism	1-5	39	3.26	0.93	4; 318; 322	2.30	0.06	-
	6-10	53	3.54	0.91				
	11-15	93	3.53	0.84				
	16-20	63	3.65	0.87				
	21 and over	75	3.74	0.74				
Performance	1-5	39	2.16	0.97	4; 318; 322	0.51	0.73	-
	6-10	53	2.19	0.85				
	11-15	93	2.04	0.89				
	16-20	63	2.20	1.14				
	21 and over	75	2.22	0.85				

According to Table 13, it is observed that there is a significant difference in the teachers' viewpoints on pass grade and common exam according to seniority of the teachers variable [ $F(4-318)=3.28$ ;  $p<0.05$ ]. Between the teachers who had 1 to 5 years seniority and those with 21 years and over seniority, it is observed that this difference is in favor of the teachers who had 21 years and over seniority. The teachers who had 21 and over seniority years considered the increase in the pass grade and the

common exams being compulsory as a positive development. In addition, the teachers' viewpoints on pass grade and common exam were determined as "I do not agree" and "I am indecisive". In general, the teachers did not consider the changes in pass grade regulation as a positive development.

According to Table 13, it is observed that the teacher viewpoints on absenteeism right do not differ at a significant level according to the seniority years of the

**Table 14.** One Way ANOVA results of the teacher viewpoints on the changes in the regulation on secondary education institutions according to classroom populations.

Dimensions	Classroom population (Pcs)	n	$\bar{X}$	S	sd	F	p
Pass grade and common exam	Between 1 and 25	57	2.88	0.94	2;	0.268	0.77
	Between 26 and 30	152	2.86	1.12	320;		
	Between 31 and 35	114	2.95	0.98	322		
Absenteeism	Between 1 and 25	57	3.44	0.84	2;	1.015	0.14
	Between 26 and 30	152	3.62	0.89	320;		
	Between 31 and 35	114	3.56	0.81	322		
Performance	Between 1 and 25	57	2.27	0.82	2;	1.976	0.36
	Between 26 and 30	152	2.21	0.98	320;		
	Between 31 and 35	114	2.01	0.93	322		

teachers [ $F(4-318)=2.30$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on absenteeism right according to the seniority variable were determined as "I am indecisive" and "I agree".

According to Table 13, it is observed that the teachers' viewpoints on performance task do not differ at a significant level according to the seniority of the teachers variable [ $F(4-318)=0.51$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on performance task dimension were determined as "I do not agree".

According to Table 14, it is observed that the teachers' viewpoints on the changes in the pass grade and common exam regulations do not vary according to average class populations at a significant level [ $F(2-320)=0.26$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on the changes in the pass grade and common exam regulations were observed to be at "I am indecisive" level.

According to Table 14, it is observed that the teachers' viewpoints on absenteeism right do not differ at a significant level according to average class populations variable [ $F(2-320)=1.01$ ;  $p > 0.05$ ]. In addition, the teacher viewpoints on absenteeism right were evaluated as "I agree" by the teachers.

According to Table 14, the teachers' viewpoints on performance task dimension do not differ according to the average class populations variable at a significant level [ $F(2-320)=1.97$ ;  $p > 0.05$ ]. In addition, the teachers' viewpoints on performance task dimension were determined as "I do not agree". The teachers do not consider performance tasks as beneficial for the students.

## DISCUSSION

The teachers' viewpoints on the change in pass grade, absenteeism right and performance task assignment did

not differ at a statistically significant level according to gender variable.

The teachers' viewpoints on pass grade, common exam and performance task dimension differed at a statistically significant level according the branches of the teachers. This difference was determined to be in favor of the teachers from physical sciences and foreign language branches. It may be claimed that the physical sciences and foreign language teachers consider the changes in pass grade and common exam as beneficial changes.

It was observed that the teachers' viewpoints on the change in pass grade and common exam showed a significant difference according to the school type variable in favor of the teachers working at vocation high school. It was also observed that the viewpoints of the teachers on the changes in the absenteeism right and the performance task did not differ at a significant level according to school type variable.

It was observed that the teachers' viewpoints on the change in pass grade, common exams, absenteeism right and giving performance task to students dimension did not vary at a significant level according to educational status (graduation) of the teachers' variable.

It was observed that the teachers' viewpoints on the pass grade and common exam differed at a significant level according to the seniority year variable in favor of the teachers who had 21 years and over seniority. It was also observed that the teachers' viewpoints on absenteeism right and performance task did not differ at a significant level according to the seniority of the teachers' variable.

It was observed that the teachers' viewpoints on the change in absenteeism right and performance task dimensions did not differ at a significant level according to the average class populations' variable.

It was observed that the teachers' viewpoints on the change in pass grade and common exam were stated as

"I am indecisive" by the participant teachers. The teachers did not consider the changes in the regulation as being highly positive. It may be interpreted as the necessity for conducting common exams, the pass grade being increased to 50 and similar issues were not considered as beneficial for education by the teachers.

It was observed that the teachers' viewpoints on the change in absenteeism right were determined as "I agree". The teachers considered the decrease in the absenteeism right, which means that students would attend school more than before, as a relatively positive development.

The teachers' viewpoints on assigning performance tasks dimension were determined to be as "I do not agree". It may be interpreted as giving performance tasks to students is not considered as a beneficial act by teachers.

## RECOMMENDATIONS

The changes that will be made on the regulations for high schools must be planned by receiving the viewpoints of the high school teachers, students and parents, who are the practitioners of these changes, without populist policies. It is recommended that the learning and teaching processes are regulated with the viewpoints of pedagogues, teachers, and educationalists.

The results of the study showed that the viewpoints of the teachers on the changes made in pass grade, common exams and performance tasks varied according to the branches, school types and seniority years of the teachers. This situation shows that the opportunities of the schools and the environment may be different in the pass grade, common exams and performance tasks in different branches, different physical environments and in schools with different characteristics. This shows that these kinds of changes and innovations must be made by considering the branches of the teachers, school types, physical environment and opportunities.

## CONFLICT OF INTERESTS

The authors have not declared any conflicts of interest.

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*Full Length Research Paper*

# Improving primary students' mathematical literacy through problem based learning and direct instruction

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This research was done on primary school students who are able to understand mathematical concepts, but unable to apply them in solving real life problems. Therefore, this study aims to improve primary school students' mathematical literacy through problem-based learning and direct instruction. In addition, the research was conducted to determine whether there are differences in the increase in literacy mathematical among students who received problem-based learning and direct instruction in primary schools located in urban areas, transition, and villages, as well as whether there is an interaction effect between the model of learning by location category of the school toward mathematical literacy skills of primary school students. The study was conducted in the academic year 2015 to 2016 in the fifth grade public primary schools in Bandung with three categories of school location (rural, city and county transition). During the research, one experimental group was treated by problem based learning, while the second experimental group was treated by direct instruction. The research approach used was a quantitative approach with quasi experimental method nonequivalent groups design pretest-posttests. The results showed that: there was a significant difference between the increase in mathematical literacy of students who received a model of problem-based learning (PBL) and direct instruction (DI) model; PBL model was more effective in improving students' mathematical literacy model than the DI; There were no significant differences regarding an increase in students' mathematical literacy by category location of the school; there is no interaction effect between the model of learning by school location factors to the increase in students' mathematical literacy.

**Key words:** Mathematical literacy, problem based learning, direct instruction, mathematics education, primary school.

## INTRODUCTION

Education is one of the core needs for humans being, because through education people can develop their natural potential given by Allah which are Al'jasad (physical), Al-Aql (intellect) and Ar-Ruh (spiritual) for the

maturity of human beings.

Therefore, education is expected to develop a wide range of potential of the students. Education is also an important factor for the development of a country,

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because education is expected to create individuals with high potential and quality Human Resources (HR) in the advancement of the nation. In Indonesia, education is required for all citizens: nine years' compulsory basic education for primary and junior high school. Therefore, basic education is important when taken for all citizens, because basic education is a process for developing a basic human capacity optimally in the intellectual aspects, social and personal. In addition, basic education is also the beginning of the acquisition of the next level of education.

The purpose of primary education is to establish the basic personality of student as whole Indonesian persons based on the level of development; development of basic understanding of science and technology, a foundation for learning in higher education and public life.

Basic education, beginning with primary school (SD), is a compulsory requirement for higher education. Primary school education is very important to equip students to prepare themselves in taking life as well as to develop its potential. One concept that is learned in primary school is math. Effective mathematics teaching requires an understanding of what students know and need to learn and then challenging and supporting them to learn it well (NCTM, 2000).

Therefore, all students learn math concepts, almost entirely dependent on the experience of teachers teaching in the classroom every day. So to achieve quality mathematics education in primary school, the teacher must:

1. Deeply understand math concepts taught in primary school.
2. Understand the characteristics of primary school students' learning, and
3. Choose strategies and mathematical tasks in accordance with the characteristics of primary school age children.

The latest curriculum in Indonesia on education and learning of mathematics in schools or other learning namely is 2013 Curriculum. 2013 Curriculum Development is a further step for developing Competency Based Curriculum which was initiated in 2004 as well as KTSP curriculum (2006). This includes competency attitudes, knowledge, and skills in an integrated manner. The rationale for creating 2013 curriculum development is due to a variety of external challenges involved in the deepening and expansion of the material. In that regard, the 2013 curriculum development is a step towards strengthening the material. This was carried out by the Indonesian Government to re-evaluate the scope of the material contained in the curriculum. This was done by eliminating materials that are less essential or less relevant to students, maintaining the material according to the needs of learners, and adding material considered

important for international comparison.

Based on government programs on 2013 curriculum development, the expected competencies of learners in various domains (cognitive, affective and psychomotor), competencies per area of study, as well as others including mathematical literacy can thrive well. Mathematical literacy (mathematical literacy) is about usability or mathematical functions that have been learned by the students in the school to everyday life in order to compete in a globalized world. In the PISA (OECD, 2013), mathematical literacy was often disputed in junior high school and high school students.

Mahdiyansyah and Rahmawati (2014) study showed that the mathematical literacy of students of secondary education is still low, even though the international test design used has been adapted to the context of Indonesia. Based on the PISA (OECD, 2013) and Mahdiyansyah and Rahmawati (2014)'s study discuss the lack of mathematical literacy in junior high school and senior high school is also experienced by primary school students; therefore mathematical literacy must also be developed in primary school students as the basis for the acquisition of basic mathematical concepts. Mathematical literacy problems high school students did not rule out the impact of mathematical literacy problems and learning primary students. Mathematical literacy problems of primary school students have looked at some of the students were only able to understand a mathematical concept, but some students are still less capable of connecting between mathematical concepts and apply mathematics in reducing the problems found in everyday life. It is also marked on the presence of some students who are not able to give right answer the case stories, especially about non-routine related to mathematical concepts that are discussed in primary school.

