

A black microphone is positioned in the upper left corner of the cover, pointing towards the center. Its cord is visible, extending downwards.

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## Educational Research and Reviews

Table of Contents: Volume 12 Number 22 23 November, 2017

### ARTICLES

- The use of Orff-based music activities for educational and therapeutic purposes with disadvantaged group of Romani children** 1062  
Bilgehan Eren and Gülnihal Gül
- Effectiveness of constructivist approach on academic achievement in science at secondary level** 1074  
Samaresh Adak
- Examining the behavior and thinking levels of secondary school students (6th-8th GRADES) towards the environment according to gender** 1080  
Nazmi Durkan
- Economics of quality education and paths leading into and out of quality education: Evidence from Debre Markos University, Ethiopia** 1086  
Tsegaye Molla
- A comparison of pre-service, in-service and formation program for teachers' perceptions of technological pedagogical content knowledge (TPACK) in English language teaching (ELT)** 1091  
Yıldız Turgut
- Emotional intelligence and self-esteem as predictors of teacher self-efficacy** 1107  
Harun Şahin

*Full Length Research Paper*

# The use of Orff-based music activities for educational and therapeutic purposes with disadvantaged group of Romani children

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"Romani people" are a disadvantaged group of people due to their socio-cultural and socio-economic conditions. This situation makes them poor and thus cannot afford education. As Romani people have the tendency to love music, it is considered that music activities may encourage their children who generally have negative attitudes towards school to attend school systematically. Therefore, this work aims to directly and indirectly encourage the Romani children to attend school through music activities. For this purpose, a public primary school was used consisting entirely of Romani children. A first-year class was selected as a pilot group. Multicultural and multidisciplinary music activities based on Orff approach were carried out with the pilot group, for 2 h per week by the music teacher, who was also the participant observer. All activities were video-taped and transcribed for systematic analysis process. The results showed that Orff-based music activities carried out for educational and therapeutic purposes created a positive effect on the musical and non-musical development of Romani children. In addition, by using a variety of activities from different countries, the children's socio-cultural awareness and understanding of multicultural differences were enhanced as well as their social interaction and communication skills.

**Key words:** Romani people, disadvantaged children, Orff-based music activities, socio-cultural awareness.

## INTRODUCTION

When a specific group of people are deprived of certain social rights and opportunities in a society, they become disadvantaged with deep-seated and chronic problems. Romani people, who have spread all over the world, are one of the groups exposed to exclusion, discrimination and marginalization by many communities because of negative prejudgements related to their specific

characteristics, even though they have the the potential to make communiities rich culturally.

Scientific research and applied studies during the last few years have been devoted to the interrelated problems of disadvantaged communities within a culture, such as the Romani who cannot provide education for their children because of their poor socio-economic and socio-

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cultural conditions (Öcal, 2015).

Within the general population of Turkey, a large number of Romani people reside. Although they are known to use various names in different regions, in the international literature they are known as “gypsy”. However, they prefer to be called “rom” which means “human” (Dişli, 2016; Şener, 2006; Ünaldı, 2012). Even though the exact number of Romani people cannot be determined officially, studies give various numbers starting from 400 thousand to 2 to 5 million (Demirvuran, 2007; Arayıcı, 2008; Taylan and Barış, 2015). When compared to the rest of the population, it can be said that socio-economic and socio-cultural problems are seen more frequently within the Romani community. The rate of problems within the Romani population is way above that of Turkey's average in terms of exclusion, poverty, lack of education, unemployment and/or unregistered employment, criminal matters and substance abuse (Taylan and Barış, 2015). These problems occur in cycle, and since the improvements and regulations made on the issues address only one aspect of the problems, the solutions to them become short-term and temporary. Therefore, the inability to break this vicious cycle should be considered as the main problem (Akkan et al., 2011; İncirlioğlu, 2008; Taylan and Barış, 2015).

Among them, "education-related problems" are at the forefront of most complications. A number of studies have been carried out in Europe, especially in England, to address the educational complications of the Romani people. The results of these studies show that the challenges of the Romani people are similar all over and have a universal character (Diktaş et al., 2016). The difficulties and needs related to education were also identified in the *Result Report of the Sociological View and Future Scenario of Romani Groups Workshop (2013)* and listed as follows (Diktaş et al., 2016; Taylan and Barış, 2015):

- (1) Lack of education of parents and therefore lack of interest in their children's education
- (2) The existence of prejudice which Romani children face in the education process
- (3) Getting involved in work life at an early age
- (4) Marriage at an early age and child-brides
- (5) Lack of occupational education
- (6) Lack of entrepreneurship education
- (7) The problems experienced initially while trying to get into the education process
- (8) A need for nursery and kindergarten,
- (9) Low education levels, difficulties in reaching public support due to lack of socialization channels

Romani people experience these educational failures, which are affected by social exclusion, discrimination and marginalization, in several different ways:

- (1) Romani children living in an integrated neighborhood are discriminated by their non-Romani peers in schools.

The exclusion and negative attitudes exhibited towards them cause them to lose their desire towards education and to leave school (Akkan et al., 2011; Genç et al., 2015).

- (2) In schools purely consisting of Romani children in neighborhoods where only Romani populations live, and lack of economic resources in schools and inadequate physical conditions hinder the access of Romani children to quality education (Taylan and Barış, 2015).

These challenges in the area of education can be considered one of the most important and fundamental issues in the life of the Romani people. This information was also confirmed specifically for the target population of this study by the members of the Local Federation of Romani Associations at the meeting that was carried out on the 10th of August 2015, before starting the research process.

In the meeting, it was hypothesized that a project planned based on the conjectural interests, competencies and needs of the Romani children would positively develop their perception about school and raise their motivation to attend school. It was decided to find a starting point where Romani people show a tendency towards and where they can be approached in a natural manner in accordance with their characteristics. Kolukırık (2009) indicates that professions based on music, dancing, singing and playing instruments are the most common forms of employment preferred among the Romanies.

Nevertheless, these activities have been transferred from one generation to the next, and not used for educational and/or therapeutic purposes within a systematic setting to contribute to the development of the Romanies in all areas. Yet, these activities can be considered as their major interests and competencies, which can be used to fulfill their needs. Therefore, the possible ideas to be implemented were determined as activities including rhythm, music, singing, dancing and playing instruments.

After the types of activities were determined, the context of these activities was discussed. Because the Romanies exhibit relatively preservative and conservative characteristics by the means of their culture, they are very close off to other cultures, customs and music but that of their own. They do not show any tendency to involve in other communities or experience their culture. Therefore, music activities would be considered as one of the best groups of activities with the means of enhancing their socio-cultural awareness and understanding multicultural differences while improving their social interaction and communication skills.

On the basis of these qualities, an approach was determined in which a child (with/without disadvantage) can feel accepted, show success, learn from each other and experience different cultures. “Orff Approach”, one of the contemporary music education and music therapy approaches, was considered as an appropriate way to



provide the Romani children an opportunity to experience other cultures via various activities such as music, dance and rhythm.

The Orff approach, which was developed by the German composer and educator Carl Orff, is a way of introducing and teaching children about music on a level that they can easily comprehend by using rhythm, music, movement and language. In this approach, various musical activities are used complementarily and these activities are considered as an effective medium of all the developmental areas (such as cognitive, motor, social, emotional, language and communication etc.) of the children. This approach provides a setting in which all the participants are served based on their interests and competencies while addressing their developmental needs. Within the Orff-based music activities, it is aimed to support an individual to gain awareness of his/her behavior and to develop self-awareness and self-confidence through the instant acoustic feedback they receive (Eren et al., 2013).

While Orff-Schulwerk was developed as an elementary music and movement education approach, it was expanded to the music therapy field by Gertrud Orff, the second wife of Carl Orff (Darrow, 2004). Orff's approach does not only include the idea of "education for music"; it also contains the idea of "education through music" (Wolfgang, 1975). The Orff approach contains different disciplines within itself. It welcomes the different cultures and various activities of these cultures. Thus, the Orff approach performs a multicultural and multidisciplinary role as it is an international phenomenon.

In relevant literature, there has been numerous research in which Orff-based music activities are utilized for educational and therapeutic purposes (Hillard, 2007; Register and Hillard, 2008; Eren et al., 2013; Colwell et al., 2013). Therefore, the Orff approach can be considered as an appropriate way to achieve educational and therapeutic purposes for all children with or without disadvantages including the Romani people.

### **Purpose of the study**

The purpose of this study was to contribute to the development of the disadvantaged Romani children within different aspects by using Orff-based music activities involving activities such as imitating and creating rhythmic patterns, making music, dancing in different forms, singing songs and playing instruments.

In this context, the aim was to create an environment where children could enjoy learning, to support their development within the scope of musical activities and to increase the attendance levels by making the school a more attractive place to be. For this purpose, a program consisting of multicultural and multidisciplinary Orff-based music activities was carried out and the educational and therapeutic effects of these activities on the development of the Romani children were examined and improvements

reported. The research questions were formulated as follows:

- (1) What are the contributions of Orff-based music activities to the development of the disadvantaged Romani children *in the musical area*?
- (2) What are the contributions of Orff-based music activities to the development of the disadvantaged Romani children *in the non-musical areas*?
- (3) What are the contributions of Orff-based music activities to the disadvantaged Romani children regarding *socio-cultural dimensions*?
- (4) What are the contributions of the educational and therapeutic rapport provided by the participant observer to the development of Romani children during the research process and how?
- (5) What are the opinions of the class teacher regarding *the effects* of the study that can be observed on the Romani children in a school setting during the research process?

### **Hyphotheses**

In this study, the following hyphotheses were examined:

- (1) A motivating educational environment enhanced with music increases attendance levels of Romani children in education.
- (2) Multidisciplinary musical activities contribute to the development of Romani children in musical and non-musical areas.
- (3) Multicultural musical activities provide the Romani children with a larger perspective of socio-cultural knowledge, awareness and understanding.
- (4) An educational and therapeutic rapport provided by the music teacher is important to enrich the outcome of the process.

## **MATERIALS AND METHODS**

### **Research design**

The research was designed as a qualitative observational study. A semi-structured participant observation method was used in this research. The participant observation is a variant of the natural observations in which the researcher joins in and becomes part of the group they are studying to get a deeper insight into their lives (McLeod, 2015). In this research, the observation process was carried out *overtly*, in *natural environment on the disadvantaged Romani children*, by *the participant observer* who was the second researcher of this study. It was recorded and transcribed *systematically*. In addition to the observational method, a semi-structured interview with the class teacher was also implemented to raise the validity of the research and give a larger perspective regarding the research process.

### **Data collection**

Demographic information of the Romani Children was collected at

the beginning of the research process. Every week at the beginning of the session attendance was taken and recorded. The observation of the sessions was noted by the participant observer just after each session. In addition to the notes of the participant observer, all sessions were also video-taped and recordings were transcribed into the "semi-structured observation form". The observation notes and the video-recordings were examined complementarily to avoid any missing data. In the second phase of the study, an interview was carried out with the classroom teacher of class 1-D in order to examine the observed effects of the study on the Romani children in a school setting. The interview was audio-recorded and also transcribed simultaneously into a semi-structured interview form. Finally, inter-observer reliability data collection process was carried out by the other member of the research team who was not a participant observer in this study.

### **Ethical considerations**

The required permission was provided from the Unit of Scientific Research Projects in Uludag University and the Governorship of the District. The consent of the parents was obtained in writing with their signatures.

### **Participants**

There are 3 different groups of participants in this research.

#### ***Romani children***

The group that was worked with in the study consisted of the 1<sup>st</sup> year class of Romani children studying in a public school. A convenience sampling was used in this research while determining the group that was to be worked with. Convenience sampling is a type of nonprobability or nonrandom sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate are included for the purpose of the study (Dörnei, 2007; Etikan et al., 2016). A school consisting of only Romani children would be the most convenient place for this research. Therefore a public primary school located in a Romani district was chosen and a pilot class (1-D) from within the first-year classes was determined as the target group to carry out the study. According to the official records of class 1-D, there should have been 27 boys and 13 girls, in total 40 students, in the classroom. However, this total number of students had never been in the classroom simultaneously during the process. The number of the students who attended at least 3 times was 22 boys and 13 girls, in total 35 students. Approximately 20 to 25 of the students attended more regularly with varying children from week to week. The age range of the students varied; 18 of the children were 6 years old, 13 were 7, 2 were 8 and one of them was 10.

#### ***Participants of the interview***

The classroom teacher of 1-D, with whom a semi-structured interview was carried out, was a 35-year-old man who has been practicing his profession for 11 years. It was his 4th year at the school and he has been teaching only first-year students since he has started to work in this school.

#### ***The research team***

The research team consisted of 2 people. One of the members of the research team, *Bilgehan EREN*, was the music teacher and the

participant observer of the study. Besides her master and dissertation studies, she has a lot of experience regarding music education and music therapy with children with disabilities and disadvantages in many different countries including Turkey, Germany, and the United States. She has been interested in Orff-Schulwerk Music and Movement Education for 15 years up until the present and has been qualified as an International Orff -Schulwerk Trainer of Trainers since 2012. The other member of the research team, *Gulnihal GUL*, has been working as an assistant professor in the Department of Music Education at the same university. She participated in this study as a second observer for the video analysis in order to provide interobserver reliability data.

### **Setting**

All activities were carried out in classroom 1-D located on the first floor within one of the 3 buildings of the school. The floor was made of concrete and the benches and tables were made of wood and they were quite old. The classroom sitting plan was not appropriate for the music activities. Therefore, it was changed at the beginning of each session by moving the tables towards the walls to create more space for the movement activities and dances. The Romani children were asked to sit or stand and dance based on the activity.

### **Materials used for Orff-based music activities**

- (1) I-pod containing music from different countries and various cultures
- (2) Sound system and extension cable
- (3) Various Orff instruments including hand drums, claves, maracas, tambourines, xylophones, metallophones etc.
- (4) Colored scarves
- (4) Stickers
- (5) Orff-based Music Activities

### **Materials used for data collection and data analysis**

- (1) An Information Form (IF) was used to collect demographic data regarding children and their families.
- (2) An Attendance Check List (ACL) was used to record the participation data of children.
- (3) An Observation Protocol Notebook (OPN) was used to keep observational notes of the participant observer.
- (4) A Semi-structured Observation Form (SSOF/IRF) was used to analyze the video-recordings of the sessions. This form was also used to check the data that the participant observer recorded to confirm if it was recorded correctly as an Inter-observer Reliability Form.
- (5) A Semi-structured Interview Form (SSIF) was used with the director of the school and classroom teacher of 1-D to collect data to increase the validity of the observational data.

### **The process of the study**

The study was started in November 2015 in a public primary school located in a Romani district just after the demographic data and the consent forms were collected. The program was carried out during an 8-month process in the Education Year 2015-2016. The Orff-based music activities were performed every Friday between 10.15 and 12.00 in two 45 minute sections, with a 15 minute break in between. The musical activities applied during the education year were finalized with a public concert in the school garden for people including the director of the school, teachers, students and parents. Various activities from different countries were applied with

**Table 1.** Orff-based music activities, their origins, working schedule.

S/N	Name of the activity	Origin of the activity	Months/Activities								C	
			1	2	3	4	5	6	7	8		
1	Greeting Song	Turkey	X	X	-	-	-	-	-	-	-	-
2	Stop and Go Games	No origin	X	X	X	-	-	-	-	-	-	-
3	König und der Klugen	Germany/Austria	-	X	X	X	-	-	-	-	-	-
4	Tuki Tuki	Brazil	-	-	X	X	-	-	-	-	-	-
5	Break Mixer	The U.S.	-	-	X	X	X	-	-	-	-	-
6	Carnevalito	South America	-	-	X	X	X	X	X	X	X	X
7	Funga Alafia	Africa/Ghana	-	-	-	-	X	X	X	X	X	X
8	A ram sam sam	Morocco	-	-	-	-	X	X	X	X	X	X
9	Obwisana	Africa/Ghana	-	-	-	-	-	X	X	X	X	X
10	Si ma ma ka	Africa/Tanzania	-	-	-	-	-	X	X	X	X	X
11	Chocolate	The U.S.	-	-	-	-	-	-	X	X	X	X
12	Habana Otrive	Israel	-	-	-	-	-	-	X	X	X	X
13	Shetland Wedding Dance	Scotland	-	-	-	-	-	-	X	X	X	-

**Table 2.** The categories and codes of semi-structured observation form.

Categories				
Development areas		The contribution of the observer participant	Socio-cultural dimension	
Musical development	Non-musical development			
Codes	Rhythm	Cognitive skills	Socio-cultural structure and norms	
	Singing	Motor skills		Educational contribution
	Movement and dance	Socio-emotional skills		
	Playing instruments	Language communication skills	Therapeutic contribution	Social interaction and communication styles

Romani children in Class 1-D. A list of activities including the name, origin and working schedule information is given in Table 1. Every other week, the activities practiced the previous week were repeated and when 80% of the students succeeded in the activity, a new activity was initiated. The activities carried out according to the months (1-8) are shown in Table 1. The column "C" indicates the activities exhibited in the concert.

### Data analysis

A qualitative systematic analysis technique was used to analyze the collected data by using the observation protocol notes, the semi-structured observation form and the semi-structured interview form in this study. The systematic analysis is one of the qualitative analysis techniques which contain the feature of content and descriptive analysis (Yıldırım and Şimşek, 2011).

In a systematic analysis, the themes and the relationship between these themes are defined in a descriptive way. In this study, after the categories were decided, codes under these categories were determined. All video recordings were reviewed and recorded in a semi-structured observation form based on the determined categories and codes as shown in Table 2, and a

qualitative systematic analysis was performed.

A systematic sampling, one of the probability based forms of sampling, was carried out on all the collected observational data. Every second video of each month was selected to be reviewed and the selected data were analyzed by the means of these categories and codes. They were given as the research questions in the study.

The entire audio-recording of the interview was analyzed descriptively.

Inter-observer reliability data were collected by using the Inter-observer Reliability Form (IRF). The chosen video recordings were also evaluated by the second observer. Impartiality was ensured by keeping the second observer out of the music sessions during the process. She was held responsible only for the inter-observer reliability process. The two main points being evaluated during the process were:

- (1) Whether or not the activities were carried out as they were defined and
- (2) The responses/behaviors/actions of the Romani children.

The inter-observer reliability was calculated by using the following formula: "consensus/ (consensus + dissensus) x 100". The result of

**Table 3.** Difficulties in the musical area during the first 4 months.

Activity	Difficulties of students in the musical area
Rhythm	Most of the students (except for 5-6 students) lacked the skills to repeat a basic rhythmic pattern; Most of the students (except for the same 5-6 student) were not able to keep to the beat of a song while they started to sing the lyrics; The students were not able to follow the instruction of “first listen then repeat the rhythmic pattern”; The students were not able to start and stop the rhythm all together in synchrony; The students had a lack of awareness when it came to the tempo and the dynamics of the rhythmic patterns
Singing	None of the students had an awareness of appropriate breathing techniques by using the diaphragm; None of the students had an awareness of appropriate singing techniques; They generally showed a tendency to speak and sing in an unregulated manner. They would mostly shout to make their voices heard; They were not able to start and to stop singing all together in synchrony; They did not know any songs in another language or from another culture except Romani songs. They did not even know any Turkish children songs
Movement and dance	Most of the students had nobody awareness and they cannot control their body parts; All the students experienced lack of coordination between body parts, especially with hand-eye coordination; Most of the students had problems to differentiate their left from their right; The movement quality of the students was very low; they moved very impulsively; They lacked spatial awareness in the classroom; They did not know any dances from another culture except that of their own. They did not even know any traditional Turkish folk dances or school dances except the one they always played repeatedly (a game called “Old Pillow”); Most of the students were not moving and/or dancing in accordance to the music and the rhythm being played
Playing instrument	None of the students had an instrumental background; None of the students recognized and/or knew how to play the instruments introduced by the music teacher such as claves, hand drums, tambourines, xylophone, metallophone, bells etc; The students lacked auditory sensitivity to the instrumental music and its elements (timbre, pitch, tempo, dynamics etc.)

inter-observer reliability was 100%.

