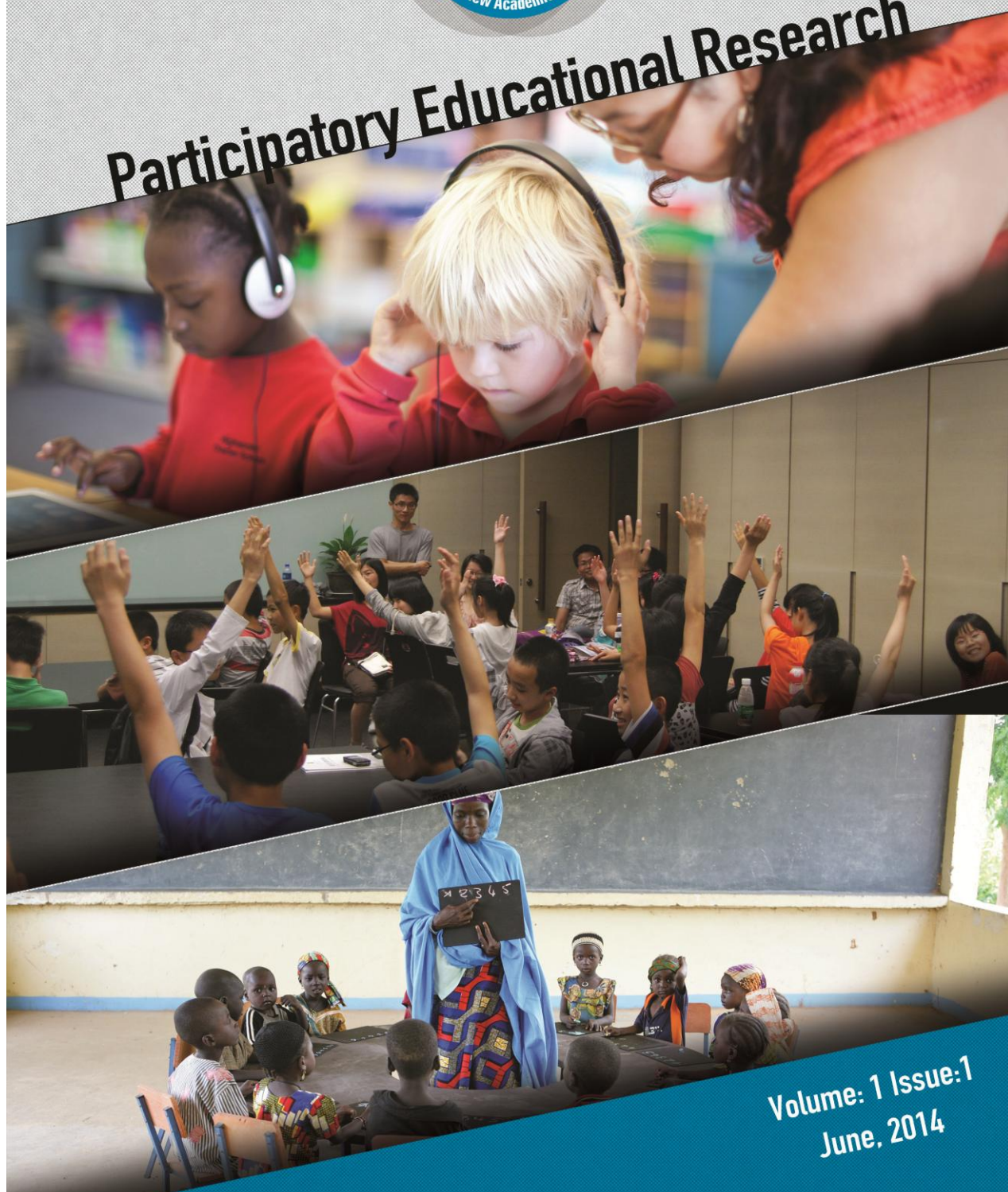


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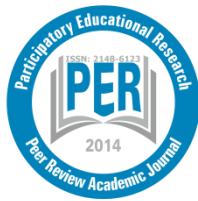
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Editor's Foreword

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Because individuals, their families and communities are faced with the challenges of daily life, solutions and support need to be found to overcome these challenges. For social transformation to take place, and in particular educational changes, the involvement and participation of all role players in educational research is needed. As O'Hanlon avers: "Without personal involvement in learning we simply reproduce the existing hegemony through the repetition of traditional orthodoxy" (2003:101). He adds that: "There is a need for an interpretive, discursive, inclusive and democratic investigatory process to keep abreast of necessary social change." (O'Hanlon 2003:117). Participatory educational research is committed to developing knowledge through mutual co-construction.

Participatory research is an action agenda for reform that may change the lives of participants, the institutions in which they live and work or even the researchers' lives. Issues facing marginalized groups such as oppression, domination, suppression, alienation and hegemony are of paramount importance. The researcher, in conjunction with participants, provides a voice for these participants in improving their lives and focussing on bringing about change in practices. Individuals are helped to free themselves from constraints in the media, language, work procedures and relationships of power in educational settings. Such research has the intention of being emancipatory from unjust structures that limit self-development and self-determination. It creates a political debate so that change can occur. It is practical and collaborative as participants are active collaborators in researchers' inquiries (Cresswell 2007:21-22).

It is important that university-based colleagues who work with those in schools should challenge the "current testing regime" and rethink what the purposes of schooling are in a democratic society (Cochran-Smith & Lytle 2009:117). Teachers' views of practice should be transformed and expanded beyond what they do when they teach. Teachers should be forming and re-forming frameworks to understand practice and should take into account that teaching is about constructing the curriculum with learners, using their experiences, cultural and linguistic resources and interpretive frameworks. Teaching also includes how a teacher's actions are part of understanding learners, and being aware of culture, class, gender, social issues, communities, curricula, materials, texts and histories. It is critical that teachers should work together in order to develop questions and frameworks which are informed by

considering the situation from various angles and the specific learners they are teaching and making sense of social, economic, political and cultural contexts they are working in. Teachers should thus take an inquiry stance on practice where they do research on their practice and that their roles should be co-constructors of knowledge and become creators of curriculum, becoming theorizers, activists and school leaders, resulting in transformed relationships with their colleagues and others. This in turn offers learners and their families expanded opportunities and good connections with communities, organizations and school-university partnerships. This orientation calls for a different approach to professional development where teachers have access to many resources but at the same time do not neglect their duty to generate knowledge from their own practice and make informed decisions. As the teacher learns differently, so the learner learns differently, where the teacher asks questions, the learners ask questions and engage with ideas (Cochran-Smith et al. 2009: 84-85).

According to Cochran-Smith and Lytle (2009:93,95,96) practitioner research is considered as a “theoretical hybrid” which is deeply grounded “in the dialectic of critical inquiry and practice”. Inquiry and practice have a relationship which is reciprocal, recursive and symbiotic, and where inquirers can take both the role of the researcher and the practitioner at the same time. Hence when university or school-based educators work the dialectic of inquiry and practice, then they do not work just as researchers or just as practitioners because the activities and their roles are integrated as well as dynamic. Practitioner research thus is grounded in identifying and empirically documenting everyday practice which leads to the development of new conceptual frameworks and theories and thus leads to improvement in practice, locally and further resulting in an “epistemological hybrid”. In broad terms it can be called a conceptual-empirical inquiry/empirical-conceptual inquiry. This type of research is a rich resource for generating new knowledge as university academics and teachers study and theorise their practice. As we teach and evaluate programs we learn from those who have done practitioner research.

The *Participatory Educational Research* journal aims to publish works which have employed participatory methodologies contributing to the generation of knowledge in the education field. It includes the role of the teacher as co-researchers in community development and also involving other stakeholders in addressing the challenges in order to facilitate social transformation.

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A Validity and Reliability Study of the SocioVirtualization Perception Scale (SVPS)

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Article history	<p>Individuals are socialized by embracing material and spiritual cultural characteristics that a society possesses. This process is put into practice with socialization factors such as family, peers, school and media. Interaction and communication in social life have started to carry socialization factors to different levels with contribution by virtual environments in our day. Since determination of the level of interaction and relationships shifting from real life to virtual life is not yet a sufficiently discussed issue in the body of literature, we could not come across an instrument of measurement, whose reliability and validity have been proved, for measuring levels of what sort of transformations, advancements and developments have been experienced in terms of socialization factors after society's beginning of turning to virtual environments. In this respect, the research objective is to develop a scale for determining levels for relationships of individuals in social life shifting to virtual environments. 294 individuals constitute the research study group. Exploratory and confirmatory factor analysis, item-factor total correlation, adjusted correlation and distinguishing features of items were calculated for investigating validity of the scale. Internal consistency coefficient and stability levels of the scale were calculated for investigating reliability of the scale. As a result, the SVPS is a 5-point Likert scale that can be grouped under three factors and consists 30 items. Analyses put forward that this scale is a reliable and valid instrument for measuring levels of socio-virtualization perception of a society's individuals in virtual environments.</p>
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Introduction

Throughout history, societies have transferred their accumulations to individuals and newly growing generations and ensured sustaining existence of their societies through their socialization. The concept of socialization, which was defined by sociologists from different aspects, is described as preparing individuals, who have participated in society, for social life and the process of their integration into society and their adaptation to their environments (Dönmezer, 1984; Doğan, 2012). While on the one hand individuals embrace the things possessed by society, on the other hand they are raised as personalities. In this regard, socialization is internalization of objective, social reality and its relative interpretation according to individuals (Jarvis, 1983). A socialized individual experiences a process of learning itself and his/her environment by embracing values and norms owned by society and fulfilling social roles (Marshall 1999). Humans experience the process of becoming a being that they are supposed to be by living within a society as different from other organisms (Evkuran 2010). The fact that humans are social beings has entailed them to be definitely present in a society. Humans, who are living in social life, have to live by considering the things that society has and commonly shared social values (Doğan, 1993). The process of transferring what society has to individuals has socialized them. While making each of its members embrace understanding of the social 'us', each individual also experiences a process of melting themselves as a 'self' within society (Celkan, 1991). Thus, while individuals were learning what is social, they have also begun to set their behaviors and lives according to their societies. Primary ways of conduct are learned by individuals with socialization and they go on with their lives in the framework of various ideals while gaining social values (Ozankaya 1986).

Individuals experience a process where they learn values, customs, traditions, knowledge and skills in an interactive way. Socialization is considered as a process of interaction between individuals and society rather than something where individuals are constantly influenced by society (Zeichner & Tabachnick, 1985). Individuals experience this in every part of life and throughout their lives; also through teaching this to newly growing generations, values and norms of society are transferred to new generations and societies are constantly kept alive in terms of socialization. In fact, each individual goes on with their lives in society as a product of their own culture. While on the one hand humans as social beings develop biologically, on the other hand their personality arises with values and norms of society within the process of socialization. After a process of solidarity and cooperation for humanity along with other people in societies, humans who were different from each other began to live together (Güvenç, 1995).

It is possible to mention various instruments of socialization for giving the things in a society to individuals. Among them, family, games and peers, education, environment, clubs, associations, artistic activities and mass communication devices are at the forefront (Josept, 1994; Özgüven, 1996). Individuals begin to embrace how they are supposed to live in society with family, peers, school and media (Coser, 1987, Parke at al., 2008). Individuals, whose process of participating in society starts with their family who brought them to this world, try to perceive and understand what is going on in their surroundings. Interactive process of socialization starts to manifest itself more after what individuals share with their peers increase and they begin to spend more time with their peers. Since the things that will be formally gathered throughout education are obvious, literary, geographical and physical things that belong to society and history as well as their situation of socialization begin to be given to individuals as things that will be necessary for them in society throughout their life. Socialization forms social identities of individuals while they are living in society. It was



stated as a result of researches conducted that innate nature of humans, culture and education have an influential role on emergence of social identity (Plummer 2010; Aluja & Blanch, 2004).

Society and Virtual Environment

It is observed in the context of literature and conducted researches that tools of socialization have fulfilled the same function in historical process in general sense (Coser, 1987, Parke at al., 2008; Jarvis, 1983; Zeichner & Tabachnick, 1985; Dönmezer, 1984; Doğan, 2012; Josept, 1994; Özgüven, 1996). Albeit tools of socialization have tried to fulfill the same functions until now, as lately various transformations and developments are the case in terms of these tools, it can be argued that socialization have been influenced by this situation. For instance, individuals access many news, events and information more quickly or can be quickly influenced by them.

It can be said that knowledge and technology, which are advancing and developing in our time, making their presence felt in every aspect has brought individuals' relationship with tools of socialization to a little bit more different levels compared to previous years. Individuals, who live in an information and technology society, have started to live socialization process different than their fathers and grandfathers. The time which is spent by humans in social life has started to decrease more in our age compared to previous years. Also, interaction between humans and machines even further increases with proliferation of technological devices and individuals begin to spend more time with televisions, mobile phones, computers and internet starting from early ages. This process results in various changes and differentiations with regard to tools of socialization. It can be said that a different process compared to previous eras has begun to be experienced ranging from domestic interaction and communication, games played with peers and chats initiated with peers to technological devices used in the area of education and to the fact that media is now everywhere along with technology. While contributions of these developments on socialization last, it is also observed that individuals now use mass communication devices more for their relationship with their environment, for interactions of social life and receiving values and norms possessed by society with beginning to use technological things. As a result, it can be said that these phenomena has begun to be slowly observed in attitudes and behaviors. It is important to re-think and analyze instruments that are effective in socialization process with technological advancements that have started to make themselves felt (Erturgut, 2008). Worldwide use of internet and individuals spending their time in virtual environment increasingly continue day by day. In this process, it was estimated that about 71% of population in developed countries and about 21% of population in developing countries will spend their time in virtual environment (IMEF, 2011). As a result of an increase in this ratio, it can be argued that new situations related to social life and socialization, which are determinative of living spheres of individuals, will be the case. Considering that particularly the young generation, who has recently participated in society (between the ages of 16 and 24), has the highest ratio of using virtual environment (TÜİK, 2011), it can be anticipated that various social phenomena might emerge among these individuals and previous generation.

However, virtual environment manifests itself with many positive aspects for learning new cultures, establishing and developing dialogues thanks to opportunities it presents to people and for presenting a world that is possible for putting new social movements as well as social and political discourses in circulation (Binark & Bayraktutan, 2008). Opportunities of

internet and social networking sites such as YouTube, dailymotion, Facebook, geocities and twitter do not only contain a one-sided communication but also an interaction. Interaction brought by virtual environment can be said to show its impact on process of socialization of individuals. Now, situations of socialization, which are addressed as four primary factors, have started to be influenced by virtual environments. Domestic communication started to take different dimensions after inclusion of virtual things. Now, relationships among husbands and wives, children and parents and brothers and sisters are experienced different than what was the case before 2000s.

There are cases of domestic relationships where individuals in families cannot find time for each other due to the fact that time to surf in virtual environments has increased. Internet is shown as one of the reasons for divorces in families.

Individuals in families like and comment under photos of each other on Facebook and other virtual networks. This demonstrates that relationships in society starting from the smallest unit of society, to wit families, have started to shift to virtual environment.

Family members, who spend a lot of time in virtual environments, cannot spend time with their families because they feel the need to surf in internet on evenings and communicate by corresponding over different computers when they need to talk even though they are in the same house, signal that relationships have changed.

Education, which provides contribution to socialization, has started to gain new dimensions with having internet in schools, distant education, online courses and actively using virtual environment.

It can be seen that along with friendships in virtual environments, virtual things are now talked about among chats of peers after emergence of the ‘generation Y’ and secondary lives rather than games on streets and neighborhood friendships. In case of being more interested in virtual things, individuals’ communication with their surrounding starts to decline (Özdemir & Usta, 2007).

What is socio virtualization?

Mass communication devices provide news to people from all over the world in a faster fashion with their virtual spheres and new technological opportunities that they present. People in the world started to communicate as if they were living in the same neighborhood with opportunities of internet and mass communication devices (İMEF, 2011). People, who receive news and know the world well, can struggle to receive news related to neighborhoods in which they live. The Arab Spring and the Gezi Park events can be shown as examples for power of interaction, which also emerged in virtualization. Impact of the case of ‘socio-virtualization’, which demonstrates its functionality in each of socialization instruments, is observed in socialization factors (Kurt, 2012). Now, virtual networks have turned into instruments of socialization for kids and young people (Feng & Xie, 2014). After social relationships and interactions have started to shift to virtual environments, a socio-virtual situation has begun to emerge. Individuals spending more time in virtual environments, increasing communication, information share and opportunities such as telecommunication steer society to a situation of socio-virtualization. Based on this, socio-virtualization can be described as individuals turning from interaction environment in society to virtual environment, spending their time there, as a decline in their interaction with things possessed by society such as customs, traditions and values that are related to society that individuals

would have learned by living in society and individuals going on with their lives in society by seeing the things that are owned and are not owned by society together with an influence by virtual environments (Kurt, 2012; Kurt, 2013).

Individuals, who resemble to society in every stage of their life and who are socialized by acting like other people in society, started to spend a certain part of their time in socio-virtual environments. It can be said that individuals, who have started to experience socio-virtualization as well as social environments in society, have found occupations that they can spend time in individual sense. We can add many activities in this process ranging from their profession, researches conducted, their will to spend their time well to making new friends and actively using communication and correspondence. Individuals, who begin to be socio-virtualized, are able to find various occupations and activities as well as a place for themselves in virtual world with network connections and 'senses and feelings of networks'. Some cases such as further decreasing of communication and weakening of relationships can emerge when individuals, who are not able to spend their time with society and other individuals as much as they are used to, start to spend this time in virtual environments. Examination of generations distinctly from each other such as X, Y and Z in a research conducted in the literature can be shown as an example of this (Brenner, 1997; Kraut et al., 1998; Prensky, 2001).

It can reveal situations for slowing down values, which are culturally owned by society and transferred to other generations, in this process or differential perceiving among individuals. One of its reasons can be given that participation in social activities and spheres as much as in the past differs in terms of individuals spending time in virtual environments. Also, if individuals start to regard virtual environment as a sphere in which they have no responsibility and feel more comfortable when they feel pressurized by society, this can even further increase shifts from social to socio-virtual.

Studies conducted in the literature are mostly researches about socialization, virtual environments and what generations do with technology and how they are affected by it. Socio-virtualization is a new outlook from the perspective of presence of socialization in virtual environments and new generations beginning to see cultural elements in virtual environments. In this regard, socio-virtualization is important with regard to being an indicator for emergence of differences because of influence of virtual environment along with decreasing time spent with society while individuals are socialized in society. The ones who would like to understand society, researches who try to understand direction and to which direction interests and needs shift, business world, each institution and organization which would like to sell their products and to which direction society is moving and how needs and wills are and will be shaped as well as every researcher can need this scale. Because, measuring turning to what is virtual with regard to needs, wills and desires of humans will provide various opportunities to product owners, the ones who want to understand individuals and to the ones who research society's tendencies. Also, each area in society having their equivalent in virtual environment by considering that environment and somehow embracing the things that belong to society are important for contemplating on this situation. For instance, beginning to use portals, platforms or web sites where importance of norms, values and communication, importance of language spoken by society and rules will be present, lived or repeated would be the case.

In terms of education, considering learning education-related things by shifting towards

virtual environments, emergence of new options would be the case for managers and instructors. Knowing students' needs (attention, need, personalities and expectations) is important in terms of effectiveness of learning-teaching process and its determination in a more realistic and efficient way in terms of teaching design. Educational needs, teaching goals, course content, structure, learning and teaching process, measurement and assessment approaches can be different for individuals whose socio-virtualization levels differ.