UNDP (2000) and the International Evaluation of Education Achievement (2000) reported the low quality of Indonesian students' ability to compete in the era of globalization, particularly in mathematics and science (Dewanto and Sumarno, 2013). The latest results from the Programme for International Student Assessment (PISA) in 2012 showed further decline in student achievement in Indonesia where the majority of students Indonesia has not reached level 2 (75%) and 42% of students have not even reached its lowest level (level 1), whereas in PISA mathematics years 2009, almost all Indonesian students reached level 3 and only 0.1% of Indonesian students were able to reach level 5 and 6. From the results of the combined tests of mathematics, science, and reading, in PISA 2012 Indonesia was ranked 64 out of 65 participating countries (OECD, 2013).

Similarly, in the case of iterations, the study results Progress in International Reading and Literacy Study (PIRLS) intended for class V, SD also showed that over 95% of Indonesian learners in grade V were at the middle



level, while more than 50% of Taiwan students got to the highest level (Kemendikbud, 2014). Mathematical literacy is important because it can facilitate students in solving real life problems related to mathematical concepts (Garfunkel, 2013).

Important capabilities in mathematical literacy are the ability to propose, formulate and resolve within or outside the mathematical problems in a variety of contexts. Such capabilities include all things in teaching mathematical concepts are given from the beginning. However, it would be much better if the students first introduced the concept of math through problem poser, problem solver, or both (Johar, 2012). Furthermore, Suyitno (2013) explains the mathematical literacy as follows:

1. Mathematical literacy defined as the ability of a person (in this case, students) to formulate, implement, and interpret mathematics in various contexts, including the ability to perform reasoning mathematically and using the concepts, procedures, and facts to describe, explain, or predict phenomena / events.

2. Problems that includes literacy mathematics, are the problems with certain characteristics such as:

- a. Non-routine
- b. Solving the problem
- c. Require higher order thinking (HOTS, higher order thinking skills) of students
- d. The solution requires two or more formulas
- e. Contains interpretations mathematics utilization in various contexts, and
- f. Be able to cultivate students' creative ideas to explain the reason why algorithm is chosen.

Problem-based learning is a learning that utilizes problems, questions, or puzzle (puzzle) as a trigger (trigger) for the students' learning process (CIDR, 2004). Padmavathy and Mareesh (2013) study revealed the effect of problem based learning in teaching mathematics to enhance students' understanding, and the ability to use the concept in real life.

Understanding and ability to use the concept in real life is a part of mathematical literacy competence. In addition, Tan (2003) explained that through problem-based learning, students are motivated to learn is high, develop higher level thinking skills, teamwork and communication skills (Tan, 2003). Based on the opinions and research on these experts, it is expected that through the implementation of a model problem based learning can improve students' mathematical literacy in primary school.

Direct instruction is a teaching model that consists of the teacher's explanation of the concept or skill of the students followed by asking the students to test their understanding by doing practice under the guidance of teachers (practice controlled), and encourage them to

continue to practice under the guidance of a teacher (Joyce et al., 2011). Din (2000) conducted a study on models of direct instruction which indicates that after guiding, the students made significant gains in their basic math skills. So applying the direct instruction model can improve students' mathematical literacy in primary schools

## METHODOLOGY

The research approach used was a quantitative approach. This is because this study tries to control how groups of research subjects are taught and then measures how the teaching affects each group. The method used in this research was quasi experiment because the research was carried out with the intention to learn something by changing conditions and observing their effects on other things.

Quasi experimental study conducted is to form groups of non-equivalent pretest-post- test design based on the idea of Fraenkel and Wallen (2007). The population of this research was all fifth grade students of primary schools in the county and cities of Bandung. Research samples of six primary school consisting of four primary schools from Bandung District represent the rural (SDN Cipaku 02 and 03) and transition areas (SDN Cinunuk 02 and 07), and two primary schools in the Municipality of Bandung represent urban areas (SDN Kebon Gedang 01 and 09).

The research instrument used was a test sheet evaluation of students' mathematical literacy in geometry for fifth grade primary school. The evaluation tests of students' mathematical literacy were conducted in order to understand and identify the mathematical literacy of students regarding instructional materials was learnt, where the implementation of the evaluation study aim to measure students' mathematical literacy in the subject matter being discussed. Instrument development was done by testing the validity criterion, the empirical validity and reliability testing The validity test was done using the formula of Pearson product moment correlation coefficient; the validity of the instruments was 0.673; R critical, 0.349. Meanwhile, empirical validity of the test results showed that the 15 questions that were tested had a valid criterion consisting of six questions about the nine categories of good and sufficient criteria. In addition, the reliability of the calculation results using Alpha-Cronbach formula was 0.785, suggesting that the results of the test instrument have high reliability.

The data analysis determines the increase of primary school students' mathematical literacy through problem-based learning and direct instruction. Data analysis technique used in this study was a statistical technique inferential parameters, where the technique was carried out using t-test, Mann-Whitney U test one-way ANOVA, test two-way ANOVA and post hoc test Kruskal-Wallis, with a significance level of 0.05. The quasi-experimental design was implemented as follows: Firstly, it involves the planning and preparation of the research; it begins with the definition of the research problems, a search for reference materials, designing of the research hypothesis, the study design, selection of a sample of a given population according to the study design, making lesson plan (RPP) of problem based learning and direct instruction models, as well as making the instruments used for the research. Secondly, conducting of the research: the research was done by placing the sample in experimental group 1 and experimental group 2, giving pretest to each group, based on the dependent variable. Experimental group 1 was taught with by using problem-based learning and experimental group 2 was taught by using direct instruction; and each group was given a posttest based on the dependent variable. Thirdly, data collection and analysis of data

**Table 1.** Significance test results students' mathematical literacy from both groups.

Model	N	Mean	Mean difference	Mann-Whitney U	Wilcoxon W	Z	Sig.	Result
PBL	115	0.73	0.19	605.000	6170.000	-11.532	0.000	H <sub>0</sub> is rejected
DI	105	0.54						

**Table 2.** Significance difference test results students' mathematical literacy among students improvement between student with PBL and DI treatment in the schools located in the village.

Model	N	Mean	Mean difference	t	df	Sig.	Result
PBL	42	0.73	0.19	12.927	84	0.000	H <sub>0</sub> is rejected
DI	44	0.54					

was done. Fourthly, research report was taken.

## RESULT

Results of the hypothesis testing begin with equality test data with an increase of students' mathematical literacy based learning model presented in Table 1.

Table 1 shows that the probability value (sig.) is less than  $\alpha = 0.05$ , so H<sub>0</sub> is rejected. Thus, there are significant differences improvement of students' mathematical literacy who received the model PBL and students who received DI models. In addition, it is known that students who get significantly PBL models earned an average improvement of students' mathematical literacy was greater than students who received DI models with an average difference of 0.19 increase.

Further testing was the significance testing of the differences in the increase of primary school students' mathematical literacy in three school locations. Results of the significant difference in the students' mathematical literacy improvement in relation to schools located in the village are presented in Table 4.

In Table 2, it can be seen that the probability value (sig.) is less than 0.05, which means that H<sub>0</sub> is rejected. Thus, there are significant differences in the mathematical literacy of those students who received the PBL and DI models in schools located in the village; those who received the PBL model significantly obtain an average increase in mathematical literacy more than those that received DI model in primary schools located in the village. Results of the tests of significance difference in the increase of students' mathematical literacy in relation to schools located in the cities using t-test are presented in Table 3.

In Table 3, it can be seen that the probability value (sig.) is less than 0.05, which means that H<sub>0</sub> is rejected.

Thus, the increase in students' mathematical literacy who received the PBL and DI models in schools located in cities have significant differences; those students who received the PBL model significantly obtain an average increase in literacy mathematical greater than those students who received DI models in primary schools located in cities.

Results of the tests of significance difference in the students' mathematical literacy improvement in relation to schools located in transition area using t-test are presented in Table 4. In Table 4, it can be seen that the probability value (sig.) is less than 0.05, which means that H<sub>0</sub> is rejected. Thus, the increase of student's mathematical literacy who get the PBL model and DI in schools located in the transition region have significant differences, as well as students who treated with PBL model significantly obtain the average increase in literacy mathematical greater than that received models DI in primary schools located in transition area. To see the influence of the learning models and location of the school on the increase in students' mathematical literacy, t two-way ANOVA test was done. The test results are summarized in Table 5.

According to Table 5, the teaching model obtained sig. <0.05, which indicates H<sub>0</sub> was rejected. There was a significant difference in students' mathematical literacy improvement due to differences in teaching model given. As for the category of the location of the school and the interaction between the learning model with the location of the school obtained sig. > 0.05. H<sub>0</sub> was accepted, and there was no significant difference due to the increase in students' mathematical literacy based school location factors or as a result of interaction between the learning model with location of the school. Thus, there was no interaction effect between the teaching model with school location factors to the increase in students' mathematical literacy.

**Table 3.** Significance difference test results students' mathematical literacy among students improvement between student with PBL and DI treatment in the school located in the city.

Model	N	Mean	Mean Difference	t	df	Sig.	Result
PBL	22	0.76	0.22	9.227	48	0.000	H <sub>0</sub> is rejected
DI	28	0.54					

**Table 4.** Significance difference test results students' mathematical literacy among students improvement between student with PBL and DI treatment in the school located in the transition area.

Model	N	Mean	Mean difference	t	df	Sig.	Result
PBL	51	0.70	0.17	9.793	82	0.000	H <sub>0</sub> is rejected
DI	33	0.53					

**Table 5.** Results of Interaction test between teaching model and school area toward the increase of students' mathematical literacy.

Source	Type III sum of squares	Df	Mean square	F	Sig.	Result
School located	0.034	2	0.017	2.961	0.054	H <sub>0</sub> is accepted
Model	1.919	1	1.919	333.039	0.000	H <sub>0</sub> is rejected
Interaction	0.023	2	0.012	2,021	0.135	H <sub>0</sub> is accepted
Error	1.233	214	0.006	-	-	-
Total	92.314	220	-	-	-	-

## DISCUSSION

From the research results, problem based learning model proved to be effective in improving students' mathematical literacy. The results of the data analysis showed a significant difference between mathematical literacy scores of experimental group 1 and experimental group 2, when direct instruction model was used. This is because in essence, mathematical literacy is the ability to help students in solving real-life problems related to mathematical concepts (Garfunkel, 2013). This is in line with the opinion of Johar (2012), who revealed that mathematical literacy capability is the ability to propose, formulate and resolve problems within or outside the mathematics in a variety of areas and contexts. Such capabilities include everything, ranging from pure mathematics to cases where there are no mathematical structures; it has been given from the beginning but is first introduced through problem poser, problem solver, or both.