## RESULTS

The results of the research are presented in this section. They are in the order of the research questions which were also the categories of the research. Even though the results were analyzed month by month under the research categories, they are presented here by being separated into 3 main sections (the first 4 months, the last 4 months, and the concert finale) so as not to get lost in small details and to give a profound overview. The assessment was based on the entire target group since the regularity of attendance of each child was not provided. The children were only assessed on the basis of observations. This study was applied in a group setting and therefore evaluations were made from a general perspective instead of each child.

### ***The results relating to contributions of the Orff-based music activities on the development of the disadvantaged Romani children in the musical area***

The Orff-based music activities were also used as an assessment tool to assess the initial level of the children within a musical area. According to the observations, difficulties being detected in the musical area during the

first 4 months are given in Table 3. According to the observations, changes being detected within the musical area during the last 4 months are given in Table 4. According to the observations derived from the concert video-recordings, characteristics being detected in the musical area during the concert are given in Table 5.

### ***The results relating to the contributions of the Orff-based music activities to the development of the disadvantaged Romani children in non-musical areas***

The Orff-based music activities were also used as an assessment tool to assess the initial level of the children in non-musical area. According to the observations the difficulties detected in non-musical areas during the first 4 months are given in Table 6. According to the observations, changes detected in non-musical areas during the last 4 months are given in Table 7. According to the observations derived from the concert video-recordings, the characteristics detected in non-musical areas during the concert are listed in Table 8.

### ***The results relating to the contributions of the Orff-based music activities to the understandings of disadvantaged Romani children regarding the socio-cultural dimensions***

The Orff-based music activities were also used as an

**Table 4.** Changes of students' behavior in the musical area during the first 4 months.

Activity	Changes of students' behavior in the musical area
Rhythm	Most of the students had made improvements in the skill to repeat the rhythmic patterns given to them by the music teacher or from a recorded music piece; All of the students were able to keep to the beat of a song while they sung the lyrics; The students were able to repeat rhythmic patterns after they listened without any prompting; The students were able to start and stop the rhythm all together in synchrony except for a couple of them who also had attendance problems; The students were more aware in keeping to the tempo and dynamics of the rhythmic patterns; They were more creative in respect to making their own rhythmic patterns while using different body percussion elements such as hand clapping, finger snapping, tapping on the knees, stamping etc; They were more proficient in the use of instruments while creating their own rhythmic patterns by using the claves, hand drums and tambourines
Singing	Most of the students gained awareness in the appropriate breathing techniques by using their diaphragm. They were able to use different breathing techniques such as sustained breathing and sudden breathing; Most of the students were aware of the appropriate singing techniques and they started to sing the lyrics and melody in a more understandable and clear way; They mostly developed a tendency to speak and sing in a regulated volume and style. They realized the differences between shouting and singing loudly, and they were audible but also in a desirable way; They were expert in being able to start and stop singing all together in synchrony with the signs of the music teacher; They learned 8 songs with lyrics and 13 dances and songs from different countries in different languages
Movement and Dance	Most of the students were more aware of their bodies and they gained control of their body parts; They were more able in performing different types of movement and dance such as fast, slow, heavy, light, forward, backward and sides; They became more controlled while moving and dancing; Most of the students gained a better body coordination ability; They gained spatial awareness in the classroom. They started to use all the space in the classroom, moving without crashing and hitting into each other; They learned 12 different dances and several hand games from other countries such as Austria/Germany, Brazil, the U. S., South America, Morocco, Africa (Ghana, Tanzania), Israel and Scotland; Most of the students started to move and dance by being aware of rhythmic and melodic characteristics.
Playing instrument	All of the students became aware of different kinds of instruments such as claves, hand drums, tambourines, xylophones, metallophonees, agogos etc; All of the students learned how to play all of the instruments during the process and they became quite good on the claves and tambourines. They showed great enthusiasm to learn more musical instruments in the future; The students gained auditory sensitivity to instrumental music and its elements (timbre, pitch, tempo, dynamics etc.)

**Table 5.** Characteristics of students in the musical area during the concert.

Activity	Characteristics of students in the musical area
rhythm, singing, movement and dance, instrument playing	26 students performed 8 different songs and dances on a stage in the school; All the students sang the songs in tune and played the instruments in synchrony; Their voices were audible and clear to the audience while they were singing the songs; They stayed in an orderly manner and acted cooperatively with the music teacher; They were very controlled while dancing on the stage and also performed the dances making very few mistakes; 22 of the students played claves and tambourines in half of the dances while the remaining 4 played hand drums

assessment tool to assess the awareness of the Romani children regarding different cultures. According to the observations, the following characteristics were detected during the first 4 months regarding the *socio-cultural structure and social interaction and communication styles*<sup>1</sup> of Romani children:

(1) An inability to obey rules and/or follow instructions

<sup>1</sup> "Socio-cultural structure and norms" and "social interaction and communication styles" are discussed as a whole since it was difficult to separate these phenomenons from eachother.

- (2) An exaggerated bond between family members (for example, the syblings wanted to sit together and tended not to play with other friends if their syblings are around)
- (3) Their mothers were interfering with their education process without boundaries (for example, the mothers tend to stay in the classroom during lesson and feed their 7 years old child with her own hands)
- (4) Same gender-based friendship between the children (for instance girls only sit by another girl)
- (5) Violent-based interaction and using abusive language towards each other

**Table 6.** Difficulties of students' behavior in the non-musical area during first 4 months.

<b>Skills</b>	<b>Difficulties of students' behavior in the non-musical area</b>
Cognitive	The students were not able to perceive and follow instructions given by the music teacher; They exhibited a lack of joint attention and a short attention span. They always needed to be given a break or they wanted to sit down; They had a lack of independent and creative thinking and acting. When one of them did something all of the others exhibited a tendency to imitate him/her; They showed a tendency to act without thinking of the chain of cause and effect
Motor	They had a lack of understanding in performing basic movements including walking forward, backward, waiting in line, making a circle and dancing in a circle; They were unable to turn right and left correctly when they were told
Socio-emotional	Their actions were destructive to each other during the musical activities. They were kicking, hitting, and shouting at each other frequently; They were not respectful to each other and to the music teacher in the beginning; They were impatient and non-observant; They showed a tendency to hold the hand of same gender friends while dancing in circles; They hesitated and didn't want to dance with the opposite gender
Language-Communication	They had problems in waiting and taking turn. They did not ask permission to talk or play

**Table 7.** Changes of students in non-musical areas during the last 4 months.

<b>Skills</b>	<b>Changes of students' behaviors in the non-musical area</b>
Cognitive	The students became able to perceive and follow instructions given by the music teacher; They exhibited a high level of joint attention and their attention spans extended. They became able to continue several activities without the need for a break; They became more aware of the cause and affect chain and they were more responsible when thinking before acting; They had a greater knowledge with regards to other countries and cultures by learning about their music and dances; They improved their spatial awareness and became more able in using various dynamics of movement and dance; They were more able in creating new ideas or actions
Motor	They became more able in understanding and performing more complex movements; They became able to turn right and left correctly when they were told in the circle dances and the couple dances; The gross and fine motor skills were improved as a result of playing hand games and instruments and by dancing
Socio-emotional	They became more patient and more observant. Their actions became less destructive to each other during the music activities. They stopped kicking, hitting, and shouting at each other during the music activities; They acted less destructively during their break time and preferred to play hand games and rhythmic games instead; They became more individually independent, they also became more harmonic in their social relationships (while dancing and playing games); They became respectful to each other and to the music teacher; They had no more limitation when holding a hand of a friend while dancing or playing games; They no longer hesitated to dance with the opposite gender; They became more self-aware and self-confident in their performance
Language-communication	They learned to wait his/her turn and take their turn when the time came; They became more polite and asked for permission to talk or play; They developed better social interactions with each other such as thanking each other, sharing instruments, appreciating the other ideas and helping each other when it was necessary

**Table 8.** Characteristics of students in non-musical areas during the concert.

<b>Skills</b>	<b>Characteristics of students in the non-musical area</b>
Cognitive, motor, socio-emotional, language-communication	All the students were very patient while they were waiting for their turn on stage; They were able to concentrate on the signals of the music teacher and performed a good starting and ending in each activity; The students were prepared for the instruments they would play and they acted very professionally while distributing and collecting the instruments; They interacted with the audience but they didn't lose their discipline on stage; They performed with joy, self-confidence and success; They bowed and left the stage without any disorientation

- (6) Displays of street culture in the school
- (7) Gang-based grouping
- (8) A tendency towards only Romani music.

According to the observations, the following characteristics were determined during the last 4 months regarding *soci-cultural structure and social interaction and communication styles* of Romani children:

- (1) A higher tendency to obey the rules, waiting in line, asking for help, thanking each other.
- (2) A more friendly environment, more understanding of each other.
- (3) No more family members in the classroom, even during the break between lessons.
- (4) No more gender or family-based discriminative friendships between the children.
- (5) Greater information regarding other countries and cultures; e.g. in Africa, the climate is very hot and dry; therefore their skin color is different from ours and their music sounds are different from ours, as does their language).
- (6) Greater understanding and awareness of the uniqueness of their own culture.

According to the observations derived from the concert video-recordings, the following characteristics were determined in *soci-cultural structure and social interaction and communication styles* during the concert:

- (1) All of the audience was very interested in the performance.
- (2) Since they have never seen a performance which did not involve Romani music and dance, they were particularly interested in seeing the results of the project.
- (3) The students were asked to wear the same type of clothes (a pair of blue jeans and a white shirt).
- (4) They were excited to perform a very different type of concert to their families.
- (5) The concert was performed interactively by including the audience.
- (6) At the end of the concert the parents approached the music teacher and the students in celebrating their achievements.

***The results relating to the contributions of educational and Therapeutic rapport provided by the participant observer to the development of the disadvantaged Romani children during the research process***

The contributions of educational and therapeutic rapport provided by the music teacher/ the participant observer to the development of the disadvantaged Romani children are explained in this section:

- (1) The music teacher/ the participant observer used the teaching techniques of behavioral approach.

(2) She used physical prompting while teaching how to play an instrument and verbal prompting and modelling while teaching a song or a dance.

(3) She reinforced the children using verbal-social reinforcement techniques, such as “high five, well done, you are great” when they exhibited a positive reaction or gave a correct answer.

(4) She always maintained eye-contact when communicating with the children even if she needed to kneel down to the level of the child when necessary.

(5) She showed an unconditional love and acceptance to the children.

(6) She gave importance to the opinions of the children when they shared any new ideas. She always motivated the children to speak.

(7) She ignored any undesirable behavior unless it disturbed others or the process. When it did, she applied the “giving a break from the activity” technique instead of punishing the child.

(8) She used age-appropriate language while giving an instruction and short and clear sentences while explaining something new.

(9) She also preferred to use dramatic-theatrical expressions to attract the children’s attention.

(10) She exhibited high awareness of small details to realize the positive characteristics of the children and reinforced them instantly.

The approaches used by the music teacher/ the participant observer to provide an educational and therapeutic rapport with the children created the following changes in the Romani children:

(1) At the beginning of the study, the Romani children did not accept the music teacher/ participant observer as an authority figure and as soon as the classroom teacher left the class for any reason, the children started to act out of order and did not listen to the music teacher.

(2) After a couple of weeks, they started to show respect and love towards the music teacher/ participant observer. They wanted to help her and get appreciation from her.

(3) They were listening more carefully and trying to do their best to please her.

(4) They did not go out of the classroom even during break and stayed with her, asking more questions.

(5) They started to play hand games and do dances instead of hitting and kicking each other.

(6) Under the supervision of the music teacher/ the participant observer started to make hand game competitions during their break.

(7) They imitated the behavior of the music teacher /participant observer and began to wait silently during the musical activities, to ask for permission to get an instrument, to thank each other, to share with each other.

(8) They looked forward to carrying their bags and instruments to the car when the session was over.

(9) The music teacher / participant observer exhibited a positive, motivating, trusting, respectful, caring attitude

towards the children and therefore the Romani children showed trust towards her.

***The results relating to the opinions of the class teacher regarding the observable effects of the study on the disadvantaged Romani children in a school setting during the research process***

The interview with the classroom teacher was carried out in classroom 1-D and lasted for 36 min. The interview outline was explained to the teacher before the interview started and his consent was given for the audio-recording.

The classroom teacher stated that he hesitated in giving 90 minutes per week for the musical activities which he thought were not of primary importance for the first-year students. However, he observed that the students were very excited for Fridays to come. Starting from Monday they were asking when the music teacher would come again and this routine also motivated them to come to school more volentarily and regularly even when there was no musical activity that day. He also emphasized that the musical activities positively affected the attitudes of the children towards the other lessons.

He said that they had no chance to carry out these kinds of activities since they have an obligatory program that they have to follow which focuses more on academic achievements such as reading, writing and basic skills in mathematics. However, he stated that he changed his mind in time:

*"I have realized that I need to do more musical activities such as you do, since I can see the positive effects of it on the children. The children are motivated by music; they find it more fun and more attractive".*

He shared one of his observations regarding the positive effects of this research process on the children outside of the classroom:

*"We participated in an activity organized by an Association of Social Solidarity and Assistance. My students, in contrast to the students from other classes, were waiting in an orderly manner, asking for permission when they needed to go to the W.C. etc. Even if it was their own neighborhood where they could act with bravado, they were responsible and respectful to me and to their friends".*

He also emphasized that the effect of this project on the children cannot be denied. One of the most important pieces of feedback from the classroom teacher regarding the positive effect of this study was that he would not give up on this group for the following years even though he has been teaching only the first-year students for the last 4 years. He thought that the way the music teacher

approached the children was also important and effective. He indicated that the acceptance the music teacher showed to the Romani children, the consistency while she carried out the activities, the unconditional love she expressed, and the respect she showed regardless of the age or social standing of the children increased the effectiveness of the activities. He stated that they do not often see a group of activities that do not include Romani music and dances at this school. Therefore he found the concert at the end of the project, which consisted of intercultural music and dance, very special and inspiring.

## DISCUSSION

This study was based on the assumption that the Romani children have show a tendency towards music and musical activities as a socio-cultural characteristic. Therefore it was thought that music and related activities such as singing, dancing and playing instruments could be used to fulfill the needs of the disadvantaged Romani children in non-musical areas.

After the research process, it was proved that not all the Romanies are necessarily engaged with and succeeded in music and related activities. The focus group of this study consisted of disadvantaged Romani children who have surprisingly no musical background or no specific tendency and competency towards music. Therefore, the expectations of the outcomes of the study were lowered and the planned musical activities were rearranged. Yet, the results showed that regardless of the origin of the children (whether they are Romani or not) and their disadvantages, musical activities were positively effective on the development of the focus group in the musical and non-musical areas.

There were also 4 hypotheses examined during this study. The first hypothesis was "creating a motivating educational environment enhanced with music for the disadvantaged Romani children that would increase the level of their attendance in education". The results of this study showed that a motivating educational environment was enhanced with the musical activities decreased the number of absenteeism of the children in comparison to the other first year students and also in comparison to the previous years.

The second hypothesis was "multidisciplinary musical activities contribute to the development of Romani children in musical and non-musical areas". The results confirmed this hypothesis to be correct. The interview results also demonstrated the same findings. The effects of Orff-based music activities were examined in many studies and the positive effects on non-musical areas were observed as follows:

- (1) A reduction of the behavioral stress and grief syndromes of children (Hillard, 2007).
- (2) Building positive social relationships



- (3) Cognitive reframing
- (4) Decreasing problems in children's grieving process (Register and Hillard, 2008)
- (5) Decreasing pain and anxiety of hospitalized children (Colwell et al., 2013).

The third hypothesis in this study was "multicultural musical activities provide the Romani children with a larger perspective of socio-cultural knowledge, awareness and understanding".

The results confirmed this hypothesis to be correct as well. The Romani children learned different elements from other countries and cultures during the process. Eventually, the concert performance, where all the activities were presented to the others, showed that the Romani children and their families can enjoy and appreciate different cultural elements from other countries.

The final hypothesis was whether an educational and therapeutic rapport provided by the music teacher is important or not to enrich the outcome of the process. This brings us to the point of the approach used by the music teacher.

As in any setting, unconditional love and acceptance have to come in front of any scientific and/or educational techniques/approaches/methods. This love and acceptance opened the "door" of the Romani children where the music teacher can infiltrate into their lives and create a therapeutic rapport and perform an educational approach. This rapport motivated the Romani children to behave better, to learn more, and to attend education. The opinions and observations of the class teacher also confirmed the positive effects of the study and the approach used by the music teacher/ participant observer.

The results of this hypotheses were also compared with other relevant literature. Bhopal et al, (2000) address the common themes in the educational obstacles of Gypsy Traveller children that include regular attendance, continuity of educational experience and satisfactory levels of achievement. This information was also confirmed in the results of our study. They also emphasized the importance of a responsive curriculum in terms of ethnic and cultural diversity in the educational setting of Gypsy Travellers.

Thus, it can be said that the positive results of the utilization of multicultural music activities in our study are overlapped with this fact.

In another research, Wilding (2008) refers that there was a noticeable improvement in behavior due to the relevancy of the lesson material and the accessibility of a pedagogical method that was able to stimulate and captivate Gypsy travellers' interest in the subject matter. This fact showed similarity of the results of this study. According to the results of the interview carried out with the class teacher of 1-D, the children tended to come to school more regularly because of the music activities which they found relevant.

## CONCLUSION AND RECOMMENDATIONS

The results showed that the musical activities, regardless of having any background of music or not, were effective in supporting the development of children in musical and non-musical areas. The musical activities increased their motivation towards school and the levels of attendance increased qualitatively and quantitatively. The musical activities from different cultures also enhanced the cultural awareness and understanding of the children. The following suggestions can be made in light of the results obtained from the research:

- (1) The place of the Romani children within society should be remembered and, regardless of socio-economic conditions, a good quality education in the school should be provided.
- (2) The school should be transformed into an attractive and motivational place where children want to go to everyday with a great desire to learn. This transformation should be planned using different aspects such as physical condition, materials and of course teaching approaches.
- (3) Complimentary educational activities should be planned besides the obligatory program. Lessons such as music, art, drama and sport should be in the education programs and carried out by qualified teachers.
- (4) Multicultural and multidisciplinary approaches should be generalized within all other educational areas. Musical activities should be in the education programs of children studying at the levels of pre-and-primary education.
- (5) The projects extended over a longer period of time should be planned and applied in order to keep the consistency of the transformation.

## ASSUMPTIONS AND LIMITATIONS

In addition to the hypotheses, some assumptions were made and listed as follows:

- (1) The Romani children show a tendency towards music and musical activities as a socio-cultural characteristic.
- (2) The class teacher will answer the interview questions sincerely and honestly.