It can be said that determining levels of individuals (students) regarding socio-virtualization is important for making teaching activities and these approaches more effective and this scale can be used in this framework. In short, next steps can be taken by measuring tendency of people towards virtual things for every case, incident and object which are wanted to be shown, taught, embraced and promoted with social life and education remaining under influence of virtual environment.

2. Method

2.1. Study Group

294 young individuals, most of them are university students, who are living in the center of Konya district, constitute study group of this research. Of all individuals, who participated in the study, 203 are females and 78 are males. 13 participants did not specify their genders. 96 of all participants, who attended this study, are in the age range of 19 and below and 186 of them are in the age range of 20 and 29. 12 individuals did not specify their ages.

2.2. Process of Developing the Scale

First of all, a pool of items were attempted to be generated in this process of developing the scale. First of all, literature review was conducted in process of developing the scale, socialization (Plummer 2010; Aluja & Blanch, 2004; Jarvis, 1983; Marshall, 1999; Evkuran 2009; Celkan, 1991; Ozankaya 1986; Zeichner & Tabachnick, 1985; Güvenç, 1995; Josept, 1994; Özgüven, 1996; Coser, 1987, Parke et al., 2008; Dönmezer, 1984; Doğan, 2012) and general characteristics of virtual environments (Erturgut, 2008; Binark & Bayraktutan, 2008; Özdemir & Usta, 2007; Feng & Xie, 2014; Altun, 2008; Dunne, Lawlor & Rowley, 2010; Chana & Dicianno, 2011; Goldberg, 1997; Young & Rodgers, 1998; Davis, 2001; Davis, Flett & Besser, 2002; Mittal, Tessner & Walker, 2007; Shapira, et al., 2000; Yang, et al., 2005; Nie, Hillygus, & Erbring, 2008; Rainie, Purcell, & Smith, 2011) were tried to be determined. A questionnaire research was performed within the framework of specified general characteristics and how perceptions of individuals, who participated in the questionnaire, between socialization and virtual environment were examined with four open ended questions (Kurt, 2013). In the framework of these questions, answers of open ended questions were tried to be categorized under each question. Obtained texts were examined, students' opinions were made items for behavior and pool of items began to be generated. Items of socio-virtualization scale were determined by making various grammar and vocabulary corrections without changing originality of answers given by individuals. A draft scale of 30 items was put forward within the framework of answers given by 100 respondents to four open-ended questions. For instance, one of the mostly preferred items among answers to the question "Do you think that social relations have changed with use of internet? If you do, could you explain in what direction did a differentiation occur?" was "I do think that it has differed. People prefer internet instead of spending time together and this

considerably weakens human relations”. This answer appeared in the scale as “I prefer internet instead of spending time with people in social life”. Again similarly, an open-ended question “Would you think that your interaction and communication with your surrounding have changed after you started to use internet” was answered by most participants as “I do not very actively use internet. However, when I spend time in internet, my communication with family members considerably comes to a halt. I live detached from home without knowing what is happening at home and who is coming to our home.” and this answer appeared in the scale as “I cannot really sit with my family much since I feel the need to surf in internet on evenings at home”.

A pool with 30 items was generated with contributions from field experts and information obtained from the literature. Choices with five levels were placed opposed to generated items to determine self-sufficiency levels of individuals that were stated in items. These choices were organized and scored as “(1) never”, “(2) rarely”, “(3) sometimes”, “(4) generally” and “(5) always”. Items, which were created as drafts, were examined by an expert on Turkish language, two field experts on educational technology and a psychological consultancy and counseling expert in terms of their content, expression, meaning, grammar and punctuation errors. Necessary adjustments were made in line with pointed criticisms and draft scale with 20 items was generated. This draft scale was applied on study group on the basis of voluntarism. Gathered data were loaded to the SPSS software 15.007 to perform reliability and validity analyses of the scale from statistical ways.

2.3. Data Analysis

Whether to perform a factor analysis was determined by firstly conducting KMO and Bartlett’s test on gathered data from the scale in the framework of statistical analyses in order to determine structural validity of this scale. Based on obtained values, exploratory factor analyses were performed on data; case of dividing the scale into factors was determined with principal components analysis and their factor loads were examined by using Varimax orthogonal rotation technique. Factor analysis is used in order to reveal whether items in a scale have been divided in fewer factors (Balci, 2009). On the other hand, as a result of principal components analysis used in factor analysis, items whose factors loads were below 0.30 and items, which did not have a 0.100 difference at least between their loads in two factors in other words items whose loads were spread to two factors, should be omitted (Büyüköztürk, 2002). As a matter of fact, factor loads of items in the scale being higher than 0.30 and explaining 40% of general variance is deemed sufficient in terms of behavioral sciences (Kline, 1994; Scherer at al., 1988). The main criterion in evaluating results of factor analysis is factor loads (Balci, 2009; Gorsuch, 1983). Factor loads being high is seen as an indicator that variable can appear below the said factor (Büyüköztürk, 2002). Additionally, it is argued that calculating common factor variance is important in terms of multi-factorial patterns in particular and it is described as common variance that factors create on each variable as a result of factor analysis (Çokluk et al. 2010).

Validity character of the scale was determined by testing item distinctiveness powers of remaining 14 items as a result of factor analysis and item-total correlations via Pearson’s r test. Finding a correlation between scores obtained from each item and scores obtained from factors to which items belong is used as a criterion in terms of understanding factors’ level of serving their general purpose (Balci, 2009). Internal consistency coefficients and stability tests were conducted in order to determine reliability of the scale. Cronbach’s alpha reliability

coefficient was used for determining internal consistency level. Reliability coefficient being 0.70 and higher is acknowledged as an indicator of this scale's reliability (Büyüköztürk, 2002; Gorsuch, 1983). The scale's stability level was calculated in the form of determining correlation between two application results performed with four weeks interval. Reliability coefficient, which represents level of consistency, rises as it approaches to 1.00 and falls as it approaches to 0.00 (Gorsuch, 1983). As is known, in general the level 0.00-0.39 signifies that there is low correlation; the level 0.30-0.70 signifies that there is medium-level correlation and the level 0.70-1.00 signifies high correlation (Büyüköztürk, 2002).

3. Findings

Operations conducted in the framework of reliability and validity analyses of the scale and findings are presented below.

3.1. Findings on Validity of the Scale

Structural validity and item-total correlations were examined within the framework of validity of the Socio-Virtualization Perception Scale (SVPS) and findings are presented as follows:

3.1.1. Structural Validity

First, Kaiser-Meyer-Olkin (KMO) and Bartlett's test analyses were performed on data to test structural validity of the SVPS and KMO was designated as 0.856 and value of Bartlett's test was specified as $\chi^2 = 2747,48$; $sd=435$ ($p=0,000$). It was understood that factor analysis can be performed on the scale with 20 items within the framework of abovementioned values.

In the first stage, principal components analysis was conducted to determine whether the scale is one-dimensional. Because, principal components analysis is a very frequently used technique as a technique of factorization (Büyüköztürk, 2002). Then, Varimax orthogonal rotation technique was used according to principal components. In this line, after omitting 6 items, whose item loads were below 0.30, from the scale, another factor analysis was performed on remaining items. There is no item in the scale, whose load is spread to two factors. Resulting pool of items were again examined by two educational technologists to ensure that scope validity would not be disrupted due to omitted items. Thanks to opinions of field experts on that these six omitted items would not affect scope validity, other analyses were able to be performed.

It was observed as a result of these operations that a total of remaining 14 items in the scale were clustered under two factors. KMO value of the 14-item scale with its final form was determined to be 0.860 and its Bartlett's test values were determined to be $\chi^2=1495,124$; $sd=91$; $p<0,001$. It was observed that non-rotated factor loads of remaining 14 items in the scale were between 0.427 and 0.693; on the other hand, these loads were between 0.669 and 0.830 in its rotated form after Varimax orthogonal rotation technique. On the other hand, it was stated that items and factors that were included in the scope of this scale explained 51.49% of total variance. As is known, factor loads not being below 0.30 and amount of variance explained in terms of behavioral sciences being 40% are regarded sufficient (Büyüköztürk, 2002; Eroğlu, 2008). Factor names were given by examining contents of items in factors. 9 items were gathered under a factor named as "negativity in communication" and 5 items were gathered under a factor named "social attention in virtualization".

This situation is also seen in the scree plot graph drawn according to eigenvalues (Figure 1). In figure 1, there are high-momentum drops in the first two factors therefore these two factors had significant contribution to variance but on the other hand, drops in other factors have acquired a horizontal shape, in other words this means that their contribution to variance is similar (Büyüköztürk, 2002; Eroğlu, 2008).

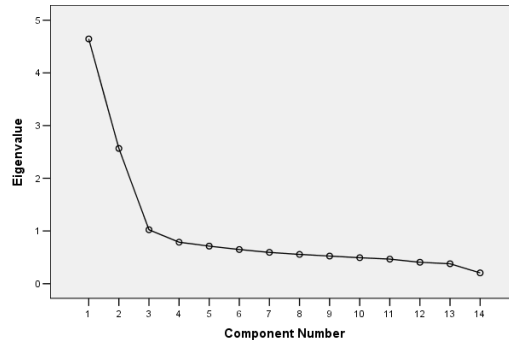


Figure 1. Scree Plot Graph (Eigenvalues according to Factors)

As a result of these operations performed, item loads of remaining 14 items in the scale according to factors, eigenvalues of factors and findings on amounts of variance explanation are provided in Table 1.

Table 1. Results of Factor Analysis of the Scale Conducted according to Factors

Items		Common Variances	F1	F2
Negativity in Communication	M16	People started to mostly establish virtual friendships, withdrew into themselves and turned into asocial virtual people.	,693	,830
	M17	People are unaware of each other in real life and they started to live very connected to virtual environment.	,638	,799
	M27	Most people in fact became asocial in real life. They go on with their lives in social networks.	,517	,718
	M20	Since they use internet a lot, I think that people expressing their feelings and thoughts in daily life has become complicated.	,518	,715
	M14	I think that now what people share with each other has decreased.	,542	,707
	M15	People give their secrets to people whom they do not know at all in virtual environments rather than talking with people in their surroundings.	,458	,671
	M21	I think that there are people, who cannot leave computers, do not know what is going on in family environment and have lives detached from their families.	,427	,654
	M23	People are able to establish communication over internet more easily but this situation complicates face-to-face communication.	,433	,641
	M13	We've started to lose our cultural values because of internet.	,411	,617
Social Attention in Virtualization	M19	The time I spend with people becomes limited unavoidably because of internet.	,558	,731
	M7	When I spend time in internet, my communication with family members considerably comes to a halt. I live detached from home without knowing what is happening at home and who is coming to our home.	,520	,712
	M2	I cannot really sit with my family much since I feel the need to surf in internet on evenings at home.	,529	,704
	M3	I prefer internet instead of spending time with other people in social life.	,513	,688

M18	I delay responding when my mom calls to me while I am playing games on internet.	,452	,669
	Eigenvalue	4,637	2,572
	Explained variance	33,122	18,374

As seen in Table 1, the scale's "negativity in communication" factor contains 9 items and factor loads vary between 0.830 and 0.617. Eigenvalue of this factor in general scale is 4.637; amount of contribution it provides to general variance is 33.122%. The factor "Social Attention in Virtualization" contains 5 items. Factor loads of items are between 0.731 and 0.669. Eigenvalue of this factor in general scale is 2.572; amount of contribution it provides to general variance is 18.374%.

3.1.2. Item Distinctiveness

In this section, scores obtained from each items in factors according to item-total correlation method and correlations among scores obtained from factors were calculated, and item distinctiveness levels in other words each items' levels for serviceability to general purpose were tested. Item-factor correlation values obtained for each item are provided in Table 23.

Table 2. Correlation Analysis of Item-Factor Scores

F1 (Negativity in Communication)		F2 (Social Attention in Virtualization)	
Item No	r	Item No	R
M16	,813(**)	M19	,742(**)
M17	,784(**)	M7	,715(**)
M27	,714(**)	M2	,684(**)
M20	,713(**)	M3	,668(**)
M14	,712(**)	M18	,713(**)
M15	,686(**)		
M21	,660(**)		
M23	,643(**)		
M13	,642(**)		

N=294; **= $p < .001$

As seen in Table 3, item test correlation coefficients vary between 0.813 and 0.642 for the first factor and 0.742 and 0.668 for the second factor. Each item is in a significant and positive relationship with the whole factor ($p < 0.000$). These coefficients are validity coefficients of each item and they refer to consistency with the whole scale in other words the level of serviceability to general purpose of the scale (Yüksel, 2009; Carminesi & Zeller, 1982).

3.1.3. Item Distinctiveness

Distinctiveness power of items in the scale was estimated. For this purpose, first raw scores obtained from each item were sorted from smaller to greater, then lower and upper groups with 80 people each that constitute the group at lower 27% and the group at upper 27% were determined. T-test values of independent groups were calculated over their total scores in groups. T values related to their distinctiveness power and findings related to their levels of significance are provided in Table 3.

Table 3. Item Distinctiveness Powers

F1 (Negativity in Communication)		F2 (Social Attention in Virtualization)	
Item	t	Item	T
M16	13,126	M19	6,710
M17	13,093	M7	6,282
M27	14,187	M2	6,194
M20	12,388	M3	5,419
M14	11,233	M18	5,294
M15	11,233	F1	23,249
M21	11,269	F2	6,690
M23	11,757	Total	32,293
M13	9,578	df: 158; p<.001	

It is observed in Table 4 that independent sample t-test values related to 14 items, factors and total score in the scale vary between 13.126 and 5.294. T value for the whole scale was determined as 32.2963. Level of each difference determined is significant ($p < 0.001$). Accordingly, it can be said that distinctiveness of both the whole scale and each item is high.

3.2. Findings regarding Reliability of the Scale

Internal consistency and stability analyses were performed on data to calculate reliability of the scale. Performed operations and findings are presented as follows:

3.2.1. Internal Consistency Level

Reliability analysis of the scale for its factors and entirety was estimated by using Cronbach's Alpha reliability coefficient. Reliability analysis values related to each factor and the whole scale are summarized in Table 4:

Table 4. Results of Reliability Analysis on Factors and the whole Scale

Factors	Number of Items	Cronbach's Alpha
Negativity in Communication	9	,873
Social Attention in Virtualization	5	,744
Total	14	,795

As seen in Table 3, Cronbach's Alpha reliability coefficient of the scale that consists of 2 sub-factors and a total of 14 items was determined as 795. On the other hand, Cronbach's Alpha values regarding factors are 0.873 and 0.744 respectively. Accordingly, it can be said that internal consistency of the scale is pretty high.

3.2.2. Stability Level of the Scale

Stability level of the scale was detected by using test-retest method. As is known, a reliable measurement tool should be able to make stable measurements (Balci, 2009). The 14-item final form of the scale was re-applied on 41 individuals, on whom this application was performed, four weeks later. Relationship between scores obtained as a result of both applications was evaluated in terms of both each item and the whole scale. Thus, ability to make stable measurements for an item that is present in the scale as well as for the whole scale was tested. Findings were summarized in Table 5.

Table 5. Test-Retest Results of Items in the Scale

F1 (Negativity in Communication)		F2 (Social Attention in Virtualization)	
Item No	r	Item No	R
M16	,416(**)	M19	,598(**)
M17	,442(**)	M7	,629(**)
M27	,378(**)	M2	,218(*)
M20	,526(**)	M3	,421(**)
M14	,558(**)	M18	,558(**)
M15	,598(**)	F1	,661(**)
M21	,464(**)	F2	,518(**)
M23	,419(**)	Total	,511(**)
M13	,321(*)		

N: 41; *= $p < 0,05$; **= $p < 0,001$

It is seen in Table 4 that correlation coefficients of each item which were obtained via test-retest method vary between 0.218 and 0.629 and each relationship is significant and positive. It is observed that correlation coefficients obtained via test-retest method for factors that constitute the scale are 0.661 and 0.518 respectively and each relationship is significant and positive. Correlation coefficient for the whole scale is 0.511. As is known, reliability is related to stability, consistency and sensitivity characteristics of a scale. For this reason, these values that were determined as stability coefficient are considered as an evidence for existence of reliability of this scale (Hovardaoğlu, 2000). Accordingly, it can be said that the scale can make stable measurements.

4. Conclusion

In this study, a scale was developed in order to determine individuals' perceptions towards socio-virtualization. The SVPS is a 5-item Likert type scale and consists of 14 items that can be grouped under two factors. Each item that is present in factors was scaled as never (1), rarely (2), sometimes (3), generally (4) and always (5). Validity of the scale was examined with two different methods. These are methods of testing validity through (1) factor analysis and (2) distinctiveness characteristics.

According to exploratory factor analysis results, the scale consists of two factors. Considering factor loads of items in factors, eigenvalues of factors and explained variance ratios, it can be said that the scale is a scale with structural validity. Item factor correlations were calculated on data to determine to what extent each item in the scale can measure characteristics that are attempted to be measured with their relevant factor. It can be said according to obtained values that each item and each factor that is present in the scale significantly serve the purpose for being able to measure desired characteristic that is sought to be measured with entirety of the scale, and each item is distinctive at a desired level. Relevant literature was reviewed for the purpose of establishing the scale's reliability of criterion (for present or similar scales); reliability for similar scales could not be calculated since a similar scale could not be found with regard to content and objective.

The scale's internal consistency coefficient was estimated by using Cronbach's Alpha formula. It can be said that the scale can make reliable measurements within the framework of these calculated values. Test-retest method was applied to determine time-dependent stability level of the scale by using data gathered in applications that were performed in four weeks intervals. Test-retest method was calculated for each item and also within the framework of

sub-factors of the scale. All items that are present in the scale are in medium-level correlation according to calculated correlation coefficients. Accordingly, each item and each factor can make stable measurements from the aspect of time-dependent stability.

Factors in the scale were named as “Negativity in Communication” and “Social Attention in Virtualization” in a way that will reflect general characteristics of items that were gathered under these factors. 9 items were grouped under the factor named “Negativity in Communication” and 5 items were grouped under the factor named “Social Attention in Virtualization”.

The factor named “Negativity in Communication” that consists of 9 items was demonstrated as that in general, people in social life go on with their life in constant communication but virtual environment makes their communication with their families in particular and surrounding decline, weaken and lose sincerity. Accordingly, the factor’s name represents a situation which signifies that communication is moving toward negativity. Albeit participants stated that their communication in social life is different than communication in virtual environment, they also argued that it is also the case that real communication would decline and be damaged. Individuals, who do not somehow feel comfortable in terms of social life, find opportunity to turn to communication and interaction in environments where they feel more comfortable with social networks (Altun, 2008; Dunne, Lawlor & Rowley, 2010; Chana & Dicianno, 2011). As a result of this communication and interaction, individuals think that they express themselves more comfortably in virtual environments rather than in social reality by moving away from sociality. And this demonstrates their turn to a situation where they can get things in virtual environments that they would have gotten in society, in other words socio-virtualization with a decline in communication and interaction in terms of socialization.

Despite many beneficial aspects of communication technologies that present numerous conveniences for people, it is possible to say that their negative effects are also witnessed (Khasawneh & Al-Awidi, 2008). Numerous studies were performed that have examined issues such as particularly using virtual environment more with developing technology, individuals’ shift mostly towards individual things by starting to move away from social life, understanding negative and positive situations regarding their socialization and declining communications of individuals with society (Goldberg, 1997; Young & Rodgers, 1998; Davis, 2001; Davis, Flett & Besser, 2002; Mittal, Tessner & Walker, 2007).

It would be the case that communications of individuals, who express that they feel more comfortable in virtual environment rather than in social life, in real life would be negatively affected due to their extensive use of virtual environments (Shapira, et al., 2000; Yang, et al., 2005). Activities of spending more time in virtual environment and utilizing virtual environment more create various negativities in social relationships. As a result, these situations in virtual environment can be argued to have negatively affected communication and relationships in real life (Nie, Hillygus, & Erbring, 2008; Rainie, Purcell, & Smith, 2011).