Based on the opinion of Garfunkel (2013) and Johar (2012), mathematical literacy is the ability of students to solve problems. This is particularly appropriate for developing students' mathematical literacy using problem-based learning model, because it is an effective way to solve problem and it enhances the skills used in

solving problems (Ozcan and Balim, 2013; Temel, 2014). Furthermore, Bilgin et al (2009) explain that the purpose of problem based learning is to help students to think, solve problems and to improve their thinking skills by building a real situation or relating concepts to be learned.

Students' mathematical literacy needs to be developed since they are in primary school. Mathematical literacy is very important for the realization of universal primary education as embodied in the Millennium Development Goals (MDGs). Therefore, mathematical literacy should be improved with the relevant teaching materials, laboratory mathematics and electronic libraries, to meet the expected program of universal primary education. If the mathematical literacy is well developed, enhanced and quite successful, it could lead to the acquisition of mathematical skills that can lead to the achievement of universal primary education (Adeyemi and Adaramola, 2014). As the mathematical literacy of students needs to be developed since they are in primary school, there is the need for a research to develop the mathematical literacy of primary school students. This was confirmed by the results of Afkhami et al. (2012) who found that students in primary school are more successful in mathematical literacy compared to junior high school and senior high school students. Mathematical literacy of

junior high school and senior high school students had no significant difference.

In primary school, students are already taught mathematical literacy through the process of mathematical problem solving in everyday life. Learning can be implemented through a problem-based learning. Problem-based learning is an education that emphasizes problem as the starting point of the learning process. These types of problems depend on the specific organization. Typically, the problem is based on real life; problems that have been selected and edited to meet the objectives and criteria of education (Graaff and Kolmos, 2003). Problem-based learning as a model of learning that develops problem-solving skills is very supportive toward the development of mathematical literacy, because basically one's capability in the development of mathematical literacy is the ability of solving real problems that often arise in the daily life of students. Besides the ability to problem-solving in everyday life, students with mathematical literacy have the following capabilities:

1. Basic mathematical knowledge and skills required of citizens in a modern and practical basic core of knowledge of mathematics.
2. A certain level of computational ability, logical reasoning, and understanding the concept of spatial (or at a beginner level, spatial imagination)
3. Interest in applying mathematics to understand numbers and symbols, and a basic understanding of mathematical concepts; and
4. Character traits that are important for learning mathematics (Tai et al., 2014).

Furthermore, in PISA 2012 (OECD, 2013), the seven components in the assessment of mathematical literacy are presented namely communication, mathematizing, representation, reasoning and argument, devising strategies for solving problems, using symbolic, formal and technical language and operations, as well as using mathematics tools.

Therefore, problem based learning is suitable to develop skills and competencies of primary school students' mathematical literacy, where students learn through problem-based learning, information about their skills after participating in problem based learning, problem solving, self-confidence, critical thinking, and teamwork. Apart from the acquisition of skills, problem based learning also encourages them to have in-depth understanding, improve their theoretical knowledge, and promote a deep approach to learning (Borhan, 2012).

The effectiveness of problem based learning in improving students' mathematical literacy also strengthens the results of the research conducted by Padmavathy and Mareesh (2013) which showed the effect of problem based learning in teaching and

understanding mathematics and the ability to use it in real life; where understanding and ability to use the concept in real life is a part of mathematical literacy competence. Implementation of the model of problem based learning is done through four stages: reviewing and presenting problems, developing strategies, implementing the strategy, and discussing and evaluating the results (Eggen and Kauchak, 2012).

In addition to implementing each stage of problem based learning presented by Eggen and Kauchak (2012), the problem based learning can also be implemented through fun method and in accordance with the characteristics of primary school age children, that is by singing and storytelling. This method is expected to develop problem based learning which attracted the attention of primary students so that students' mathematical literacy can thrive. This is in line with the opinion of Levenberg (2015) which states that integrating songs and stories in mathematics which is used as an important tool for the cultivation of mathematical literacy as well as one of the ways to overcome learning difficulties. Learning mathematics is important if environmental topics related to children are integrated. Mother Goose is one of the songs that can be used to carry out mathematical activities dealing with issues of series and their graphical presentation.

In social constructivism view, mathematics can be considered as a social construction. This refers to the traditional nature, in accepting the fact that human language, rules and agreements play a key role in developing and justifying mathematical truth. In accepting that mathematics is a social construction, it is implied that mathematics as objective knowledge which is the product of humans thinking. The application of mathematics has two reasons:

1. Mathematics is based on empirical natural language, and
2. Semi-empiricism mathematical meaning that is not so different from empirical science (Ernest, 2004).

One model of social constructivism view is the problem-based learning model. The theoretical basis of problem based learning is collaborativism, where collaborativism is a view which argues that students will develop knowledge by building reasoning of all the knowledge he/she already had and all acquired as a result of activity of interacting with other people. It also implies that the learning process moves from the facilitator of information transfer students to the knowledge construction process of social and individual nature. According constructivism, humans can only understand through self-construction (Lidinillah, 2008). Thus, the problem based learning model is very suitable to implement, develop and justify mathematical truth.

Zheng and Zhou (2011) also explained one of the

characteristics of problem based learning in which every complex question is decomposed into a series of fine coherent sub-questions following criteria carefully designed to maintain a balance between guiding students and inspiring them to think independently. Learning problem based learning allows students to solve complex questions in the context of progressive inductive. Therefore, mathematical literacy students can develop well through a series of complex questions to solve problems in everyday life. Students who obtain a model of learning by using problem-based learning in the learning process in this study is known to have higher literacy than students taught with direct instruction models. It is marked on the N-gain value where the difference between the students who got the problem based learning models and direct instruction model was equal to 0.17. In addition, the mathematical literacy enhancement significance test also showed that there are differences in mathematical literacy improvement of students who received problem based learning model and those who received direct instruction model.

The results of the study showed that students who learned with problem based learning model in the learning process had an increased literacy than those students who learned with direct instruction model. This is reinforced by the opinions of Etherington (2011), who revealed that the problem based learning deserves a more prominent place in science undergraduate primary education for teachers because the process empowers students and educators to direct the study, define and analyze problems and develop solutions. Limitations found in research are very acceptable, because there is no perfect thing. Certainly there will be weaknesses in different aspects. The limitations in this research are as follows:

1. Sampling was not done randomly (random), so it cannot fully control the variables that could affect the implementation of the experiment.
2. Lack of control variables, so characteristic in the treatment group could not be made equal to or equated.

Based on those limitations, the researchers recommend further research that would be much better by using mixed research methods. This will make the research findings more accurate, valid, reliable and trustworthy. Sampling should be done randomly in order to fully control the variables that could affect the demographics such as age, gender, social and economic background of the research subjects.

## CONCLUSION

In line with the formulation of the problem and research questions, the study came to the conclusion with respect

to the results of empirical studies on the experimental problem based learning to improve mathematical literacy of fifth grade students in primary school. Based on the research results obtained, the followings are concluded: First, there are differences in the increase of mathematical literacy of students taught with problem based learning and those students taught with direct instruction model in schools located in rural, urban and transition regions.

Secondly, the interaction between the learning model and location of school affected the increase in students' mathematical literacy. The interaction between the teaching model and location of school may not be sensitive to primary school students' mathematical literacy. Differences in the increase of students' mathematical literacy are only caused by different teaching models. By ignoring the factor, location of the school, the teaching model makes an impact on students' mathematical literacy.

Therefore, the interaction between the model problem based learning and direct instruction models affects the students' mathematical literacy, where the problem based learning model has a significant influence on the improvement of primary school students' mathematical literacy. So, whatever the location of the school, both in the village, town or transition areas has no effect on enhancing students' mathematical literacy. But rather an increase in students' mathematical literacy is influenced significantly by learning model (problem based learning and direct instruction models). Mathematical literacy of the students can increase by implementing learning model and the location of the school.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

## Social problem solving levels of pre-service social studies teachers

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The purpose of this study is to examine pre-service Social Studies teachers' social problem solving levels based on different variables. A total of 247 preservice Social Studies teachers (103 females (41.7%) and 144 males (58.3%)) from Erzincan University, Faculty of Education, Department of Social Studies Teaching participated in the study. The descriptive model was used in the study. The Social Problem Solving Inventory (SPSI), developed by D'Zurilla and Maydeu-Olivares in 1995 and 1996, revised by D'Zurilla, Nezu and Maydeu-Olivares in 2002 (SPSI-R), and adapted into Turkish by Eskin and Aycan and the "Revised Social Problem Solving Inventory (Tr-SPSI-R)" were used in the study as the data collection instruments. According to the analyses, positive problem orientation (PPO) scores decrease as negative problem orientation (NPO) scores increase; NPO scores decrease as rational problem solving style (RPSS) scores increase; PPO scores decrease as impulsive-careless problem solving style (ICPSS) scores increase; RPSS scores decrease as ICPSS scores increase; PPO scores decrease as APSS scores increase. According to the classroom variable, there is a significant difference. According to this study, there is a significant difference between preservice teachers' NPO and Avoidant Problem Solving Style (APSS) scores based on gender.

**Key words:** social problem solving, social studies, preservice teacher, problem solving skills.

### INTRODUCTION

The concept, "problem solving" is defined as "the self-directed cognitive-behavioral process by which an individual, couple or group attempts to identify or discover effective solutions for specific problems encountered in everyday living" (Chang et al., 2004).

Nezu et al. (1989) defined "problem solving" with regard to behavior as, a form of learning where the individual changes his current behavioral state as a response to a problematic event; with regards to social learning as the process of self-management; and with

regards to mental health as the primary coping strategies which facilitate exploring effective behaviors (Çam and Tümkaya, 2008).

According to Bingham (1998), it is a process which requires a set of effort to extinguish the problems encountered while achieving a target. Charness (1998) defines problem solving as an activity which enables an individual to go into a desired state from a premise state, in which problem solving concerning how to reach the desired results is clear.

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“Social problem solving” is a cognitive, independent and behavioral process related to exploring or defining coping strategies which are coherent and effective with problematic events encountered in daily life. Problem solving focuses primarily on process measurements and result measurements. While process measurements evaluate cognitive and behavioral activities which prevent resolutions by facilitating the exploration of effective and coherent problem resolutions, results measurements evaluate the quality of resolutions related to the problems. While a strong relationship between the two measures are not always expected, variables apart from problem solving attitudes and skills can affect the quality of problem solving results under certain conditions (D’Zurilla and Magdeu-Olivares, 1995).