This study was limited with;

- (1) A group of first year Romani students,
- (2) A group of multicultural musical activities based on the Orff approach planned by the participant observer / music teacher.
- (3) A school year.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

## Effectiveness of constructivist approach on academic achievement in science at secondary level

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The present study investigated the effectiveness of constructivist approach on academic achievement in science at secondary level using pre-test, post-test, experimental and control group design, with 58 samples grouped as experimental group (29) and control group (29) on the basis of matching by intelligence test. The investigators conducted this experiment over three weeks by using both traditional and constructivist 7E-model. The self-developed achievement test covering Class IX Textbook of West Bengal Board of Secondary Education, India was used as tool. The study found that the students exposed to the constructivist 7E-model significantly achieved better than traditional method. In addition, students exposed to the 7E-model performed significantly higher than those exposed to the traditional teaching method in respect of their gained scores at every intelligence levels. The constructivist approach strategy is capable of improving student's mastery of content at the higher order levels of cognition. It is therefore recommended that constructivist 7E-model strategy be used in science teaching for the development of student's higher achievement in science at secondary level.

**Key words:** Constructivist 7E-model, science, secondary level.

### INTRODUCTION

Education is a social process that changes society as well as adult's role of society, shifting responsibilities of education from parents to teacher and from family to school. Societies change its effective use of education in designing, developing, producing, implementing and evaluating curriculum. It aids teaching learning process in a classroom situation, increases both learning outcome and students' achievements, reduces students' dropouts and burden, stress, anxieties and frustration. So today's development of new teaching strategies is essential for all-round developments of students. This research aims

to compare the difference between the traditional lecture methods with constructivist approach. Constructivist teaching is based on constructivist learning theory which has emerged as a prominent approach to teaching during this past decade. The work of Dewey, Montessori, Piaget, Brunner and Vygotsky among others provides historical precedents for constructivist learning theory. Constructivism represents a paradigm shift from education based on behaviorism to education based on cognitive theory. Behaviorist epistemology focuses on intelligence, domains of

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objectives levels of knowledge and reinforcement. Formalization of the theory of constructivism is generally attributed to Jean Piaget, who articulated mechanism as that by which knowledge is internalized by the learners. He suggested that through process of 'accommodation' and 'assimilation', individuals construct new knowledge from their experiences.

The Biological Science Curriculum Study (BSCS) team along with its principal investigator Roger Bybee developed an instructional model for constructivism, called the 5Es which was recommended for science teaching. In this model, the process is explained by employing 7 E's. They are Elicit, Engage, Explore, Explain, Elaborate, Evaluate and Expand.

### Rationale of the study

Throughout the world, science is one of the compulsory subjects in schools. Majority of students in schools ignored learning science due to lack of interest and motivation that leads to low academic achievement in science. Majority of teachers generally follow the traditional methods of instruction in schools. The conventional teaching method of teachers as sole information giver to passive students appears outdated. At secondary level, scientific concepts to be taught should comprise everyday experiences.

Apart from simple experiments and hands on experiences, an important pedagogic practice at this stage is to engage the students (in groups) in meaningful investigations; particularly of the problems they perceive to be significant and important. Indian Education Commission (1964 to 1966) criticized that if science is poorly taught and badly learnt, then it will become a burden for the learner's mind. Therefore, appropriate method of curriculum transactions must be to inculcate scientific temper. Science inculcates the value of creativity and logical thinking. Due to limitations of traditional teaching, nowadays some skills such as updating, practicing, criticizing and analyzing of knowledge gain importance. Constructivist theory thus plays an important role in the field of education.

Secondary education is the base for future education and it prepares students for higher education. In secondary level, science knowledge construction is very essential and welcomes constructivist approach (Icon-model/7E-model) of teaching. Lee and Fraser (2000) have reported that science students independently perceived their classroom environment in a more favorable light than students of other stream. Miheso (2002) revealed that girls achievement score is better than boys by using icon model than traditional teaching method. It is also found that other researchers (Jong, 2005; Peter et al., 2010; Nayak, 2010; Cakici and Yvuz, 2010; Enok and Joel, 2011; Saran, 2011) used the constructivist approach in social science subjects; also,

Miheso (2002), Becker and Maunsaayat (2004), Obiekwe (2008), Abu (2008), Hussein (2009), Hijazi (2009), Bimbola and Deniel (2010), Ovute (2014) and Qarareh (2016) studied on science subjects and Daloğlu et al. (2009) studied on language subject and have reported that students taught through constructivist approach scores higher than those taught with traditional method. The existing literature in science education is inconclusive about gender achievement in science; hence, there is a need to examine the role of constructivist 7E model on the performance of male and female students in science. Lin (1998), Panda (2005), Agrawal and Chawla (2005), and Satyaprakasha and Patnaik (2005) have reported that co-operative learning has a significant effect on student's achievement in science and sociability among learners. Kim (2005) have found that constructivist teaching is more efficient than traditional; also, ineffective in relation to self-concept and learning strategy but has some effect on motivation anxiety towards learning and self-monitoring. Dhindsa and Emran (2006), Hijazi (2009), and Qarareh (2016) have reported that there was no gender difference in the mean achievement score for the constructivist group than traditional method. Pritinanda (2007) had found that icon model has no significant effect on achievement of English, but a statistically significant effect on communicative competency like reading, writing and speaking. Folasade and Akinyemi (2009) had concluded that constructivist learning technique is more efficient, and also reported that there was no significant difference between the performance of male and female students taught with constructivist approach. Saran (2011) reported that low achiever students that learnt through constructivist approach had achieved significantly higher score as compared to their counterpart that learnt by traditional method for social science (Geography) subject. NCF-2005 has emphasized following constructivist approach in classroom so that students can construct their own knowledge and understand the concept at grass-root level. Ultimately their achievement will be enhancing. However, many research findings are in favor of it. Based on this, the researcher wants to find out the extent of significant effect constructivist approach has on student achievement in comparison to traditional method; hence it is worthwhile to study the effect of constructivist approach on the achievement of physical science students.

An analysis of all the above studies indicates that the application of constructivist approach during the teaching of science has been widely used. Majority of researchers have found that the constructivist approach of teaching is better than traditional method of teaching in Biology, and in some Social Science subjects it is most significant but it has no significance on English subject. It has been found that the low achievers students highly benefit from the constructivist approach. From the above analysis, no such study has been found on the effect of 7E-Model in

achievement of students in physical science subjects in relation to intelligence and gender. The most important point here is that all the studies have been conducted on the English medium C.B.S.E. curriculum; hence the researcher aims to study the effect of constructivism (7E-Model) on academic achievement of secondary school students in West Bengal Board of Secondary Education (Bengali Medium) on the basis of intelligence.

### Statement of the problem

NCF-2005 has emphasized the following constructivist approach in classroom so that students can construct their own knowledge and understand the concept at grass-root level. At secondary level, science knowledge construction is very essential and can be meaningfully achieved through the use of constructivist approach (Icon-model) of teaching. Thus, the present study is aimed at examining the effectiveness of constructivist approach on academic achievement in science at secondary level.

## METHODOLOGY

### Operational definition of the key terms

#### *Constructivist approach*

- i) This refers to knowledge constructed by connecting new ideas/experience to existing ideas /experience.
- ii) Here, the researcher has taken 7E-Model of constructivism for intervention.

#### *Achievement*

- i) This refers to performance of the students.
- ii) Here, achievement refers to the scores obtained by secondary school students in science before and after using constructivist approach.

#### *Secondary school students*

- i) The students studying in Class V to Class X are considered as secondary school students.
- ii) In this study, the researcher has selected Class IX students only.

### Objectives of the study

1. To study the effect of constructivist approach over traditional method on students' achievement in physical science.
2. To compare the effect of constructivist approach over traditional method on students' achievement in physical science with respect to their intelligence.

### Hypotheses of the study

1. Students taught through constructivist approach gain significantly

high achievement in physical science than traditional method.  
2. There is no significant difference in achievement test score among High, Average, and Low IQ students through constructivist approach over traditional method of teaching in physical science.

### Delimitations

- i) This study was conducted in Bengali medium Dakshineswar Adyapeath Annada Vidyamandir, (Bengali medium) of Kamarhati Municipality, Kolkata, which is affiliated to West Bengal Board of Secondary Education.
- ii) The present study was conducted on 80 Class IX students only.
- iii) This study was limited to physical science subjects only.
- iv) This study is a purposeful study limited to two lessons (from physical science) of Class 9<sup>th</sup> science and other units not covered.

### Study design

The design of study was quasi-experimental Pre-test, Post-test, control group design).

### Population

Class 9<sup>th</sup> students of Dakshineswar Adyapeath Annada Vidyamandir were the population of this research.

### Sample

Purposive sampling was used in selecting Secondary School. 58 students were selected from two sections for the purpose of the study. Section 'A' was regarded as experimental group and Section 'B' as control group.

### Tools and techniques

Two types of tools have been used in this research, viz; i) Instructional and ii) Measuring Tool.

**Instructional tool:** This was in the form of unit-wise lesson plans based on 7E model of teaching. Moreover, other teaching aids like pictures, chart papers, models etc., were also used.

**Measuring tool:** For grouping the students, Ravens Progressive Matrices was used. Measuring tools is in the form of teacher made achievement test questions based on constructivist principles (7E-model).

### Data analysis

The data were analyzed by using appropriate statistical techniques like Mean, SD, SEM, t-test, ANOVA.

## FINDINGS

On the basis of the results and their interpretation, the following major findings were found

- i) There was no significant difference between experimental and control group in pre-test [M1=7.1,

$M_2=6.1$ , 't'-value is 1.042, significance value is 0.306, that is, no significant difference between two group at 0.05 levels]. In the present study, it is found that there exists no significant difference between the mean scores of students in experimental group and control group before intervention. From the above statistical analysis, it is clear that mean of pre-test score of experimental group were slightly higher than the mean score of control group but no significant difference found in students' achievement in between both groups before interventions.

ii) There exists significant difference between the mean scores of students in experimental group and control group in post-test. From the comparison of achievement score of control and experimental group in post test the mean difference between two groups in post test is 4.24 and its 't' value is 5.627 which is significant at 0.01 levels. So from mean difference (4.2) and significance value (0.000), it can be concluded that there is difference between experimental and control groups post-test achievement scores, which arises due to different treatment, that is, by constructivist 7E approach and traditional approach.

iii) Constructivist approach (7E-model) had significant effect on the achievement of class 9<sup>th</sup> students in physical science than traditional method. Experimental group gain score mean is greater than control group gain score mean with 3.24, 't'- value is 4.387, and significance value is 0.000, that is, there is significant difference between gain scores of experimental and control groups at 0.01 levels). From both mean difference and significant difference it can be concluded that there is significant difference between the gain score obtained by experimental and control group. Hence, it can be concluded that there is difference between experimental and control groups post-test achievement scores, which arises due to different treatment, that is, by constructivist 7E approach and traditional approach. From the mean values of experimental (10.38) and control group (7.14), this research found that gain by experimental group is higher than the gain by control group. Hence, it can be concluded that experimental group gain greater achievement (constructivist 7E-approach) than control group (Traditional-approach). Thus, the stated hypothesis is accepted. Finally, it can be concluded that constructivist approach has significantly improved the achievement of students in science at secondary level.

iv) Constructivist approach had significant effect on low and average intelligent students by constructivist 7E-approach with respect to high intelligent students. Mean difference gain score between experimental and control groups by low intelligent students (4.86) is higher than the gain by average intelligence students (3.42), which is also higher than gain by high intelligent students (1.9). For high intelligence level, mean difference in gain score is not significant (0.281) at 0.05 level; for average intelligence level, gain score mean difference is

significant (0.003) at 0.01 level and for low intelligence, gain score mean difference is significant (0.005) at 0.01 levels. Since previous basic knowledge of high intelligence students are comparatively higher with respect to average and low intelligence, high intelligence students scored high with respect to average and low intelligence students in pre-test before interventions. But after intervention, achievement score is more or less similar for all intelligence levels. Thus, the mean difference of gain score (1.9) is lower with respect to average (3.42) and low (4.86).

There is no significant difference in achievement test score among High, Average, and Low IQ students through constructivist approach over traditional method of teaching in physical science. Variance (ANOVA) of experimental post test in relation to intelligence level is as shown in Table 1.

#### **ANOVA of experimental post test in relation to intelligence**

From the ANOVA Table 1, F-value is 1.856 and significance value is 0.176 which proves that there is no significant difference in score among High, Average, and Low intelligence students.

#### **Educational implications**

The study and its findings will be applicable for:

The most outstanding characteristics of any research is that it must contribute something new to the development of the area concerned. The present study was conducted on regional medium students to find the effectiveness of 7E model of teaching in science. The result is useful for teachers, curriculum planner, students, teacher educators, text book writers, researchers, corporate and government organization. 7E model can be used by a teacher as effective teaching methodology for difficult and complex concepts; a model of learning that may also help the learners construct their knowledge in a meaningful way as it gives enough scope for active participation and interaction in classroom with peers and teachers. Through 7E interaction, low intelligent students can get better opportunity to acquire knowledge and comprehend what they are learning. In addition, this model will create a joyful learning environment between teacher and students. The implications can also be categorized as follow:

**i) For learners:** In general constructivist approach and in particular, 7E's model of teaching helps the learners construct their knowledge positively. It gives enough scope for active participation and social interaction in

**Table 1.** Analysis of variance of experimental posttest in relation to intelligence level.

Parameter	Sum Squares	df	Mean Squares	F-value	Significance
Between groups	38.384	2	19.192		
Within groups	268.857	26	10.341	1.856	0.176
Total	307.241	28			

classroom with peers and teachers. Through interaction, students of all intelligent levels can get better opportunity to acquire new knowledge, especially for low intelligent students. They can develop the ability of analysis, divergent thinking, interpretation, ability, critical thinking and scientific attitude towards science education.

**ii) Teachers:** Teacher will benefit greatly by understanding the constructivist approach of teaching which the findings of the present study handles. As such, teachers need to encourage peer interaction, group discussion, experimentation, field visiting etc. 7E's model of learning can provide such situation between teacher and student. This model promotes joyful learning among students in classroom situation by facilitating learning process as a two-way mode of learning between learners and teacher. The ideals of teaching learning process of teacher as a facilitator while students develop their potentialities after getting instructions from teacher is what the study indicated.

**iii) School administration:** School atmosphere plays crucial role in managing the teaching learning process. The administration of school has important role to develop a congenial atmosphere among teachers as well as students. 7E's model may create such situation where a learner can interpret the concepts in many ways and teachers always try to provide them appropriate learning situation. Constructivist approach of learning brings better academic achievement of the students. For successful implementation of this strategy, the school administration should understand how learning need to be supported and provide all required learning resources to the learners.

**iv) Policy makers:** The present study and its finding has shown how the constructivist approach learning in science at secondary level enhance students' achievement and this need is taken into consideration while framing the policies of school education to bring qualitative change. At the same time, curriculum planner may incorporate this strategy in curriculum planning and development and preparation of framework/guidelines for achievements of intended learning outcomes.

### Suggestions for further research

1) The present study was conducted only on secondary

school students. Further studies can be conducted with other group of sample and also study can be conducted on school located at rural area process using constructivist 7E-model.

2) The study was conducted on students' achievement in science at secondary level. Therefore, study can be conducted on the specific branch of science like on Chemistry, Physics and Biology at secondary level and also non science subjects required to be studied.

3) A study can be undertaken to know the effect of constructivist approach on students' self-concept and their learning process.

4) In this study, only 7E's Model has been implemented. Other models of constructivist approach Interpretation Construction model (ICON-model) may be taken up for the purpose of study.

5) Problems and issues regarding assessment through constructivist approach is an emerging topic to investigate for the present situation.

6) The study also can be undertaken by taking larger sample and other context.

### Conclusions

From the whole review, analysis and discussions, the following conclusions can be arrived at:

1) Constructivist approach is an effective learning tool, which has significant effect on the achievement in science concepts among all psychological groups of students.

2) Constructivist approach helps in achieving meaningful learning in science concepts among Class 9<sup>th</sup> students.

3) There is no significant difference in achievement test score among High, Average, and Low IQ students through constructivist approach over traditional method of teaching in physical science.

### CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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*Full Length Research Paper*

# Examining the behavior and thinking levels of secondary school students (6<sup>th</sup>-8<sup>th</sup> GRADES) towards the environment according to gender

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The aim of this study is to examine the behavior and thinking levels of secondary school students towards the environment according to grade and gender. Relational screening model was used for the study. The sample includes a total of 958 (512 females and 446 males) secondary school students. Of the participants, 261 (27.2%) are in 6<sup>th</sup> grade, 461 (48.1%) are in 7<sup>th</sup> grade, and 236 (24.6%) are in 8<sup>th</sup> grade. The sample was chosen randomly. As a data collection tool, Environmental Attitude Scale developed by Uzun and Sağlam was used. Using ANOVA, the study shows that there is a statistically significant difference between the levels of environmental behavior in terms of grade (F (2-952),  $p < .01$ ). In order to determine the source of the difference, post-hoc least significant difference (LSD) test was implemented, and the findings indicated that there is a significant difference between 6<sup>th</sup> and 7<sup>th</sup> grades and 6<sup>th</sup> and 8<sup>th</sup> grades. There is also a statistically significant difference between the environmental behavior levels of students according to their gender (F (1-952),  $p < .01$ ). There is no statistically significant difference according to their gender and grades (F (2-952),  $p > .05$ ). However, a significant difference was found between the levels of environmental thinking of secondary school students according to gender (F (1-952),  $p < .01$ ). The level of environmental thinking of male students ( $X = 33.94$ ) is higher than that of females ( $X = 31.39$ ).

**Key words:** Environmental behavior, environmental thinking, secondary school, gender differences.

## INTRODUCTION

With the rapid increase in population and in turn the needs of people in the 21st century, many problems have occurred such as fast and unconscious air and water consumption, contamination and irregular urbanization. As natural balance gets ruined, significant environmental problems arise also. This situation makes the members

of political and scientific societies to think about the reasons. Environment education is considered herein (Akinoğlu and Sarı, 2009). Environment education became a current issue for the education system in the 70s when the search for a solution to environmental problems was very common. Recognizing that environmental corruption

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rooted in the interaction between humans and the environment can be healed by humans themselves, environmental education is considered as the main way to provide cognitive, emotional and behavioral changes (Özdemir, 2007). Environment education should be constructed to affect positively individuals' values and behaviors and to make them consider the natural environment. The main purpose is to develop environmental awareness and sensibility to protect and use the environment (Başal, 2003: 366).

Environment education has three domains: cognitive, affective and behavioral. The cognitive aspect includes developing individuals' literacy in ecological culture and environment, while the affective includes constructing values, behaviors, and attitudes towards the environment and environmental problems (Doğan, 1997; Hsu, 2004). Behavioral aspect comprises training individuals who try to take responsibilities for solving environmental problems and perform these responsibilities (Değirmenci, 2012). The main purpose of environmental educators is to develop environmental literacy and change people's behaviors towards the environment by training responsible citizens in the environment (Knapp, 2000). Environmental literacy is to comprehend the relationship of people and societies with their environment in a deeper way (Orr, 1990). Individuals who have environmental literacy are aware of the effects of activities about science, technology, culture, and agriculture on natural systems, and make effective decisions to provide the sustainability of the environment. Individuals who have the attitudes, values, and skills that can transform their knowledge on the environment to behavior are called literates in the environment (Goldman et al., 2006). There are two important concepts for environment literacy: Attitude towards environment and behavior towards the environment. Attitude towards environment refers to all positive and negative manner and thoughts about people's helpful behaviors to the environment such as fears, anger, anxiety because of environmental problems; values and readiness for problems' solutions. Behavior includes active and planned participation which aims to solve problems. The categories of environmental behavior are persuasion, consumers' behavior, physically protection behavior, political and legal behaviors (Volk and Mcbeth, 2001). Recently, the instructional curriculum of developed countries has the common aim to train individuals who have information, skills, and attitudes on the importance of science and technology for the environment by constructing scientific literacy (Aydın, 2006). The required skills which shape the societies of the future gather under the concept of scientific literacy. Considering the importance of physical sciences for the development of science and technology, science education is also gaining importance in education (Demirci, 1993).