Increasing use of internet and having effectiveness on adolescents as much as their social life also influences familial relationships of individuals. In a research conducted on relationship between family and internet, it was detected that children do not have same opinions with their parents on issues related to internet (Kuzu, 2011). It was found that as time that parents spend for using internet increases, domestic and face-to-face communication decline. This

situation is another point that was detected to be also valid for children whose use of internet has increased. Decreasing face-to-face communication because of internet has also multiplied domestic conflicts. In other words, individuals replace the process of socialization, which they will experience via information that will be obtained from their family and surrounding, with their relationships established in virtual environment (Kelleci, 2008).

It was found in another research performed (Horman et al., 2005) that social developments of children who spend most of their time with computer games considerably regress, self-confidence of these children is low and their social anxiety levels and aggressive behaviors increase. In another study conducted (Colwell et al., 2000), a negative relationship was detected between time to spend playing games in computer and self-confidence. This factor was called “Negativity in Communication” since interaction and face-to-face communication among individuals decline with a decrease in activity and activeness of individuals in society and in general, this aspect was emphasized in participants.

Answers given considering situations such as spending time in virtual environments, moving away from places in social life and delaying responsibilities and what to dos in real life were gathered under the factor “Social Attention in Virtualization” that consists of 5 items.

Socialization of new generation individuals, who are particularly referred with various names today, is important in terms of analyzing impact of virtual environments on newly growing individuals and understanding them (Prensky, 2005; Odabaşı, 2009; Palfrey & Gasser, 2008). Contemporary individuals, who know that all opportunities of virtual environment are in their hands, take all information whether to be used or not and confuse everything due to constantly receiving information, needs, wills and desires in time, can be influenced by virtual attraction rather than social one. Because, while social life draws a limit with its morals, values and rules, these limits do not exist in virtual environment. Social attentions of individuals shifting towards socio-virtualization in these aspects would be the case. It can be argued that virtual interests of individuals who have relationships and responsibilities in society are higher due to the fact that virtual environment is different than social life in terms of relationships and responsibilities. And this case causes them to move away from sociality.

It is stated that individuals, who have started to spend more time in virtual environments, get distant from social life, their social relations are weakened and their communication with their family and surrounding declines (Şan & Hira, 2005). Thus, virtual environments’ aspects that are influential for individuals are more preferred with their characteristics such as getting in touch without communication and entertainment (Morahan-Martin, 1999).

With time spent with people getting limited unavoidably because of internet and considerable disruption of communication within families, family members, who are sometimes not aware what is going on in their house, can prefer virtual environments rather than spending time with people in social life. What is experienced in virtual environments is mostly shaped and used within the framework of individuals’ needs (Johnson, 2001).

Today, new generation which grows along with technological opportunities is called “Generation Y” and its attributes are analyzed by investigating it from every aspect (Brenner, 1997; Stoll, 1995; Turkle, 1996; Kraut et al., 1998; Prensky, 2001). Attributes and opportunities of generation Y are further above what societies present to them in our day and they are in a position that mostly commands material side of culture. They have a nature which likes competition individually and which commands communication technologies

thanks to what elements of material culture have added to them, which prioritizes their interests, wants to live more free, sees desires and wills as needs and wants to stay away from social responsibility. In this regard, they remain in a position that sits between concepts of socialization and socio-virtualization and that should be investigated and examined from many more aspects. Compared to previous generation, Generation Y is more prone to modern educational platforms and uses internet at a higher rate (TUIK, 2007). Name of this factor was designated as “Social Attention in Virtualization” due to referring generations with different names influenced by technology, shifting what is experienced in social life to virtual environments, creation of similar situations like social life with platforms such as secondlife and spending more time in virtual environments.

After starting to re-shape and re-organize individual and social things in terms of present day, perceptions, habits, needs, wishes and desires have also begun to change. Newly-raised generations, particularly with generation “Y”, growing with technology and looking at life and society a little bit different than previous generations distinguish them with various attributes. Among them, receiving education, differentiation of occupational groups and situations like knowledge, ability, attitude and behaviors of required employed personnel can now be perceived differently for social life. For instance, today, people might not have to go to work. They can also stay at home by tracking their jobs from virtual environment. Another example is that we do not have to mesh into society to do shopping. If desired, one can do shopping in virtual environment. Also, while using internet in education and performing distant education is taken for granted for new generation, it can be seen as a different situation that is difficult to get used to for previous generations. Considering examples given so far, they were given as examples to works and activities that are performed in virtual environments distant from social life. Thus, individuals are mostly occupied with socio-virtual things rather than social things, virtual environment can now be witnessed in every aspect of life and its effect is somehow the case (Hamburger & Ben-Artzi, 2003). With developing technology and age of information, design types to be determined for new generation, putting forward attributes in terms of goals, and results and continuity of information and skills to be learned in terms of teaching and learning process have a great importance (Friend & Bursuck, 2002; Slavin & Cheung, 2004; Keller, 2007).

When the SVPS is considered in terms of newly growing generation and its needs regarding perceiving and experiencing social life, existence of virtual environment that now manifests its impacts in every area of life and that has somehow a contact in life should not be ignored. Every area ranging from family, education, peers to social environment, shopping, mass communication devices, business and entertainment environments has somewhat gained a different dimension after inclusion of virtual environment into the equation. In this regard, it should not be forgotten that the SVPS will provide contribution to analyzing the abovementioned social environments, will aid understanding curricular and extra-curricular situations from the aspect of needs, knowledge, ability and wishes of learners and might also help clearing topics that should be taken into consideration for planning teaching activities. However, due to the fact that this concept is quite new, dimensions of impacts of virtual environments on areas which are factors of socialization such as family, education, peers, media, environment, religion and etc. have not been researched. Topics such as in what environments, to what extent, how and why does socio-virtualization dimension of socialization occur after virtual environment will be areas of research for future years. In this context, researching impacts of socio-virtualization on socialization factors and on different variables in changing and shrinking new world can be suggested.

Consequently, it can be said that the SVPS is a reliable and valid scale that can be used for determining perception levels of individuals towards socio-virtualization. No reliable and valid measuring tool could be encountered in the literature that covers cases related to socialization by utilizing values, norms and culture that remain between socialization and virtual environments for individuals in particular. Therefore, it can be considered that this measurement tool can provide important contributions to the literature. However, ages of majority of study group, through which reliability and validity studies of measurement tool were executed, is around 25 and it generally consists of students. Repeating validity and reliability studies of the scale on different age and occupational groups can be suggested to overcome this limitation. Also, all items of the scale factors named “Negativity in Communication” and “Social Attention in Virtualization” are negative. All factor loads of these items are negative. Using this scale by taking this situation into account or re-checking reliability and validity by converting items to positive while using the scale in another research can be suggested.

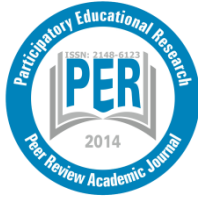
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Adapting Computer Programming Self-Efficacy Scale and Engineering Students' Self-Efficacy Perceptions

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Students might have different type and different level of perceptions: Positive or negative perceptions on programming; a perception on benefit of programming, perceptions related to difficulties of programming process etc. The perception of student on their own competence is defined as self-efficacy. Based on the discussions reported in literature, measuring self-efficacy is certainly necessary and, in this context, is highly important in order to develop new pedagogical methods to address the problems related to computer programming. The purpose of this study is to adapt a well-known self-efficacy scale and determine engineering student's C++ computer programming self-efficacy levels. The sample group consists of 378 engineering students. In order to test the validity of the scale, an exploratory factor analysis has been conducted and item discriminative power has been evaluated. The reliability of the scale, on the other hand, has been justified using the internal consistency level. The results indicate that the scale is reliable and valid, and it can be used to measure the self-efficacy of the engineering student in Turkish cultural environment. Furthermore, it is revealed that the level of self-efficacy perception of the students is middling and it does not show any meaningful difference between genders. On the other hand, self-efficacy perception of students in computer engineering is found to be higher than that of the students in electrical-electronics engineering.

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1. Introduction

As a result of rapid technological developments on information and communication technologies, the demands on graduates with a high competence in computer skills are ever-increasing in knowledge-based economies around the world. Furthermore, market analysis shows that the level of investment in software related industries are dramatically increasing compared to hardware related industries, which is a phenomenon that put an emphasis on the learning programming (Lee & Cheng, 2011). As a consequence, such expectations pose a new challenge which should be addressed especially through introducing novel and efficient computer programming courses in higher education institutions. However, despite this tendency and demands on the human sources with high competence and skills of computer programming, there are plenty of studies in literature, which report the deficiency in computer programming education (Lee & Cheng, 2011, Sivasakthi & Rajendran, 2012; Nikula et. al., 2011; Robins, 2010; Tan & et. al., 2009). It is reported that learning of a computer programming requires a considerable cognitive load on students (Garner, 2009) and students are perceived computer programming course as one of the most difficult courses. As learning to program is perceived as a difficult task, compared to other subjects, a high drop-out and failure rates are very common (Korkmaz, 2013; Nilsen & Larsen, 2011; Caspersen & Kolling 2009; Bergin & Reilly 2005; Winslow, 1996; Dreyfus & Dreyfus, 1986;). Therefore, despite the popularity of learning a computer programming increases among the students, the process of acquiring the skill are hard and requires a great amount of effort. Gomes and Mendes (2007) states that there are problems related to acquiring computer programming skills in terms of academic success and level of student's satisfaction. Fang (2012), Garner (2009) and Nilsen and Larsen (2011) commonly states that students experience difficulties with programming courses and they do not understand the content and algorithmic structure of the programming mainly due to low self-efficacy and motivation.

Learning process of programming skills might be investigated into two main perspectives. The first is the professional software engineering perspective, which aims to undertake big projects requiring a complete competence and synchronized teamwork. On the other hand, the pedagogical perspective is focused on acquiring individual programming skill in a well-defined, limited-scope of framework (Humphrey, 1999; Brooks, 1995; Boehm, 1981). Evaluation of computer language, programming methods and teaching of programming are based on various psychological variables (Erdogan et al., 2008). Psychology of programming requires, beyond programming itself, higher order cognitive and affective processes which compromise of thinking, problem solving, planning and designing. The acquiring "programming" is perceived by students as a process which requires higher order cognitive skills and hence programming courses are perceived as one of the most difficult subjects (Fang 2012; Tan and et. al., 2009; Lau & Uuen, 2009; Milne & Rowe 2002). It is possible to count several factors which affects the success in the learning process, but it is generally accepted that the attitude and self-efficacy perception are the most important factors among the others (Anastasiadou & Karakos, 2011; Erdogan et al., 2008; Sacks et al., 1993; Austin, 1987).

Competence on computer and computer literacy are not just related to the level of knowledge, constraints, applications and the effect of computer but, at the same time, it is directly related to individual's attitudes towards computer (Levine & Donitsa-Schmith, 1998). In literature it is reported that there is a meaningful relation between the accomplishment of tasks defined in computer environment, and attitudes of student towards computer (Sacks et. al., 1993; Koohang, 1989). Furthermore the studies in literature show that there is a confirmative and meaningful relation between the perception of computer's usefulness and attitudes towards

computer.

During the learning phase of computer programming, difficulties faced by student contributes directly to development of negative perception on computer. This phenomenon causes a sense of misjudgement among student, that the learning and acquiring a competence on programming is highly difficult process. As consequence, students unconsciously reject the task of learning programming (Tan et. all, 2009). Therefore, it is crucial task to determine, before in hand, the students' perception on programming and take countermeasure to tackle and address the problems associated with this perception.

Students might have different type and different level of perceptions: Positive or negative perceptions on programming; a perception on benefit of programming, perceptions related to difficulties of programming process etc. The perception of student on their own competence is defined as self-efficacy and it is stated that "different people with similar skills or the same person under different circumstances may perform poorly, adequately, or extraordinarily depending on fluctuations in their beliefs of personal efficacy" (Bandura, 1997). In this context, the self-efficacy perception is a self-evaluation of a person, on his/her competence to conduct a task successfully (Korkmaz 2011; Bandura, 1987) and it is considered as an prediction of a person's aptitude on what he/she might accomplish, being in aware of his competence to complete the particular task. A person might have all necessary qualities to accomplish a task, but deficiency in self-believe and lack of motivation may give rise a failure. On the other hand, it is reported in literature that self-efficacy has direct effect on the process of acquiring new skill and using the acquired skill. Therefore, the level of self-efficacy might be used as a tool and a reliable indicator in order to predict a person's performance (Askar & Davenport, 2009).

Based on the discussions reported in literature, measuring self-efficacy is certainly necessary and, in this context, is highly important in order to develop new pedagogical methods to address the problems related to computer programming. Therefore, in this study, the aim is to measure the self-efficacy perception of the students in engineering programs. "Computer Programming Self-Efficacy Perception Scale" (CPSEPS) is translated and adapted in Turkish in order to determine the self-efficacy level of the students in department of electrical & electronics engineering and computer engineering.

2.Method

2.1. Research Model

The present study is an attempt to detect the self-efficacy of the students in the electrical & electronics engineering and computer engineering departments, towards' C++ programming self-efficacy and it is executed via scan model. Although it is mainly a scale analysis, at the same time, it is also a qualitative research. Within this framework, students' computer programming self-efficacy perceptions have been attempted to detect.

2.2. Study Group

The study group of the research consists of collectively 378 engineering students from four different Universities. The 3rd and 4th year students from computer engineering and electrical & electronical engineering departments are involved in the study. All students have already taken C++ programming languages course. The distribution of students with respect to gender, university, class and department is summarized in Table 1.



Table 1. The distribution of study group with respect to gender, university, class and department

Departments	Class	Gender	Bulent Ecevit Un.	Erciyes Un.	Karabuk Un	Nigde Un.	Total
Computer Eng.	3 rd	Male	0	0	47	0	47
		Female	0	9	16	0	25
	4 th	Male	28	8	24	12	72
		Female	12	8	4	5	29
Electical-Electronics Eng.	3 rd	Male	24	0	0	37	61
		Female	3	0	0	5	8
	4 th	Male	21	0	13	64	98
		Female	13	0	7	18	38
Total			101	25	111	141	378

2.3. Measurement Tool

The data of this research have been collected via Computer Programming Self-Efficacy Scale (CPSES) designed by Ramalingam and Wiedenbeck (1998). The instrument consists of thirty-two items about programming in the C++ Language. The strength of self-efficacy is measured by responses on a 7-point Likert-type scale ranging from 1 (not confident at all) to 7 (absolutely confident). The instrument was validated by administering the test first during the first week of the semester to 421 students (324 males) enrolled in eight sections of an introductory computer programming course by authors. The results of exploratory factor analysis suggested four factors which Ramalingam and Wiedenbeck (1998) labeled: (1) independence and persistence, (2) complex programming tasks, (3) self-regulation, and (4) simple programming tasks. Reliability coefficients were calculated for the scores on the full thirty-two item scale and the empirically derived factors which emerged in the exploratory factor analysis. Test-retest reliability was also calculated. The overall alpha reliability of the scores was found to be .98. The corrected item-total correlations ranged from .50 to .84. The alpha reliabilities of the factors were: (1) independence and persistence = .94, (2) complex programming tasks = .93, (3) self-regulation = .86, and (4) simple programming tasks = .93.

2.4. Scale Adaptation Process

In the process of scale adaptation, according to Hambleton and Patsula (1999), translation step is the one of the most critical phases. In this stage the original scale has been translated by an educational technologists and a computer engineer who are efficient in both Turkish and English languages. For the noticeable differences of statement between expert translators, a second opinion has been asked and translation procedures have been finalized. Subsequently the adapted scale has been reviewed and amended by a language specialist. The final translation form has been retranslated into English by two experts as stated by Hambleton and Patsula (1999) as well and the consistency with the original item structures has been analyzed. In this analysis it has been realized that the items in original scale and the items in the Turkish form have linguistic equivalence.

Following this stage the adapted test needs to be applied on test group (Deniz, 2007). Within that scope the test that has been adapted and amended must be applied on the pilot group prior to examining psychometric features and it should be detected if there are any other changes need to be done on the scale. The adapted test has been inspected by 21 students from 2nd year in Computer Engineering Department and was reevaluated in line with student views. Following the formation of the scale form accordingly, the scale has been applied on total 378

students in order to evaluate the factor structure of the scale, the structure validity, the scale scores' reliability and the distinctiveness of items. Based on the data extracted from the application, the factor structures for the Turkish form of the scale have been analyzed.

Following the application of draft scale on the study group, SPSS 15.0 and Lisrel 8.7 are utilized to conduct the scale's validity and reliability analyses of the obtained data statistically. The validity of scale's factor structure within Turkish culture has been tested via confirmatory factor analysis (Gülbahar & Büyüköztürk, 2008). The basic parameters of confirmatory factor analysis indicated that the factor structure of the scale is not matching the criteria set for model-data compatibility for both the first and secondary levels detected in Turkish culture hence an explanatory factor analysis was deemed necessary. In order to measure the reliability of the scale, internal consistency analyses have been conducted on data.

2.5. Data Analysis

The factor structure of self-efficacy scale has been analyzed via exploratory factor analysis. As part of the statistical analyses, KMO and Bartlett test analyses were carried out on the data collected with the scale. The fact that the KMO value was over 0.90 is interpreted that the data set is perfectly appropriate for factor analysis. In addition, it is seen that the null hypothesis was rejected with a significance level of 0.05 according to the Bartlett test values, which are known to be the unit matrix of the correlation which it tests (Eroglu, 2008; Büyüköztürk, 2002).

In the light of the values obtained, the exploratory and confirmatory factor analyses were conducted on the data, the scale's allocation to the factors was specified through principal component analysis and the factor loads were examined using the Varimax rotation method. The items with a factor load lower than 0.30 and the items that do not have at least 0.1 differences between their loads on two factors, or in other words, the items with loads separated into two factors, should be removed (Büyüköztürk, 2002). As a matter of fact, the factor loads of the items in the scale over 0.30 and at least 40% of the general variance is found to be sufficient for the behavioral sciences (Eroglu, 2008; Büyüköztürk, 2002; Kline, 1994; Scherer et. all, 1988). For item distinctiveness effects, item total correlations and Cronbach's alpha internal consistency coefficients have been calculated.

The score obtainable from the scale is in the range of the minimum 28 and the maximum of 196 points. According to this the levels that are the equivalents of scores obtained from sub scales can be given such: 28-84: Low Level; 85-140: Medium Level; 141-196: High Level. On these data, the frequency, percentage, arithmetical means, standard deviation and t, Anova and Scheffe tests have been employed in order to detect self-efficacy perception levels of students. In differentiation analyses $p < 0,05$ significance level has been considered sufficient.

3. Findings

3.1. Findings relevant of Scale's Validity

3.1.1. Structural validity

In order to test the structural validity of the CPSES, firstly Kaiser-Meyer-Okin (KMO) and Bartlett tests were applied to the data and their results were found to be $KMO =$



0.958 and $\chi^2 = 9495,954$; $df=496$ ($p=0,000$) for the Bartlett test. In terms of these values, it was seen that factor analysis could be conducted on the 32-item scale. In the first place, principal component analysis was conducted in order to determine whether the scale was one-dimensional or not. Then, the Varimax rotation method was used according to the principal components. In line with this, after 4 items with less than 0.40 item load were removed from the scale, the factor analysis was applied to the remaining items again. After these processes, it was seen that the remaining 28 items in the scale were gathered as a single factor. It was found that the KMO value of the final 28-item scale was 0.960 and the Bartlett values were $\chi^2=8169.752$; $df=378$; ($p<0.000$). After these processes, the findings regarding the item load, the Eigen value and variance explaining the percentages of one dimension for the remaining 28 items are presented in Table 2.