Social problem solving is generally discussed as “intrapersonal”, “interpersonal”, “impersonal” and “social problems” (D’Zurilla et al., 2004). The success of interpersonal problem solving is related to “the capacity of defining the problem that occurs interpersonally in a set of stressful states, generating a solution and making a logical selection among the solutions focusing on the objective (D’Zurilla and Chang, 1995). An effective problem solving skill also requires understanding the definition, formula and characteristics of a problem, describing realistic goals and perceiving the cause-effect relationship (Yunus et al., 2006). It is evident in studies that deficiencies in social problem solving skills is a predictor of psychological problems and difficulties such as depression, schizophrenia, anxiety and aggression (Eskin and Aycan, 2009).

“Problem orientation” and “problem solving style” are being developed with regards to problem solving training (Ciarrochi et al., 2009). Problem orientation focuses on metacognitive aspects of problem solving and the way of problem solving; and on the skills for finding and implementing the resolutions convenient with the problems (Heppner et al., 2004). According to Shure and Spivack (1982), interpersonal problem solving skills consist of the following elements;

1. Generalizing alternative resolutions (for example, the skill to generalize various resolutions in solving a problematic state).
2. Thinking of the outcomes of social behaviors (for example, the skill of considering the effects of the individuals’ behaviors on the individual and others).
3. The development of resolution-outcome couples (for example, using sequence steps in problem solving),
4. Development of the social-causal thought (for example, knowing that the behaviors and emotions of a person is related to the behaviors and emotions of others).
5. Being responsive to problems (being aware of types of problems that can occur under specific conditions).
6. Dynamic orientation (for example, accepting that

behaviors do not always reflect motivations that are hard to be noticed).

The three dimensions of the social problem solving model are;

1. Inclining towards the problem
2. Appropriate problem resolution and
3. Carrying out problem solving skills. Inclining towards the problem refers to becoming aware of the problem, causal contributions and the individual’s expectation from problem resolution and constitutes the motivational aspect in problem solving (Arslan et al., 2012).

Problem solving skills or problem solving styles; while problem solving is considered as different types of problems such as intra-personal, inter-personal, impersonal and social problems, the two independent processes related to problem solving of individuals are;

1. Problem orientation and
2. Problem solving styles. Problem orientation consists of two dimensions, positive problem orientation and negative problem orientation; problem solving styles consist of three dimensions, rational problem solving, impulsive-careless style and avoidant style (D’ Zurilla et al., 2004).

### **Problem orientation**

1. Positive Problem Orientation: In this orientation, the individual has a tendency to see problems as challenging, believes in himself in successfully resolving the problem and it is stated that problem solving is time consuming and requires effort and patience. Individuals consider the problems and their personal competences for solving them in a positive way (Eskin and Aycan, 2009).
2. Negative Problem Orientation (NPO): In this orientation, problems are considered as threats for the individual’s well-being and there is a suspicion on solving the problem successfully. The individual feels limited and unhappy when he or she encounters a problem. There is a dysfunctional or frustrating cognitive-motivational construct (Eskin and Aycan, 2009).

### **Problem solving style**

1. Rational problem solving style; four primary domains have been defined to rationally resolve the problems in this orientation;
  - (a) The problem should be defined and formulized
  - (b) Resolution options should be set
  - (c) The most effective solution should be chosen
  - (d) The solution should be implemented and evaluated (D’Zurilla and Goldfried, 1971).



2. Careless/Impulsive Style; While the attempts in solving problems in this orientation are limited, impulsive, careless, hasty or deficient, it is also common to produce a limited level of solution options and to take steps according to the first solution that comes to mind (D'Zurilla et al. 2004; Nezu, 2004; Demirbağ, 2013).

3. Avoidant Style; problem solving in this orientation is usually referred to as delaying, being passive or failing to take action, being addictive, dysfunctional and at the same time deficient. The reason for deficiency is due to addictiveness, inactivity, passiveness and delaying (Eskin and Aycan 2009; Bayani et al., 2013).

The fact that the social life embodies many problems and that the individual generates approaches to cope with and resolve these problems has brought the problem solving skills to the agenda. The personal approach of the individual affects being a social individual through a cognitive, affective and behavioral process. In order for the individual to solve social problems effectively, he needs to be guided, a setting for practice needs to be prepared and needs to be familiar with problem solving stages. Hence, it is crucial to increase awareness related to problem solving skills during the socialization process (Ayvaz and Demirel, 2010). When the literature is considered, it is evident that there are many studies on problem solving and that they have been discussed under the title "issue/problem solving". Studies on social problem solving are limited. No studies related to Social Studies preservice teachers' social problem solving skills were detected.

The Social Studies program aims at furnishing primary school year 4 to 8 students with the first 9 skills along with 6 other unique skills. One of these skills is the "problem solving" skill. In addition, in the primary approach of the program it is underlined that "rather than a fully behavioristic approach, it takes into consideration the value of information and the individual's experiences and develops by supporting a structure based on supporting and improving the individual's active participation in life, making right decisions and problem solving".

It is also stated that "methods and techniques, which support re-structuring of the information and performing of the skills they acquire and problem solving" (MEB, 2005a) and the roles of the teachers during the educational process were defined as; taking measures in cases where problems are encountered in student development. In the general purposes section of the Social Studies program, with regards to the term social problem it was underlined that; "they express unique opinions for the resolution of personal and social problems" (MEB, 2005b).

In the new Social Studies Course Teaching Program (Draft) for year 4, 5, 6 and 7 students, it was stated that "the events and problems that students encounter in their

daily lives are taken into consideration while preparing Social Studies Teaching Program". When the general purposes are considered, it is emphasized that; "as citizens of the Republic of Turkey, they are individuals who are aware of rights, freedom and responsibilities, who create peaceful settlements to problems encountered in the democratic life they actively participate in and who contribute to creating and developing a culture of tolerance and compromise".

In the field of Individual and Society Learning, it is stated that; "Based on the fact that, as social beings, individuals influence and get influenced by their environment, it is crucial that they can realize themselves and create solutions for the problems they encounter according to their interests, desires and skills". In the field of Effective Citizenship Learning, it is underlined that; "...acquisitions, which aim at raising participating citizens who are aware of their rights and responsibilities, who take initiatives and who create peaceful solutions for their problems, have been created". Under the same learning section, it is also stated that "they study the roles of the groups in solving social problems encountered in the social setting". The term "social problem" is given under the concepts section (MEB, 2015).

With regards to this approach, it can be said that the Social Studies course has a crucial role in furnishing with social problem skills. Thus, the purpose of this study is to evaluate social problem solving levels of preservice teachers who will give the Social Studies course in the future and their approaches related to problem solving. Thus, answers for the following questions were sought;

1. Are there any differences among the sub-dimensions of the Social Studies preservice teachers' social problem solving skills scale with regards to various variables (age, gender, classroom level)?
2. What is the level of Social Studies preservice teachers' social problem solving skills?

## METHODOLOGY

### Design of study

This study is a descriptive study designed with the screening model and which has been planned to evaluate preservice Social Studies teachers' "Social Problem Solving Levels" with regards to various variables. The screening model is a formation of scanning conducted on a population or a group, example or sample from that population so as to come to a general judgment on the population which consists of many elements. The screening model is based on discussing a situation in its current state through an objective approach (Karasar, 1999).

### Study group

The study group consisted of a total of 247 preservice Social

**Table 1.** Demographical distributions of participant preservice teachers based on the types of the variables.

Type	Variable	F	Percentage (%)
Gender	Female	103	41.7
	Male	144	58.3
	Total	247	100.0
Grade	Year 2	38	15.4
	Year 3	81	32.8
	Year 4	128	51.8
	Total	247	100.0

Studies teachers, 103 female (41.7%) and 144 male (58.3%) and, selected randomly from Erzincan University, Faculty of Education, Department of Social Studies Teaching. Based on the grade variable, 38 (15.4%) students were in year 2; 81 (32.8%) students in year 3; and 128 (51.8%) students were in year 4 Table 1 shows the demographic information about the participants.

#### Assessment instrument and data collection

##### Preservice teachers' information form

In this form consisting of three questions, there are demographic questions related to grade, gender and age.

##### Revised Social Problem Solving Inventory (Tr-SPSI-R)

The Social Problem Solving Inventory (SPSI), which was developed by D'Zurilla and Maydeu-Olivares (1995,1996) and revised by D'Zurilla et al. (2002) (SPSI-R), consists of 5 point Likert type 52 items (Eskin and Aycan, 2009). The inventory consists of five sub-scales which evaluate the domains of the social problem solving process:

1. Positive problem orientation (PPO, 5 items)
2. Negative problem orientation (NPO, 10 items)
3. Rational problem solving style (RPSS, 20 items)
4. Impulsive-careless problem solving style (ICPSS, 10 items)
5. Avoidant problem solving style (APSS, 7 items).

The short form (SPSI-R-S) of the twenty-five item SPSI-R was developed by decreasing the number of each sub-scales' items to five. While item scores of the SPSI-R long form range between 0 and 4 times the number of items, they range between 0 and 20 for the short form. High scores indicate well problem solving skills. It has been observed that the original form of SPSI-R, developed by D'Zurilla et al. () is at a high level for evaluating the social problem solving structure and that it has sufficient level of psychometric features (Eskin and Aycan, 2009).

The long form of the inventory was used in this study. Internal consistency coefficients of the scale, whose both short and long forms were adapted into Turkish by Eskin and Aycan (2009), were observed to be between 0.62 and 0.92 and the test-retest reliability coefficients were observed to be between 0.60 and 0.84. Long and short SPSI-R scale scores were observed to be statistically and

theoretically correlated to each other. When the correlation coefficients between the SPSI-R scales and Problem Solving Inventory (PSI) dimensions are considered, it is evident that both short and long SPSI-R scales have significant and desired correlation coefficients with the PSI scores.

Correlation coefficients between the long and short SPSI-R scales and the Rosenberg self-esteem scale (RSES), interpersonal behavior scale (IPBS), beck depression inventory (BDI), Beck hopelessness scale (BHS) and suicide probability scale (SPS) were calculated. While the positive dimensions of SPSI-R "Positive Problem orientation and Rational Problem Solving Style" scale scores have negative correlations with BDI, BHI and SPS, they are positively correlated with IPBS, RSES and grade point average. While the three negative dimensions of SPSI-R "NPO, ICPSS and APSS" scale scores have positive correlations with BDI, BHI and SPS, they are negatively correlated with IPBS, RSES and grade point average (Eskin and Aycan, 2009; Demirbağ, 2013). The form consisting of 52 items and 5 sub-dimensions were used in this study. The reliability coefficient of the scale was observed to be 0.817 in this study.