Apart from environmental education, personal variables such as gender and age might have an effect on the attitudes toward the environment. For instance, Teksöz et

al. (2010) found a significant difference in the attitudes towards the environment, interest in the environment and using the environment in terms of females; and in knowledge in the environment in terms of male pre-service teachers.

The aim of this study is to examine the behavior and thinking levels of secondary school students towards environment according to grade and gender. The research questions are as follows:

- 1). Is there a significant difference in the environmental behavior levels of secondary school students towards environment according to their gender?
- 2). Is there a significant difference in the environmental behavior levels of secondary school students towards environment according to their grades?
- 3). Is there a significant difference in the environmental behavior levels of secondary school students towards environment according to their gender and grades?
- 4). Is there a significant difference in the environmental thinking levels of secondary school students towards environment according to their gender?
- 5). Is there a significant difference in the environmental thinking levels of secondary school students towards environment according to their grades?
- 6). Is there a significant difference in the environmental thinking levels of secondary school students towards environment according to their gender and grades?

## METHODOLOGY

Relational screening model was used for the study. Karasar (2012) defined relational screening model as research which aims to determine the degree of covariance of two or more than two variables.

The universe of the study is the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> grades of secondary school students attending public and private schools in Pamukkale District in Denizli. A total of 3000 students attending 45 state and private secondary schools in Pamukkale District consist of the universe. The sample includes a total of 958 (512 females and 446 males) secondary school students. Of the participants, 261 (27.2%) are in 6<sup>th</sup> grade, 461 (48.1%) are in the 7<sup>th</sup> grade, and 236 (24.6%) are in 8<sup>th</sup> grade. The sample was chosen randomly.

As a data collection tool, Environmental Attitude Scale developed by Uzun and Sağlam (2006) was used. The scale comprises 27 items and two sub-dimensions named Environmental Behavior Sub-Dimension and Environmental Thinking Sub-Dimension. The scores got from 13-item Environmental Behavior Sub-Dimension are between 13 and 65, while from 14-item Environmental Thinking Sub-Dimension is between 14 and 70. The higher the score from the dimensions, the higher is the level of environmental behavior and thinking. The reliability coefficient of Environmental Attitude Scale is 0.80 and 0.76 (Spearman-Brown two-half test correlation). As for the Environmental Behavior Sub-Dimension, the reliability coefficient is calculated as 0.88 and 0.81 (two-half test correlation), and for the Environmental Thinking Sub-Dimension, it is 0.80 and 0.75 (two-half test correlation). The inter-reliability coefficient of the scale is .815 for the current study. The scale was fulfilled by each student individually for the study. To analyze the data, two factors ANOVA and Post Hoc Least Significant Difference (LSD) test were used.

**Table 1.** Descriptive statistics of environmental behavior levels according to gender and grade.

Grade	Female			Male			Total		
	N	X	Sd	N	X	Sd	N	X	Sd
6 <sup>th</sup> grade	137	42.69	9.57	124	40.94	11.36	261	41.86	10.47
7 <sup>th</sup> grade	245	39.11	10.23	216	36.70	10.56	461	37.98	10.45
8 <sup>th</sup> grade	130	38.50	9.53	106	34.32	10.51	236	36.62	10.18
Total	512	39.91	10.01	446	37.31	11.03	958	38.70	10.57

**Table 2.** ANOVA results for environmental behavior levels according to gender and grade.

Source	Sum of Squares	df	Mean of Squares	F	p
Grade	4035.856	2	2017.928	18.965	0.000*
Gender	1688.071	1	1688.071	15.865	0.000*
SXC	195.822	2	97.911	0.920	0.399
Error	101297.160	952	106.405		
Total	1542252.0000	958			

\*p&lt;0.01.

## FINDINGS

According to the findings of ANOVA, there is a statistically significant difference between the levels of environmental behavior in terms of grade ( $F(2-952)$ ,  $p<0.01$ ) (Tables 1, 2 and 3). In order to determine the source of the difference, Post Hoc LSD test was implemented, and the findings indicated that there is a significant difference between 6<sup>th</sup> and 7<sup>th</sup> grade and 6<sup>th</sup> and 8<sup>th</sup> grades. The level of environmental behavior of 6<sup>th</sup>-grade students ( $X=41.86$ ) is higher than that of 7<sup>th</sup> ( $X=37.98$ ) and 8<sup>th</sup> grades ( $X=36.62$ ).

There is also a statistically significant difference between the environmental behavior levels of students according to their gender ( $F(1-952)$ ,  $p<0.01$ ). The environmental behavior levels of female students ( $X=39.91$ ) is higher than of the males ( $X=37.31$ ). There is no statistically significant difference between according to their gender and grades ( $F(2-952)$ ,  $p>0.05$ ) (Tables 4 and 5). However, a significant difference was found between the levels of environmental thinking of secondary school students according to gender ( $F(1-952)$ ,  $p<0.01$ ). The level of environmental thinking of male students ( $X=33.94$ ) is higher than of females ( $X=31.39$ ).

## DISCUSSION

Results show a significant difference between the levels of environmental behavior of the students in terms of their grades. According to this, 6<sup>th</sup>-grade students have a higher level of environmental behavior than the others (Table 3). In Aydın and Çepni (2012)'s study, a significant difference was found between 6<sup>th</sup> and 8<sup>th</sup> grade students

in favour of 6<sup>th</sup> grade and between 7<sup>th</sup> and 8<sup>th</sup> grade students in favour of 7<sup>th</sup> grade students. These findings might be evaluated as a decrease in the levels of attitudes and behaviors towards environments as the grade level increases. This might be because of the busy schedule of the students for the high school entrance exams. Esen (2011) also found significant difference in environment knowledge in terms of grades. This difference is rooted in 5<sup>th</sup> and 8<sup>th</sup> grades. In another study, Sarıgöz (2013) concluded that 9<sup>th</sup>-grade students have more positive behaviors than the students at 10<sup>th</sup> and 11<sup>th</sup> grades while 11<sup>th</sup>-grade students have a more sensitive approach for the environment than the students at 10<sup>th</sup> grade have. Sarıgöz (2013) commented that at 9<sup>th</sup> grade, students attend environment class and this may cause more sensitive behavior for the environment. However, as the grade level increases, the effect of this course might decrease and the level of sensitivity to the environment might decrease as well. According to grade, there is no significant difference between the levels of environmental thinking. Consistent with the current study, Aydın and Kara (2011) also found no statistical difference between high school students' sensitiveness to the environment according to their grades. In Esen (2011)'s study, there found no significant difference between the students' attitudes towards environment according to grades. In a study conducted with college students (Şahin et al., 2016) on the effect of grade level on pre-service teachers' knowledge, usage and attitude to the environment and their interest in environmental problems, results showed that 1<sup>st</sup> and 4<sup>th</sup>-grade students in Primary Education and Science Education Departments differentiate according to their knowledge, usage, and attitude to the environment and their interest in environmental

**Table 3.** LSD results for the difference between groups according to grade.

(I) Grade	(J) Grade	Mean difference (I-J)	Sig.
6 <sup>th</sup> grade	7 <sup>th</sup> grade	3.8773*	0.000*
	8 <sup>th</sup> grade	5.2392	0.000*
7 <sup>th</sup> grade	6 <sup>th</sup> grade	-3.8773*	0.000*
	8 <sup>th</sup> grade	1.3619	0.099
8 <sup>th</sup> grade	6 <sup>th</sup> grade	-5.2392*	0.000*
	7 <sup>th</sup> grade	-1.3619	0.099

\*p&lt;0.01.

**Table 4.** Descriptive statistics of environmental thinking levels according to gender and grade.

Grade	Female			Male			Total		
	N	X	Sd	N	X	S	N	X	Sd
6 <sup>th</sup> grade	137	31.43	5.88	124	33.48	8.96	261	32.40	7.55
7 <sup>th</sup> grade	245	31.85	7.53	216	34.41	9.13	461	33.05	8.40
8 <sup>th</sup> grade	130	30.50	5.17	106	33.54	9.17	236	31.86	7.39
Total	512	31.39	6.58	446	33.94	9.08	958	32.58	7.94

problems. This might be because as the grade level increases, courses on the environment may contribute to the scores of pre-service teachers' knowledge, usage, and attitude to the environment and their interest in environmental problems.

The level of female students' environmental behavior is found to be higher than that of males, while the level of male students' environmental thinking is found to be higher than that of females (Table 5). There is a significant difference between environmental behavior and thinking levels. There are some studies that have parallel results as the current study. For instance, Uzun (2007) indicated that there is a significant difference between the environmental thinking of high school students according to their gender, but there is no for environmental behavior. Kaya et al. (2009) revealed a significant difference in environmental behaviors of high school students according to gender, not in their environmental thinking. In a study conducted with 6-8<sup>th</sup> grades by Benli et al. (2015), female students have a higher level of attitudes than the males have. In a similar way, Sarigöz (2013) found that girls think more sensitively about the environment than the boys in a study conducted with 921 secondary school students. In some research, it is indicated that the reason for the sensitivity of the girls may be rooted in their higher level of anxiety about the environment than the boys (Deniş and Genç, 2007; Spellman et al., 2003). In another study, Aydın and Çepni (2012) stated that environmental attitude scores of male students are higher than those of

females. In their study with college students, Sarsour et al. (2015) indicated that females get higher scores of environmental awareness than males. In contrast, Kayhaoğlu and Kırıktaş (2015) found no significant difference between environmental behaviors and thinking of high school students according to gender. Esen (2011) found no significant difference in environment information according to gender in his study with 106 primary school students. In another study (Akillı and Genç, 2015) conducted with 713 secondary school students, environmental literacy was found to have no significant difference in terms of gender.

Along with the limitations of the current study, there can be some implications for future studies. In the current study, the behavior and thinking levels of students for the environments were determined via their self-reports. Research might be conducted with more crowded samples including teachers, parents, and peers. Students' environmental behaviors and thinking might be examined with the variables of academic achievement, free-time activities, and parents' attitudes towards the environment. Examining the behavior and thinking level according to various variables have great significance in terms of outlining the determinations of environmental attitudes in adolescence. In this way, educational programs might be developed in order to create positive behaviors and attitudes for the environment in little children and adolescents. The number and variety of activities such as tours, making projects might be increased. In social activities and clubs conducted in secondary schools, some

**Table 5.** ANOVA results for environmental thinking levels according to gender and grade.

Source	Sum of squares	df	Mean of squares	F	p
Grade	208.435	2	104.218	1.691	0.185
Gender	1422.364	1	1422.364	23.080	0.000*
SXC	30.467	2	15.234	0.247	0.781
Error	58669.652	952	61.628		
Total	1077691.000	958			

\*p&lt;0.01.

implementations for environment education might take place. Schools with specific themes such as ecologic school might be found. More research is needed for gender differences in environmental attitudes. Under which conditions gender differences take place should be determined. Seminars and educational programs on the environment should be organized for families. In secondary schools, projects about environment education should be made including families. The number of data collection tools about the issue can be increased through studies among Turkey sample. Secondary school students' attitudes towards environments and the determinants of these attitudes can be searched in different countries and Turkey with intercultural studies. Laçin-Şimşek (2011) stated that respect and values for the environment are neglected in primary school science and technology course books. In our time to discriminate human problem and environment problem is difficult; beyond doubt it is extremely important to identify an individual value for the protection of the environment, and to develop an environment and values education based on this. Moreover, longitudinal studies might be conducted in order to observe the effects of the curriculum. With longitudinal studies, it is possible to examine the effect of secondary school education on environmental attitudes in adulthood. Furthermore, learning settings, in which students can show their interest, attitudes, and behaviors towards the environment can be constructed; and studies examining the reasons for difference between various school types should be conducted.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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*Full Length Research Paper*

# Economics of quality education and paths leading into and out of quality education: Evidence from Debre Markos University, Ethiopia

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The difference in economic development among nations entirely emanates from difference in human capital development as it is the priority pathway out of poverty, diverse socio-economic and environmental crises. Although, huge investment in human capital development has long been made, mere investment will never lead to quality labor force unless paths for quality education are well substantiated. This study identifies viable paths to quality education using cross-sectional survey design by making data acquisition from 150 students selected using multistage sampling. Factor analysis and path analysis were employed to identify principal components explaining most of the variation in academic performance and to identify statistically significant paths leading into and out of quality education, respectively. Accordingly, labor market demand (unemployment), student's learning-attitude, communication skill, curriculum teaching method and learning facility are statistically significant factors, together explaining 74% of the variation in academic performance of students. Path analysis result indicated that the availability of learning facilities and macroeconomic situations (perceived unemployment and perceived employment-by-chance) is statistically significant. Thus, paradigm shifts in both internal (students and institutions) and external forces are needed. Specifically, ensuring cumulative grade point average (CGPA)-based employment as compared to chance-based employment followed by fulfillment of learning facilities will equip students for better academic results. Besides, the interaction of curriculum revision and learning facilities, and assisting students from low-income family are necessary policy synergy interventions to realize the quest of "quality education-quality labor force for economic development" if implemented with greater inter-sector integration from micro to macro levels.

**Key words:** Quality education, paths to quality education, policy synergy.

## INTRODUCTION

Improving educational quality requires a focus on institutions and efficient education spending (WB, 2007).

Investment in human capital development should be the primary focus for every nation that aspires to achieve

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economic growth. It is a proven fact that the difference in economic development among nations stems from the difference in human capital development. This is because human capital investment is the path out of diverse socio-economic and political progress of nations.

Human development is still a challenge in Ethiopia. Human Development Index (HDI) value of the country stands at 0.442 (HDI, 2015). Since the intervention of Millennium Development Goals, Ethiopia is classified as a low human capital development country despite significant improvements in educational programs. Ethiopia's vision, during the period of GTP II, in its quest to become a middle-income country (UNDP, 2014), is to build an education system which assures quality and equity in education by 2019/20 with the aim of producing competent human resource for the country.

Development of tertiary education is identified by the education sector as major priority in the country to ensure the relevance and quality of education at all levels besides general education and TVET (FDRE, 2015). Acting dynamically through education policy reform is imperative towards achieving sustainable human capital development in Ethiopia. Hence, this study aimed to identify feasible paths for higher education institutions to attain quality education.

## METHODOLOGY

### Sample size and sampling technique

This study was done in Debre Markos University, Ethiopia. Debre Markos University is one of higher education institutions established in 2007. Multi-stage sampling procedure was used to select sample of undergraduate students. The first stage involves purposive selection of students of Agriculture College followed by stratification of the sample into five departments for sample representativeness. Finally, after identifying the sampling frame containing the complete list of all students per stratum (department), 150 sample students were randomly selected using probability proportional to size sampling technique.

### Methods of data analysis

Cross-sectional survey design was used to collect data from sample undergraduate students. Data collection was done by administering questionnaire comprised of items pertaining to the study objective. Before the actual data collection, the questionnaire was restructured by conducting pilot survey with few undergraduate students to obtain reliable data.

To achieve the objective of the study, factor analysis was employed to analyze primary data collected from sample students. This is because it is popularly used by many researchers (Kyoshiba, 2009; Ibrahim et al., 2009; Irfan and Shabana, 2012; Georgis et al., 2012; Samuel and Kibrom, 2015) to reduce many variables to smaller principal factors and to pinpoint which of the factors have the most impact (DiStefano et al., 2009; Williams et al., 2010; An and Sean, 2013) for variation in academic performance of students thereby easing policy interventions for urgent remedial action. OLS regression model was fitted by regressing perceived student's academic performance (dependent variable) upon Likert-scale score results for identification of theoretically valid and

statistically significant variables (factors) determining student's academic performance. Regarding measurement of academic performance, some researchers have used five-point Likert scale (Georgis et al., 2012; Irfan and Shabana, 2012), while others preferred to use GPA (James, 2005; Jessica, 2006; Victor, 2011) as a valid measure of student's academic achievement given that the assessment and grading procedures used by teachers is accurate (James, 2005). However, the appropriateness of cumulative grade point average (CGPA) is conditional upon academic results limited to specific subjects/courses, particular semester, year and single test scores. Despite that, using CGPA has the problem of convergence; hence, not indicative of differential academic performance by students in every course and semester.

For the purpose of this study, academic performance of the student was measured using a five-point Likert-scale (proxy for quality education ranging from strongly agree to strongly disagree) as a valid measure for capturing the variability in their academic performance. Various factors drawn from literature and researcher's personal experience were considered by factor analysis for extraction of principal factors. Factor analysis used in this study is formulated as:

$$Z_{p \times 1} = \lambda_{p \times m} F_{m \times 1} + e_{p \times 1}$$

Where,  $Z$  =  $p \times 1$  vector of variables;  $\lambda$  =  $p \times m$  matrix of factor loadings;  $F$  =  $m \times 1$  vector of factors and  $e$  =  $p \times 1$  vector of error or residual factors (Sharma, 1996).

Perceived score values of selected factors were used for path regression analysis for predicting student academic performance and validating statistically significant paths to attain quality education. Path regression equation fitted to identify feasible paths leading to better academic performance of students is given below:

$$AP = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + e_i$$

Where, AP = perceived academic performance;  $a$  = regression constant (the value of intercept);  $b_1$ ,  $b_2$  and  $b_3$  are regression coefficients and  $e$  is the error term.

## RESULTS AND DISCUSSION

### Pathways leading into and out of quality education

#### Factor analysis

Dynamic studies on quality education deterrents are required to take proactive and reactive measures for delivery of quality education among higher education institutions in Ethiopia. Factor analysis was done to extract principal external and internal factors determining quality education. The KMO value was 0.656 for all items included for analysis and the corresponding test statistic value for sphericity was found significant, indicating appropriateness of the data for factor analysis as shown in Table 1.

To account for factors that influence students' academic performance, the factor components with Eigen value greater than 1 were considered and 7 factors were extracted (Table 2). Accordingly, these seven factors explain 74% of variations in academic performance of



**Table 1.** KMO and Bartlett's test.

Kaiser-Meyer-Olkin measure of sampling adequacy.		0.656
	Approx. Chi-square	616.626
Bartlett's test of sphericity	df	210
	Sig.	0.000

Source: Survey, 2016.

**Table 2.** Total variance explained.

Component	Initial Eigenvalues			Rotation sums of squared loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1	5.534	26.353	26.353	4.024	19.162	19.162
2	2.190	10.430	36.783	2.309	10.995	30.157
3	2.090	9.952	46.735	2.088	9.941	40.098
4	1.730	8.238	54.973	1.890	9.002	49.100
5	1.563	7.442	62.416	1.784	8.497	57.597
6	1.336	6.360	68.775	1.756	8.360	65.957
7	1.098	5.227	74.003	1.690	8.046	74.003
8	0.905	4.312	78.315			
9	0.783	3.730	82.044			
10	0.659	3.139	85.184			
11	0.658	3.133	88.316			
12	0.439	2.089	90.405			
13	0.432	2.055	92.460			
14	0.348	1.658	94.118			
15	0.289	1.376	95.494			
16	0.244	1.160	96.654			
17	0.192	0.917	97.570			
18	0.180	0.856	98.427			
19	0.154	0.735	99.162			
20	0.130	0.618	99.780			
21	0.046	0.220	100.000			

Source: Survey, 2016.

students. Specific to components, labor market problem is the external component explaining the largest variation (more than 19%) in academic performance (Table 3).