Table 2. Factor analysis results of the scale

Items		Common factor variances	Factor Loads
I1	I can write syntactically correct C/C++ statements.	,503	,709
I2	I understand the language structure of C/C++ and the usage of the reserved words.	,494	,703
I3	I can write logically correct blocks of code using C/C++	,535	,731
I4	I can write a C/C++ program that computes the average of any given number of values.	,448	,670
I5	I can use built-in functions that are available in the various C/C++ libraries	,500	,707
I6	I can write a small C/C++ program given a small problem that is familiar to me	,604	,777
I7	I can write a reasonably sized C/C++ program that can solve a problem that is only vaguely familiar to me	,513	,716
I8	I can write a long and complex C/C++ program to solve any given problem as long as the specifications are clearly defined	,640	,800
I9	I can organize and design my program in a modular manner	,610	,781
I10	I understand the object-oriented paradigm	,448	,669
I11	I can identify the objects in the problem domain and declare, define, and use them	,479	,692
I12	I can make use of a pre-written function, given a clearly labeled declaration of the function	,553	,744
I13	I can debug (correct all the errors) a long and complex program that I had written and make it work.	,501	,708
I14	I can comprehend a long, complex multi-file program.	,522	,722
I15	I could complete a programming project if someone showed me how to solve the problem first.	,516	,718
I16	I could complete a programming project if I had only the language reference manual for help.	,464	,681
I17	I could complete a programming project if I could call someone for help if I got stuck.	,507	,712
I18	I could complete a programming project once someone else helped me get started.	,512	,716
I19	I could complete a programming project if I had a lot of time to complete the program.	,504	,710
I20	I could complete a programming project if I had just the built-in help facility for assistance.	,473	,688
I21	I could find ways of overcoming the problem if I got stuck at a point while working on a programming project.	,651	,807
I22	I could come up with a suitable strategy for a given programming project in a short time.	,611	,781
I23	I could manage my time efficiently if I had a pressing deadline on a programming project.	,523	,723
I24	I could mentally trace through the execution of a long, complex,	,614	,783

	multi-file program given to me		
125	I could rewrite lengthy confusing portions of code to be more readable and clear.	,580	,762
126	I can find a way to concentrate on my program, even when there were many distractions around me	,381	,618
127	I can find ways of motivating myself to program, even if the problem area was of no interest to me.	,488	,699
128	I could write a program that someone else could comprehend and add features to at a later date.	,552	,743
Eigenvalue			14,726
Explained variance			52,591

As seen in Table 2, it was found that the unrotated factor loads of the remaining 28 items were between 0.448 and 0.651, while the rotated factor loads after the Varimax rotation method was applied were between 0.618 and 0.807. The Eigen value of the factor within the general scale is 14,726 and its contribution to the general variance is 52.591%.

3.1.2. Item Factor Total and Corrected Correlations

In this section, the correlations between the scores obtained from each item and the scores obtained from the total scores with the item total correlation and corrected item correlation method were calculated and each item's level of serving the general purpose was tested. The item-factor correlation values and corrected correlation values for each item are presented in Table 3.

Table 3. Item-factor scores correlation analysis

Items Factor Total Correlation (N=378)				Items Corrected Correlation (N=378)			
Items	r	Items	r	Items	r	Items	r
I1	.708	I15	.680	I1	.683	I15	.692
I2	.703	I15	.711	I2	.678	I15	.653
I3	.731	I17	.713	I3	.707	I17	.686
I4	.674	I18	.708	I4	.644	I18	.689
I5	.711	I19	.687	I5	.683	I19	.682
I6	.779	I20	.804	I6	.756	I20	.659
I7	.718	I21	.778	I7	.691	I21	.785
I8	.799	I22	.720	I8	.779	I22	.757
I9	.782	I23	.781	I9	.761	I23	.695
I10	.674	I24	.760	I10	.643	I24	.760
I11	.696	I25	.621	I11	.667	I25	.737
I12	.745	I26	.699	I12	.720	I26	.588
I13	.721	I27	.743	I13	.681	I27	.674
I14	.717	I28	.721	I14	.696	I28	.718

**
p<, 001

As seen in Table 3, the item test correlation coefficients vary between 0.621 and 0.804. Each item is in a significant and positive relationship with the general factor ($p<0,000$). Besides, as seen in Table 3, the corrected correlations between each item and the total score that it belongs to vary between 0.588 and 0.779. In this regard, it can be said that each item serves both the general purpose of the scale.

3.1.3. Item Discrimination

The discrimination power of the items in the scale was calculated. For this reason, firstly, the raw scores obtained from each items are ranged from the highest to the lowest. Then, the lowest and highest groups of students which formed by including the top 27% and the bottom of 27%, the total of 103 students, were determined. The t test values of the independent

groups were calculated with the total scores in the group. The findings regarding the t test values and significance levels of the discrimination powers are presented in Table 4.

Table 4. Item discrimination powers

Items	t	Items	t	Items	t	Items	t
I1	-16,558	I8	-23,087	I15	-16,975	I22	-18,922
I2	-17,387	I9	-24,129	I16	-13,351	I23	-15,056
I3	-17,501	I10	-17,717	I17	-14,992	I24	-21,370
I4	-15,495	I11	-19,234	I18	-15,502	I25	-19,709
I5	-17,355	I12	-19,146	I19	-14,909	I26	-11,010
I6	-23,641	I13	-17,294	I20	-13,799	I27	-14,370
I7	-19,108	I14	-19,333	I21	-20,829	I28	-17,727
df: 204; p<.001				N=378			

In Table 4, it can be seen that the independent sample t test values regarding the 28 items, the total score in the scale varies between -21.370 and -13.351. The t value for the general scale was found to be -37.133. The level of each difference determined is significant ($p < 0,001$). In this regard, it can be said that the general scale of the scale have high item discrimination power.

3.1.4. Internal Consistency Level

The scale's whole reliability analyses were conducted using Cronbach's alpha reliability coefficient. The scale's Cronbach's Alpha reliability coefficient was found to be 0.966. In this regard, it can be said that the general scale can make consistent measurements.

3.2. Findings relevant of Self-Efficacy Perceptions Levels of Engineering Students'

Self-efficacy perceptions levels of engineering students' are as summarized in Table 5.

Table 5. Engineering students' self-efficacy perceptions levels

Değişken	N	\bar{X}	sd	Min	Max	Levels (f/%)					
						Low	Medium	high			
Computer Eng.	173	126.99	29.85	33	193	15	8.57	100	57.8	58	33.5
Electrical-Electronics Eng	205	109.14	36.11	28	193	51	24.9	116	56.6	38	18.5
Total	378	117.31	34.52	28	193	66	17.5	216	57.1	96	25.4

As shown in Table 5, students' self-efficacy perceptions levels change between 28 and 193; the mean is $\bar{X}=117.31$. As data on Self-Efficacy Perceptions Levels are examined it is detected that more than half of the students (57.15%) have medium, 25.4% have high and 17.5% have low level Self-Efficacy Perceptions. Accordingly it can be argued that students' self-efficacy perception levels are medium. As the scores obtained from each of the departments are examined, it has been detected that the students from Computer Engineering Department have the highest average which is $\bar{X}=126.99$. In Table 6, the students' self-efficacy perceptions levels with respect to departments are summarized.

Table 6. The effect of departments on self-efficacy perceptions levels

Variables	N	\bar{X}	Sd	T	df	P
Self-Efficacy	Computer Eng.	173	126.9	2.27	5.178	376 .000
	Electrical-Electrical Eng	205	109.1	2.52		

As demonstrated in Table 6, students' departments created, in terms of total score, a

meaningful differentiation on their self-efficacy perception levels ($t(2-276)=5.178$; $p<0,001$). According to score means computer engineering student's perceptions higher than Electrical-Electronics Engineering students' perceptions. It can thus be asserted that self-efficacy perceptions levels of students from Electrical-Electronics Engineering Department is meaningfully lower than students receiving training in the other two departments.

In Table 7, the findings relevant of students' self-efficacy perceptions Levels with respect to gender are summarized.

Table 7. The effect of gender on students' self-efficacy perceptions levels

Variables		N	\bar{X}	sd	t	df	p
Self-efficacy	Female	96	120.34	33.37	,996	376	,320
	Male	282	116.28	34.89			

As given in Table 7, there is not a meaningful difference in students' self-efficacy perceptions levels with respect to gender ($t_{(2-376)}=-0,996$; $p>0,05$). Therefore it can reasonably be argued that gender has no effect on students' self-efficacy perceptions skill levels.

4. Conclusion and Discussion

In present study, "Computer Programming Self-Efficacy Scale (CPSES)" has been adapted into Turkish to detect students' self-efficacy perceptions levels. The scale is consisting of 28 items that can be collected as a single dimension. The strength of self-efficacy is measured by responses on a 7-point Likert-type scale ranging from 1 (not confident at all) to 7 (absolutely confident). According to the findings obtained from exploratory factor analysis, it was seen that the unrotated factor loads of the remaining 28 items were between 0.448 and 0.651 while the rotated factor loads, after the Varimax rotation method, were between 0.618 and 0.807. The Eigen value of the factor within the general scale is 14,726 and its contribution to the general variance is 52.591%. Accordingly the correlation values between each scale item and scores belongs to change between 0.621 and 0.804. Hence it can be asserted that each item in the scale serves meaningfully to the characteristics aimed to be measured via the whole scale and each item has the desirable level of distinctiveness. The discrimination power of the items in the scale was calculated. According to this, it can be said that the general score of the scale has a high item discrimination power. Internal consistency coefficients of scale have been calculated via Cronbach's Alpha reliability formula. According to this the scale's Cronbach's Alpha reliability coefficient was found to be 0.966. Consequently it can reasonably be argued that "Computer Programming Self-Efficacy Scale (CPSES)" is a valid and reliable scale that can be employed in detecting students' self-efficacy perception levels of engineering students in Turkey.

Additionally below given results have been obtained regarding students' self-efficacy perception levels: students' self-efficacy perception levels are generally medium. This finding is consistent with the literature. Indeed, similar conclusions were reached made by Robins et al., (2003), Hernane et al. (2010) and Hawi (2010).

As programming skill is an essential part of their career, it can be concluded that the level of students' self-efficacy perception in engineering faculties is not adequate and acceptable. This level of self-efficacy is an indicator that the students in the department of computer and electrical-electronics engineering do not possess self-efficacy in C++ computer programming and they are lack of confidence in developing a complete software solution to a given

problem. At this point, it is crucially important to highlight possible factors which contribute to lack of self-efficacy among the student and to shed light on the main problems so as to provide a treatment in order to alleviate the main obstacles.

Students' self-efficacy perception levels do not differ with respect to gender. In a study conducted by McDowell et al. (2003), it was concluded similarly that there is no significant variation between women and men in terms of the scores they attain on programming skills. Similar findings can also be found in the works of Pioro, (2004) and Lau and Yuen (2009). In contrast, however, results in the literature can be heard. For example in a study conducted by Askar and Davenport (2009), female students had significantly lower initial self-efficacy beliefs compared with those of their male peers. Self-efficacy perception levels of students from Electrical-Electronics Engineering Department are meaningfully lower than from Computer Engineering Department. The reason behind this finding could be the fact that the computer engineering students generally takes more computer programming related courses than the students in the electrical-electronics engineering department. In this context, it can be said that the difference is quite natural.

In relevant literature, it is found that there are limited researches on the students' self-efficacy perception levels towards C++ programming language. Therefore, within this framework, it can be suggested that various studies should be conducted to analyse students' self-efficacy perception levels towards programming languages.

5. Acknowledgements

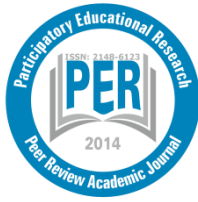
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INVITED ARTICLE

Inclusive Education: Beyond the Chalkboard or Just another Brick in the Wall?

(Inaugural lecture: formal induction as professor)

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In the formal induction as professor, the author uses two metaphors to equate her research efforts in the field of inclusive education to that of beyond the chalkboard and not as just another brick in the wall. The lecture is partly inspired by Pink Floyd's hit "Another brick in the wall" which deals with the laying of metaphorical bricks. Floyd reflects on how he was demeaned by a teacher and dreaming of rising up against teachers who are "just another brick in the wall." By referring to the dismal reports of the Annual National Assessment (2012) for languages and mathematics the author expresses her concern particularly for learners who experience barriers to learning and resorts to the route of inclusive education where all learners are able to access equitable, quality education. She draws on theories such as Freire, Vygotsky and Bronfenbrenner as her theoretical framework for her research and takes an asset based approach to inclusive education. Five research highlights are used to illustrate her research activities, with a detailed exposition of the "Learn not to Burn" research project. Recommendations are made regarding the training of teachers to not just be "another brick in the wall" but to go "beyond the chalkboard" in an effort to ensure quality inclusive teaching practices.

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Introduction

In this, my formal induction as a professor, I intend to focus on my research as an endeavour to promote scholarship and to celebrate my achievements in the field of inclusive education. With due recognition that a certain amount of controversy surrounds this field, only the most salient issues relating to inclusive education will be addressed. Further, I will present my preferred paradigm for research, highlight certain of my research endeavours and elaborate on one particular project. In so doing, I will relate the outcomes of my research to a sphere of influence and practice which lies 'beyond the chalkboard'. I shall argue that my research does not form just 'another brick in the wall' but constitutes an innovative contribution to the successful implementation of inclusive education in South Africa.

Inclusive education can be described as both a philosophy and a practice which is based on particular theories of teaching and learning. Firstly, the philosophy of inclusive education is based on the right of all people to equal and quality education and their right to develop their potential and to receive due respect for their human dignity. This means that all people should be physically integrated into mainstream education by the provision of accessible classrooms and facilities and instructional support systems such as a flexible curriculum (Peters 2007: 99). Education for All (EFA) has been firmly placed on the international policy agenda; however, current education inequalities and insufficient progress toward EFA with particular reference to people with disabilities can still be seen (Peters 2007: 98). Children with disabilities are still marginalized in society and "reflect the unadorned aims of education and of the international community" (Peters 2007:106). In order to meet the EFA millennium development goal, that is universal primary education, a goal ratified by 152 countries, a commitment is required to ensure effective activation of the EFA framework for people with disabilities whereby countries which make exceptions are not tolerated and all exclusionary policies in education are challenged (Peters 2007: 1-7). Secondly, as a practice inclusive education is defined by UNESCO (UNESCO, Guidelines for Inclusion: Ensuring Access for All 2005:13) as "a process of addressing and responding to the diversity of needs of all learners through inclusive practices in learning, cultures and communities and reducing exclusion within and from education. It involves changes and modifications in content approaches, structures and strategies, with a common vision which covers all children of appropriate age range and a conviction that it is the responsibility of the regular system to educate all children."

Both the underlying philosophy and definition of inclusive education bring to my mind the popular British rock band, Pink Floyd, famous for their progressive and psychedelic music and composition of philosophical lyrics, certainly a most successful and musically influential group in the realm of pop music. Their song, *Bricks in the wall*, deals with the laying of metaphorical bricks (or the accumulation of problems) by a character called Pink. Pink reflects on how he was demeaned by a teacher and dreams about the kids in his school rising in protest against their abusive teachers by dragging them out of the school, chanting:

We don't need no education
We don't need no thought control
No dark sarcasm in the classroom
Teachers leave them kids alone
All in all it's just another brick in the wall
All in all you're just another brick in the wall.

Pink describes the personal wall that hedges him in and isolates him from the rest of the

world; his teachers are just another brick in that wall. Eventually Pink tears down the wall to once again emerge a caring person. In my lecture I hope to shed light on the murky waters of inclusive education where so many bricks in the wall exist and to emphasise the need to exert ourselves (as teachers) beyond the chalkboard. But first I refer to the literature which serves as a background to this lecture and to offer a perspective regarding the alignment of the two metaphors in the title.

Salient Aspects of Inclusive Education

The education situation in South Africa and its implications for inclusivity

The current education dilemma in our country with particular reference to learners experiencing barriers to learning and its implications for the implementation of inclusive education in South Africa is the driving force of my research. Sadly, in South Africa, The Report on the Annual National Assessments (ANA) 2012 (Grades 1-6 and 9) reflects a bleak situation where the national average percentage mark for mathematics shows a decrease from Gr 1 (68%) to Gr 9 (13%). The national average percentage mark for language is reflected as Gr 1 (58%) and Gr 3 (52%). Mean scores for the Intermediate Phase (Gr 4-6) and Gr 9 is comparatively lower with a maximum average mark of 43% (Home Language) and a minimum of 30% in Gr 5 First Additional Language. It is encouraging, however that the ANA (2012) report states the new curriculum development, Curriculum Assessment Policy Statement (CAPS) “takes learners back to basics in a systematic order”. This is illustrated in Foundation Phase (Grade R – reception year - to Grade 3): Literacy, which emphasises Phonics. In contrast to these national outcomes, I cannot be but awed by achievements abroad. An article entitled “The Great Schools Revolution”, published in *The Economist* (17 September, 2011), alludes to the 2009 Programme for International Student Assessment (PISA) scores and ranking. In this exercise Shanghai and South Korea topped the ranking list for Reading, Mathematics and Science with exceptional achievements. Why is this so? Of course, cultural factors exercise a powerful influence as Asian parents are known to strongly emphasise children’s test results and insist on optimal school performance. Success in these geographical areas can also be attributed to:

- Educational decentralisation, that is, giving power back to schools;
- A focus on underachieving learners;
- The choice of different types of schools.

Finally, in these societies a deep-seated respect for the teaching profession prevails. In Hong Kong, “the effective teacher is seen as a figure of authority, morality and benevolence”. I have had the privilege to witness these abovementioned features first-hand during my extensive fieldwork in China. Just a touch of the tenets of Confucianism would be welcome in our children’s classrooms (The Economist, 17 Sept 2011)! Chinese teachers are “not just another brick in the wall” of obstruction. Instead they are epitomized by the Great Wall of China - their education system is strong and empowering!

The inspiring examples abroad lead me back to the challenges at home. In South Africa we cannot afford a laissez-faire attitude towards the teaching profession. Good teaching, which includes a dedication to teaching the basics and a commitment to those learners with barriers to learning, is imperative in an effort to promote equal quality education for ALL. Engelbrecht (2011, International research proposal) reports: “It has become increasingly clear



that the South African education system still bears many profound and enduring effects of Apartheid inequalities and that some dominant practises have remained essentially the same and therefore continue to constrain the rights of groups within and through education”. She continues that even though fundamental changes in education have taken place and, as indicators reveal, equity regarding general access has been realised, the right to basic education with particular reference to equitable opportunities, is still problematic. This is evidenced in the huge disparities in basic resources, trained teachers and effective leadership, which persist between formerly advantaged and disadvantaged schools, and in particular schools in rural areas. Poverty and its manifestations are the most salient characteristics in these schools. Thus, to implement inclusive education, the challenge is to ensure that mainstream schools become environments where dialogue (about implementation of inclusive education) and action can take place on different levels and where difference is accepted and dealt with in ways that ensure that the school community experiences a sense of belonging through meaningful participation (Engelbrecht, 2011: 6-18). Engelbrecht posits that “Exclusionary practices in school communities indicate a lack of acceptance of difference and are thus cause for grave concern as they militate against the development of an equitable inclusive education system in South Africa”.