#### Data analysis

Study data were analyzed through the Statistical Package for Social Sciences (SPSS) for Windows 22.0 software. Number, percentage, average and standard deviation were used as the definitive statistical methods in evaluating the data. The t-test was conducted in comparing the continuous quantitative data between two independent groups; the One Way ANOVA test was conducted comparing the continuous quantitative data between more than independent groups. The Scheffe test was conducted as the complementary post-hoc analysis so as to determine the differences at the end of the ANOVA test. The Pearson correlation analysis was conducted on the continuous variables of the study. Findings were evaluated at 95% reliability range and 5% significance level.

## FINDINGS

Findings resulting from the analysis of the data which were collected from the preservice teachers through the scales are given in this section to settle the study problem. Explanations and comments were made based on the findings.

In Table 2, results of the one way variance analysis (ANOVA), which was conducted to determine whether or not the NPO score averages of preservice teachers significantly differed with regards to the grade level variable, show that there is a statistical significant difference between the group averages ( $F=5.286$ ;  $p=0.006<0.05$ ). A complementary post-hoc analysis was conducted to determine the source of the differences. NPO scores of year 3 students ( $14.654\pm 7.135$ ) were observed to be higher than the NPO scores of year 4 students ( $11.484\pm 6.647$ ).

According to the ANOVA, which was conducted to determine whether or not there is a significant difference between preservice teachers' PPO, RPSS, Impulsive-Careless Problem Solving Style (ICPSS), Avoidant Problem Solving Style (APSS) and SPSI-R total score

**Table 2.** Averages of the revised social problem solving inventory (SPSI-R) levels based on the grade level (ANOVA).

Variable	Group	N	Ave.	Ss	F	p	Difference
Positive problem orientation (PPO)	Year 2	38	13.605	3.538	1.054	0.350	-
	Year 3	81	14.235	3.941			
	Year 4	128	13.445	3.920			
Negative problem orientation (NPO)	Year 2	38	13.579	8.016	5.286	0.006	-
	Year 3	81	14.654	7.135			
	Year 4	128	11.484	6.647			
Rational problem solving style (RPSS)	Year 2	38	52.079	11.783	0.559	0.572	-
	Year 3	81	54.988	14.446			
	Year 4	128	53.961	14.317			
Impulsive-careless problem solving style (ICPSS)	Year 2	38	9.553	4.631	1.607	0.203	-
	Year 3	81	11.321	6.066			
	Year 4	128	10.258	5.299			
Avoidant problem solving style (APSS)	Year 2	38	6.790	5.189	1.857	0.158	-
	Year 3	81	8.210	4.676			
	Year 4	128	7.109	4.328			
Total score	Year 2	38	14.042	2.064	0.655	0.520	-
	Year 3	81	13.826	2.394			
	Year 4	128	14.197	2.278			

averages with regards to the grade level variable, the difference between the group scores is not statistically significant ( $p>0.05$ ).

In Table 3, results of the t-test, which was conducted to determine whether or not NPO scores of preservice teachers significantly differed with regards to the gender variable, show that the difference between the group averages is statistically significant ( $t=2.683$ ;  $p=0.008<0.05$ ). NPO scores of females ( $x=14.272$ ) were observed to be higher than the NPO scores of males ( $x=11.826$ ).

According to the t-test, which was conducted to determine whether or not the avoidant problem solving scale score averages of preservice teachers significantly differed with regards to the gender variable, the difference between the group averages is statistically significant ( $t=-3.785$ ;  $p=0.000<0.05$ ). APSS scores of males ( $x=8.333$ ) were observed to be higher than the APSS scores of females ( $x=6.146$ ).

According to the t-test, which was conducted to determine whether or not there is a significant difference between preservice teachers' PPO, Rational Problem

Solving Style (RPSS), Impulsive-Careless Problem Solving Style (ICPSS) and SPSI-R total score averages with regards to the gender variable, the difference between the group scores is not statistically significant ( $p>0.05$ ).

Table 4 shows the correlations between the sub-dimensions of the revised social problem solving inventory. There is a weak, negative and significant relationship between NPO and PPO ( $r=-0.262$ ;  $p=0.000<0.05$ ). Based on this result, it can be asserted that PPO scores of students decrease as their NPO scores increase. There is a moderate, positive and significant relationship between Rational Problem Solving Style (RPSS) and PPO ( $r=0.674$ ;  $p=0.000<0.05$ ). Based on this result, it can be asserted that RPSS scores of students increase as their PPO scores increase. There is a highly weak, negative and significant relationship between RPSS and NPO ( $r=-0.222$ ;  $p=0.000<0.05$ ).

Based on this result, it can be asserted that NPO scores of students decrease as their RPSS scores increase. There is a highly weak, negative and significant relationship between Impulsive-Careless Problem Solving

**Table 3.** Averages of the revised social problem solving inventory (SPSI-R) level based on gender.

	Group	N	Ave	Ss	t	p
Positive problem orientation (PPO)	Female	103	13.175	4.433	-1.912	0.069
	Male	144	14.125	3.376		
Negative problem orientation (NPO)	Female	103	14.272	6.850	2.683	0.008
	Male	144	11.826	7.212		
Rational problem solving style (RPSS)	Female	103	53.408	15.655	-0.570	0.583
	Male	144	54.438	12.688		
Impulsive-careless problem solving style (ICPSS)	Female	103	9.777	5.662	-1.755	0.080
	Male	144	11.014	5.314		
Avoidant problem solving style (APSS)	Female	103	6.146	4.040	-3.785	0.000
	Male	144	8.333	4.767		
SPSI-R total score	Female	103	14.023	2.354	-0.169	0.866
	Male	144	14.072	2.238		

Style (ICPSS) and PPO ( $r=-0.247$ ;  $p=0.000<0.05$ ). Based on this result, it can be asserted that PPO scores of students decrease as their NPO scores increase. There is a weak, positive and significant relationship between ICPSS and NPO ( $r=0.405$ ;  $p=0.000<0.05$ ).

Based on this result, it can be asserted that NPO scores increase as ICPSS scores increase. There is a highly weak, negative and significant relationship between Impulsive-Careless Problem Solving Style (ICPSS) and Rational Problem Solving Style (RPSS) ( $r=-0.227$ ;  $p=0.000<0.05$ ). Based on this result, it can be asserted that RPSS scores of students decrease as their ICPSS scores increase. There is a highly weak, negative and significant relationship between APSS and PPO ( $r=-0.166$ ;  $p=0.009<0.05$ ).

Based on this result, it can be asserted that PPO scores of students decrease as their APSS scores increase. There is a weak, positive and significant relationship between APSS and NPO ( $r=0.333$ ;  $p=0.000<0.05$ ). Based on this result, it can be asserted that NPO scores increase as APSS scores increase. There is a moderate, positive and significant relationship between APSS and ICPSS ( $r=0.515$ ;  $p=0.000<0.05$ ).

Based on this result, it can be asserted that ICPSS scores increase as APSS scores increase. There is a high, positive and significant relationship between SPSI-R Total Score and PPO ( $r=0.735$ ;  $p=0.000<0.05$ ). There is a moderate, negative and significant relationship between SPSI-R Total Score and NPO ( $r=-0.663$ ;

$p=0.000<0.05$ ). There is a moderate, positive and significant relationship between SPSI-R Total Score and Rational Problem Solving Style (RPSS) ( $r=0.685$ ;  $p=0.000<0.05$ ). There is a moderate, negative and significant relationship between SPSI-R Total Score and ICPSS ( $r=-0.669$ ;  $p=0.000<0.05$ ). There is a moderate, negative and significant relationship between SPSI-R Total Score and Avoidant Problem Solving Style (APSS) ( $r=-0.599$ ;  $p=0.000<0.05$ ). The relationships between the other variables are not statistically significant ( $p>0.05$ ).

According to this result, it is evident that as the R total scores of students increase, the PPO and RPSS sub-dimension scores of R increase; but the NPO, ICPSS and APSS scores decrease (Table 4).

## DISCUSSION

Problem solving is a process which requires logic and effort and also is an integrative part of daily life (Malik et al., 2010). In order to decrease illogical thought during the problem solving process, problem overcoming mechanisms should be introduced and activities and practices which emphasize positive thought considering these acquisitions should be offered to individuals (Bedel, 2014). While positive problem orientation is constructive problem solving, negative orientation is a dysfunctional orientation. In negative orientation, there is a tendency of "threat, distrust in the solution, being disappointed, anger,

**Table 4.** Correlations between the sub-dimensions of the revised social problem solving inventory (SPSI-R).

Variable	Average	Standard deviation	Positive problem orientation (PPO)	Negative problem orientation (NPO)	Rational Problem solving style (RPSS)	Impulsive-careless problem solving style (ICPSS)	Avoidant problem solving style (APSS)	SPSI-R total score
Positive problem orientation (PPO)	13.729	3.872	1.000	-	-	-	-	-
Negative problem orientation (NPO)	12.846	7.152	-0.262**	1.000	-	-	-	-
Rational problem solving style (RPSS)	54.008	13.981	0.674**	-0.222**	1.000	-	-	-
Impulsive-careless problem solving style (ICPSS)	10.498	5.485	-0.247**	0.405**	-0.227**	1.000	-	-
Avoidant problem solving style (APSS)	7.421	4.599	-0.166**	0.333**	-0.088	0.515**	1.000	-
SPSI-R total score	14.052	2.283	0.735**	-0.663**	0.685**	-0.669**	-0.599**	1.000

aggression, social anxiety, perfectionism” towards the problem (Bedel and Hamarta, 2014).

According to the study results, social problem solving levels of preservice Social Studies teachers who participated in the study were evaluated based on the total and sub-scores. It is evident that there is a weak, negative and significant relationship between NPO and PPO; between RPSS and NPO; between ICPSS and PPO; between ICPSS and RPSS and between APSS and PPO. According to this result, it is evident that; PPO scores decrease as NPO scores increase; NPO scores decrease as RPSS scores increase; PPO scores decrease as ICPSS scores increase; RPSS scores decrease as ICPSS scores increase; PPO scores decrease as APSS scores increase.

According to the study conducted by Yıldız et al. (2011), there is a moderate, negative and significant relationship between RPSS and PPO;

between APSS and ICPSS; there is a weak, positive and significant relationship between ICPSS and NPO; between APSS and NPO. Based on this result, it can be asserted that RPSS scores of students increase as their PPO scores increase; ICPSS scores increase as APSS scores increase and NPO scores increase as APSS scores increase.

The study also suggested that preservice teachers applied the avoidant approach most frequently; and as a result they failed to think of collecting information on the problem they encounter, they failed to put sufficient amount of effort in overcoming the problem when their solution failed and that they did not think of what is useful and what is not regarding the path they follow after solving the problem. Similarly, Bayrak (2015) also found that preservice teachers' problem solving levels were low and stated that preservice teachers preferred to let things aside

rather than overcoming the problems and seeking effective solutions.