### Path regression analysis

To identify statistically significant components, path regression analysis was done (Table 4). Path regression result of academic performance predictors indicated that the labor market (demand for job) negatively and significantly determine students' motive towards better academic performance. This is because whenever employment opportunities are scanty out there, their hope for future employment will be dwindled which in turn erode their academic motive. Learning facility is also a statistically significant variable which has positive

influence on academic performance of students signifying adequate provision of required facilities (like ICT, laboratory technology and reference materials) through prioritization. Besides, the interaction of fulfilling learning facilities and curriculum reform will significantly improve students' academic results than either alone strategy signifying the need for policy synergy.

### Conclusion

Labor market situations (adequacy of labor market demand) and employability are external factors that largely jeopardize student's motive for better academic performance followed by adequate learning facilities. Even internal forces have conditional effect on quality education as they are driven by external forces altogether,

**Table 3.** Factor loading.

Factor	Item	Loading
Labor market problem	Employment inadequacy	0.927
	Employment not considering CGPA	0.886
	Employability after graduation	0.816
Entrepreneurial motive	Entrepreneurial intent after graduation	0.767
Learning facilities	Lack of adequate laboratory	0.892
	Lack of adequate ICT	0.846
	Lack reference materials	0.820
School environment	Student guidance from teacher	0.789
	Friend/peer relationship	0.562
	Learning preference	0.535
Student personality	High school background	0.867
	Learning motive	0.724
	Learning-attitude	0.657
	Communication skill	0.615
	Student expectations	0.586
	Academic preference	0.561
Curriculum	Lack of practicum	0.867
	Group learning	0.856
	Internship	0.527
Family background	Low income family	-0.649
	No family	-0.622

**Table 4.** Estimation result of path regression model.

Variable	Academic performance without interaction effect	Academic performance with interaction effect
Labor market problem	-1.355***(0.587)	-1.403***(0.610)
Entrepreneurial motive	1.511(1.884)	1.547(1.902)
Learning facility	0.864**(0.455)	0.817**(0.467)
School environment	0.293(0.471)	0.270(0.422)
Student personality	0.190(0.170)	0.168(0.129)
Curriculum	0.117(0.152)	0.140(0.163)
Family background	-0.138(0.218)	-0.106(0.189)
Learning facility and curriculum	-	1.153***(0.271)
Constant	0.547(0.312)	0.487(0.297)
Observations	150	150
R-squared	0.488	0.572

Standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$  and \*  $p < 0.1$ .

to guarantee better academic performance of students. The interplay result will ultimately impact supply of quality

labor pertinent to sustain economic development of the country.

## POLICY RECOMMENDATIONS

For production of quality labor from huge education investment, identified paths leading into and out of quality education should be relieved with more focus on external and internal forces exacerbating learning morale of students.

The Ministry of Finance and Economic Development (MoFED) has to promote expansionary fiscal and monetary macroeconomic policies aimed at increasing employment opportunities which will absorb more graduates based on academic merit/performance.

Employer institutions should give value to CGPA-academic performance to ensure fairness on behalf of CGPA-based employment than pursuing prevailing chance-based employment. Whenever vacant jobs are announced, employers should recruit qualified labor using a mix of criteria like CGPA, practical exam and interview. This might encourage student to work harder for high academic performance as it will be later required to secure employment. To better solve the internal problems, Higher Education Institutions/Ministry of Education should capitalize and set priority to provide learning facilities required for assuring quality education.

Equipping students with entrepreneurial morale, integrating group-learning and assisting students from low-income family background are necessary interventions to realize supply of quality labor force for economic development of the country.

Educational institutions have to go through curricular revision and monitoring to add assessment methods aligning practice with theory, abandon simultaneous delivery of block and parallel courses, and relieve student communication problems being language which pampers progress of quality assurance in education.

Policy synergy (hurdle-rule) involving grassroots participation of education policy (educationalists), employment policy (business), economic policy (economists) and other stakeholders is also among necessary policy interventions in the pursuit of realizing quality education which will in turn lead to production of quality labor force needed for economic development. Therefore, it seems necessary to appropriately review and solve problems associated with policies lacking genuine and equitable implementation.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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*Full Length Research Paper*

# A comparison of pre-service, in-service and formation program for teachers' perceptions of technological pedagogical content knowledge (TPACK) in English language teaching (ELT)

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**In view of the rapid advancement of technology, technological pedagogical content knowledge (TPACK) has been extensively studied. However, research on technological pedagogical content knowledge (TPACK) in teaching English appear to be scarce and addressed either pre-service or in-service teachers, but not their comparison. Additionally, although teacher-certificate programs are employed in many countries, none of the existing studies have examined teacher-candidates' TPACK, especially in English language teaching (ELT). To fill the gap, this study aims to compare TPACK among teacher-candidates, pre-service and in-service English as a foreign language (EFL) teachers in Turkey. Quantitative and qualitative data analysis indicated significant differences among them. Based on these findings, suggestions for teacher education and future research were made.**

**Key words:** Pre-service teachers, in-service teachers, teacher certificate program, English language teaching (ELT), technological pedagogical content knowledge (TPACK), self-perception.

## INTRODUCTION

One of the milestones in teacher education that changed the standards of qualified teachers is Shulman (1986) perspective. According to these standards, qualified teachers should master not only content and pedagogical knowledge but also the intersection of both: pedagogical content knowledge.

In addition to Shulman (1986) ideas, changes in technology led Mishra and Koehler (2006) to propose that

technology also cannot be separated from pedagogical content knowledge (PCK); therefore, they suggested technological pedagogical content knowledge (TPACK) framework, which consists of technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). Moreover, the intersections of these knowledge domains are PCK, technological content knowledge (TCK), and technological pedagogical

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knowledge (TPK). PCK addresses the ways of teaching particular content-based material to students. TCK denotes selecting and then using technologies to teach particular content knowledge, while TPK refers to using a particular technology when teachers are teaching a certain subject matter. Finally, the intersection of the three circles forms a combination of the three knowledge domains, referred to as TPACK (Thompson and Mishra, 2007).

In line with these changes in standards, implementing technology into teacher education programs has changed. In early models, technology training and the rest of teacher preparation program were disconnected because computer literacy courses were separate from content methods classes and seldom engaged in real collaboration on how teachers could integrate technology into authentic learning experiences (Cetin-Berber and Erdem, 2015).

As a result, technology training failed focusing only on how to use computers, but not addressing how to teach students more effectively and using a variety of technological tools (Wentworth, 2007). That is, as the research indicated, pre-service teachers (PTs) believe that receiving the technology training in a single course isolated with the content hindered them to retain and transfer to their classroom teaching the information gained from this course (Sutton, 2011). Therefore, universities are revising courses to infuse the introduction and utilization of technological tools, to enhance instruction (Stobaugh and Tassell, 2011). Technology education is moving from a stand-alone technology course to technology-integrated curricula and context-specific approaches, modelling of technology use by college educators, faculty development, and providing opportunities for prospective teachers to use technology (Pamuk, 2012).

Increasingly, teachers are being prepared to teach in innovative ways; for instance, blended classrooms including virtual and face-to-face learning enable students not only to use digital devices as personal learning and productivity tools to comprehend digital content and Web 2.0 tools, but also to be guided and assessed their learning by using data (SETDA, 2010). This process is also similar with technology education for PTs in Turkey. Even though using computers in education began in 1984 (Akbaba-Altun, 2006), taking any technology-related course to fulfil the requirements for teaching became a requirement in PT curricula from 1998 (Yildirim, 2007). Hence, 'Computer' and 'Instructional Technology and Material Development (ITMD)' courses became mandatory in teacher education programs (Goktas et al., 2008).

A 'Computer' course provides basic concepts and computer applications, that is, word processors, presentation software, the Internet, and so forth, whereas an 'ITMD' course provides knowledge and skills on the function of instructional technology in learning process

and selecting appropriate technologies to enhance teaching and learning (Goktas et al., 2008).

Examining the effectiveness of the technology-related courses reported that although PTs had positive attitude for the effectiveness of technology-related courses, they stated that technology training was limited to these two courses and these courses were relying more on theoretical technology education rather than giving PTs practice opportunities, and (Yuksel and Yasin, 2014); for that reason, the knowledge and skills gained from this process remain isolated and unused (Goktas et al., 2008; Cetin-Berber and Erdem, 2015). That is, although PTs might know the basic functions of technology use in the classroom, they might not be prepared to truly integrate these skills into their teaching (Ertmer, 2005; Sahin, 2011; Tondeur et al., 2012); consequently, teacher preparation programs may not prepare PTs to effectively use technology (West and Graham, 2007; Cetin-Berber and Erdem, 2015).

As technology is advancing fast and not all teachers from schools have received the education on integrating technology into the teaching process (Carbová and Betáková, 2013), it is necessary for in-service teachers to receive technology integration training. The trainings were provided through nation-wide projects in different countries, such as in Australia 'Teaching Teachers for the Future' (Parr et al., 2013), in the US Preparing Tomorrow's Teachers for Technology (Polly et al., 2010) and in Ethiopia UIN SUSKA (Ansari, 2015).

Similarly, in agreement with the significant educational reforms being made by the EU countries, Ministry of National Education (MoNE) in Turkey has emphasized the use of technology as an important instructional tool within schools across the country through Movement of Enhancing Opportunities and Improving Technology (FATİH) Project (MoNE, 2010). The five components of the project are:

1. Providing equipment and software substructure
2. Providing educational e-content and management of e-content
3. Effective usage of the information and communications technology (ICT) in teaching programs
4. In-service training of the teachers, and
5. Conscious, reliable, manageable and measurable ICT usage (MoNE, 2010).

Through these components the project aimed to improve technology in schools for the efficient usage of ICT tools in both teaching and learning processes through providing tablets and liquid-crystal display (LCD) Interactive Boards as well as in-service trainings for teachers working at preschool, primary and secondary schools. Through projects as schools are equipped with technology much better than ever before, researchers have investigated the way they are used in the classes.

In the literature, teachers' technology use is various. For instance, Fisher et al. (2012) state that teachers use

technology to support learning for distributed thinking and knowing, engagement and motivation, communication and knowledge building. Other studies revealed that teachers use technology to give students practice on content and skills; more specifically, they use the Internet to find activities or content for class, create learning materials for students on the computer or assess student learning on instructional objectives (Kopcha and Sullivan, 2007; Kurt, 2013).

Moreover, Bang and Luft (2013) indicated that teachers used PowerPoint for teacher-centred lecture-style classes, whole-class setting arrangements or reviewing facts for exams. Websites are often used for one-way communication by teachers through showing video clips and pictures found on relevant sites to help students understand the scientific facts they have learned. However, websites are rarely used for generating class discussions promoting collaborative learning or creating knowledge (Cetin-Berber and Erdem, 2015). Hence, it is revealed that a majority of teachers use technology to support low-level curricular task for assisting traditional teaching and learning, rather than for high-level tasks to engage learners as active contributors to the learning process (Ottenbreit-Leftwich and Brush, 2011; Bang and Luft, 2013).

In Turkey, similar to the studies mentioned earlier, teachers use the Internet and word processing software mostly to prepare the documents for instruction, homework and assessments, and use PowerPoint presentations to deliver the contents of the subject matter (Gulbahar, 2007; Yildirim, 2007; Goktas et al., 2009; Cakir, 2012; Unal and Ozturk, 2012; Kurt, 2013). That is, teachers use technology mostly to support their traditional ways of teaching and administrative purposes (Kurt, 2010; Kurt and Ciftci, 2012; Kurt, 2013; Cetin-Berber and Erdem, 2015).

In many countries, in order to respond to the shortage of teachers, though in general teachers are educated in education faculties, alternative paths to teacher training have been adopted for example pedagogical formation/teaching certificate programs (TCP) and master's programs, such as Postgraduate Certificate in Education (PGCE) in UK, Professional Development Certification and master's degree in Education in the US, Australia, Israel, India, and so on.

TCP provide PK training, which is necessary to know how to teach what you know, to candidates for teacher licensure who have received a bachelor's degree in the content area. Similarly, since 2010, students who graduated from Science and Arts Departments and successfully completed two-semester-long pedagogical formation program offered by Faculties of Education in Turkey can become teachers (Ozoglu, 2010).

In TCP curriculum, only one technology course is mandatory, ITMD is also offered in PT education programs. Furthermore, unlike teacher education programs, the bachelor degree programs in Science and Arts Departments do not include the basic computer

courses. Although the need for teachers has tried to be met through the certificate programs, it is still a continuing debate as to whether or not such programs are effective in training qualified teachers (Yüksel, 2004).

Particularly in recent years, regardless of the department and faculty of graduation, nearly every university graduate can take formation education, even via the distance education medium. This naturally has given rise to many questions about the quality of the teaching profession (Yildirim and Vural, 2014).

In line with the rapid advancement of technology, TPACK has been discussed and extensively studied, such as establishing a conceptual framework (for example, Mishra and Koehler 2006), conducting preliminary enquiries (Ferdig, 2006), creating assessment tools (Koh et al., 2010), and exploring TPACK in specific domains (Graham et al., 2009; Niess et al. 2009). However, studies on TPACK in teaching English as a second or other language (TESOL) or as a foreign language (EFL) appear to be scarce (Wu, 2013; Wu and Wang, 2015). Furthermore, TPACK studies have examined either pre-service or in-service teachers. Up to date, there is one study (Dong et al., 2015) comparing in-service and pre-service teachers' TPACK majoring in six different subjects: Chinese Language, English Language, History, Education, Math and Physics.

Therefore, this study may be the first in TPACK research to provide comparison of pre-service and in-service teachers in a single refined major: English language teaching (ELT). Additionally, despite it is widely used as an alternative path to teacher education, none of the existing studies examined Teacher Certificate Program candidates' TPACK in the field of ELT. In conducting effective technology-enhanced instruction, the importance of teachers' TPACK has been recognized; however, the understanding of teachers' TPACK when teaching EFL, in conjunction with the need for their further TPACK development has not been properly addressed.

To fill the gap in TPACK research in the EFL domain, this exploratory study aims to explore the TPACK among pre-service teachers from ELT program at education faculty, candidates of ELT certificate program and in-service EFL teachers at primary and secondary schools in Turkey. With this aim, the following research questions guided the study:

1. Is there any difference among PTs', teacher-candidates' at a certificate program and in-service EFL teachers' self-perceptions of their TPACK?
2. From participants' perspective, what does TPACK integrated ELT mean?

Answering these questions might shed light on the nature of TPACK in EFL settings. More specifically, as research indicates that there are gaps between the rhetoric of policies of the program and its practices of TPACK (Kedir, 2006; Jeylan, 2006; Abera, 2014). Examining

technology integration in three teacher education and training contexts, PTs', TCP candidates', in-service teachers' TPACK and associated beliefs can provide a holistic picture of policies and practices of technology integration in ELT. As Schmidt et al. (2009) stated, using TPACK as a framework for understanding what knowledge teachers must have to integrate technology into teaching, and how they might develop this knowledge. Various types of training and professional development experiences might be designed for teachers. Hence, a better understanding of teacher's beliefs and TPACK can lead to improve the efficiency of teacher education and training programs.

## LITERATURE REVIEW

### Studies on TPACK with pre-service English language teachers

As pre-service language teachers' TPACK have 1 recently begun to draw attention of researchers (Wu, 2013), few studies conducted either to report the results of training programs or to evaluate the status quo are summarized below.

Effectiveness of workshops and training sessions on TPACK were examined (Koçoğlu, 2009; Yan and Yuhang, 2012; Kurt et al., 2014; Eranlı, 2016). Koçoğlu (2009) explored how 27 senior pre-service EFL teachers improved technology integration into L2 teaching during a semester-long 'Computer-Assisted Language-Learning' course in Turkey. The findings of the qualitative study revealed that through the course, PTs had practiced and developed their TPACK skills.

Similarly, Yan and Yuhong (2012) examined how ICTs can be effectively integrated into subject-teaching in Comprehensive English course and how the pre-service English teachers could benefit from the infusion of ICTs both as English language learners (ELLs) and would-be teachers in China. They highlighted that no matter how much the teacher knows about ICT, the knowledge he knows cannot be automatically transformed into the ability of utilizing it in teaching. Also, they reported that the integration of ICTs on pre-service English teacher education impacts shifting the focus from the teaching knowledge to teaching competence, from teacher-centred to student-centred learning facilitating learners to construct knowledge.

Kurt et al. (2014) investigated Turkish pre-service EFL teachers' TPACK development. The teachers participated in a 12-week explicit TPACK development program based on Learning Technology by Design approach (Mishra and Koehler, 2006). The findings of their study showed that even though the participants hadn't received any prior training on technology integration into L2 teaching, after the treatment, there was a statistically significant increase in participants' TK, TCK, TPK and TPACK scores.

Also, it is reported that at the end of the program, PTs were more confident in choosing technologies that enhance both the teaching approaches and students' learning in a lesson. Eranlı (2016) examined the effectiveness of a five-week training session of an ELT Methodology Course on TPACK of Junior 59 pre-service EFL teachers enrolled at a state university in Turkey.

In a mixed-method design, data were collected through TPACK Competency Survey (Archambault and Crippen, 2009) and participants' journals. The results indicated a statistically significant improvement in participants' TPACK scores. Moreover, the journal entries indicated an increase in many applications and websites that could be used with more effective and to the point objectives in the classroom. Furthermore, participants performed better in manufacturing and altering language learning/teaching materials with specific goals.

Besides effectiveness of short-term training sessions on TPACK, four-year teacher education programs were examined for status quo. For example, Solak and Çakır (2014) assessed 137 Turkish PTs' TPACK competencies at the end of four-year ELT teacher education program with respect to gender and academic achievement. Based on TPACK Competency Survey (Archambault and Crippen, 2009), the results suggested that while males' TK was higher than females, females were better than males in PK. Meanwhile, no significant difference was found between TPACK mean and academic achievement.

Similarly, Oz (2015) examined 76 pre-service EFL teachers' TPACK at the end of four-year teacher education program in Turkey. Based on TPACK Scale (Schmidt et al., 2009) with some open-ended questions, the findings revealed a highly developed knowledge of TPACK. Qualitative data analysis revealed that faculty members used more TPACK in the courses than cooperating teachers at practicum schools. Oz suggested that in learning and teaching quality could be improved through integrating TPACK into the existing teacher education curriculum and providing technologically rich environment for language learners.

Kwangsawad (2016) examined senior 33 EFL PTs' TPACK through TPACK Survey (Schmidt et al., 2009), lesson plan assessments and classroom observations of actual practice in Thailand. The results showed high scores for all domains. The highest mean score was for TPK, and the lowest for CK. Moreover, analysis of lesson plan documents indicated a well-presented theoretical development of the participants' technology integration skills.

The actual practice was closer to self-report survey data to assessing teachers' ability to apply their TPACK than the lesson plans. All the domains of TPACK, except TPK, reported higher scores in the EFL PTs' actual practices as compared to their self-report.