In the light of these challenges, a clear understanding of inclusive education as elaborated by UNESCO (2005) has direct implications for how we as South Africans conceptualise inclusive education in our unique context. In this regard, the *White Paper Six: Special needs education* (DoE, 2001:31) is key. The foundations of this definitive policy which envisages an inclusive education system for all learners (including those with disabilities) (DoE, 2001:11) are the values embodied in the South African constitution: human dignity, equality, human rights and freedoms. Building on the reports of the National Commission on Special Needs in Education and Training (NCSNET) and the National Committee on Education Support Services (NCESS) of 1997, *White Paper Six: Special needs education* was accepted in 2001 as the legal policy to build an inclusive education and training system. These documents focussed on integrating special and ordinary education by alterations to buildings, development of the curriculum and making the necessary modifications, training of staff and inter-sectoral collaboration (Walton: 2006: 45). In particular, the White Paper earmarked a flexible curriculum to which all learners (including those with disabilities) would have access (DoE, 2001:11). Thus, the White Paper 6 (2001) is the guiding document for the implementation of inclusive education in South Africa. Its principles are as follows:

- All children and youth can learn and need support;
- Diversity (including learning needs) is valued;
- Education must meet the needs of all learners;
- Home and community is an important source of learning;
- Attitudes, behaviours and teaching methodologies need to change in order to meet diverse needs;
- Maximised learner participation in the educational process is necessary;
- Learners’ individual strengths need to be encouraged.

Central to the process of inclusive education implementation are the learners with intrinsic and extrinsic barriers to learning, which is a continuum of factors in interaction. The barriers to learning referred to comprise barriers within the learner, the school, the education system as well as /or the broader social, economic and political context (Swart & Pettipher 2005: 17). The NCSNET and NCESS (1997) identify the following barriers to learning in the South

African context: socio-economic deprivation; barriers as a result of impairments; negative attitudes; an inflexible curriculum; inappropriate languages/LoLT; lack of support services; inadequate policies and legislation and lack of parental involvement and recognition. Although we need to recognise these barriers, we should not sink into the pessimism of a predominantly needs-approach to education. Here I stress the worldwide shift to Positive Psychology, which “focuses on intrinsic strengths, assets and resources and positive constructive intra-psychic domains” and which underlies the asset-based approach to education (Ebersohn & Eloff 2006 in Ryan 2008). The asset based approach should be applied to the development of inclusive policies to change the deep structure of exclusion which affects children worldwide. It calls for effective practices in inclusive education which require community involvement where efforts are made so that all voices are heard: teachers’ voices, learners’ voices, parent’s voices and the voices of authority which “remain[s] at the heart of the inclusion/exclusion discourses” (Mitchel, De Lange & Thuy 2008: 109). This approach moves us away from the needs-based approach which focuses on the deficits/limitations of learners (Du Toit and Forlin 2009: 670). Instead it concentrates on the strengths of learners and the assets located in the different systemic levels (which features later on in this lecture).

In summary, this brief exposition of salient aspects in inclusive education illustrate that inclusion is not only a state but also a process (Ainscow, 2005:15). This confirms the UNESCO definition cited earlier and calls for inclusive education researchers to be actively involved in that process for the betterment of education in South Africa and elsewhere.

The discussion now moves to my preferred theoretical framework with regard to my research in inclusive education.

A Paradigm for Conducting Research in Inclusive Education

I am intrigued by critical pedagogy (CP) as a sub-field of critical social theory as it attempts to develop a “pedagogy of critique” as well as a “pedagogy of hope” as my concern is the inflexible curriculum which learners with barriers to learning face. CP encompasses three overarching projects, namely experience, anti-system and inclusion of which the latter is emphasised here. Freire, in *Pedagogy of the oppressed* (1972), proposes a ‘problem-posing’ pedagogy to emancipate and democratize education, thus “creating an emancipatory culture of schooling” which aims to empower learners and in particular learners experiencing barriers to learning. The main aim of the project of inclusion is to reform, among others, educational institutions to be more inclusive, based on principles of equality and anti-discrimination. The ultimate goal is equal opportunity and power for the “underprivileged, oppressed, marginalised or subjugated.” Its rationale is rights-based liberalism and multi-culturalism. CP however needs to develop long-term and sustainable transformation in educational structure and practices. Although CP is “couched in abstract and ethical ideals such as hope, love, democracy, utopia, and care”, Cho (2010: 321) cautions against “succumbing to its speculative and idealistic tendencies.”

Keeping the aforementioned in mind, I see inclusive education as having a propensity towards a systems approach which includes the interrelated systems in society, such as the classroom, school, family, community and government. Interaction between these systems is necessary to support learners and to effect their change, growth and development (physical, biological, psychological, social and cultural). Since continuous causal processes are involved in changes (such as from an exclusive to an inclusive education system), all the other systems are



affected by what happens in the one system. I am therefore convinced that researchers in inclusive education should lean on Bronfenbrenner's ecological systems theory developed in the 1970's.

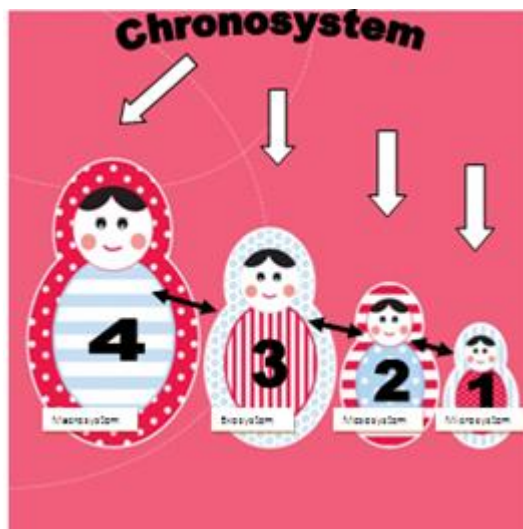


Figure 1: Russian dolls epitomizing Bronfenbrenner's ecological systems theory
Acknowledge: B Ben-David (Doctoral graduate, Unisa 2012)

This influential theory epitomizes child development as four nested systems namely the micro-, meso-, exo- and macrosystem interacting within the chronosystem. Interacting dimensions needed to understand how the levels of systems in the social context interact are person, process, context and time (Nel, Nel and Hugo 2013). Complementary is Bronfenbrenner's recent work (1998) namely the bio-ecological model of development (in the 1970's) where person and process factors and the time dimension were further elaborated upon, as the different levels of the environment which influence one's development (Swart and Pettipher 2005: 10). The interconnectedness of the theoretical frameworks of Bronfenbrenner's Ecological- and Bio-Ecological Development Theory, Vygotsky's sociocultural theory (which focuses on the social and cultural aspects of the learners' development) and critical theory (Foucault and others) influence my research.

The quantitative part of my research, which is characterised by empirical science and post-positivism and which challenges the absolute truth about human behaviour to be discovered, reflects a deterministic philosophy. Yet I also assume that reality can be interpreted. Consequently my epistemology, that is my view of the nature of knowledge, is constructivist and hence I see knowledge as experiential, personal and subjective when gathering information about people. By adopting one paradigm in lieu of the other, I would be failing to pragmatically address those aspects which other paradigms may be able to address (Brannen 2004). Thus, mixed-method design is preferred in most of my research efforts.

My Research Highlights

In the light of my theoretical and methodological preferences, I would like to highlight five of my recent research projects, which have been influenced by a combination of the inclusive education discourse, the asset-based approach, CP (sub-field of critical social theory), Bronfenbrenner's ecological systems theory, Vygotsky's socio-critical theory and the White Paper 6 policy. All of these projects were collaborative by nature. The aim of mentioning these projects individually and elaborating on one of them, namely the Learn Not

To Burn (LNTB) project, is not only to provide a bird's eye view of my work, but also to demonstrate how I brought all the pieces of the puzzle together to form a holistic understanding of Inclusive Education. In all the projects mentioned above, my personal objective was to challenge teachers, researchers and stakeholders to deal with the complexities of implementing inclusive education in a diverse country such as South Africa.

The five projects are the following:

- i) The birth of an African-university-affiliated early childhood centre of excellence: investing in children, families and communities: the Unisa Centre for Early Childhood Education. This comprises efforts to establish an early childhood education centre as a centre of excellence, where research is in the forefront of a university community engagement project. The research resulted in an article entitled: *The Whisper Test and Checklist as tools for teachers to screen hearing loss in young children as a preventative measure for barriers to learning*.
- ii) An on going, international, collaborative research project directed at a comparative analysis of teachers' roles in inclusive education in Finland, Slovenia, Lithuania, China, England and South Africa. This investigation gave rise to the collaborative writing of five articles of which *Exploring teacher self-efficacy for inclusive practices in three continents* is probably the most important.
- iii) Basic training for facilitators of people with hearing loss. In 2011 I was approached by the National Institute for the Deaf to develop a short learning programme, together with colleagues in the Inclusive Education Department, College of Education as part of a community engagement project, as basic training for facilitators of people with hearing loss to be offered at Unisa in 2015.
- iv) A current international research project in collaboration with colleagues in China, which is investigating the interplay of Early Childhood Development (ECD); English Second Language (ESL) (literacy); Inclusive Education; poverty and education in the rural areas; teaching practice. The research team will explore the theme: *Teaching teachers to teach reading for meaning: A framework for in-service teacher training*.
- v) The implementation of the "Learn Not To Burn" (LNTB) curriculum for learners with barriers to learning.

There is currently limited fire safety training given to learners in South Africa. This limitation and the fact that learners with severe intellectual disability (SID) experience the mainstream curriculum as a barrier to learning, necessitated research regarding differentiated pedagogy as an effective adjunct to inclusive practice. Thus, in collaboration with the Early Childhood Development Institute (ECDI) the programme entitled "Learn Not to burn" (LNTB), a pre-foundation, mainstream burn prevention programme, was adapted and implemented for inclusive education. This LNTB programme consists of ten lessons focusing on fire safety education.

The LNTB programme enabled us to investigate an important research question, namely *What differentiated instructional practices do teachers need to employ to teach a specific curriculum to learners with Severe Intellectual Disability (SID)?* This study was conducted in the context of a public special school (in collaboration with the Early Childhood Development Institute – GDE) in Gauteng which caters for learners with SID, ranging from the age of three up to the age of eighteen years. Although the school primarily caters for learners with SID, many learners have multiple disabilities.



We concentrated on the micro level, that is, the teaching practices for teaching the LNTB curriculum. However, as Bronfenbrenner's theory dictates, we regarded it as important to also take all the other related systems into account. For the sake of brevity, I will only mention the next level, the meso level, which is the institutional level (the school). On this level, the School Management Team (SMT) in collaboration with the rest of the staff were involved in the planning and adaptation of the curriculum, subsequently implementing it on the micro level, that is teaching the ten adapted LNTB lessons.

A qualitative research design was used to elucidate themes regarding teacher implementation of the LNTB curriculum. Constructivist practices, where the social aspect, language, concept formation and scaffolding strategy (teachers and peers offer support by using cues and suggestions) were an integral part of this study. The zone of proximal development (ZPD) is where the learner's existing knowledge is a springboard for learning to take place and where the teacher or peer offers some assistance which eventually leads to independent task performance. In this study, however, the target learner group may not have reached this level, despite teachers' efforts to enable the more able learners. The theoretical framework included the Constructivist Theory associated with the works of Piaget, Bruner and Vygotsky (Westwood, 2004:22-23).

A pilot study was conducted which formed part of a larger research project (2009-2011). It also served as a Unisa community engagement project. A descriptive ethnographic design was used to address the research question. Furthermore, visual empirical methods were employed to assist with retrospection of lived experiences of participants. Contextual validity by way of triangulation was ensured as photographs and video clips were taken of the children, the teachers and the therapists as they were performing activities. Other forms of data collection methods included focus group interviews with teachers and therapists, completion of questionnaires by teachers and therapists and journal entries were made and recorded by the principal and deputy principal. Data were systematically examined, analysed, coded and as categories emerged they were organised according to themes. These significant findings resulted in the formulation of useful pedagogical praxis recommendations.

The findings focused on the relevance of differentiated instructional practices, such as visual stimulating focused activities, hands on learning and the importance of incorporating music in ensuring access to the LNTB curriculum for the SID population. An adapted version of Smith's (2008: 4-11) *Model of Dynamic Differentiation (MoDD)* was used to allow for differentiating the curriculum to cater for these learners (SID).

The school's staff, together with the multidisciplinary (such as a speech therapist and occupational therapist) team, made the necessary modifications, adaptations and accommodations to the LNTB curriculum (in collaborative forums and referred to as learning circles) in order for all learners in all phases the phases are able to benefit by and have access to it. Teachers made use of a repertoire of teaching strategies as a way of transferring the ten fire safety messages to the learners. By scaffolding, that is breaking the lessons into smaller parts and repetition of the content over a long period of time was effective in ensuring that difficult concepts were grasped. Teachers concentrated on the learners' senses, particularly the visual modality in combination with play activities. Practical and hands-on activities assisted the learners in remembering facts easier and to apply the skills and knowledge they had learnt.

During the research, the teachers were afforded the opportunity to be innovative and creative in an effort to develop appropriate and effective ways to differentiate the curriculum enabling

learners with SIDs to benefit by the curriculum. They utilised the learners' senses and made the lessons very practical, starting from the concrete (using real objects) then to the semi-concrete (using pictures) accompanied by frequent verbalisation and engaging in play and music activities. It was noticeable that when making use of differentiating teaching methods, that support materials; assessment procedures; learner interests, learning styles and strengths (assets) need to be taken into consideration to ensure that they have grasped all the concepts.

By reflecting on the efforts that the teachers and the multidisciplinary team had made to differentiate the curriculum (by way of appropriate adaptations and accommodations and being mindful of the learners with SIDs assets and weaknesses) proved to be successful as learners were able to demonstrate what they had learnt. They understood and could apply the ten core messages of the LNTB curriculum (Nel, Kempen & Ruscheinski 2011: 191-208).

The outcomes of the project included an article published in an accredited journal; the principal of the research school completed her doctoral thesis, based on an aspect of the project; the adapted LNTB curriculum has been included in the Birth to Four Curriculum of the Early Childhood Education Institute of the Gauteng Department of Education.

Emerging from this project, the teachers and therapists trained teachers from six schools and ECD Centres in Soweto (2011) where I acted in an Inclusive Education advisory capacity.

Implications of My Research: From a Brick in the Wall to Beyond the Chalkboard

Finally, as envisaged at the beginning of this lecture, I shall relate the outcomes of my research to the catch phrases in the title: 'beyond the chalkboard' or 'just another brick in the wall'. In this manner I hope to contribute to the implementation of inclusive education in South Africa.

Researching education with various lenses encapsulates and refines the various educational practices. I believe that I belong to the community of inclusive education researchers who are endeavouring to reach consensus on inclusive education practice. This lecture was an effort to reflect on the nature of my work during the 11 years I spent at Unisa (of my 41 years in the service of education) and to determine whether they indeed have had an impact on those involved in inclusive education. I needed to know whether these efforts have moved beyond the chalkboard or were they just another brick in the wall?

The undeniable answer to this question, is yes: I have taken a systems stance on how I look at inclusive education. In this way I was, for example, able to look at the learner in the LNTB project holistically. I have observed that experiential learning and co-operative learning were facilitated; that staff was enabled to make the necessary modifications, adaptations and accommodations; that by learning the 10 fire safety lessons, learners with SID were equipped and that they were able to demonstrate their knowledge and skills regarding fire safety. Also, the outcome of the *Whisper Test* research project proved that the *Whisper Test* can be used successfully by teachers as a tool to identify learners with hearing loss at an early age in order to prevent developmental and learning problems. This certainly goes beyond the chalkboard.

In addition, the short learning programme, *Basic training of facilitators of people with hearing loss*, empowers teachers to enable learners with hearing loss to access the mainstream curriculum. This is not just merely another brick in the wall; rather bricks are dismantled by the implementation of this programme and teachers become part of a learner empowerment process.



Furthermore, the *Comparative analysis of teachers' roles in inclusive education in Finland, Slovenia, Lithuania, China, England and SA* evidenced that teacher roles in inclusive education are emphasised and collaboration is the determining factor in ensuring curriculum access for learners experiencing barriers to learning. What was brought to the fore was teachers' training needs, especially their need to be equipped with the ability to implement multi-level teaching, differentiation, Universal Design for Learning and evidenced-based pedagogy. Teachers also expressed a dire need for support in terms of smaller classes; training and planning time; teacher support and assistance to adjust the curriculum. As academics it is incumbent upon us to ensure that teachers are trained in these areas and that teaching practice provides them with the necessary experience. We have to make sure that the teachers we train do not become part of a wall that hems learners in to the narrow sphere of their disabilities. Teachers should be equipped to open the vistas beyond the chalkboard.

All in all, we need to become acquainted with the micro system that the learners belong to, the assets/strengths that they bring to the meso system (i.e., the classroom and the school environment) and the barriers that they are faced with in this system. We have to become familiar with the other systems that influence education. By moving away from a needs-based approach of inclusive education located within a deficits paradigm to an asset-based approach, I believe that we recognise and give expression to the phrase, "Education for All". As inclusive education in South Africa is a human rights issue, it also constitutes a pursuit of equity and a non-discriminatory, non-oppressive world. Inclusive education is undoubtedly concerned with social justice for ALL. It is concerned with breaking down walls, not building them.

In view of the fact that theory influences practice, I have adopted Bronfenbrenner's Ecological- and Bio-Ecological development theory, Vygotsky's sociocultural theory, the critical theory of Freire, Foucault and others. By doing so, the voices of people with disabilities have been heard as they cry: "Nothing about Us without Us!" In order to avoid being another brick in the wall of mediocrity, I have been motivated by the burning issues in the field of inclusive education and by the theoretical frameworks that inform and underpin research that provides innovative answers.

Finally, in an effort to transcend the chalkboard and tear down the metaphorical wall, I wish to offer the following suggestions concerning the College of Education's work. It is incumbent upon academics at this university to infuse within their courses, from the initial teacher education courses to postgraduate level without exception, with the values of equity, social justice, non-discrimination and inclusivity. The College of Education should primarily be a place where diversity is recognised and catered for and where exclusionary practices are eradicated. In addition, a signature module which converts all students into change agents, which includes all these values and which advocates a way of thinking about curriculum and pedagogy that suits ALL learners irrespective of their intrinsic or extrinsic barriers, is desperately needed. Teachers need to be immersed in classrooms where there are learners with disabilities and to learn about them. Teachers require good content knowledge of the subjects they teach; simultaneously they need to be well versed in curriculum differentiation as part of their role as curriculum developers. They need to be tutored on how to engage in research on interventions, modifications, accommodations and adaptations that can or should be made to the curriculum and how to implement multi-level teaching, particularly in the South African context. In addition, they need to be skilled in forging collaborative partnerships on all levels so that the learners become the responsibility of the nation as a whole. If teachers can do this, they will not just be bricks in an imprisoning wall; they and their learners will move far

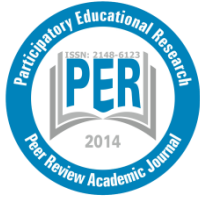
beyond the chalkboard. It is my heartfelt desire that every school subject in all the teacher education programmes offered in the College of Education should be characterised by a Universal Design for Learning. I dream about programmes that cater for all learners and which will equip teachers from the onset to adopt a diversity/inclusivity ethos and pedagogy and as such cater for ALL learners.

If, as the title of this lecture implies, inclusive education goes beyond the chalkboard and if it is to be not just another brick in the wall, we, as academics, need to become serious change agents in society, particularly in education where Unisa is purported to be training approximately 55% of South Africa's teachers. I thus concur with Dunn (in Lacy 2002: 50) who professes that "If children do not learn the way we teach them we must teach them the way they learn". "A one-size-fits-all education won't work any longer, if it ever did ... [we should] search for ways to teach smarter, not harder" (Wormeli 2007:3-4) and it is our responsibility to ensure that teachers do just that.