With regards to negative problem orientation, it is observed that adolescents with single parents have higher levels of approaching the problem negatively than adolescents with two parents and that their life satisfaction levels are significantly lower (Bedel and Işık, 2015). On the other hand, constant anger, anger repression and anger expression behaviors increase as the negative problem approaches of the student increases (Arslan, 2010).

Studies on social problem solving emphasize the importance of social problem solving skills education. For example, according to Cartilli and Bedel (2015), social problem solving skill education has a significant effect on the increase in the level of mothers' constructive and functional problem solving skills. In the study conducted by Çekici and Güçray (2012), it is stated that a

positive effect is observed in “social problem solving skills” and “anger thoughts towards the world” variables through social problem solving skills education and that this effect is a long-term permanent effect.

In another similar study, it is underlined that family, peer and teacher support provided to university students who receive “social support and problem solving support” increase positive problem orientation and rational problem solving approaches, which are among the functional problem solving approaches (Traş, 2013). There are various studies which support problem solving such as social problem solving education. These studies also state that various educational practices have a positive effect on social problem solving skills. Bedel and Arı (2011) stated that interpersonal social problem solving skills education has a significant effect in increasing the constructive problem solving skills of adolescents living in orphanages; Güneş et al. (2014) underlined that assertiveness training positively affects interpersonal problem solving skills during student communication; Altuntaş and Altınova (2015) emphasized that creative drama education has a positive effect on social problem solving skills.

The deficiency in social problem solving skills affects the individual’s mental, cognitive and behavioral approaches. For example, in the study conducted by Öksüz and Bilge (2014), it was underlined that social problem solving and interpersonal anger variables predict suicide probability; negative orientation towards the problem is the primary predictor of suicide probability; one other factor was identified as an inner-impulsive approach stating that a deficiency in social problem solving skills is related to the individual confronting unresolved problems and that it can increase the probability of suicide when considered together with anger.

According to Erozkan (2013), there is a positive relationship between constructive problem solving and persistent-ambitious problem solving skills and social self-efficacy. In the study conducted by Yiğit (2013), it was observed that preservice teachers with high subjective well-being levels, high life satisfaction levels and who are effective in attaining their goals approached the problems encountered in daily life positively and realistically, they did not ignore problems and they tackled them carefully. Subjective well-being positively increases the rational sub-dimension of social problem solving and this is considered to be a positive outcome.

## Conclusion

In the study conducted by Baltacı and Hamarta (2013), it was observed that when the relationship between “social avoidance, concern for being criticized, feeling valueless, social anxiety and problem solving” and “problem solving

approaches” are considered, there is a positive relationship between the sub-dimensions of social anxiety and problem solving approaches. In the study, it was stated that distrustful individuals who do not receive social support experience social avoidance; impatient and distrustful individuals who act without thinking experience a concern for being criticized and impatient, shy, distrustful and unplanned individuals experience the feeling of self-depreciation. On the other hand, according to Bedel and Hamarta (2014), in the relationship between interpersonal problem solving and academic motivation; the constructive problem solving and persistent-patient problem solving approaches are significantly related to academic motivation.

With regards to the grade level variable; the score averages between NPO are significant in this study. NPO scores of year 3 preservice teachers are higher than the scores of year 4 preservice teachers. This result is parallel with the study conducted by Samancı and Uçan (2015). According to the study, social problem solving levels of preservice form teachers are above average and social problem solving levels differ when the year 3 and 4 variables are considered. This result of our study is parallel with the study results of Katkat and Mızrak (2003) underlining that problem solving skill improves as the grade level increases; problem solving skills of lower grade students are lower than those of the students in higher grades. However, in the study conducted by Saracaloğlu, Yenice and Karasakaloğlu (2009), it is stated that there are no significant differences among the parameters of sub-dimensions of problem solving skills.

According to this study, there is a significant difference between participant preservice teachers’ both NPO and APSS scores with regards to the gender variable. NPO NPSS scores of males are higher than females. However, there are no significant differences between preservice teachers’ PPO, RPSS and ICPSS scores based on the gender variable. According to Işık and Yıldız (2014), negative problem orientation differs significantly in interpersonal problem solving with regards to gender; studies conducted by Yenice and Karasakaloğlu (2009), Bayrak (2015), Genç and Kalafat (2010) state that there are no differences with regards to gender. Suggestions can be made based on the study findings:

1. With regards to teacher training policies of the faculties of education and the primary objectives of Turkish National Education, raising individuals; with healthy and stable physical, mental, moral, spiritual and emotional personalities, with free and scientific power of thinking, with an extended vision of the world; who respect human rights; who value personalities and enterprises; who have a sense of social responsibility; who are constructive, creative and productive is the primary aim. Social problem solving levels of preservice teachers are

expected to increase as their grade levels increase. Thus, the skills and acquisitions of preservice teachers should be predicted based on the grade level.

2. The fact that social problem solving levels of faculty of education students studying in the same educational program do not significantly differ with regards to the gender variables was among the expected results. If there is a significant difference considering the gender variable, then the reasons for this can be a research subject for other studies.

3. Social problem solving levels of teachers working in disadvantaged schools or regions should be examined and educational programs of the faculty of education should be improved accordingly.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

# Perceptions of teacher candidates about social network usage levels in Turkey

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This study was conducted to determine the perceptions of the teacher candidates in educational faculties in Turkey about social network usage levels in today's globalizing world. The study was performed with 4 separate study groups. The first study group consisted of 657 teacher candidates, the second study group consisted of 364 teacher candidates, the third study group consisted of 121 teacher candidates, and the fourth study group consisted of 676 teacher candidates. This study, designed based on the Scanning Model, is a descriptive study. It is revealed in the study that the teacher candidates in Turkey think that they are different from each other in the use of social networks. Their perceptions are given in a scale, 'The perceptions scale of the teacher candidates about social networks'.

**Key words:** Teacher candidates, social networks, communication technology.

## INTRODUCTION

The concept of social network was first used by Barnes in 1954 who saw it as the relations a person has with other people around. According to Barnes, social networks consist of individuals that are psychologically important for people who interact with them (Aksut et al., 2011).

Today, on the other hand, we can describe social networks as a series of applications that group information exchange online, increase social connections and shared area for cooperation and group interaction (Boyd and Ellison, 2007).

According to another definition, social networks are the software that facilitates mutual interaction among individuals and groups, facilitates social feedback, and supports the formation of social relations. In addition, Boyd (2003) expresses that social networks support personal desires of individuals, include them in the

process, and become the desire of the group in order to have personal aims (Bilen et al., 2014).

In this globalizing world, developments in information and communication technologies and improvements in the infrastructure of the Internet created structural transformations in the online world. At first, there were webpages on which the users could not assess the contents and were passive. However, with time and as technology advanced, new webpages on which the users could form the contents and which provided bilateral interaction were developed (O'Reilly, 2007).

Before 2004, the web technologies that did not allow interaction and only allowed single-sided communication were called Web 1.0. After 2004, the pages that were used to create webpages that allowed bilateral interaction were developed and were called Web 2.0 (Levy, 2009).

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Web 2.0 is the technology in which internet users can create contents and establish communications with each other (O'Reilly, 2007; Albion, 2008). The web services that are created by using Web 2.0 technology are called Social Media (Duggan et al., 2015). Blogs, social networks, photograph/document sharing sites, video sharing sites, RSS and social innuendo sites may be given as examples for social media sites (Duggan et al., 2015; Onat and Alikilic, 2012).

Social networks differ from other social media sites in that they allow creating a profile page and establishing communications over this profile for their users (Rigby, 2008; Dube, 2016). Boyd and Ellison (2007) defined social network sites as web-based services in which the users are listed and there is sharing among these users on the system that has certain limits; and the user information is open or close according to the permission of the user. Facebook, Twitter, Instagram, and Whatsapp may be given as examples of commonly-used social networks.

Social networks are used widely both in the world and in Turkey (Tuik, 2016). Turkey is at the top levels in the usage rates of social networks in the whole world. The number of active social network accounts was around 42 million in 2015 in Turkey. 96% of the young people between the ages of 1 to 29 are using social networks in Turkey. The most frequently used social network site is Facebook with a rate of 89%, followed by Instagram and Twitter (Dijitalajanslar, 2016).

Turkey ranks fifth in the whole world in terms of spending time in social networks; and with this value, it is higher than the average value of the whole Europe (95.7%). The most frequently used social networks are Facebook and Twitter, and they are widespread among university students. The number of the members of Facebook is around 717 million, and Turkey is on the 5th row with 30 million members in the whole world. As the number of the users of Twitter in Turkey moves closer to 5 million, the number of Turks using LinkedIn is about 630.000. The use of other social networks is increasing at a fast pace in Turkey, which is the 2nd country in Europe that watch online videos (Youtube, Vimeo, Dailymotion) (Tektaş, 2014).

It is possible to claim that the use of social networks has both positive and negative influences on the society that sustains their existence in the world today. As a matter of fact, the intense use of social networks influences the social lives, psychological characteristics and educational properties of students (Hazar, 2011; Castells, 2012). Using social networks in a frequent manner sometimes may reach the level of addiction among young people (Babacan, 2016; Chan et al., 2015). For this reason, young people are isolated from the external world, and their academic success levels are influenced negatively (Samaha and Havi, 2016; Iskender and Akin, 2010; Cagan et al., 2014).

Apart from the negative influences of social networks mentioned earlier, they also have some positive influences. To illustrate, social networks provide a medium for users to express their emotions and ideas in a free manner (Dahlgren 2009; Tufekci and Wilson, 2012). This situation enables users to express themselves and ensure that they acquire information on different attitudes and ideas in various situations (Tufekci and Wilson, 2012).

Social networks enable users to interact with different individuals whose ideas they may benefit from, and increase their social capitals by meeting new people (Fenton and Barassi, 2011). We can claim that using social networks influences educational environment in many aspects. Social networks enable students to establish communications about their lessons via communities created in social networks with their friends and teachers, and share information and documents about their lessons (Veletsianos, 2012; Odabası et al., 2012; Laird, 2014; Tiryakicioglu and Erzurum, 2011).

This situation supports that students share informal learning activities according to their learning desires and needs (Ozdamli, 2013; Mitchel, 2012; Stevenson and Lui, 2010). The forming of groups or lists in social networks enables students to establish communications with specialist people that have different information in various fields in many different learning communities (Lepi, 2014; Tinmaz, 2011). The learning communities in social networks facilitate the application of many different educational methods and techniques like discussion, cooperative learning and peer teaching (Hueng and Yuen, 2010).