Kwangsawad (2016) concluded that the program was confirmed as being successful in training teachers with

highly developed TPACK knowledge that provides them with skills and knowledge of technology to be implemented in their practical teaching.

### ***Studies on TPACK with pre-service English language teachers in teacher certificate program***

Turkish Council of Higher Education has initiated a teacher certification program to provide an opportunity for graduates of certain faculties to qualify as teachers (Ozoglu, 2010). Thus, measuring the occupational readiness level of this group joining the teacher candidates is crucial. However, to the best of the researcher's knowledge, there is no study focusing on TPACK of English language teacher-candidates attending to teacher certificate program. In Turkey, there are two studies focusing on TPACK of teacher-candidates.

Delen et al. (2015) conducted a mixed-method study for teacher certificate program to measure whether 175 mathematics teacher candidates' beliefs regarding to their abilities to use educational technologies show differences according to their age, gender, and experience in Turkey. After TPACK survey (Bulut, 2012) was administered, candidates were asked to create sample activities and to describe what they knew about Turkey's technology initiative (named as FATIH Project).

Based on quantitative results, teacher candidates appeared to think they were ready to teach and use technology in their classrooms; however, the qualitative results indicated the situation was contrary in terms of the PCK they possess. More than half of the candidates (54%) could not create activity examples using technology in mathematics education and half of the participants could not describe FATIH project.

The other study evaluated teacher certificate program in Muğla Sıtkı Koçman University, Turkey based on the opinions of 36 teacher-candidates who graduated from the departments of Turkish Language and Literature, German Language, Philosophy, Mathematics, History, and Physics (Aykaç et al., 2015). According to focus group interviews, the most significant problems experienced by the teacher-candidates throughout the program were that a lot of information was tried to be given in a short time, and the classrooms are very crowded.

Moreover, as traditional lecturing was adopted as the primary means of instruction and there were only projectors used in the teaching at the education faculty, though there were smart boards at practicum schools, teacher-candidates stated that they experienced some difficulties in the use of technological tools such as smart boards in their classes. Also, they think that no matter how much technology the school has, if the teachers are indifferent to these technologies, they cannot be effective as means of instruction.

### ***Studies on TPACK with in-service English language teachers***

As in-service teachers and domain specific TPACK, precisely language, are the least searched domain in TPACK literature (Wu, 2013; Wu and Wang, 2015), limited research conducted either to evaluate the status quo or to report the results of training programs are summarized below.

Exploratory studies of in-service English language teachers' performances on the seven TPACK construct components were conducted (Wetzel and Marshall, 2011; Abera, 2014; Yuksel and Yasin, 2014; Wu and Wang, 2015). Wetzel and Marshall (2011) exploratory qualitative case study investigated ways a sixth grade middle school English language teacher show evidence of behaviours that fit the TPACK framework in the classroom. The data gathered through classroom observations and interviews showed that a foundation for the use of technology in content (language arts) and pedagogy (project-based learning) was provided by the teacher. That is, the teacher demonstrated TPK through both well-planned classroom management practices and the interplay between components of the framework.

Additionally, Abera (2014) examined the ELT program and EFL teachers' TPACK applications in Ethiopia. The results of the structured questionnaire (Schmidt et al., 2009), 10 interviews, 20 classroom observations, and documents indicated that the teacher education program failed to educate connections between technology, content, and pedagogy.

ELF teachers' TPACK was also found to be low. That is, teachers applied their PCK while teaching English language through televised instruction like the conventional instruction. Another study examined 124 EFL teachers' TPACK competency levels in terms of gender, length of service, and workplace in Turkey (Yuksel and Yasin, 2014).

The results of TPACK-Deep survey (Yurdakul et al., 2011) indicated that the teachers had average competency levels in TPACK and there wasn't any significance between the teachers' TPACK and their gender, experience, workplace, the time they have spent using a computer or the Internet. However, participants with five years or less of teaching experience and those working in private schools had higher scores in TPACK than the other groups. Lastly, Wu and Wang (2015) explored TPACK of 22 in-service EFL teachers' at elementary schools in Taiwan.

The results of a quantitative self-reported questionnaire, interviews and classroom observations indicated that the EFL teachers must be confident in their PK and they need more TK to further develop their TPACK. The participants' TPACK focused much on motivating students, providing language input or displaying information rather than using technology for creating opportunities for students to use English



language meaningfully and authentically. That is, components such as meaningfulness, creativity, autonomy, and higher order thinking skills (analysing, evaluating, and creating) were less frequently observed in the classrooms than lower order skills.

Effectiveness of TPACK training courses for in-service teachers was also examined. In a mixed-method study, Liu and Kleinsasser (2015) examined six EFL vocational high school teachers' TPACK and perceived computer self-efficacy from their use of technology while participating in online project-based EFL instruction. Data analysis revealed after receiving CALL training courses five of the teachers' TPK, TCK, TPACK ratings and computer self-efficacy items scores in the survey increased.

In the interviews and posted messages, all the participants reported the benefits and their professional growth for joining this in-service program. Also, they stated that they were confident about improving students' learning motivation through Internet technology. However, these teachers' perceived computer self-efficacy as mainly relevant to their TK development rather than TPACK as a whole. The other study investigated the impact of a training course on a secondary school English teacher's lessons (Carbová and Betáková, 2013). This qualitative study based on a TPACK questionnaire, interviews and 16 lesson observations, indicated that during the course the participant was becoming more and more aware of the differences in practicing skills and sub-skills by means of traditional technologies and the interactive whiteboard. Moreover, the study showed that although the teacher started using some new technologies and was capable of developing further on her own, these changes refer mostly to TK but her PCK took this into account and took steps to avoid it in the next training.

To the researchers' knowledge, there is one study comparing in-service and PTs' TPACK; however, the study included participants from different majors. Dong et al. (2015) examined 390 PTs and 394 in-service teachers' TPACK, their beliefs about constructivist oriented teaching (CB) and design disposition (DD) in China. Participants majored in Chinese Language, English Language, History, Education, Math, and Physics. Based on the TPACK constructs (Chai et al., 2013a) and constructivism belief (Chai et al., 2013b) surveys, CB and DD were found between PTs and in-service teachers significant differences in the TPACK factors.

PTs' TPACK profile shows that they perceived themselves strongest in terms of their TPK and weakest in terms of their CK. All other factors of TPACK fall within these range, indicating that the PTs didn't possess high efficacy about TPACK knowledge. In-service teachers profile indicated that they were at least with some confidence in their TPACK but there was a need to develop the teachers' TPACK, especially through

professional development activities, directly engaging them in designing ICT integrated lessons. With regards to the beliefs measured, both PTs and the in-service teachers are inclined toward constructivist beliefs, with the in-service teachers expressing stronger inclinations toward CB.

## METHODOLOGY

### Theoretical framework

The theoretical background of this study was TPACK framework (Mishra and Koehler, 2006) since it has been widely used as a theoretical basis for structuring ICT curriculum in teacher education programs (Angeli and Valanides, 2009; Chai et al., 2011; Cetin-Berber and Erdem, 2015).

### Context of the study and participants

The study was conducted in the ELT department of a state university located at the southern part of Turkey, in addition to the primary and secondary schools located in the same city. In selecting the participants, convenience sampling technique was employed, which is a common non-probability sampling technique in L2 research where an important criterion of sample selection is the convenience to and resources of the researcher (Dörnyei, 2007).

PTs attending to senior level in a four-year ELT program at Education Faculty (N= 53), English language teacher-candidates enrolled in the Teacher Certificate Program (N= 39), and in-service English language teachers working at primary and secondary schools (N=103) participated voluntarily in the study. ELT program and Certification program were offered by the same department.

The four-year ELT program consists of professional courses including methodological and pedagogical approaches to EFL teaching as well as courses raising students' awareness on the English language system, and first and second language acquisition. Additionally, the program organizes practicum in selected schools. In the program via other content and subject-specific methods courses PTs are supposed to develop TPACK skills. These courses and the order they will be offered are decided by Higher Education Council.

Hence, the standard curriculum is employed around the country. However, to what extent the technology will be integrated into courses varies among universities, depending on instructors' TPACK. Related to technology, PTs receive three courses: Computer (I and II) and Instructional technologies and material design course (ITMD). The Computer course, which is a standalone technology course received in the freshman year, focuses on the development of basic computer skills such as learning how to use office programs and selected software and how to use the Internet effectively. ITMD course, offered by Department of Educational Sciences, enables PTs to design handmade teaching materials, websites and e-portfolios. As the requirement of School Experience I/II courses, in the senior year PTs are placed to the schools organized by the department to do their practicum. While School Experience I course requires PTs to do structured observation tasks followed by discussions related to theoretical and experiential considerations in EFL, School Experience II course, offered in the second semester, includes observation and supervision of carefully prepared student teaching followed by critical appraisal. PTs are expected to do both micro and macro-teachings during their practicum. During practicum courses PTs are expected to observe and experience technology use in collaborating schools.

**Table 1.** Number of items and possible scores for each TPACK domains of the scale.

Subscale	Number of items	Possible minimum-maximum scores
TK	7	7-35
CK-Literacy	3	3-15
PK	7	7-35
PCK	4	4-20
TCK	4	4-20
TPK	5	5-25
TPACK	8	8-40
Model of faculty	8	8-40
Model of TPACK	3	3-12

The Pedagogical Formation program since 2010, as a teacher certification program, has been offered to meet the need of teachers in Turkey. The path for teacher-candidates is to obtain a Bachelor's degree and then complete a pedagogical formation program. The program lasts two semesters -14 weeks each- and includes 10 courses with 21 credits in theory and 10 credits in practical education courses (MoNE, 2011).

The courses are: Introduction to educational sciences, Principles and methods of teaching, Instructional technologies and material design, Educational psychology, Teaching methods, Classroom management, Measurement and evaluation, and Teaching practice. Teaching practice is limited to one semester and it covers School Experience II. In this study, participants majored in Linguistics, English Language and Literature, Translation and Interpreting, and American Culture and Literature. These Bachelor programs do not include any technology courses in their curriculum. Therefore, teacher-candidates received only one technology course, ITMD, during the teacher certificate program.

In-service English language teachers were teaching at primary and secondary public schools in the same city that the university was located. Participants were graduated from either Education Faculties or Teacher Certificate program. Through FATİH project, as a requirement, the teachers have received technology training organized by MoNE in Turkey. According to the in-service teachers, these training sessions were usually in a seminar format rather than practice-based one.

### Data collection and analysis

Attempting to accurately portray the TPACK of the EFL teachers, this mixed-method study investigated their self-perceived performance on the seven TPACK components with a quantitative instrument (Schmidt et al., 2009), and explored their synthesized TPACK by means of open-ended questions at the end of the survey and class observations conducted both in the ELT department and practicum schools.

TPACK survey, a 5-point Likert confidence scale, included multiple items related to each of the seven types of knowledge represented in the TPACK construct (Table 1). The survey was administered to participants at the end of the spring semester of 2014. The statistical data was analysed through Games -Howell post hoc. As the participants were in ELT, only Literacy subcategory of Content Knowledge (CK) domain in the survey was included in the analysis.

The qualitative data from the open-ended items that investigated the respondents' perceptions of how the TPACK was modelled by schoolteachers, faculty and participants themselves was analysed through Phenomenological Data Analysis (Moustakas, 1994). The

first step is Horizontalization in which every quote relevant to the experience was listed. Then, for the Reduction and Elimination step, repeated, overlapping and irrelevant statements to the topic were deleted.

The related invariant constituents of experience were clustered into a thematic label. These clustered and labeled constituents composed the cores themes of the experience. For final Identification of the Invariant Constituents and Themes by Application, the researcher checked the invariant constituents and themes against the complete record of participants (Table 3). Using the relevant, validated invariant constituents and themes, the researcher constructed an Individual Textural Description for each participant of the experience including verbatim examples from the qualitative data. Based on the Individual Textural Description and Imaginative Variation an Individual Structural Description for each participant was constructed. Then, a Textural-Structural Description for each participant of the meanings and essences of the experience, incorporating the invariant constituents and themes, was constructed. From here, the researcher developed a Composite Description of the meanings and essences of the experience that represent the group as a whole.

At the beginning of this study, the researcher's role was an insider (Punch, 1998), who was a full participant in activity, program, or phenomenon because the researcher was an instructor at the department. Then, starting from the data collection and forward, the researcher's role became an outsider (Punch, 1998), more of an objective viewer to reflect only the participants' perspectives on the phenomenon through phenomenological analysis.

To increase credibility, codes and themes emerged from the data were checked by a colleague. Inter-rater reliability was assessed using Miles and Huberman (1994) formula and found to be 0.90. Moreover, the researcher observed 30 lessons the participants taught, 40 min each, and took field notes during the observations and then organized them accordingly. The field notes of classroom observations were also used to triangulate the data gathered through an open-ended question and the TPACK self-confidence scale.

Regarding the TPACK survey, two limitations were reported in related literature. Firstly, this instrument might be a context-dependent as it was specifically designed for PTs majoring in elementary or early childhood education with a focus on four content areas of social studies, mathematics, science, and literacy. However, this context limitation doesn't apply in this present study because a standard curriculum, which doesn't allow any specialization to teach at different levels, is administered in a four-year ELT program. That is, pre-service English language teachers can teach English at all levels after graduation. Secondly, the scale was designed as a self-assessment tool; for that reason, it may be

prone to student under- or over-reporting (Hofer and Grandgenett, 2012).

According to any self-reporting measure, the ability of the instrument to accurately represent knowledge in the TPACK domains is limited by the ability of the respondents to assess their knowledge and respond appropriately to the survey items. However, when it is used along with additional data, the survey has been demonstrated to be valid and reliable and provides an efficient tool for research and evaluation relating to TPACK (Abbitt, 2011). This limitation also doesn't apply in this present study because the survey scale was used with other data collection methods such as the qualitative part that includes open-ended questions and classroom observations for data triangulation.

### Ethical issues

Great care was taken to obtain all data in accordance with the guidelines of ethical conduct. As the researcher was also the lecturer of the course, in order to maintain confidentiality participants used pseudonyms while filling out the instruments. Besides, the data were analysed after the participants graduated from the program. The same principle was applied to the school teachers who participated in the study. Moreover, all participants contributed to the study voluntarily.

## FINDINGS

### Is there any difference among PTs', teacher-candidates' at a certificate program and in-service EFL teachers' self-perceptions of their TPACK?

Games-Howell test results showed that in all other TPACK construct components as well as Modelling Faculty and Modelling TPACK, except TPACK component, there was a significant difference among the perceptions of PTs', teacher-candidates and in-service EFL teachers (Table 2).

In TK ( $F(2, 192) = 7.002, p = 0.001$ ), TPK ( $F(2, 192) = 12.58, p = 0.000$ ) and PK ( $F(2, 192) = 3.67, p = 0.027$ ) it is found that self-efficacy of in service teachers ( $M = 19.40, SD = 4.07$ ;  $M = 19.40, SD = 4.07$ ;  $M = 28.37, SD = 3.54$ ) was significantly lower than teacher-candidates ( $M = 22.28, SD = 2.08$ ;  $M = 22.28, SD = 2.08$ ;  $M = 29.74, SD = 2.97$ ) and PTs ( $M = 21.47, SD = 2.83$ ;  $M = 21.47, SD = 2.83$ ;  $M = 29.57, SD = 2.96$ ). However, PTs did not significantly differ from teacher-candidates in the certificate program.

In addition, in terms of CK- Literacy ( $F(2, 192) = 12.07, p = 0.000$ ), teacher-candidates ( $M = 13.46, SD = 1.53$ ) had significantly higher self-efficacy than PTs ( $M = 11.92, SD = 2.59$ ) and in-service teachers ( $M = 11.53, SD = 1.97$ ). However, PTs did not significantly differ from in-service teachers (Figure 1).

With respect to PCK [ $F(2, 192) = 9.862, p = 0.000$ ] and TCK [ $F(2, 192) = 23.071, p = 0.000$ ] in-service teachers ( $M = 16.07, SD = 2.34$ ;  $M = 16.04, SD = 2.30$ ) had significantly higher self-efficacy than PTs ( $M = 14.16, SD = 3.38$ ;  $M = 13.35, SD = 3.15$ ) and teacher-candidates ( $M = 14.56, SD = 2.85$ ;  $M = 13.39, SD = 2.24$ ). However,

PTs did not significantly differ from teacher candidates in the certificate program. Additionally, considering TPACK component, there was no significant difference [ $F(2, 192) = 2.71, p = 0.069$ ] among PTs', teacher-candidates and in-service ELF teachers' self-efficacy of TPACK.

In Model of Faculty and Model of TPACK there was a significant difference [ $F(2, 192) = 12.47, p = 0.000$ ;  $F(2, 192) = 3.89, p = 0.022$ ] among PTs', teacher-candidates and in-service ELF teachers' self-efficacy modelling. In Model Faculty, in-service teachers ( $M = 30.10, SD = 4.75$ ) had significantly higher self-efficacy than PTs ( $M = 26.16, SD = 5.76$ ) and teacher-candidates ( $M = 27.23, SD = 4.35$ ). However, PTs did not significantly differ from teacher-candidates. On the other hand, in Model TPACK, teacher-candidates ( $M = 8.20, SD = 2.12$ ) and PTs ( $M = 7.43, SD = 2.17$ ) had significantly higher self-efficacy than in-service teachers ( $M = 7.07, SD = 2.14$ ).

### From participants' perspective, what does TPACK integrated ELT mean?

Three open-ended questions were placed at the end of the survey (Schmidt et al., 2009). Through these questions, participants were asked to describe a specific episode where their instructors at their department/training sessions, practicum teachers and the participants themselves effectively demonstrated or modelled combining content, technologies and teaching approaches in a classroom lesson.

Also, in these episodes participants were expected to provide details, such as what content was being taught, what technology was used, and what teaching approach(es) was implemented. Additionally, field notes of classroom observations were gathered and organized for additional data. Through Phenomenological data analysis, reflecting essences of the experience from PTs enrolled in a four-year ELT program, teacher-candidates attending ELT certificate programs and in-service ELT teachers' perspectives, findings regarding this research question are presented through the subheadings of Technology as an efficiency aid in conventional instruction, Technology as TK and Technology as transforming teaching/learning process (Table 3).