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The Analysis of the Relation between Eight-Grade Students' Estimation Performance in Triangles with Their Teaching Style Expectations and Sources of Motivation

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In this study, eight-grade students' estimation achievements in triangles were analysed according to motivation types and knowledge type expectations. Three hundred and thirty-seven students from three different elementary schools attended in this study. In order to determine the students' estimation performances, an estimation test in triangles (ETT) was developed. At the end of the study, it was indicated that the estimation performances of the students in triangles related with high level intrinsic motivation and conceptual knowledge expectation. It was also indicated that the estimation performances of the students who have extrinsic motivation source were lower. Moreover it was pointed out that the students expecting procedural knowledge from their teachers had low level of estimation performance in triangles. This study shows that estimation skills in triangles, one of the subjects of geometry, are related with some important variables like motivation types and conceptual knowledge. There are some important questions that should be answered by future studies like 'How can students' estimation skills in geometry be developed? 'How can it be integrated into curriculum? What are the possible strategies students apply and which factors are they related to?'

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Introduction

In this century, it is very important for students to be able to think critically and examine the validity of the information that they are receiving in their daily life (Sriraman & Knott, 2009). From this view, estimation and measurement can be seen as basic skills in daily life particularly when it comes to judging about the results of problems or situations which make sense or not (National Council of Teachers of Mathematics [NCTM], 2000). The importance of estimation skills on mathematics education has been emphasized in many studies. (Levin, 1981; Reys & Bestgen, 1981; Siegel et al. 1982; Segovia & Castro, 2009). It was also emphasized that applying estimation skills promotes conceptual learning in mathematics (MoNE, 2009; Reys et al. 1991; Aytekin, 2012; Olkun & Toluk Uçar, 2006).

Measurement can be defined as a repeated unit used to determine length, width, area, volume or a weight of something (Workman & Ahn, 2011). There are lots of situations requiring to make good estimation about measurements and using the estimation when it is necessary to judge about situations where the precise measurement is not needed (Adams & Harrel, 2010). When people encounter these situations, measurement estimation skills can be very important and useful, since it does not require any measurement tools, therefore people can get a result by performing it very quickly. Measurement estimation can be identified as a critical skill in Mathematics Education (Joram, Subrahmanyam and Gelman, 1998). In addition, measurement estimation can be defined as a physical measurement performed without tools (Bright, 1979). Similarly, Reys, Lindquist, Lambdin, and Smith (2009) defined estimation as a process of producing answers that are close enough to allow for good decisions without performing elaborate or exact computations.

Measurement estimation can be seen as one of the fundamental skills that provide understanding the natural world (NCTM, 1996; NCTM, 2000). Estimating about a measurement needs to use mental and visual information to measure without using any measurement tools (Van de Walle et al. 2010). Measurement estimation heavily depends on previous experience. From this point of view, estimation cannot be seen as a simply guessing. Measurement estimation process includes making a judgment about values of measurements. Students use variety of strategy in this process that reflects students' conceptual knowledge in estimated domain (Olkun & Toluk Uçar, 2006). Teaching and learning how to estimate measurements are very crucial for three reasons. First, it is often needed in daily life, when measurement instruments are absent or inconvenient (Levin, 1981; O'Daffer, 1979). Second, it provides a useful method for teaching physical measurement (Joram et al. 2005). Third reason and more important one is that it provides and reflects a deep understanding (Joram, et al. 2005) in some geometrical concepts like angle and length.

Some of the previous studies have focused on beneficial role for the use of strategies in estimating measurement (Piaget & Szmanska, 1964; McLaughin, 1981; Segovia, 1997), while others have focused on how it can be developed (Bright, 1979; McLaughin, 1981; Markovits & Hershkowitz, 1993; Pajera, 2001). Siegel, Goldsmiths and Madson (1982) have emphasized the role of mental images to facilitate students' measurement estimation skills. In addition, Reys and others (2009), stated that, students, who are successful in written problems, are not good estimators generally.

Studies related to estimation can be evaluated under two headings: The first one includes operational estimation surveys on decimal numbers, rational numbers, fractions etc. (Bana & Dolma, 2004; Lemaire et al. 2000; Hanson & Hogan, 2000; Case & Sowder, 1990; Leutlinger et al. 1986, Bestgen et al. 1980). The second one includes measurement estimation that

focused on applying estimation on terms like area, volume, length (Segovia & Castro, 2009; Siegel et al. 1982; Bright, 1979; Markovitz, 1987; Forrester, 1990). When the literature is reviewed, it is seen that there aren't any studies examining to make estimation on triangles. So that it can be expected that the study focused on estimation skills in triangles would be able to provide valuable data about estimation skill itself and teaching triangles. It is thought that it guides new studies on teaching various geometrical terms applying estimation skills.

Turkish Education System and Estimation

There has been an on-going change in Turkish education system in last ten years. It can be said that the change started with the project about training teachers and restructuring educational faculties between World Bank and Ministry of Education (Kızılcıoğlu, 2006). The changes started at higher education level at first led to a complete change in curriculum of elementary schools from first grades to eight grades in 2004 (Bal, 2008; Bulut, 2006). The changes happened can be seen easily when examining the old and new approaches and contents of mathematics curriculum. The 2004 curriculum emphasized the importance of instructional approaches focusing on conceptual understanding rather than only focusing on procedural knowledge in mathematics education (ERG, 2005). Another important feature of the 2004 curriculum is that it emphasizes on some necessary skills for today's world. These skills are stated as problem solving, reasoning, making connections and communication skills (MoNE, 2009). It is underlined that 21st century is a technology century, it is needed to develop individuals who are able to solve problems and make reasoning (Bulut, 2007). To develop these skills, developed estimation skill is needed. Estimation skill was included also among the general aims of mathematics in previous curricula (MoNE, 1998), but it has been started to be taught with 2004 mathematics curriculum (MoNE, 2009; MoNE, 2013). That can be easily seen in the expressions of the new mathematics curriculum indicating that "to develop estimation skills systematically and mental calculation should be given importance". In the problem solving part of 2004 curriculum, it was stated that making a good estimation and checking the result of a problem are related each other. It is indicated that in order to promote students' reasoning skill, their estimation skills should be developed. Estimation skill is classified as computational estimation and measurement estimation. In the curriculum, it is emphasized that students' estimation skill cannot be developed without any systematic education so it was also advised that teachers should ask students to make estimation, to measure and to control their estimation. It is indicated that such a process is vital for students both to promote their strategies and to develop estimation skills.

Turkish Ministry of Education settled down a new education system called as 4+4+4 in 2012-2013 academic term (MoNE, 2012). With that system, compulsory education in the country increased from eight years to twelve years (MoNE, 2012). According to this regulation, eight-year-elementary education divided into two terms: the first four-year-level and the second-four-year level. The first one is called as elementary school, and the second one is called as middle school. In the first four-year level of elementary education, primary school teachers are responsible for most of the lessons included mathematics and Turkish. After this eight-year education all over the country, students have to sit an exam called as OGES (High school entrance exam) to from among different types high schools. Especially in the eighth grade, the level of consciousness of students and parents are increasing. Some of the students believe that they can be successful by memorizing solutions of the previous exam questions and solving similar questions in the exams before while some of them prefer preparing for the exam by analysing and understanding the concepts even if it takes long time (see Table 3). In this point, to develop conceptual understanding, some researchers emphasized that estimation



skill is related to conceptual understanding rather than memorizing the procedures of estimation skill and practicing (Aytekin, 2012; Olkun & Toluk Uçar, 2006). In our study, eight grade students' estimation performances on triangles were examined. In order to be successful in the exam of OGES, both conceptual and procedural knowledge are needed. In our study, estimation performances of two group students will be analysed: the first group consists of students who prefer to learn mathematics by focusing on mostly conceptual knowledge and the second group consists of students who prefer to learn mathematics by focusing only memorizing and practicing procedural knowledge. By means of the analyzing the two groups' estimation performance, it is expected to reach new and enlightening knowledge about the relation between estimation skills and conceptual and procedural learning.

The Relation of Conceptual/Procedural Knowledge and Estimation

To be able to make an efficient estimation is based on understanding mathematics concepts to (Aytekin, 2012; Tekinkır, 2008; Olkun & Toluk Uçar, 2006). The relationship between expecting conceptual knowledge from teachers and estimation skill was examined in this study. Therefore, it will be necessary to give mostly accepted definitions of conceptual and procedural knowledge is vital. The mostly accepted definitions of conceptual and procedural knowledge are expressed by Hiebert and LeFevre (1986).

Conceptual knowledge is knowledge that is rich in relationships. It can be thought of as a connected web of knowledge, a network in which the linking relationships are as prominent as the discrete pieces of information. Relationships pervade the individual facts and propositions so that all pieces of information are linked to some network. (p. 3)

One kind of procedural knowledge is a familiarity with the individual symbols of the system and with the syntactic conventions for acceptable configurations of symbols. The second kind of procedural knowledge consists of rules or procedures for solving mathematical problems. Many of the procedures that students possess probably are chains of prescriptions for manipulating symbols. (p. 3)

According to these definitions, conceptual knowledge can be seen as relational structure which constitutes of rich knowledge network. On the other hand, procedural knowledge is described as both the signs of mathematics and the knowledge of some rules and procedures applied while solving mathematical problems. One who can understand a concept deeply is expected to able to do all of the operations easily (Maciejewski et al. 2011). When the studies on estimation are examined, it can be easily seen that estimation skill is related to deepness level of one's conceptual knowledge rather than doing operations fast and mentally. To illustrate, most of the items in measurement tools in order to measure students' estimation skills includes questions in which difficult to use memorized procedures without thinking their relations with concepts. (Aytekin, 2012; Reys & Bestgen, 1981; Reys, Reys & Penafiel, 1991; Rubenstein, 1985; Levine, 1982). Similarly, it is explained that the students who are successful in estimation tests have deep conceptual understanding and so they can effectively use procedures (Volkova, 2005; Sowder & Wheeler, 1989; Case & Okamoto, 1996). For this reason, estimation researches give important information about conceptual and procedural knowledge. Byrnes and Wasik (1991) indicated that conceptual and procedural knowledge require different mental processes. The students who expect for conceptual knowledge mostly focus on making relationships while the students who expect for procedural knowledge focus on only using procedures in order to reach their achieving goals.

To make connections between procedural and conceptual knowledge also enable students have reasoning skills about the underlying reasons of the procedures and about the effective way of using right procedure at right time (Hiebert & Lefevre, 1986). The students with deep conceptual knowledge can easily notice their mistakes while applying the procedural knowledge (Byrnes & Wasik, 1991). The situation is parallel with the observations about estimation skill. The students with high level of estimation skill can easily notice the mistakes during solving questions by understanding the logic of problem result (Aytekin, 2012). Carpenter (1986) found out that the students with developed conceptual knowledge can evaluate the results of using procedures incorrectly during solving fraction problems whether they are logical or not.

Davis (1992) stated that there are two points of view as former and new views in mathematics education. The former view focuses on procedures and rules, on the other and the new one focuses on the meanings and relations rather than memorizing the procedures and the new one indicates that mathematics teaching process is a constructing and making sense process. Similarly Schoenfeld (1990) pointed out that mathematic education should aim conceptual understanding rather than promoting mechanical skills.

Järvelä and Haapasalo (2005) divided students into three groups based on their information expectations. These are procedures oriented students, conceptual oriented students and procedurally bounded students who expect only procedures ignoring their conceptual relations. According to this classification, procedurally oriented students focused on firstly learning procedures then they try to develop conceptual relations of procedures. Conceptual oriented students firstly focus on concepts and then enrich procedural knowledge based on the concepts. The students who only focus on procedural knowledge try to memorize the procedures by exercising repeatedly without focusing on their conceptual relations. A similar classification was made by Entwistle and Tait (1990). In that study, it is pointed out that some students only focus on memorizing the procedures instead of the meaning. But some students try to associate them with prior knowledge and to make sense of new terms by searching for relations. Marton and Säljö (1976) and Entwistle and Tait (1990), indicated that there are two different situations based on learning styles. The first group is expressed as learning focusing on meaning and aiming to making association with prior knowledge. The second group focused on memorizing key points of a topic without making association with prior knowledge. Biggs (1993) stated that the students who study to get the high can be thought as the third group. Especially in the first years of elementary education, teachers are tend to teach procedures mostly, but especially in the university level firstly the concept is described and then practices are made with similar subjects (Haapasalo, 1993). In these two approaches, students' beliefs about solving mathematical problems are affected in a negative way. Kadijevich and Haapasalo (2001) pointed out that understanding the relations between procedural and conceptual knowledge can be developed with learning activities. Not only the quality of teaching activity but students' attitudes towards learning also affect the speed of this association process. It is a fact that some students focus on memorizing procedures rather than learning for conceptual relations (Lauritzen, 2012). It is needed to find ways of directing these students from expecting only for procedures, to expecting for conceptual knowledge.

In the curriculum of elementary level mathematics in Turkey after 2004 (MoNE, 2009; MoNE, 2013), there are some sentences about conceptual and procedural knowledge like that 'This program emphasizes the process of making relations among concepts and underlying meanings of operations and enriching operation skills'. At the core of the program, there are learning zones of concepts and operations. Conceptual approach indicates that much more

time should be spent to develop students' conceptual basics of mathematical knowledge, so that relations between conceptual and operational knowledge and skills are established. Such a curriculum with that approach can be expected to affect students' estimation skills in a positive way. Even if, it was emphasized to integrate estimation skills with curriculum (Sowder & Wheeler, 1989; NCTM, 1989), there aren't any objective about estimation skills in triangles.

The Knowledge for Real Life and Estimation

Some students' reason of learning mathematics would be only to be able to solve real life problems which require mathematical information (Lauritzen, 2012). Some of problem solving processes, procedural knowledge is not sufficient, require to be able to associate procedural knowledge with conceptual knowledge.

The compulsory education in Turkey has been eight year-long until 2012. some of the students (%10,3 for 2010-2011; %7,44 for 2011-2012; National Education Statistic, 2013) have left from the school after eight year compulsory education. For this reason, it is expected that some of the students who leave the formal education after completing the compulsory education, would focus on only useful information for everyday life. Some would say that there are also many students who think in the same way but not want to leave the formal education. For that reason, in this study it was analyzed that the estimation performances of the students expecting 'the knowledge for real life' and the students who expecting procedural and conceptual knowledge. In this study, the knowledge for real life is described as a kind of knowledge that is evaluated in terms of applying in real life conditions so it doesn't matter whether it is conceptual and procedural knowledge. Many researchers also emphasized that estimation skill is a related and adequate skill for real life (Reys & Bestgen, 1981; Reys et al. 1991; Rubenstein, 1985; Levine, 1982; Sowder & Wheeler, 1989; Case & Okamoto, 1996). From these thoughts, we also decided to analyse students' estimation performance who expect knowledge for real life from teacher.

Types of Motivation and Estimation

Intrinsic motivation is an incentive situation for individuals themselves to do an activity without any outer effects (Deci & Ryan, 2000; Deci & Ryan, 1985) while extrinsic motivation can be defined as getting motivated considering some social factors (Herzberg, Mausner & Synderman 1959). Passion for success, learning because of wondering are regarded as intrinsic motivation sources while passion for self-realization, exam scores and vocational anxiety are seen as extrinsic motivation sources (Ryan & Deci, 2000). According to Herzberg and others (1959) intrinsic motivation related to take pleasure from learning content, on the other hand outer factors are related to satisfaction (Akman, 2011). Inner factors motivate individuals at highest levels while outer factors provide appropriate conditions for them to be motivated (Argon & Ertürk, 2013). In the literature, it is indicated that there is a positive correlation between success in mathematics and motivation types (Volkova, 2005). When the relation between success in mathematics and motivation types is considered, it is expected that the students with higher level of intrinsic motivation are more successful (Evans & Wedege 2004). It is known that both intrinsic and extrinsic motivation affect students' success positively. In this study, one of the aims is to search the relation between motivation and estimation skill and to analyse the effects of different types of motivation source on students' estimation performance in triangles.

Wæge (2009) mentioned about five variables in the measurement tools in order to be

developed to determine students' motivation types. The first one is expressed as the focus on learning and understanding beside true answer. The second one is enjoyment of attending mathematical activities and the third is having positive feeling about mathematics and the last two variables are wanting to have risk to solve problems and having self confidence in learning mathematics.

Research Question

There are two type of estimation research in the literature; these are measurement and computational estimation research. In this study, students' measurement estimation performances on triangles have been analysed. Measurement estimation generally is a way of creating an approximate answer by comparing qualities like area, volume, length and angle to reference points in mind without applying a measurement tool. Measurement activities require the integration of spatial and numerical concepts into the situations with unifying idea of an iterated unit (Hiebert, 1981). Measurement estimation in triangles is very different from estimation in other areas that every dimension can be thought separately. Measurement estimation in triangles involve the coordination of angle, length and other concepts which only be used in geometry like bisector, median, congruent and similarity. In this article, we investigated eight grade students' measurement estimation performance in triangles and its relation to some variables like knowledge type expectation and source of motivation for studying mathematics in Turkey. The main problem of the study is the question 'Do the eighth grade students' estimation achievements in triangles differ from each other according to their knowledge type expectations and motivation sources types?'

Methodology

Participants

The subjects were 337 students studying in the 8th grade from three public middle schools in the city center of Kırşehir from Turkey. The subjects participated in the study were selected by convenience sampling procedure. These schools were selected in order to represent general characteristics of the middle schools in Kırşehir.

Instruments

In this study there were two instruments. One of them was Estimation Test in Triangles (ETT). The ETT was developed by the four researchers who are specialist in mathematics education to measure the performance of students' measurement estimation ability in triangles.

The test was piloted before the study to check its reliability, appropriateness, discrimination of items and to determine difficulty of questions. In the development process of the ETT, firstly four researchers wrote 42 multiple-choice questions according to seven objectives (principles) of 8th grade mathematics. These objectives were taken from Elementary School Mathematics Curriculum and listed in table 1. (MoNE, 2009). In the following objectives, there aren't any objectives about triangle area. The reason for that is in elementary mathematics curriculum (MoNE, 2009), area subject is included in measurement learning part, not in geometry. In this study, the objectives about triangles in eight grade mathematics lesson are indicated.



Table 1. Objectives of the Estimation Test in Triangle.

Objectives
Be able to determine the relation of the sum or the difference of the lengths of any two sides between the length of the remaining side
Be able to determine the relation of the lengths of each sides with the opposite angles of each sides
Be able to draw a triangle with given measures of the sufficient elements
Be able to construct perpendicular bisector, angle bisector and altitude of a triangle.
Be able to explain the equality terms associated with triangles.
Be able to explain the similarity terms associated with triangles.
Be able to construct Pythagoras relation

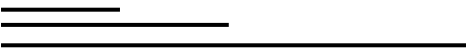
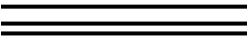
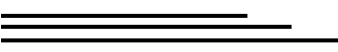
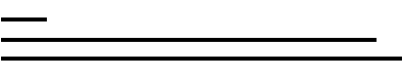
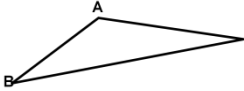

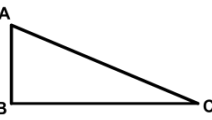
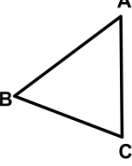
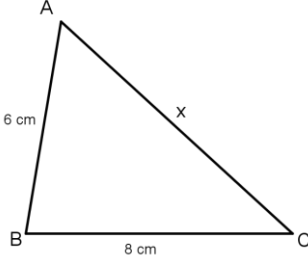

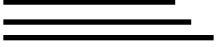


The questions of the ETT were checked for their appropriateness and clarity of the items by two researchers with doctoral degree and one graduate student in the field of Elementary Mathematics Education. According to their feedback some changes were made and the ETT was made ready for pilot study. 38 multiple-choice items had been decided to use in pilot study. The language of the items in ETT was Turkish.