Social networks develop the critical thinking and problem solving skills of students, and provide them with an active learning environment (Laird, 2014; Munoz and Towner, 2009). Social networks also facilitate the establishing of communications with academicians for students, and also increase their interactions (Ozmen et al., 2011).

## METHODOLOGY

This study is a descriptive study in which the Scanning Model is used. The scanning models are used in studies which aim to determine the ideas, attitudes, inclinations and similar characteristics of a group (Creswell, 2013). The Causal-Comparative Design was used in the study to determine whether the perceptions of the teacher candidates about social networks vary at a statistically significant level according to their gender and grades. In Causal-Comparative Design, the issue of whether the sub-groups of the independent variables (female-male; village-county-city, etc.) show difference at a significant level from each other based on the dependent variables is examined (Cohen et al., 2013).

### The study group

This study was conducted with four different study groups. The first,

second and third groups were used to know the validity and reliability of the study, "The Perceptions Scale of the Teacher Candidates about Social Networks". The fourth study group was used to determine whether the perceptions of the teacher candidates about social networks varied at a statistically significant level according to gender and grade variables.

### The first study group

This study group consisted of 657 students, who were studying at Marmara University Atatürk Faculty of Education in 2015 to 2016 academic year. The data obtained from this group were used in the Explanatory Factor Analysis of the scale used in the scope of the study, and in determining the Cronbach Internal Consistency Coefficient. When the forms that were returned by the students were examined, it was observed that some forms were incomplete, and these forms were eliminated. The remaining 621 forms were used in the analyses. It was determined that 342 students of this study group were females (55%) and 279 were males (45%); 131 were 1st graders (21%), 165 were 2nd graders (26%), 154 were 3rd graders (25%), and 171 were 4th graders (28%).

### The second study group

This study group consisted of 364 students who were studying at Dicle University, Ziya Gokalp Faculty of Education in 2015 to 2016 academic year. The data obtained from this study group were used in determining the Confirmatory Factor Analysis results of the scale used in the study. When the forms that were returned by the students were examined it was observed that some forms were incomplete, and these forms were eliminated. The remaining 334 forms were used in the analyses. 161 students of this study group were females (48%) and 173 were males (52%); 92 were 1st graders (27%), 84 were 2nd graders (25%), 88 were 3rd graders (26%) and 70 were 4th graders (22%).

### Third study group

This study group consisted of 121 students who were studying at İnönü University, Faculty of Education in 2015 to 2016 Academic year. The data obtained from this group were used in determining the test-retest reliability results of the scale used in the study. It was determined that 65 students of this study group were females (54%) and 56 were males (46%); 61 were 2nd graders (50%) and 60 were 3rd graders (50%).

### Forth study group

This study group consisted of 676 students who were studying at İnönü University, Faculty of Education in 2015 to 2016 Academic year. The data obtained from this group was used in determining whether the perceptions of the teacher candidates about social networks varied significantly according to gender and grade variables. When the forms that were returned by the students were examined, it was observed that some forms were incomplete, and these forms were eliminated. The remaining 635 forms were used in analyses. It was determined that 399 students of this study group were females (61.5%) and 250 were males (38.5%); 188 were 1st graders (29%), 181 were 2nd graders (27.9%), 181 were 3rd graders (27.9%) and 99 were 4th graders (15.2%).

### Data collection tool

"The Perceptions Scale of the Teacher Candidates about Social

Networks" was used in the study. When the scale was developed, the literature was scanned, and an "Item Pool" consisting of 43 items was created (references will be made to ... scales).

For 43 items, specialist viewpoints were received from 8 academicians, who were working at Marmara University, Dicle University, and İnönü University Educational Faculties, Social Sciences Departments and Educational Sciences Departments. After the viewpoints of the specialists were received, 3 items were eliminated, and the remaining 40 items were used. With these 40 items, the Explanatory Factor Analysis (EFA) was performed in order to determine the factor structure of the measurement scale.

After the EFA, the items that had irrelevant dimensions, the items whose factor load values were below ".30", and the items that had higher load values in more than one dimension (Buyukozturk, 2010) were eliminated, and the remaining 22 items, which constituted the 4 dimensions, were used to create the scale (Appendix 1).

It was observed that the factor loads of the items of the scale varied between "0.439" and "0.801"; and the 22 items in the scale explained 50.095% of the total variance, and the Cronbach's Alpha Internal Consistency coefficient of the scale was .80 for the Educational Benefit Dimension; 0.75 for the communication dimension; 0.75 for the Weak Sides Dimension; and 0.72 for the time dimension. In giving points to the scale, the 5-Point Likert Scale was used varying from "I definitely disagree" to "I definitely agree".

The structure obtained after the Explanatory Factor Analysis was tested by using Confirmatory Factor Analysis (CFA). The Goodness of Fit values of the Confirmatory Factor Analysis are as follows:  $\chi^2=278.96$ ;  $sd=202$ ;  $\chi^2/sd=1st380$ ;  $GFI=0.94$ ;  $AGFI=0.91$ ;  $NNFI/TLI=0.97$ ;  $IFI=0.98$ ;  $CFI=0.98$ ;  $RMSEA=0.035$ ;  $RMR=0.060$ ;  $SRMR=0.056$ . When the values obtained after the Confirmatory Factor Analysis were evaluated in the light of the criteria used in the literature, it is possible to claim that the scale is acceptable and has a good Goodness of Fit value (Byrne, 2010; Cokluk et al., 2010; Kline, 2010; Secer, 2013; Simsek, 2007; Tabachnick and Fidell, 2007).

In order to determine the consistency of the scale with time, the scale was applied to the students in the 3rd study group with an interval of 18 days. The correlational coefficients obtained in the application for the educational benefit, communication, weak sides and time dimensions were: "0.88", "0.91", "0.84" and "0.87", respectively. When the correlational coefficients are evaluated, we can claim that the scale is consistent with time.

### The analysis of the data

It was checked in the study before the data were analyzed whether there were mistakes in entering the data or not, and the mistakes were corrected. The Extreme Value check was performed in the dataset, and it was determined that there was no Extreme Values. To determine whether the dataset showed normal distribution or not, the Skewness and Kurtosis values were used. The varying of the Skewness And Kurtosis values as " $\mp 1.00$ " (Cokluk et al., 2010) is the proof for the dataset showing normal distribution. In the analysis it was determined that this value varied between +0.654 and -0.874. In determining whether the perceptions of the teacher candidates about social networks varied significantly according to the gender variable or not, the t-test was used; and in determining where these values varied according to the grades variable, the One-Way Variance Analysis (ANOVA) was used.

## FINDINGS

The findings on determining the perceptions of the

**Table 1.** The analysis of the weak sides dimension of the perceptions of the teacher candidates on social networks according to the gender variable.

The scale	Dimension	Gender	N	$\bar{X}$	S	t	P
Perception on social networks	Weak sides	Female	399	27.7494	5.30737	-0.417	0.67

**Table 2.** The analysis of the perceptions of the Teacher candidates on communication dimension of the social networks according to gender variable.

The scale	Dimension	Gender	N	$\bar{X}$	S	T	P
Perception on social networks	Communication	Female	399	21.6566	3.73425	0.118	0.90
		Male	250	21.6200	4.04240		

**Table 3.** The analysis of the perceptions of the teacher candidates on educational benefit dimension of the social networks according to gender variable.

The scale	Dimension	Gender	N	$\bar{X}$	S	t	P
Perception on social networks	Educational benefit	Female	399	16.2055	3.38900	-	.4
		Male	250	16.4240	3.35638	0.802	2

university students about using social networks is presented in Table 1. As it is observed in Table 1, the weak sides dimension of the perceptions of the teacher candidates about social networks did not vary statistically according to gender variable ( $p>0.05$ ). In other words, the perceptions of the female ( $\bar{X}=27.74$ ) and male students ( $\bar{X}=27.92$ ) on the weak sides of the social networks are similar.

As observed in Table 2, the perceptions of the teacher candidates on communication dimension of the social networks did not vary statistically according to the gender variable ( $P>0.05$ ). In other words, the communication dimension perceptions of the female and ( $\bar{X}=21.65$ ) and male ( $\bar{X}=21.62$ ) students about social networks are similar.

As observed in Table 3, the educational benefit dimension of the teacher candidates about the perceptions of social networks did not vary statistically according to gender variable ( $P>0.05$ ). In other words, it was determined that the educational benefit dimension perceptions of the female ( $\bar{X}=16.20$ ) and male ( $\bar{X}=16.42$ ) students about social networks did not vary significantly.

As it is observed in Table 4, the Social Networks Perceptions of the teacher candidates on time dimension according to gender variable did not vary statistically

( $P<0.05$ ). In other words, the arithmetic average of the female teacher candidates' time dimension points ( $\bar{X}=11.96$ ) is higher than the male students' arithmetic average ( $\bar{X}=11.32$ ), and show significant difference ( $t(647)=2nd901, p<0.05$ ).

As it is observed in Table 5, teacher candidates' Social Networks Perceptions time dimensions showed statistically significant difference according to grade variable ( $F(3-645)=3.165, p<0.05$ ). The groups were compared with each other in order to determine among which groups this difference was. Upon comparison, it was observed that the 4<sup>th</sup> grade teacher candidates ( $\bar{X}=27.81$ ) perceived the weak sides of the social networks more than the 3<sup>rd</sup> grade teacher candidates ( $\bar{X}=27.17$ ).

As it is observed in Table 6, the teacher candidates' social networks perceptions communication dimension showed statistically significant difference in terms of grade variable ( $F(3-645)=3.743, p<0.05$ ). The groups were compared with each other in order to determine among which groups this difference was. Upon comparison, it was observed that the 1st grade teacher candidates ( $\bar{X}=22.37$ ) stated that social networks affected communication in a positive manner more than the 4th grade teacher candidates ( $=20.92$ ).

As it is observed in Table 7, teacher candidates' social network perceptions educational benefit dimension did

**Table 4.** The Analysis of the perceptions of the teacher candidates on time dimension of the social networks according to gender variable.

The scale	Dimension	Gender	N	$\bar{X}$	S	t	P
Perception on social networks	Educational benefit	Female	399	11.9603	2.61493	2.901	0.00
		Male	250	11.3209	2.91114		

**Table 5.** The analysis of the perceptions of the teacher candidates on time dimension of the social networks according to grades variable.

Scale	Dimension	Grade	N	$\bar{X}$	S	Sd	F	p	Difference (Scheffe)
Perception on social networks	Weak sides	1st grade	188	27.46	5.34	3	3.165	0.02	C-D
		2nd grade	181	27.53	5.41	645		-	-
		3rd grade	181	28.82	5.47	648		-	-
		4th grade	99	27.17	4.48	-		-	-
		Total	649	27.81	5.30	-		-	-

**Table 6.** The analysis of the perceptions of the teacher candidates on communication dimension of the social networks according to the grades variable.