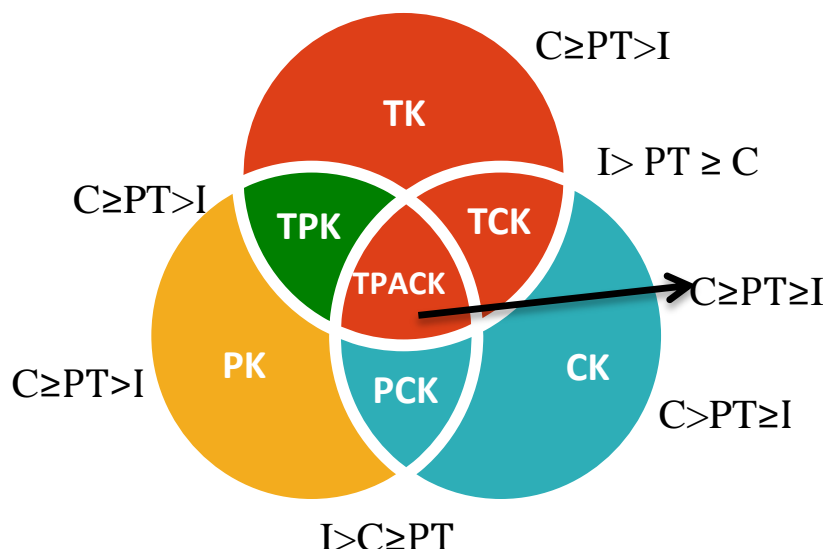
### In-service teachers: 'Technology as an efficiency aid in conventional instruction'

Firstly, not only several in-service teachers but also many pre-service and certificate program participants stated that using technology in lessons at primary and secondary schools were very limited. Besides reporting that, some PTs explained the reasons for it as:

"Although it is necessary to use technology in public schools, many teachers lack of knowledge about how to

**Table 2.** TPACK perceptions of PTs, teacher-candidates and in-service teachers of EFL.

Variable		SS	df	MS	F	p
TK	Between groups	344.061	2	172.030	7.002	0.001
	Within groups	4717.352	192	24.570	-	-
	Total	5061.413	194	-	-	-
CK-Literacy	Between groups	105.370	2	52.685	12.076	0.000
	Within groups	837.629	192	4.363	-	-
	Total	942.999	194	-	-	-
PK	Between groups	79.511	2	39.755	3.672	0.027
	Within groups	2078.915	192	10.828	-	-
	Total	2158.426	194	-	-	-
PCK	Between groups	150.838	2	75.419	9.862	0.000
	Within groups	1468.261	192	7.647	-	-
	Total	1619.099	194	-	-	-
TCK	Between groups	300.564	2	150.282	23.071	0.000
	Within groups	1250.689	192	6.514	-	-
	Total	1551.254	194	-	-	-
TPK	Between groups	298.175	2	149.088	12.589	0.000
	Within groups	2273.867	192	11.843	-	-
	Total	2572.042	194	-	-	-
TPACK	Between groups	103.742	2	51.871	2.715	0.069
	Within groups	3668.584	192	19.107	-	-
	Total	3772.327	194	-	-	-
Model faculty	Between groups	617.312	2	308.656	12.476	0.000
	Within groups	4750.073	192	24.740	-	-
	Total	5367.384	194	-	-	-
Model TPACK	Between groups	36.069	2	18.035	3.896	0.022
	Within groups	888.709	192	4.629	-	-
	Total	924.778	194	-	-	-



**Figure 1.** The pattern showing TPACK perceptions of PT, certificate and in-service teachers.

**Table 3.** Themes emerged from open-ended questions of the survey.

Levels	Themes
In-service	<b>Technology as efficiency aids in conventional instruction</b>
	• No use
	○ Lack of TK
	▪ In-service training in a seminar format
	○ Devises not working
	○ MoNE's official <i>mandate</i> of Course book use
	○ DynEd not properly used
	• Technology as efficiency aids
	○ Show picture
	○ Listen from PC instead of tape recorder
• Look up a new word and practice pronunciation	
Certificate	<b>Technology as Technological Knowledge (TK)</b>
	• TK and name of devices
	○ Major specific software
	▪ Content via PP, word
	▪ N-gram, Linguistic and simultaneous translation software
	○ Vague description of ITMD
• Teach how they've been taught	
Pre-service	<b>Technology as transforming teaching/learning process</b>
	• Integrated / infusion
	○ Skill based examples
	▪ L, videos, songs, e-stories
	▪ S= movie
	▪ R=online newspapers, stories
	▪ W= story completion
	○ Technology based
	▪ Body parts: video PP, song
	▪ Global warming: Pictures, Smartboard,
	○ Attract students' attention

use it. They generally think that crowded classes hinder using technology in class. Also, they don't have a tendency to use technology. They only use course books. Course books are very important."

Also, in-service teachers admitted,

"Indeed, I didn't have a chance to prepare such a combined lesson in teaching experiences. First of all I can say that I haven't got enough knowledge to use technology. Secondly, the devices in the schools are not enough or they don't work well."

One of the in-service teachers clarified the situation:

"Our main problem is the resource books for learning English. The books chosen for the students are prepared by Turks, I mean the using of grammar or the chosen listening or reading or writing activities don't have an order like the books prepared by publishers in UK and US. As you know it is forbidden for teachers to suggest or make the students buy resource books except the ones,

which are given by MoNE. 4 h a week also isn't enough for young learners to learn English. In Turkey, we (the teachers) only can teach English grammar, not more than this!"

Few participants also reported that in-service training sessions on technology conducted by MoNE in line with the FATIH project were mainly based on seminar format rather than hands-on activities and practices. Regarding technology integration modelling in practicum schools, few participants mentioned DynED, an English learning program that MoNE has mandated all schools to practice English for at least two-hours per week in labs. About this practice, a PT noted:

"My teacher in the practicum school don't use any kind of instructional technology. They only let the students play (not use) with DynEd for an hour. It is not useful!"

Additionally, during the classroom observations conducted some of in-service teachers complained about the inconvenience of technological devices especially for

speaking in DynEd. These quotations indicate that even the mandatory use of technology in ELT classes is not effective.

After reporting the limited use of technology due to several reasons, for the cases of technology integration into lessons, it is observed by the researcher and stated by participants that at schools technology were often used to assist school teachers to do their job easier rather than to transform learning and teaching practice. When in-service teachers were asked to describe a specific episode where they effectively demonstrated combining content, technologies, and teaching approaches in a classroom lesson, they reported,

“In previous week I taught the simple past tense. In the lesson I used a projector in order to demonstrate historical events. By historical pictures, the lesson was more easily understood.”

Another teacher reported similar use:

“In my lessons about ‘jobs’ or ‘animals’ I mostly use computers in these lessons to show pictures or animations”

Other example is that:

“I used a song to show the use of present perfect. I projected a popular song’s video clip. First, the students listened to the song & watched the clip. Then I gave them the lyrics of the song but with blanks. I had left blanks for the verbs that used in that song. SS tried to fill in the blanks. I let the students to watch & listen to the song for three times.”

Furthermore, PTs and teacher-candidates stated that practicum teachers use PowerPoint to teach grammar points and do exercises, a laptop to do listening and fill-in the blanks activities, and a projector to watch a movie. A teacher-candidate gave an example:

“The teacher used laptop projector and audio speakers in order to show some animals’ pictures and let students hear their sounds. In this way he could teach their names to the students easily”.

Only one in-service teacher gave a different example:

“I use the computers at my school for educational activities. The students can look up new words and I showed them how to use Internet to learn English, especially how to pronounce new words.”

During the classroom observations, it was observed that instead of using flashcards, teachers were using PowerPoint slide with pictures, they replaced OHP with PowerPoint to reflect the content knowledge or multiple choice test questions in a written format on the wall and instead of carrying a type, they use a laptop for listening

activities without providing any contextual clue about the listening material such as a pictures. That is using technology as efficiency aids in replacement of type, flashcards, OHP, etc, with laptop and PowerPoint software. However, they could have used PowerPoint features such as inserting a video, a listening material, using animation features, giving hyperlinks to other documents or websites etc. and making it even more interactive way that each student in class can contribute to it through connecting the smartboard via their computers. That can be considered as using technology to transform teaching and learning processes, rather than efficiency aid.

### **Teacher-candidates in the certificate program: ‘Technology as TK’**

As previous experiences, participants in the certificate program stated that their faculty members in the Bachelor program they graduated from used PowerPoint and word documents. Also, they stated that in Simultaneous interpreting, Computer Assisted Translation Studies and Corpus linguistics courses were useful to them for the use of technology. The instructors provided them technological tools for simultaneous interpretation in booth and linguistics related software programs, such as N-grams. Participants, in relation to teacher certificate program courses, stated

“For teaching approaches, an instructor effectively demonstrated the topic with the help of PowerPoint slide shows by combining content, technology, and teaching approaches” and specifically for ITMD course the participants stated vaguely “during the course, my use of internet and pc has increased”.

When the teacher-candidates were asked to describe a specific episode where they effectively demonstrated combining content, technologies, and teaching approaches in a classroom lesson, they answered that question through writing a list of technological devices: computer, audio systems, projectors and software (PowerPoint, online dictionaries). Some of them explained the reason for it as

“I had opportunity to teach a lesson but I didn’t make use of technology because I didn’t have time for planning such a lesson” and “I didn’t use technology for lessons. I didn’t know how to use technology as a teaching approach. I taught the topics as my teachers did”.

### **Technology as transforming teaching/learning process’**

Compared to in-service teachers and teacher-candidates

in the certificate program, while describing their professors' modelling content, technologies and teaching approaches, pre-service ELT program participants reported technological devices the least and gave more details on the application of technology in their courses and specifically on language skills:

"The technological devices are usually used in the lessons, especially for teaching skills. The videos, songs or e-stories are used for listening skills. For speaking skills, a film is watched and talked about. For writing skills, a story is shown on the computer and the students write the end of the story. Newspapers or stories can be read online for reading skills."

Unlike in-service teachers and teacher-candidates in the certificate program, PTs at ELT program provided more elaborate descriptions of episodes that they used technology to teach English. For instance, one of the participants explained the use of technology in his/her teaching practice as:

"In teaching the topic 'Global Warming' I used projector in order to show some pictures on it and did some activities. I used smart-board to do some activities about Simple Present Tense to attract students' attention." Another one gave this example: "While I was teaching 'body parts', I used communicative language teaching. I used videos, PowerPoint, and music; while teaching the body parts."

Those examples show that PTs use technology to transform the teaching and learning process for learners.

## DISCUSSION

Findings of quantitative data analysis revealed that except for TPACK subdomain, in other components, there was a significant difference among PTs' attending to senior level in ELT program, teacher-candidates enrolled in ELT teacher-certificate program, and in-service ELT teachers' self-perceptions of TPACK. More specifically, in TK, TPK, PK, and CK components teacher-candidates and PTs had significantly higher self-efficacy than in-service teachers.

In TK, TPK, and PK teacher-candidates was not significantly different from PTs. In CK- Literacy, also teacher-candidates had significantly higher self-efficacy than PTs and in-service teachers; however, PTs did not significantly differ from in-service teachers. With respect to PCK and TCK, in-service teachers had significantly higher self-efficacy than PTs and teacher-candidates. However, PTs did not significantly differ from teacher-candidates. Similar to previous studies, in-service teachers' self-perception of TK (Wu and Wang, 2015) and TPK (Dong et al 2015) was lower than PTs and teacher-candidates.

Additionally, there was a significant difference in Model Faculty and Model TPACK. In Model Faculty, in-service teachers had significantly higher self-efficacy than PTs and teacher-candidates. However, PTs did not significantly differ from teacher-candidates. On the other hand, in Model TPACK, teacher-candidates and PTs had significantly higher self-efficacy than in-service teachers. Even though in-service teachers' participated in training sessions of nation-wide technology integration project, FATIH, their self-perceptions of TPACK modelling of instructors was lower than PT and teacher-candidates who haven't received such training. It might be due to the structure of the training program, lecturing, as reported by the participants. Therefore, in-service teachers need to further develop their TPACK, especially through directly engaging them in designing technology-integrated lessons (Kurt et al., 2014; Dong et al., 2015).

As Yan and Yuhang (2012) clarified that no matter how much the teacher knows about ICT, the knowledge he knows cannot be automatically transformed into ability in utilizing it in teaching. This might be true for PTs because teacher-candidates and in-service teachers, who received none or limited ICT training, outperformed PTs in all TPACK subdomains.

Contrary to quantitative results, the qualitative data analysis showed that the opposite case is true. Each individual TPACK assessment has its limitations. For example, self-report surveys may be prone to participants under- or over-reporting (Hofer and Grandgenett, 2012); and therefore, may not provide enough detail to examine TPACK. As a result, it is advised that TPACK should be examined in various ways to be truly useful for program refinement (Koehler and Mishra, 2008; Harris et al, 2010; Abbitt, 2011; Kwangsawad, 2016).

Parallel to this, in this present study, the open-ended questions of the survey and classroom observations showed that PTs' TPACK knowledge and applications were more advanced than teacher-candidates and in-service teachers contrary to the quantitative findings. However, similar to Abera (2014) findings, even for PTs', all participants' TPACK was also found to be low. That is, participants applied their PCK while teaching English language through technology like the conventional instruction with teacher-centred focus (Yan and Yuhang, 2012).

Although teacher-candidates' self-perceived TPACK mean scores were the highest, their statements showed that they considered technology as only TK rather than TPACK as a whole, similar to previous studies (Carbová and Betáková, 2013; Aykaç et al, 2015; Liu and Kleinsasser, 2015). That is, based on quantitative results, teacher candidates appeared to think they were ready to teach and use technology in their classrooms; however, qualitative results indicated the situation was contrary in terms of TPACK they possess, similar to Delen et al. (2015). Instead of writing technology integration episodes, teacher-candidates wrote names of technological

devices and applications they were introduced to and used, especially related to their majors rather than teaching English. In that, knowing how to use technology and using it for individual purposes all the time does not mean that teachers can integrate technology efficiently into their instruction to improve teaching and learning (Kessler and Plakans, 2008; O'Bannon, 2011). Also, in line with existing literature, teachers who improve their technology literacy do not necessarily enhance TPK or TCK unless simultaneously revisiting their PK or CK (Doering et al., 2009; Jang, 2010; Benson and Ward, 2013; Liu and Kleinsasser, 2015).

Hence for the participants, the link between TK, CK and PK (TPACK) hasn't been established and though TK is important, it is not an indicator of making use of technology in instruction to enhance teaching and learning.

Similar to previous studies, all participants declared that practicum-schools and teachers were very limited to provide an example of technology infusion in English lessons (Aykaç et al., 2015; Oz, 2015).

Moreover similar to previous studies (Ertmer, 2005; West and Graham, 2007; Goktas et al., 2008; Sahin, 2011; Tondeur et al., 2012; Abera, 2014; Cetin-Berber and Erdem, 2015; Oz, 2015), in-service teachers' TPACK was found to be low despite technology training, as mentioned. That is, teachers applied PCK while teaching English language through technology like the conventional instruction (Kurt and Ciftci, 2012; Abera, 2014); for instance, projector and PowerPoint were used for only showing some pictures and delivering content similar to previous studies (Gulbahar, 2007; Yildirim, 2007; Goktas et al., 2009; Cakir, 2012; Unal and Ozturk, 2012; Kurt, 2013). This is to make their job easier and to motivate the students (Fisher et al., 2012). Few teachers used DynEd software as it was mandatory in English lessons at schools and the majority of the teachers used technology as efficiency aids rather than as a way of transforming learning and teaching practice. Different from other studies, in-service teachers expressed that they weren't allowed to use any material except the course books and their pdf versions on smart-board, which might restrict the technology use in lessons.

PTs used more integrated approach of TPACK domains compared to teacher-candidates and in-service teachers. Statements of PTs highlighted a more balanced TPACK in the episodes of not only Faculty members', but also their own integration of technology into lessons. PTs' descriptions included more to the point objectives of technology integrated teaching (Ersanli, 2016) and observations of lessons showed a well-presented theoretical development of the participants' technology integration skills similar to Kwangsawad (2016) study.

Hence, participants were more enabled to combine CK, PK, and TK. On the other hand, the difference between 'knowing' and 'doing' was also demonstrated in PTs.

Although PTs were confident about different knowledge

domains, their implementations were limited. Similarly to the results of the previous study (So and Kim, 2009), knowing about technology or the content did not produce effective technology use in the given context. Although PTs may have TPACK, TPACK development from interactions among these components was problematic to a certain degree (Marino et al., 2009; Sahin, 2011; Tondeur et al., 2012; Cetin-Berber and Erdem, 2015).

## Conclusion

This exploratory study illustrates the TPACK of pre-service English language teachers, teacher candidates attending to ELT certificate program and in-service English Language teachers who have been working in primary and secondary public schools. The current paper contributes to the field of teacher education and training of TPACK in three major aspects.

Firstly, this study compares PTs of ELT, teacher-candidates attending to teacher certificate program with ELT focus and in-service teachers of ELT through self-perceived TPACK survey and classroom observations. None of the existing studies have attempted to do such comparison in ELT field before. Therefore, current study provides a holistic picture of TPACK integration of ELT by different type of teachers.

Secondly, based on the picture, this study suggests changes in teacher education and teacher-training programs. Despite increases in computer access and technology training, technology was under used by prospective and in-service teachers to support the various kinds of instruction. Teacher-candidates' high TK confidence does not necessarily equal innovative and integrated technology and subject matter use.

Additionally, in-service teachers' use of technology was mostly for enhancing rather than transforming teaching and learning process. Integrating technology into classroom instruction means more than teaching basic computer skills and software programs in a separate computer class. Effective technology integration should happen across the curriculum in ways that research shows deepen and enhance the learning process.

Besides, teachers' reflections on how technology is used in a language class should be highlighted in TPACK courses. Other ways to develop TPACK for teachers are also presented, such as portfolios, peer-assessment, holding meetings, etc. Mishra et al. (2009) explained that one reason new technologies have failed to transform education is because "most innovations have focused inordinately on the technology rather than more fundamental issues of how to approach teaching subject matter with these technologies".

Lastly, the findings provide discerning evidence that teacher-candidates have perceived self-efficacy as mainly relevant to their TK rather than TPACK as a whole. Additionally, they are the ones who had highest



self-perceived TPACK in many sub-domains, without taking any technology related courses. Therefore, special attention should be given to this program, and practicum duration should be extended.

## IMPLICATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

As there is something special and different about teaching with technology than without technology, it is necessary to educate the prospective and in-service teachers the connections between technology, content and pedagogy (Abera, 2014), and how to use technology to create real interactions, increase cooperation, and promote creativity among students (Wu and Wang, 2015).

Therefore, educators of teacher's technology-enhanced learning environments should be provided to prospective teachers to engage in as students, and help them experience TPACK on their own (Oz, 2015). Meanwhile, such modelling should both demonstrate good classroom examples, and it should also be expanded to include 'cognitive modelling' revealing the logic behind the teacher educator's actions (Wu and Wang, 2015).

The findings of this study strongly suggest that developing PCK and TCK is an important factor in overall technology integration; teachers must prioritize this before integrating technology. Besides, the development must be supported with actual teaching experience and prospective teachers should be directed to reflect on their TPACK concerning the use of technology and the incorporation of higher-order thinking skills (Ottensbreit-Leftwich and Brush, 2011; Bang and Luft, 2013; Wu and Wang, 2015), with ELT focus.

Furthermore, similar to previous studies (Niess, 2006; Pamuk, 2012), this study indicate that, lack of or limited direct teaching experience limit prospective teachers in effectively using or integrating technology into teaching (So and Kim, 2009; Koh et al., 2010). Therefore, as supported by previous study (Aykaç et al., 2015) for teacher-candidates in the certificate program, the period of practicum should be extended to cover one or two semesters.

Despite FATIH project, as the participants reported, technology integration in schools wasn't at expected level. There might be several reasons for this result, such as trainings are conducted often as seminars, short term and off-site, which is beyond the scope of this study. However, what emerged from the data was that continuous in-service training should be designed among faculty members, school-teachers, technology specialists and PTs.

Studies (Margerum-Leys and Marx, 2002) investigating the exchange of knowledge of technology between student/mentor pairs prove that mentor teachers often learned about technology from student teachers, and

then the mentor teacher would incorporate this knowledge with pedagogical knowledge to inform classroom practices. Faculty members might contribute to TPACK integration process for both the pre-service and in-service teachers. Moreover, it is apparent that much attention has been devoted to motivating learners when integrating technology in English instruction, but less has been directed to how technology can help in using English in a meaningful context with an authentic audience.