The participants of the pilot study were 187 students (87 female, 100 male) from three public middle schools in city center of Kırşehir. An item analysis test was conducted and according to its result, discrimination indices of eight items of ETT were not satisfactory. Their discrimination indices were below 0.20. Therefore, these questions were excluded from the final version of the ETT. Cronbach's alpha reliability coefficient of the ETT was found as 0.79 for the pilot study. According to result of the pilot study, the final version of ETT included 30 multiple-choice items. In figure 1, four items of the ETT were represented as examples.

The final version of ETT was administrated 337 students (172 female, 165 male) in the study. Cronbach's alpha reliability coefficient was found as 0,808. Average difficulty of the final version of the ETT was found as .59, discrimination index was found as .52.

In addition, a survey was prepared to determine students' believes about their achievement in mathematics and their opinions about mathematics education. In this survey there were six questions and these questions were about the expectation of math grade at the end of the semester, the perception level of students about the relationships between mathematics and real life, the perception of teachers/parents evaluation of their mathematical proficiency, the students' motivation types of doing mathematics and the students' expectation of knowledge types from their teachers. All researchers had reached a consensus about all survey questions and items of ETT were suitable for the purpose and clarity of the questions and items were appropriate for eighth graders in Turkey. In that study, the relation between students' responses about motivation types and knowledge types expectations in the questionnaire and their estimation success level are focused.

Figure 1. Examples of Estimation Test in Triangle*

<p>3) Which of the following options, a triangle cannot be constructed with given line segments?</p> <p>A) </p> <p>B) </p> <p>C) </p> <p>D) </p>	<p>18) Which of the following options, the angles of the triangle are the closest 65°, 60° and 55°.</p> <p>A) </p> <p>B) </p> <p>C) </p> <p>D) </p>
<p>12) </p> <p>Which of the following options, the closest length of x segments of the triangle is given?</p> <p>A) 14 cm B) 9 cm C) 3 cm D) 1 cm</p>	<p>27) Which of the following options, a wide-angled triangle can be constructed with given line segments?</p> <p>A) </p> <p>B) </p> <p>C) </p> <p>D) </p>

*The actual version of the ETT was developed in Turkish by authors of this article. The examples of items given here were translated by the authors from Turkish to English.

Procedure

In the beginning of the study, it was explained to students that it was an estimation test, so there was no need to use paper and pencil computation. Students were asked to estimate the closest values of given shapes, and decide which choice was the most sensible.

Before the administration of the ETT, a survey which included six questions was administrated to students. In this study, two of the questions in the questionnaire are accepted as the independent variable. The analysis of the other questions in the questionnaire is not included in this study. The first one was motivation types that students regard as their reason for their studying maths and the other one was knowledge type expectation from their teachers. And the success levels of estimation in triangle were examined in that study.

Data Analysis

The sentences were prepared for knowledge type expectation by researchers. The students would select the most appropriate one for themselves were examined in three groups while analysing the data. The first group sentences included procedural knowledge and the

second one included conceptual knowledge and the last one included everyday life knowledge. This classification was in accordance with the classification of Hiebert and LeFevre (1986). There were also types of sentences that the students use mostly about the sources of motivation. The students who chose the sentences like “I’m studying mathematics because of not getting poor mark, I have to study mathematics in order to get the profession which I want in the future, I want to prove myself to my social surroundings by studying mathematics” have extrinsic motivation. On the other hand the students who chose the sentences like “I’m studying only interesting topics of mathematics, I’m interested in all topics of mathematics and I want to learn all of them” have intrinsic motivation. The classification of those sentences is parallel with the study conducted on motivation types by Deci and Ryan (2000).

None of the subjects had a systematic education about estimation ability in geometry. One lesson hour (40 minutes) was given to students to complete ETT and six survey questions. During the implementation of the ETT, it was observed that the duration was enough for all students. In order to analyse the data Tamhane T2 test was conducted since Levene’s equal variance assumption was not satisfactory.

Findings

At the end of the analysis of data obtained from the study, there found out significant differences on the levels of estimation skills usage on triangles among the groups based on motivation types and teaching styles expected from the teachers. There were not significant differences between males and females about their estimation performances ($p>0,05$). It was found out that generally all of the students had lower achievement mean scores of estimation of triangles (see Table 2).

Table 2. Mean scores of estimation of triangles of male and female and t-test results

Scores of Estimation of Triangles Test Scores						
Gender	Mean (M)	Number of students (N)	Standart deviation	df	t	p
Male	18,10	165	5,823	335	1,171	0,243
Female	17,41	172	5,079			
General	17,75	337	5,459			

Source of Motivation and Estimation of Triangles

Table 3. The source of students’ motivation of studying mathematics and the achievement scores from ETT

Source	Sentences of students’ motivation studying mathematics	N	Mean	Sd
External Motivation	I’m studying mathematics because of not getting poor mark	52	14,38	5,664
	I have to study mathematics in order to get the profession which I want in the future.	62	17,03	5,182
	I want to prove myself to my social surroundings by studying mathematics	59	16,20	5,195
Internal Motivation	I’m studying only interesting topics of mathematics.	23	20,09	4,457
	I’m interested in all topics of mathematics and I want to learn all of them	141	16,91	6,201

From Table 3, it can be understood that the number of students choosing the sentence 'I'm studying only interesting topics of mathematics.' had highest mean to the rest of the students who choose other sentences from the questionnaire. The students' estimation performances who chose these sentences "I have to study mathematics in order to get the profession which I want in the future, I'm interested in all topics of mathematics and I want to learn all of them, I want to prove myself to my social surroundings by studying mathematics" were close each other. The students who chose the sentence as their motivation source "I'm studying mathematics because of not getting poor mark" have the lowest ETT mean scores.

Table 4. The results of the independent sample t-test for the source of motivation and the achievement scores from ETT

	N	Mean	Sd	t	p
External Motivation	173	15,95	5,415	-6,574	0,000
Internal Motivation	164	19,64	4,845		

When the ETT scores of the groups based on their motivation sources are analysed, it is concluded that as seen in the table 4 the students who have internal motivation sources have higher ETT scores than the students who have external motivation source.

Knowledge Types Expectations and Estimation

When the findings of the questionnaire are analysed, there are some differences about students' expectation types for knowledge from their teachers. Some students expect that they learn the necessary rules and procedures they believe as helpful in OGES and solve examples so that they can apply these procedures while the other students expect useful knowledge for everyday life. These classifications can be seen as the prior expectations of students. In a similar way, a student can want to both understand the concept and to apply procedures effectively. The classification of that study is evaluated as prior expectation. In order to make a comparison about estimation success, the sentences the students chose in the questionnaire are classified as: expectation for procedural knowledge, expectation for conceptual knowledge and expectation for knowledge in daily life.

Table 5. Students' expectation types from teachers about teaching mathematics and the achievement scores from ETT

Students' choices of learning	N	Mean	Sd	Minimum	Maximum
Unstated	3	17,00	4,359	14	22
The teacher has to show me the better method of memorize the mathematical procedure and to solve lots of different problem type to be successful in OGES	204	16,77	5,328	4	28
The teacher has to teach me the meaning of procedure and support us to find different solutions of problems.	116	19,72	4,886	5	30
The teacher has to teach me useful information in daily life than preparing exams	14	15,71	7,660	3	26
Total	337	17,75	5,459	3	30

As seen clearly in the table 5, the students expecting lessons based on meanings of concepts, rules and procedures instead of only rules and procedures have higher scores of ETT than the other. There is only one point difference between the scores of the students expecting only knowledge types and students expecting only knowledge about everyday life. However there are three points difference between the students expecting rules and procedures and the students expecting knowledge about meanings of concepts, rules and procedures.

Table 6. Levene's test of Equality Error Variance for Students' expectation types from teachers about teaching mathematics

Test of Equality of Variance			
F	df1	df2	Sig.
3,693	3	333	0,013

In order to determine whether the variance of students' ETT scores in the groups formed based on knowledge types they expect to learn is homogenous or not, Levene test was conducted. Because the test the variance in the group is not homogenous, an appropriate test for such a situation, Tamhane T2 test was conducted.

Table 7. The results of Tamhane T2 test for the Students' expectation types of knowledge from teachers about teaching mathematics

Students' expectation types (i)	Sudents' expectation types (j)	Mean differences (i-j)	p
Procedural knowledge	Conceptual knowledge	-2,950*	0,000
	Knowledge for daily life	1,060	0,997
Conceptual knowledge	Procedural knowledge	2,950*	0,000
	Knowledge for daily life	4,010	0,378
Knowledge for daily life	Procedural knowledge	-1,060	0,997
	Conceptual knowledge	-4,010	0,378

According to the results of Tamhane T2 in Table 7, it is seen that there is a significant difference between the ETT scores of the students indicating that they want to study mathematics to prepare for exams and the ones indicating that they want to study mathematics to understand it.

Discussion

The research findings indicate the success of applying estimation skill in triangles is affected by motivation sources. It draws attention that the students who study mathematics only for not getting poor grades have lower estimation performance in triangles. Most of the studies on motivation make explanation about enjoyment of a discovery reached via brain, being proud of doing an activity, getting happy to learn without mark anxiety. This motivation type is called as intrinsic motivation. The study finding is parallel with the idea of Covington (1999) about that the students who do not have score anxiety and have higher level of intrinsic motivation have higher level of academic success.

The study presents there can be some discussion about the study results of Covington and Dray (2002). They expressed that expectations to get higher scores for secondary school students are much more effective than intrinsic learning passion. However our study result showed that the students who study aiming to get high scores have rather low academic success in applying estimation skill in triangles. The students who acquire procedures to study exams may be more successful in ordinary exams than the students who focus on conceptual understanding. But the test in the study requires using estimation skill in triangles

as a life skill so it is getting harder for the students to solve the questions by using only procedural knowledge. Getting high scores seen as a tool of proving themselves by students. If the teachers give importance to procedural knowledge and ask questions in exams about conceptual understanding and estimation, the students who want to get high scores and prove themselves have to act in accordance with the teachers' expectation. For that reason studying with the aim of getting high scores can affect applying estimation skills in different areas positively if teachers' criteria is giving the high grade focused on estimation skill and conceptual understanding. However in our study it is seen that the expectation for getting high scores does not affect the success of applying estimation skill in triangles as much as expected. That expectations or scare of high scores prevent meaningful learning is a commonly expressed point in different studies (Covington & Omelich, 1984). As a matter, of course, students who don't give importance to meaningful learning and put the aim of getting high mark in the first place, have difficulty in estimation, which is related to conceptual learning closely.

Many studies show that intrinsically motivated students have higher achievement level, lower anxiety level and are aware of their own talents (Gottfried, 1982). Students' intrinsic motivation provides successful studies and this success increases the intrinsic motivation, too (Harter & Connell, 1984). The students choosing the sentence "I'm studying only interesting topics of mathematics." in the questionnaire have rather high level of estimation mean scores. Such students can be said to have intrinsic motivation. According to the results of t-test, estimation achievement of the students with intrinsic motivation is higher than the one of those with extrinsic motivation and the difference is significant statistically, too. Many studies pointed out students with intrinsic motivation are much more successful (Yates, 2000; Wedege & Evans, J. 2006; Ryan & Deci, 2000). Similarly, the study indicated the students with intrinsic motivation are much more successful in estimation in triangles.

The students choosing the sentence "I'm studying only interesting topics of mathematics." in the questionnaire are tend to behave independently from curriculum and school system. The study result shows that the estimation success of these students is statistically significant higher in estimation than the others. In other words, if students are given the chance to study freely and behave freely in the school, they can be intrinsically motivated in both primary and secondary schools (Deci et al., 1991; Grolnick & Ryan, 1987) and this may causes the higher estimation performance in triangles.

Some students tend to memorize procedures rather than relations among mathematical concepts (Lauritzen, 2012). As seen in the Table 5, two hundred four of the students attended in the study expressed that if teachers solve much more similar exercises, show short ways of solution, they believe they can be more successful. This kind of knowledge is called as procedural in the literature. Conceptual understanding is seen as a conscious thinking activity (Hiebert & Lefevre, 1986). As seen in the Table 5, one hundred and sixteen of the students attended in the study expected to learn the meaning of procedures. Only fourteen of the students expressed they expected to learn the knowledge for real life. At the end of the analysis, the students expecting conceptual knowledge have higher ETT scores than the others have. It is seen that more than half of the students expected procedural knowledge. According to result of analysis, there are no significant differences between these two groups. The students' estimation successes who expect only procedural knowledge and the knowledge for real life are lower than the ones who expect conceptual knowledge. This shows that the instruction based on conceptual knowledge and meaning is effective for estimation success. If the students have the chance to attend in discussions in the class and are directed to solve

problems about mathematical thinking, and if their answers are evaluated to explain their reasoning habit and to compare different solution ways, the students' conceptual thinking and problem solving skills are developing (Gearhart et al., 1999) and so their estimation skills are developing, too.

If we hope an education focusing on conceptual knowledge more than procedural knowledge, we should form our assessment standards (Schoenfeld, 1982). Because the students face to exams requiring only procedural knowledge, they are getting eager to memorize procedural knowledge than taking attention to conceptual knowledge (Lauritzen, 2012). The findings of the study show that believes of students about learning mathematics affect their success in estimation achievement in triangles. So it can be indicated the students expecting procedural knowledge believe they will be successful in that way and they perform weakly than the students focusing on meanings do. It is impossible to have an effective mathematics education without focusing on development of conceptual understanding. In this study, 60 % of the students prefer procedural knowledge (Table 5). Similarly in the reports of NAEP (1993), it is pointed out that about 90% of the students believe there is a procedural process and the process should be remembered. This approach is resulted from only focusing procedural knowledge in lessons. The teachers with teaching styles focusing on providing procedure firstly show the procedures and then solve various exercises in which the same procedures should be followed. The style leads that students see mathematic learning as a lesson of procedures to be memorized rather than a meaning research process. When it takes into attention that making estimation is a skill based on conceptual understanding rather than procedures, it is very essential to direct students to conceptual knowledge.

Conclusion

The results of the study suggest that intrinsically motivated students are statistically significantly more successful in their estimation performance in triangles. For this reason, the activities that improve their intrinsic motivation level are very important to increase their estimation ability. It is known that instructional activities that aim to help students understand concepts are crucial to raise students' intrinsic motivation (Covington and Dray, 2002). Owing to the fact that there were limited items in the questionnaire used in this study, it is necessary to conduct more detailed studies with questionnaires including more items to reach more comprehensive data that will show the relationship between types of motivation and estimation success. According to the findings of this study, it can be said that intrinsically motivated students could integrate their competence in triangles to the ability of estimation.

At the end of the study, it was seen that the students focused on high scores showed lower success in their estimation. It can be said that this kind of students do not consider mathematics as a part of real life but as a procedure irrelevant to real life and that should be learnt to reach external goals. As a result of the exam-oriented education system, students have to pass exams in which mathematics has an important place to be able to reach certain targets. Therefore, families at home and teachers at school force students to be exam-oriented and this pressure may cause students to learn mathematical knowledge and procedures instead of acquiring them by connecting them to their life. This situation brings about people not being able to see how mathematics function in real life and people with lack of ability to use mathematics in their life effectively. Such students may have difficulties solving the problems in which they have to use their estimation ability that is relevant to conceptual learning rather than procedural knowledge. For this reason, it is vital that the questions asked in the exams in schools and in the university entrance exams measure conceptual understanding more.

It draws attention that the estimation average of the students marking the item “I am studying only interesting topics of mathematics” among the items on the sources of motivation is much higher than the others. This result can be considered as expected as the role of “interest” in learning has long been accepted largely in literature. This situation of the students who marked the item “I am studying only interesting topics of mathematics” as their reason to study can be evaluated as meeting the students’ need for autonomy. In this context, it can be said that this choice contributes well to their intrinsic motivation.

Most studies show that in secondary schools, studying induced by intrinsic motivation changes into learning to get higher scores (Eccles, et al., 1993). In this study, extrinsically motivated secondary school students induced to study in order to prove themselves to the other people around, get a good job, or not to get a low remark have much lower estimation ability than the students in the other group. For this reason, it can be recommended that conceptual learning methods and process evaluation techniques be utilized and thus students be kept away from the rivalry environment that blocks their being intrinsically motivated learners. Furthermore, it is thought that utilizing estimation skills in instruction and assessments leads students to acquire conceptual knowledge and thus contributes well to their motivation positively since the students with good conceptual competence enjoy finding various and different solution methods and getting approval and appreciation of others. However, most of the extrinsically motivated students do not value the results of their successful attempts because they do them reluctantly and with a fear of failure.

Another important finding of the study is that the points that the students who expect to get conceptual knowledge are statistically higher than those that the students who expect to get procedural knowledge. If the test had consisted of the questions measuring the knowledge about triangles, the students who prefer procedural knowledge might have been more successful. However, when the need to integrate mathematical knowledge to the estimation ability occurred, the students who were not able to achieve conceptual learning might have difficulties in such a test. For this reason, to be able to grow people with good ability to make use of mathematics in their personal life effectively, conceptual learning should be emphasized more. Since the estimation ability requires conceptual understanding, the activities that deepen and focus on conceptual understanding contribute well to students’ success in estimation positively. However, it is stated that a student who has only conceptual knowledge but cannot do the calculations well does not feel good. Likewise, a student who can only do the calculations well but does not know the meanings does not consider himself as good at mathematics (Lauritzen, 2012).

Ma (1999) states that knowledge levels of teachers affect their teaching strategies. From this point of view, it is clear that there is a relationship between instructional methods and focused knowledge types. For example, it can be observed that in the environment where the teachers are the people who transfer the related knowledge and there is little in-class communication, procedural skills are stressed more and thus they improve (Cobb, 1988). To improve estimation skills, it is necessary to focus on the meanings of the procedures rather than procedures only.

Motivation researchers stress that an education system with focus on daily life increases student motivation, too. It is stated that if during instruction, teachers encourage students to connect whatever is learned to their daily life, this increase the personal interest and enhances meaningful learning in students. Motivation researchers state that instructions connected to students’ daily life increase student attention and thus induce them to try harder to learn

(Krapp, 1999). However, in this study, the estimation success averages of the students who expect knowledge for everyday life are observed much lower than the others. It is thought that this situation may be due to instructions with focus on procedures in an exam-oriented system and with no connection to the conceptual basics and real life and thus students' expectations are not satisfied.

This study was carried out with limited number of items of questionnaire, so it is needed to conduct new studies on the relation between motivation types and estimation achievement in order to get deeper data. Moreover, this study shows that estimation skills in triangles, one of the subjects of geometry, are connected with some important variables like motivation types and conceptual knowledge. There are some important questions that should be answered by future studies like 'How can students' estimation skills in geometry be developed? 'How can it be integrated into curriculum? What are the possible strategies students apply and which factors are they related to?'

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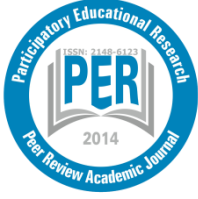
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Experiences of pre-service English teachers gained through community service learning in kindergartens

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Many authors agree that community service learning should be integrated into pre-service teacher education in order to achieve the maximum positive impact on the next generation of teachers. This study aims at inquiring the experiences of pre-service English teachers gained through community service learning. The study is based on qualitative case study design. Qualitative data were collected using participant portfolios from 40 pre-service English teachers in ELT Department who kept portfolios throughout their observations of eleven weeks. The data were analyzed using qualitative content analysis method by coding and creating categories/themes. Results showed that pre-service teachers faced some problems during the process of community service. However, their practices through community service learning in kindergartens helped them gain various experiences which will contribute a lot to their future teaching careers. The evaluative feedback stressed marked improvement in the quality of the student learning and engagement experiences. It is hoped that the experiences of pre-service English teachers engaged in the portfolio development process will help other educators who are implementing portfolios within teacher education programs. The results of this study also provide important information for both policy-makers interested in the reform of pre-service teacher education and practicing teacher educators focused on achieving the goals of pre-service teacher education through the use of community service learning.