Scale	Dimension	Grade	N	$\bar{X}$	S	Sd	F	P	Difference (Scheffe)
Perception on social networks	Communication	1st grade	188	22.37	3.85	3	3.743	0.01	A-D
		2nd grade	181	21.44	4.12	645		-	-
		3rd grade	181	21.46	3.89	648		-	-
		4th grade	99	20.92	2.98	-		-	-
		Total	649	21.64	3.85	-		-	-

**Table 7.** The analysis of the perceptions of the teacher candidates on educational benefit dimension of the social networks according to the grade variable.

Scale	Dimension	Grade	N	$\bar{X}$	S	Sd	F	p	Difference (Scheffe)
Perception on social networks	Educational benefit	1st grade	188	16.37	3.86	3	0.109	0.95	-
		2nd grade	181	16.31	3.37	645		-	-
		3rd grade	181	16.25	3.19	648		-	-
		4th grade	99	16.14	2.66	-		-	-
		Total	649	16.28	3.37	-		-	-

not show statistically significant difference in terms of grade variable ( $P > 0.05$ ). In other words, teacher candidates think that social networks are educationally beneficial no matter which grade they are studying in.

As it is observed in Table 8, the teacher candidates' social networks perception time dimension showed a statistically significant difference in terms of grades ( $F(3-645) = 16.626$ ,  $p < 0.05$ ). The groups were compared with

each other in order to determine among which groups this difference was. Upon comparison, it was observed that the 1st grade teacher candidates ( $\bar{X} = 12.12$ ) stated more than the 4th grade teacher candidates ( $\bar{X} = 10.35$ ) that social networks influenced time; and 3rd grade teacher candidates ( $\bar{X} = 12.46$ ) stated more than the 4th

**Table 8.** The analysis of the perceptions of the teacher candidates on time dimension of the social networks according to the grade variable.

The scale	Dimension	Grade	N	$\bar{X}$	S	Sd	F	p	Difference (Scheffe)
Perception on social networks	Time	1st grade	188	12.12	2.57	3	16.626	.00	A-D
		2nd grade	181	11.27	2.78	645		-	C-D
		3rd grade	181	12.46	2.32	648		-	-
		4th grade	99	10.35	3.08	-		-	-
		Total	649	11.71	2.74	-		-	-

grade teacher candidates ( $\bar{X}=10.35$ ) that social networks influenced time.

## RESULTS AND DISCUSSION

Social networks are used commonly within the society. This common usage has influences on individuals and society. Determining the perceptions of social network users about these networks will be beneficial in solving the problems stemming from the use of social networks, and in bringing deductions for the purpose of ensuring that social networks are used in a more efficient and productive manner.

When the relevant literature was examined, no measurement scales conducted to measure the perceptions of the users on Social Networks were observed. The measurement tools that have been developed so far have focused generally on the attitudes towards Social Networks (Karakus and Varol, 2012; Otrar and Argin, 2015), usage motivations, usage aims (Bonds-Raacke and Raacke, 2010; Usluel et al., 2014; Jenkins-Guarnieri et al., 2013) addiction or usage intensity (Ellison et al., 2007; Turkyilmaz, 2015; Andreassen et al., 2012) or educational usage (Mazman, 2009; Kuzu, 2014).

In this study, a valid and reliable measurement tool intended to measure the perceptions of university students about Social Networks has been developed, and the students' perceptions were determined according to some variables. In the development stage of the scale, an "Item Pool" was created as a result of the literature scan and in the light of the interviews with the students. The viewpoints of 8 specialists were received in terms of coverage and face validity, and the Scale Form was formed. As a result of the structural validity analyses, a 4-Factor Model consisting of total 22 items was obtained.

In this 4-Factor Model, the first dimension consisted of 8 items that measured the perceptions of the students on the weak sides of social networks; the second dimension consisted of 6 items that measured the perceptions of the students on the influence of Social Networks on communication; the third dimension consisted of 5 items

that measured the perceptions of the students on the influence of Social Networks on educational benefit; and the fourth dimension consisted of 3 items that measured the perceptions of the students on the influence of Social Networks on time management.

According to the Factor Analysis made, it was found out that this model explained 50,095% of the Total Variance. The Goodness of Fit values of the Confirmatory Factor Analysis are as follows:  $\chi^2=278.96$ ,  $sd=202$ ,  $\chi^2/sd=1st380$ ,  $GFI=0.94$ ,  $AGFI=0.91$ ,  $NNFI/TLI=0.97$ ,  $IFI=0.98$ ,  $CFI=0.98$ ,  $RMSEA=0.035$ ,  $RMR=0.060$ ,  $SRMR=0.056$ . When the values obtained as a result of the Confirmatory Factor Analysis are evaluated in terms of the criteria used in the literature it may be claimed that these values are acceptable and have a good Goodness of Fit value (Byrne, 2010; Cokluk et al., 2010; Kline, 2010; Secer, 2013; Simsek, 2007; Tabachnick and Fidell, 2007).

The Cronbach's Alpha Internal Consistency Coefficients of the scale were computed as 0.80 for the educational benefit dimension; .75 for the communication dimension; .74 for weak sides dimension; and .72 for the time dimension. The arithmetic averages of the answers given

to the weak sides factor ( $\bar{X}=27.81$ ) may be concluded to be at medium level when the highest possible score in 40.00 points is considered. The students' weak sides factor points being over the average value makes us conclude that the students have the perception that Social Networks influence social and face-to-face communication skills in a negative manner. When the fact that the highest points that may be received is 30.00 is considered, the arithmetic average of the answers given

to the Communication Dimension ( $\bar{X}=21.64$ ) is over average.

Usluel et al. (2014) and Mazman (2009) conducted studies found that Social Networks were used for the purpose of communication at the highest level. When it is considered that the highest point that may be received is 25.00, the arithmetic average of the answers given to the educational benefit factor may be considered as being at an average value.

Sabimbona (2013) conducted a study and concluded

that university students perceived Social Networks as an educational and beneficial tool. Kokoc and Karal (2010) conducted a study and found that students used Social Networks for educational purposes at an average level. When the fact that the highest point that may be received is 15.00, it may be considered that the average values of the answers given to the time factor are over the main average. This situation may cause us think that students have a perception claiming that Social Networks are harmful in that they cause addiction and also harmful in using time in an efficient and productive manner. Similarly, Argin (2013) and

Karakus and Varol (2013) conducted a study and found that students had the consideration that Social Networks influenced time management in a negative manner and caused addiction. It was observed that the points received from the weak sides factor did not differ according to Gender variable. Both female and male students have values that are close to each other in terms of the arithmetic averages of the answers given to the weak sides factor. No significant difference was determined between the points received from the communication factor according to gender variable. The points received from the educational benefit factor did not vary significantly according to gender variable. The points received from the time factor differentiated at a significant level according to gender variable ( $t(647)=2.901, p<.05$ ).

Argin (2013) and Uysal (2013) conducted a study on students and found that the attitudes towards social networks did not vary according to gender. It was observed that the average values of the female students were higher at a significant level when compared with the average values of the male students. The average values of the male students being lower may be interpreted as their conscious levels being lower on using Social Networks. Females having more addiction to social networks than males may be a reason for this outcome (Andreassen et al., 2012).

Similarly, in a study conducted by Akdağ et al. (2014), it was found that the addiction levels of the male students were higher than the female students. Alican and Saban (2013) conducted a study and found that male students had more positive attitudes towards Social Networks.

Significant difference was found between the points received from the weak sides dimension according to Grade Variable ( $F(3-645)=3.165, p<0.05$ ) between the 3rd and 4th Grades. The averages of the answers of the 3rd Graders given to this factor were observed to be significantly higher than the 4th Graders. A significant difference was determined between the points received from the communication factor according to grade variable ( $F(3-645)=3.743, p<.05$ ). The communication factor points of the 1st Graders were higher than those of the 4th Graders at a significant level.

Uysal (2013) conducted a study on vocational high school students and found that the communication

dimension average points of the 12th Grade students were higher than the other grades. No significant difference was determined between the points received from the Educational Benefit Factor according to Grade variable. Similarly, Kuzu (2014) conducted a study and found that the viewpoints of the students on using Social Networks for educational purposes did not vary according to Grades. The points received from the time factor differ at a significant level according to Grade variable ( $F(3-645)=16,626, p<.05$ ). The points of the 4th Grade students received from the Time Factor are significantly lower than those of the 1st Grade and 3rd Grade students.

Based on the results obtained in the study, although trainings are provided for the students on using Social Networks in an efficient and productive manner because the students have perceptions claiming that Social Networks cause addiction and they influence time management in a negative manner, the Educational Benefit Factor points are lower than the points of the other factors. For this reason, trainings may be organized for the students and academicians on how to use Social Networks for educational purposes.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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**Appendix 1.** Explanatory factor analysis results (The dimensions, factor loads and common factor variances of the items in the perceptions scale of the teacher candidates on social networks).

Items	Dimensions				Common factor variance
	Weak sides	Communication factor	Educational benefit	Time	
M28	<b>0.733</b>	-	-	-	0.447
M17	0.711	-	-	-	0.524
M29-Social networks hinder the development of the empathy skills of a person	0.671	-	-	-	0.596
M20	0.607	-	-	-	0.607
M21-Social networks hide truths and give missing information	0.580	-	-	-	0.593
M24	0.572	-	-	-	0.508
M16	0.552	-	-	-	0.501
M30	0.476	-	-	-	0.495
M6-Social networks improve the communication skills of people	-	0.694	-	-	0.501
M2	-	0.685	-	-	0.495
M7	-	0.647	-	-	0.546
M1-Social networks play roles in interpersonal interactions	-	0.641	-	-	0.537
M13	-	0.592	-	-	0.477
M12	-	0.584	-	-	0.443
M8-Social networks provide active learning environment	-	-	0.439	-	0.404
M4	-	-	0.736	-	0.397
M3-Social network is a suitable tool for educational purposes amaçlı kullanım için uygun bir araçtır	-	-	0.732	-	0.409
M35	-	-	0.626	-	0.413
M5	-	-	0.622	-	0.480
M33-Social networks create addiction by preventing other possible activities of people	-	-	-	0.801	0.620
M34	-	-	-	0.727	0.713
M32	-	-	-	0.710	0.557
Eigenvalue	1.569	1.419	1.062	0,958	-
Explained total variance (50.095%)	15.69	14th19	10.62	9.58	-
Cronbach alpha	0.75	0.75	0.80	0.72	-
Cronbach alpha (For the whole scale)			0.75		-

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