Therefore, in-service teachers' perception of technology should be changed from using technology as a facilitating tool and an innovative attention-getter to using it to transform teaching and learning process providing more opportunities for students to use the language meaningfully, creatively, and autonomously. For that purpose, "individual TPACK profiles" promoting reflective processes (Benson and Ward, 2013) might be used as professional training tools. Teachers might keep track of the degree and manner "in which their individual knowledge areas overlap and integrate" via individual profiles when coming across different processes of developing TPK or TCK among peers in an in-service program.

Also, they might devote professional development time to improving their instruction and their assessments with technology (Boche, 2014). During that time, organized in a collaborative learning environment, they might observe one another (teachers, faculty members and PTs) and then discuss their observations (Ansari, 2015). Meanwhile, teacher educators could emphasize the positive experiences teachers have in the process of transition to new modes of teaching with technology (Wong and Benson, 2006), which might help teachers to re-conceptualize their instructional beliefs and fine-tune their design of future technology-enhanced learning practices (Rienties et al., 2013; Liu and Kleinsasser, 2015). If the teachers were explicitly taught the different ways to understand their TPACK and reflect on it, they would notice what was missing from their TPACK (Wu and Wang, 2015).

In line with the FATIH project, there should have been a revision in the PT education and teacher certificate programs. The curriculum of teacher education programs hasn't been revised since 2007. In both curriculums there is one course, ITMD, offered by Educational Science Department, but there isn't any course on domain-specific TPACK such as technology integrated ELT. Additionally, though the curriculum is same in the ELT programs in Turkey, how and what kind of technology will be integrated into content/method courses depends on the faculty members. Therefore, courses and curriculum should be restructured requiring further TPACK incorporation.

The limitations of this study recommend the following directions for future research. Future researchers may recruit a larger sample of participants with counterparts in

different educational contexts and countries to offer additional perspectives. In addition to self-assessment, EFL participants might conduct peer assessment on each other's TPACK development.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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*Full Length Research Paper*

# Emotional intelligence and self-esteem as predictors of teacher self-efficacy

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Teacher self-efficacy is related to teachers or pre-service teachers feeling competent in their profession. The purpose of this study is to examine the relationship between the pre-service teachers' self-efficacy perceptions and their emotional intelligence and self-esteem. The study group of the current research comprised a total of 212 pre-service teachers of whom 141 are females (66.5%) and 71 are males (33.5%) and whose ages range from 20 to 35. The study conducted with fourth year's students in Mehmet Akif Ersoy University and from Early Childhood Education, Elementary Teacher Education, Social Studies Teacher Education, and Mathematics Teaching Program. The data of the current study were collected by using Teacher Self-efficacy Belief Scale, The Emotional Intelligence Scale-Short Form and Rosenberg Self-Esteem Scale. In the analysis of the collected data, Pearson Product-moment Correlation Coefficient and multiple linear regression analysis were used. When the research results were examined, it was found that while some sub-dimensions of emotional intelligence (well-being, sociality and self-esteem) positively and significantly predict the pre-service teachers' self-efficacy level, some other dimensions (self-control and emotionality) do not significantly predict the self-efficacy level.

**Key words:** Teacher self-efficacy, emotional intelligence, self-esteem.

## INTRODUCTION

Self-efficacy is an individual's perception of whether he/she can handle a specific job and first it was explored by Bandura (1977) in his social-cognitive theory. Moreover, self-efficacy belief determines how an individual will cope with his feelings, thoughts, and difficulties and forms his/her conviction about whether he/she he will succeed in a job. People with self-efficacy beliefs are more determined to successfully complete a job they are responsible for.

Self-efficacy can be researched as general self-efficacy as well as self-efficacy specific to the situation. The situation-specific self-efficacy can also be expressed as self-efficacy in specific issues such as academic or interpersonal (Chen et al., 2004; Scherbaum et al., 2006). The situation-specific concept also includes teachers and pre-service teachers' self-efficacy perceptions. Teacher self-efficacy is related to teachers or pre-service teachers feeling competent in their profession (Çapa et al., 2005).

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Teacher self-efficacy is also related to the teacher's confidence in his/her capacity to ensure the participation of students hard to motivate and to promote their eagerness to learn. In this connection, it can be argued that even if a teacher or a pre-service teacher has the power to cope with a difficulty, if they do not believe in this power, they will fail (Tschannen-Moran and Woolfolk-Hoy, 2001; Ünüvar, 2010).

When the studies in the literature focusing on teacher and pre-service teacher self-efficacy are reviewed, it was discovered that there are some studies exploring different variables regarding teacher self-efficacy (Başer et al., 2005; Çalışandemir and Senemoğlu, 2005; Çapri and Çelikkaleli, 2008; Ekici, 2006; Girgin, 2017; Yeşilyurt, 2013). There are also some other studies investigating the relationships between teacher self-efficacy and pre-service teachers' metacognitive learning strategies (Baykara, 2011); problem solving skills (Gürten, 2011); professional anxieties (Girgin, 2017; Kafkas et al., 2010) and burn-out levels (Skaalvik and Skaalvik, 2010).

Bandura (1977) emphasizes that life experiences, verbal skills of individuals and their psychological state are influential in the development of self-efficacy. In this regard, it is thought that emotional intelligence may be related to self-efficacy. Emotional intelligence refers to the ability to define one's own and others' feelings, to motivate himself/herself and to manage his/her emotions in his/her intra-personal and inter-personal relations. Salovey and Mayer first used the concept of emotional intelligence in the academic circles in 1990 (Goleman, 2000). Emotional intelligence emphasizes the individual's ability to establish healthy communication and his/her social aspect. People who experience problems in their social relations generally become disoriented, which causes them to worry more and their mental health to deteriorate (Gross, 1998). Individuals with high levels of emotional intelligence can better understand the expectations, strengths, weaknesses and needs of others. In addition, these individuals can be more open to positive and negative experiences and more comfortable to deal with these experiences (Baltaş, 2006). Thus, it can be said that emotional intelligence is an important trait for teachers. In the literature, there are studies exploring the relationships between emotional intelligence and sense of humor, personality and well-being (Kazarian and Martin, 2004); psychological intimidation (Erdemir and Murat, 2014); and stress coping (Deniz and Yılmaz, 2006). Similar to emotional intelligence, the ability of the individual to arrive at better awareness of his/her expectations, strengths and weaknesses is related to self-esteem.

While the self is the individual's perception of himself/herself, the self-esteem is the unity of the individual's opinions about himself/herself and his/her expectations related to approval or disapproval of his/her opinions. If the person tends to evaluate himself/herself positively, then his/her self-esteem is relatively higher; yet, if he/she tends to evaluate himself/herself negatively,

then his/her self-esteem is relatively lower. Individuals with high self-esteem respect themselves, have close relationships and have strong coping skills (Baumeister et al., 2003; Rosenberg, 1965; Sam et al., 2010). When the literature focusing on issue of self-esteem is examined, it is seen that there are studies investigating the relationships between self-esteem and contact obstacles and life satisfaction (Tagay, 2015); loneliness and psychological well-being (Güloğlu and Karairmak, 2010); and communication skills and psychological well-being (Tagay and Karakelle, 2014).

According to Bacchini and Magliulo (2003), there is a significant relation between self-efficacy and self-esteem. Teacher's self-efficacy and self-esteem traits are very important for their personal and career development. Also self-efficacy and self-esteem increase person's oral communication and ability to cope with social problems (Verba et al., 1995). The purpose of the current study is to investigate the relationship between the pre-service teachers' teacher self-efficacy and their emotional intelligence and self-esteem. Although there is no consensus on which characteristics teachers should have, it seems that a great deal of research has been conducted on this subject in recent years. As is known, it is important for teachers to feel competent in their profession both for their professional satisfaction and for the success of their students. In addition, the education service provided by teachers with high self-efficacy will be more qualified (Bümen and Özaydın, 2013). It is the first study which brings into pre-service teachers' self-efficacy, emotional intelligence and self-esteem. As known, teacher training programs aim to improve pre-service teacher's field knowledge and competence and self-confidence for teaching. The current study aims to determine the variables thought to be predictors of the pre-service teachers' self-efficacy. The findings of the study are believed to make some contributions for researchers and teacher training programs.

## METHODOLOGY

The current study employed the relational survey model. The relational survey model is used to determine the relationships between variables and to predict the possible outcomes. The correlation level between two or more variables is analyzed by means of statistical tests (Metin, 2014). The study made use of the standard multiple regression analysis in order to prove the power of the assessment of emotional intelligence self-esteem to predict self-efficacy of pre-service teachers. The dependent variable of this research is pre-service teacher's self-efficacy and independent variables are self-esteem and emotional intelligence.

### Study group

The study group of the current research is comprised of a total of 212 pre-service teachers of whom 141 are females (66.5%) and 71 are males (33.5%) and whose ages range from 20 to 35. The study was conducted with fourth year's students in Mehmet Akif Ersoy University and from Early Childhood Education, Elementary

Teacher Education, Social Studies Teacher Education and Mathematics Teaching Program.

### Data collection tools

#### *Teacher self-efficacy scale*

The teacher self-efficacy scale developed by Tschannen-Moran and Hoy (2001) and adapted to Turkish by Çapa et al. (2005) consists of 24 items and 3 sub-dimensions. The results of the confirmatory factor analysis indicate a good fit. The scale was first translated to Turkish by researchers having a good command of English and having worked in the field of self-efficacy. The Cronbach-alpha reliability values for the sub-dimensions of the scale are 0.82, 0.86, and 0.84. In the current study, Cronbach-alpha reliability coefficient of the scale was found to be 0.95.

#### *Emotional intelligence scale-short form*

The emotional intelligence scale-short form (TEQue-SF) developed by Petrides and Furnham (2000, 2001) and translated to Turkish by Deniz et al. (2013) is a 7-point Likert scale consisting of 20 items. The aim of the scale is to determine individuals' emotional competence levels. High scores taken from this scale indicate that the emotional competences are perceived as high and low scores mean that emotional competences are perceived as low. The scale's linguistic validity and equivalence were confirmed by the positive correlation between the scores taken from the English and Turkish versions of the scale. In order to test the construct validity of the scale, the exploratory factor analysis was conducted and as a result a four-factor construct (well-being, self-control, emotionality, and sociability) consisting of 20 items was obtained. The confirmatory factor analysis results of the scale indicate a good fit to the sampling. Internal consistency reliability coefficient of the scale was found to be 0.81 for the whole scale and test-retest reliability coefficient was found to be 0.86.

In the current study, Cronbach-alpha reliability coefficient was found to be 0.68 for the sub-dimension of well-being, 0.47 for the sub-dimension of sociability, 0.40 for the sub-dimension of emotionality, and 0.58 for the sub-dimension of self-control.

#### *Rosenberg self-esteem scale*

The Rosenberg self-esteem scale developed by Rosenberg (1965) and adapted to Turkish by Çuhadaroğlu (1986) and Tuğrul (1994) is a four-point Likert scale having five positive and five negative statements. The reliability of the scale was tested by calculating Cronbach-alpha coefficient and it was found to be 0.85, which is considerably high for such a short scale. In the adaptation study (Çuhadaroğlu, 1986), the Cronbach-alpha coefficient was reported to be 0.76. In the test-retest method conducted, four weeks after the adaptation study, the reliability coefficient was found to be 0.71. A high score taken from the scale after the reverse coded items were corrected indicates a high self-esteem. In the current study, the Cronbach-alpha reliability coefficient of the Rosenberg self-esteem scale was found to be 0.81.

### Data collection and analysis

The data were collected in the 2016/2017 academic year. The scale was administered on a volunteer basis and the researchers went to classrooms to explain how the scales would be completed. The completion of the scales lasted for 30 min on average. The predicted variable of the study is teacher self-efficacy and

predicting variables are emotional intelligence and self-esteem. Univariate normal distribution conditions (kurtosis and skewness) before the analyses (multiple normal distribution and equilibrium conditions) were investigated before path analysis. Prior to the analysis of the data, four incomplete data were excluded from the data set. Furthermore, standardized z scores were considered while examining one-way extreme values. A total of 14 observations whose standardized z scores are outside the score interval of -3 and +3 were excluded from the data set. In the model, there should not be a correlation between the error terms. In this connection, first, the Durbin Watson value, which is expected to be between 1.5 and 2.5 and is used to test the auto-correlation in the model, was calculated and it was found to be 1.93 so there is no auto-correlation in the model, standard errors of b coefficients are very small and the regression assumptions is satisfied. The correlation between the variables of the study was tested with Pearson correlation coefficient and then standard multi-regression analysis was conducted to determine the extent to which emotional intelligence and self-esteem predict teacher self-efficacy. The research data were entered into SPSS 15 program and then analyzed in this program. The significance level was set to be 0.05 in the current study.

### FINDINGS

Correlation coefficients showing the relationships between the variables and the results of the descriptive statistics conducted prior to the multiple standard regression analysis performed to determine whether the sub-dimensions of emotional intelligence, sociability, emotionality, self-control and well-being and self-esteem predict teacher self-efficacy are presented in Table 1.

As shown in Table 1, the independent variables have correlations with each other and with the dependent variable at the level of 0.01 and 0.05. The correlation values should not exceed 0.90 in terms of multi-correlation risk (Çokluk, Şekercioğlu and Büyüköztürk). Therefore, as there was no multi-correlation problem, the regression analysis was continued. The results of the standard multiple regression analysis conducted to determine whether emotional intelligence and self-esteem predict self-efficacy are shown in Table 2.

As shown in Table 2, emotional intelligence and self-esteem explain nearly 38% of the total variance in teacher self-efficacy of the pre-service teachers ( $R=0.613$ ,  $R^2=0.376$   $F(6-204) = 24.827$ ;  $p<0.01$ ). The results of t-test conducted to test the significance of the regression coefficients show that emotional intelligence's sub-dimensions of well-being ( $t = 5.453$ ,  $p < 0.05$ ) and sociability ( $t = 3.102$ ,  $p < 0.05$ ) and self-esteem ( $t = 2.589$ ,  $p < 0.05$ ) significantly predict the self-efficacy level of the pre-service teachers in the positive direction. On the other hand, the sub-dimensions of emotionality ( $t = -1.624$ ) and self-control ( $t = -0.508$ ) were found to be not significantly predicting the self-efficacy level of the pre-service teachers. According to the standardized regression coefficients, the significant predictors of the self-efficacy level of the pre-service teachers can be given in order of importance as follows: well-being ( $\beta = 0.374$ ), sociability ( $\beta = 0.226$ ), and self-esteem ( $\beta = 0.199$ ).

**Table 1.** Correlation coefficients between variables and descriptive statistics related to variables.

Variable	1	2	3	4	5	6	M	SD
1. Self-efficacy	-	0.554	0.419	0.119	0.204	0.471	162.7	26.7
2. Well-being	0.554	-	0.405	0.116	0.274	0.552	20.3	4.5
3. Sociability	0.419	0.405	-	0.503	0.407	0.546	20.6	4.2
4. Emotionality	0.119	0.116	0.503	-	0.418	0.407	18.9	4.3
5. Self-control	0.204	0.274	0.407	0.418	-	0.433	20.3	4.8
6. Self-esteem	0.471	0.552	0.546	0.407	0.433	-	33.4	5.2

**Table 2.** Multiple-Regression Analysis Results related to the Extent to which Emotional Intelligence and Self-esteem Predict Teacher Self-efficacy.

Variable	B	Sh	$\beta$	t	p
Self-efficacy	-	-	-	-	-
Well-being	2.200	0.403	0.374	5.453	0.00
Sociability	1.435	0.463	0.226	3.102	0.02
Emotionality	-0.649	0.421	-0.105	-1.542	0.12
Self-control	-0.181	0.356	-0.033	-0.508	0.61
Self-esteem	1.009	0.390	0.199	2.589	0.01

R= 0.613, R<sup>2</sup>=0.376, F<sub>(6-204)</sub>=24.827; p<0.01.

The findings obtained from the standard multiple-regression analysis can be summarized as follows: well-being, sociability and self-esteem significantly predict the self-efficacy level of the pre-service teachers in the positive direction, while self-control and emotionality do not significantly predict it.

## DISCUSSION

The findings of the current study revealed that well-being, one of the sub-dimensions of emotional intelligence, significantly and positively predicts the self-efficacy level of the pre-service teachers ( $t=5.453$ ,  $p<0.05$ ). Thus, it can be argued that with improving well-being, the pre-service teachers' self-efficacy level will also increase. What is meant with well-being, one of the sub-dimensions of emotional intelligence, is individuals' being aware of their strengths and believing that they can cope with difficulties in their lives; that is, their being positive. Individuals with high levels of well-being can cope with the stress more easily and can turn negative states into opportunities (Petrides and Furnham, 2003). Chan (2006) reported that there is a negative correlation between teachers' emotional burn-out levels and positive arrangement. Moreover, Mohzan et al. (2013) stated that academic achievement of the students with high levels of emotional intelligence is also high. In the current study, it was found that self-efficacy levels of the pre-service teachers whose well-being levels are high are also high. Also in literature, it is revealed that there is a significant correlation between self-efficacy and self-esteem (Bacchini and

Magliulo, 2003). It can be maintained that pre-service teachers having high levels of well-being will have high self-confidence and can evaluate positive and negative events more objectively.

Another finding of the current study is that one of the sub-dimensions of emotional intelligence, sociability significantly and positively predicts the self-efficacy levels of the pre-service teachers ( $t=2.589$ ,  $p<0.05$ ). In other words, the pre-service teachers having high levels of sociability also have high levels of self-efficacy. According to Petrides and Furnham (2003), people with high level of sociability can manage their relationships well and can comfortably and easily express themselves. People with high levels of sociability can show empathy and effect others' feelings as well. In their study, Çiftçi and Taşkaya (2010) found that there is a significant and positive correlation between the self-efficacy level of the pre-service classroom teachers and their communication skills. As individuals having high levels of sociability feel more comfortable in dealing with conflicts with others, in affecting them and communicating with them, their self-efficacy levels are expected to be high.

The findings of the current study revealed that self-efficacy levels of the pre-service teachers having high self-esteem ( $t=3.102$ ,  $p<0.05$ ) are also high self-esteem. When individuals trust their own performance, when they feel confident and when they believe that they will be successful, their self-efficacy levels also increase (Alderman, 1999). High self-esteem is related to successful adaptation to life events, positive emotions, self-control ability to accept criticism, and coping with stress, as well as not being overly critical of oneself or

others. One having self-confidence and trusting his/her own performance is related to self-esteem (Carr, 2004). In the current study, self-efficacy was found to be associated with self-esteem. In the literature, there are also some studies reporting that self-esteem and self-efficacy are related to each other (Aypay, 2010; Chen et al., 2004; Hajloo, 2014).

As is known, the high level of self-efficacy of pre-service teachers is gaining importance both in terms of teaching skills and their personal development. Teacher training programs at universities aim to improve the self-efficacy levels of pre-service teachers. According to the results of the current study, conducting activities that can develop pre-service teachers' emotional intelligence and self-esteem can play an important role in enhancing their self-efficacy. Training in what needs to be improved is conducive to improving self-efficacy, which in turn is conducive to building self-esteem. Moreover, the number of training programs organized to increase pre-service teachers' self-efficacy level can be increased and other variables that can be related to pre-service teachers' self-efficacy can be explored.

## CONFLICT OF INTERESTS

The author has not declared any conflict of interests.

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A background image featuring a black microscope on the left and a stack of colorful books (orange, white, black, brown, purple, yellow, blue, green) on the right, all set against a light blue background with a white horizontal band.

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