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Introduction

Teaching English to Young Learners (TEYL) is a rapidly growing field around the world, and English education is increasingly found at the primary levels. Recent trends in Turkey's educational policy have focused on meeting the challenges of globalization and internationalization. As English has achieved the status of a major international language, the government of Turkey has been actively expanding the teaching of English as an essential part of the school curriculum. Today, English education is a required course for second graders in elementary school. Moreover, there are attempts to change the English teaching policy to require that elementary school students begin their English learning from the first grade onward. One real advantage of having children start learning English at an early age is that they are better equipped to develop English language acquisition. It is also maintained that acquirers who begin exposure to second language during childhood are believed to achieve higher second language proficiency in the long run than those beginning as adults (Krashen et al., 1979; Long, 1990). According to the findings of these studies the area responsible for language learning goes through a furious growth from around age 5 to the onset of puberty.

The EFL curriculum for young learners in Turkey has been renewed and implemented in 2013-2014 school year and this new curriculum, developed by the Ministry of National Education, favors the principles of a constructivist understanding with a learner centered, process oriented and task-based approach using various communicative activities (MoNE, 2013). Given all these efforts to provide young learners with English as early as possible, the main challenge seems to make sure that the instruction they receive is developmentally appropriate, pedagogically sound and culturally responsive (Koller, 2006). In order to meet all these demands, we should be sure that pre-service English teachers learn all the things necessary for being a qualified teacher and gain various experiences which will contribute a lot to their future teaching careers. Pre-service English teachers take some compulsory courses such as Approaches and Methods in ELT, Teaching Technologies and Material Design, Principles and Methods of Teaching, Classroom Management, Teaching Young Learners, School Experience and Teaching Practice, during their four year academic training. The problem is that, they do not have enough chance to apply the things they have learnt. In their third year, pre-service English teachers have a course entitled "Community Service Learning" which is designed to enhance pre-service-teachers' empowerment through their work with community service learning projects like working willingly in public elementary school classrooms and kindergartens. Empowerment in student teaching is characterized by initiative, leadership, assertiveness, creativity, and recognition of one's success (Wade, 1997). Since community service teaching provides such an opportunity for the pre-service teachers, it can also give them a chance to improve their skills in teaching young learners in primary public schools. Within this framework, the present study aims at inquiring the possible problems and difficulties facing pre-service English teachers in teaching English to children, specifically in kindergartens. Thus, the practices of pre-service English teachers during their community service teaching are illustrated in detail in an illustrative case study design.

2. Literature Review

2.1. Teaching Young Learners

Many theorists and practitioners believe that there are some benefits of beginning to learn English at an early age:



- to develop language awareness
- to encourage motivation and interest in language learning
- to learn about other cultures
- to provide more opportunities for English learning at school

It is important to remember that an early start alone will not necessarily improve children's ability to learn English. It is also very important that L2 instruction include language structures that are presented within a context that is meaningful and communicative.

Carol Read (2005) suggests that the seven Rs provide an integrated framework for managing children positively:

- **Relationships** – creating and maintaining a positive relationship with learners is at the heart of establishing a happy learning environment.
- **Rules** – establish a limited number of rules and make sure they are clear, as well as the reasons for having them.
- **Routines** – classroom routines make it clear to everyone what is expected of them and what they should do.
- **Rights and Responsibilities** – although these may not be stated explicitly with very young learners, teachers can model through their own actions which of these they value.
- **Respect** – students who are treated respectfully by the teacher will respond in a similar way to the teacher. If the children feel that the teacher treats them as individuals, they will also respond to the teacher as an individual and not with a collective group mentality.
- **Rewards** – reward systems can be an effective way of reinforcing appropriate behavior e.g. using stars, stickers, points, smiley faces, raffle tickets or marbles in a jar.

Young children are active learners. They are open to new experiences. They are imaginative and explorative. They 'learn by doing', for example through play, movement, and interaction with others. In a similar vein, Scott and Ytreberg (1990) argue that young learners' own understanding comes through hands and eyes and ears, and the physical world is dominant at all times. Using brightly colored visuals, toys, puppets or other objects will work well with young children. Craft activities such as painting, origami and play doughs can be physically satisfying for the young learners. It is also great to use songs, chants and poems in the classroom. A variety of activities with different paces and tempos are necessary since children have a short attention span (Scott & Ytreberg, 2001; Shin, 2006). Role of motivation for young learners in foreign language education has been studied extensively so far (Cameron, 2001; Chambers, 1999). It is a common fact that it is impossible for learners to go on with their learning process effectively if they feel demotivated. Demotivated learners may have poor concentration and low self-esteem. The motto should be learning by enjoying, and the more fun the students have the better they will remember the language learned (Shin, 2006). Children have a set of characteristics that facilitate the learning of another language besides

their mother tongue. These include few inhibitions, low level of anxiety, higher enthusiasm in game-like activities, and higher skills in imitating models and patterns. In this process, the teacher's role is highly demanding. They should adapt their language, teaching techniques and methods, and the emotional, cognitive and physical atmosphere in the classroom according to the children's needs and readiness in order to achieve an effective learning.

There is a wide consensus (Biricik & Özkan, 2012) that teachers should give proper and comprehensible instructions and use the mother tongue to make the statements much clearer to young learners. As these young learners are not proficient even in their mother tongue, we cannot expect them to fully understand the instructions given in the target language. So, it is inevitable for the teacher to use their native language in the classroom.

As young learners enroll in kindergartens in record numbers, educators must continually strive to provide effective, nurturing environments and developmentally appropriate instruction for all learners. This instruction should take into consideration the characteristics of young English language learners, the learning conditions that are most effective for them, and the kinds of instruction that best meet their needs.

2.2. Community Service-Learning in Teacher Education

Community service – learning may be described as both a philosophy of education and an instructional method. As a philosophy of education, service-learning reflects the belief that education should help students develop personally while also enhancing their social responsibility through preparation for active citizenship in a democratic society. As an instructional method, service-learning involves a blending of service activities with the academic curriculum in order to address real community needs while students learn through active engagement and reflection (Cairn & Kielsmeier, 1991).

Community service -learning is also proliferating in teacher education programs throughout Turkey. In Turkey, over 100 teacher education programs offer students service – learning experiences and these programs are interested in developing such opportunities for pre-service teachers. The prospective teachers in these programs typically engage in service-learning by working with children in need through schools and community agencies, assisting teachers and developing service-learning activities for use during student teaching. Educators at all levels report that well-designed and implemented service-learning activities can help address these concerns while simultaneously providing students opportunities for enhancing academic knowledge and skills and personal growth (Root, 1997). Teacher educators cite the following reasons for integrating community service-learning into their courses (Anderson & Guest, 1993):

- To help socialize teachers in the essential moral and civic obligations of teaching, including teaching with care, adapting to the needs of learners with diverse and special needs;
- To enhance pre-service teachers' ability to reflect critically on current educational practices and their own teaching;
- To accelerate the process of learning how to perform a variety of roles needed to meet the needs of students such as counselor, advocate, moral leader, etc.;
- To develop human service oriented teachers who can work effectively in schools with integrated services or other social service settings.



Briefly, community service learning is recognized as having the potential to develop students' academic, cognitive, interpersonal and human relationship skills (Strage, 2004; Closson & Mullins Nelson, 2009). It also affords students opportunities to apply their classroom learning to real-life context, develop an appreciation of the relevance of classroom learning. Indeed, Weglarz and Seybert (2004) found that a major benefit of community service learning is the opportunity for practical application of theory/course content. Community service-learning involves the key elements of community service and intern-ships so both the service providers and the service recipients benefit. These benefits result from a dual focus on the service being provided and the learning that will occur. Educators at all levels report that well-designed and implemented community service-learning activities can help address unmet community needs while simultaneously providing students the opportunity to gain academic knowledge and skills. Wade (1995) noted an increase in pre-service teachers' positive attitudes about community participation, and gains in self-esteem and self-efficacy. Seigel (1995) concluded that teacher education students who completed a community service experience increased their sensitivity to diversity and became more insightful about their own responses to diverse students.

A number of studies have determined that teacher education students have largely positive experiences with community service learning (Anderson & Guest, 1993; Boyle-Baise, 1997; Wade & Yarbrough, 1997). Initial research results, teacher educators and pre-service teachers all suggest that community service-learning can be a worthwhile and powerful learning experience. Within this framework, the present study aims at examining the pre-service teachers' experiences while teaching young learners during their community service learning, specifically in kindergartens in state schools.

3. Method

3.1. Participants

The data for this study is drawn from those 40 students, 14 of whom were male and 26 of whom were female. During the first semester of the 2012-2013 school year, ELT student teachers enrolled at a state university in Izmir, Turkey were required to engage in one form of community service. The minimum requirement for this activity was 30 hours. Students were required to submit reflections on their community service experiences as a portfolio at 4 elementary practice schools determined officially. During a period of 11 weeks they performed their community service. The classes they attended were composed of rather young learners, children at the age of 5.

3.2. Data Collection

Pre-service English teachers were asked to complete a community service learning portfolio which has the following components: the aims and objectives of the activities they prepared for each week, the duration of the activity, materials used for the activity, how they felt before and after the activity, the difficulties they faced during the activity and their reflections about the benefits of community service learning. The guidelines for the personal reflections were also broad, allowing students to reflect on any aspect of the experience that they thought appropriate. Participants were encouraged to write their portfolios weekly and hand them to the researcher on a regular basis. Each participant handed a portfolio of eleven papers to the researcher at the end of the semester.

3.3. Data Analysis

The data were analyzed using qualitative content analysis method by coding and creating categories/themes. Creswell's (2002) strategy was followed for the coding process. A preliminary exploratory analysis was conducted to obtain a general sense of the data and think about the organization of the data. The text was divided into segments of information with codes. In subsequent analyses, these codes were reduced to a few major themes through the process of eliminating redundancies and codes that could not be conveniently categorized. As a strategy for enhancing the validity of the findings (Creswell, 2002), a colleague conducted a thorough review of the study and reported back in writing the strengths and weaknesses of the analysis. In the spirit of authenticity, no corrections were made in the participants' use of grammar or vocabulary. The names used in this article are pseudonyms.

4. Findings

In this present study, two specific core themes and their subthemes, which offered something unique to the research literature, are addressed in the data. The emerging core themes and their subthemes are presented and commented using direct quotations from the participants.

Core theme: Experiences gained through community service learning in terms of teaching young learners

Related to this core theme, four subthemes are presented and commented: lack of concentration and motivation, classroom management (discipline problems) and overcrowded classes, individual differences and insufficient physical conditions.

Subthemes:

Lack of concentration and motivation

A systematic analysis of the journal entries about the comments on lack of concentration and getting bored easily revealed that children have a short attention span. One participant, Emre, shared his experiences in his portfolio and explained how he motivated his students:

As far as I have observed, kids become more motivated when they see the teacher, energetic, jumping, and/or walking around the class. They also like funny teachers. They love making funny noises. Although a bit tiring, I try to be as energetic as possible. Oh! Hard work....

In some cases, especially with Serpil, it proved that the objective to motivate young learners can be achieved pedagogically:

When we use materials such as English cartoons and songs and play simple English games, students get motivated and indulged in the lesson. I think, they are willing and enthusiastic about learning English.

Similarly, Gizem stated:



The world of the imagination is vivid and real to these children, so they move easily in and out of a world where animals talk or activities take place on a magical trip to another world.

Ezgi's comments are also striking:

Because they are very self centered, they do not work well in groups, and they respond best to activities and learning situations relating to their own interests and experiences. Although they have a short attention span, they have great patience for repetition of the same activity or game. Preschoolers respond well to concrete experiences and to large-motor involvement in language learning.

Classroom management (discipline problems) and overcrowded classes

Naturally, the participants were not experienced in classroom management and they found it difficult to cope with discipline problems. Moreover, the classes were overcrowded which made the situation harder for the participants as Esra stated:

I am making remarkable effort to teach English, but unfortunately I cannot sustain silence in such a crowded class.

Some participants tried to find a solution to calm down some naughty students in the class and the activities they planned worked well. Caner described the process:

It is a good idea to always carry an extra "life saving" activity. No matter how wonderful your activities for the day are and how great your expertise is, some days will be rough. In days like this I would take out a bag of play-dough or another tactile activity and postpone my wonderful plans to the next day. That's how it is.

Individual differences

A good deal of portfolio entries was categorized about individual differences, mainly in terms of learning styles and learning strategies. There was a general agreement on inadequacy of teachers to meet the needs resulting from the individual differences. Şule's reflection indicated these differences:

Some learners thrive in a highly social and interactive environment; others feel more comfortable and may do better when they can think and learn alone. Some learners are motivated and empowered by carefully structured, linear tasks and unvarying routines; they may find it annoying and distracting when bulletin boards or visuals are not carefully aligned and the classroom isn't neat and orderly.

Umut's ideas about individual differences also support the same situation:

Other students feel suffocated by so much structure and long for the freedom to solve problems and be creative. These same students enjoy classes in which the teacher keeps them guessing and sometimes makes random leaps from one topic to another. These students don't usually mind a little clutter—it makes them feel at home!

Amazingly, Esra's observations are parallel with her friends' observations:

Many students need a supportive emotional climate in which to learn, and regular assurance that they are valued as people, regardless of their performance. A few students, on the other hand, just want to be left alone to learn—on their own! Some students need to touch, or move, in order to learn. (That's probably true of almost every primary school child.)

In a related manner, Zeki stated:

Some students benefit most from visuals and teachers' gestures when they are learning or reviewing language; others won't feel confident of the information until they see it written out; still others, with poor vision or a brain that processes visual input poorly, don't benefit from either.

Insufficient physical conditions

Most of the pre-service teachers agreed that the physical conditions of the school were not appropriate for kindergarten children. Walls, curtains, desks and board were colorless and toys were not interesting enough.

One pre-service teacher, Özge, complained:

When I entered the class the first day, I was shocked by the size of the class. It was too small. I thought it would be difficult to organize games or such things ... The class was also so dim. It needed some more light, I think.

Zeki also thought in the same way:

My friends and I couldn't concentrate on what we were doing because of the old-fashioned furniture and the depressing atmosphere in the class. If we had the chance, we would have painted all the walls, for instance.

Core theme: Experiences gained through community service learning in terms of teaching methodology

Related to this core theme, six subthemes are presented and commented: gaining confidence, realizing their own deficiencies and self-evaluating themselves, the use of the mother tongue, preparing suitable materials, lack of technology and technical problems and communicating with children and learning about child psychology.

Subthemes:

Gaining confidence

One of the advantages of community service learning was that pre-service teachers gained confidence in their teaching English to young learners.

Zeki, for example, stated:

My community service learning experience was tiring but amazing at the same time. Before that I had thought that I could do nothing with such small children. However, it was not so. Day by day, I discovered the potential inside me and I became more confident. I was relaxed and felt good.



Ozan also supported a similar idea:

Before my experience in this kindergarten, I wasn't aware of my potential. I was afraid and not confident. But now, I know that I learned many things about young learners and can teach them many things.

Realizing their own deficiencies and self-evaluating themselves

Through community service learning, pre-service English teachers realized their own deficiencies and this led to self-evaluating themselves. Community service learning was their only contact with small children and they practiced all the theoretical knowledge they had learned in their courses. They also had the opportunity to observe the classroom teacher in the class. One of the pre-service teachers emphasized the role of the classroom teacher in this process and described how the support she received from the classroom teacher positively influenced her:

The classroom teacher's behavior and the relationship between the teacher and the student affect the student's motivation towards the lesson. Teacher behavior is a motivational tool. I've observed the classroom teacher's behaviors and gained experiences from her. Cooperation with her worked well.

In addition, Serpil pointed out:

The key point is to establish a relationship of mutual trust and respect with learners. This situation may lead to enthusiasm. It seems hard to achieve this. But, I think, I can do it. I need some time...

Simay, also expressed her ideas:

As I studied with young learners, I learned to be patient. Normally, I am impatient and a bit nervous. But these small children taught me to be patient and tolerant. I repeated the same thing maybe four or five times to them till they learn. It is possible that some of the challenges pre-service teachers faced resulted from their being inexperienced about teaching young learners. However, they succeeded in overcoming their deficiencies.

The Use of the Mother Tongue

A systematic analysis of the journal entries about the comments on the use of the mother tongue revealed that the mother tongue gives an opportunity to clarify the meaning and reduces student anxiety. Participants believe that teachers need to tolerate a certain amount of mother tongue, as long as it is accompanied by attempts at producing target language output.

As Emre pointed out:

I used L1 in the classroom as a resource for forwarding the learning process without becoming too reliant on it. I tried to concentrate on building communicative skills. So that, I saved time for the target language actually within students' reach.

Aslı also shares her experiences:

When I realized that the students didn't understand what I said, I quickly made a difficult expression comprehensible by translating it into the mother tongue. To be honest, I used the mother tongue for complicated directions for activities.

Preparing suitable materials

Kindergarten learners are both curious and willing to learn new things. Therefore, English courses for them should not adhere to only books; on the contrary the courses should be enriched by using additional instructional materials. English courses should be supported by songs, real objects, games, cartoons, videos, CDs, etc.

As Derya pointed out:

Teaching English to young learners was really enjoyable, but tiring at the same time. Play, play, play! My first grade students enjoy creating and playing games that reinforce whatever language elements we are working on. Games that involve closing eyes and hiding objects are especially successful.

The pre-service English teachers found it rather difficult at first to prepare suitable instructional materials. However, as they gained experience each week, they found materials to attract young learners' attention.

Lack of technology and technical problems

The portfolio entries by most of the participants repeatedly pointed to the lack of suitable facilities, technologies and materials, as Koray illustrated:

My first technology use with the young learners was an extraordinary moment.....To illustrate simply, when I attempted to turn on the computer it did not work. The CD player was also not working.

In a related manner, Aslı indicated that she had many problems while she was doing the listening activities:

I had prepared various listening activities before I came to the class. However, as I entered the class, the classroom teacher said that the CD player had not been working for weeks. So, all my listening activities were read by me. Oh! What a shame...

Cemre also described the process:

The first day I entered the class I was a bit nervous since it was my first experience with small children. I knew for certain that listening to some songs would be useful and attractive for the children. I had a good Cd in my bag and decided to teach them a lovely song about numbers. As I attempted to turn on the computer I realized that it was not working. What I felt was a cold shower over me...

Almost all of the participants are found to have criticisms against poor technological conditions.

Communicating with children and learning about child psychology

Almost all of the participants believed that learning about child psychology is crucial in teaching young learners. Providing a safe, entertaining and educational environment and making them feel competent and confident while learning English are the key points in keeping them motivated.

Aslı, for example, stated:

There is no distance between me and children. To be honest, I am affectionate to them. They feel comfortable and relaxed. They are not afraid of me. I sit by them I call them with pleasant nicknames.

Another pre-service English teacher, Demet, explained that communication was a very sensitive topic, and echoed Aslı's thoughts:

Children generally seem to love me because I do not get angry. I have established a good rapport with them. They feel themselves secure. They are not afraid while answering questions because they know I will not get angry and scold in case of a wrong answer.

As Filiz illustrated:

They need to feel accepted, liked, part of the group, and to be noticed and smiled at by the teacher. Feeling uncomfortable in class makes them physically sick (tummy ache). They like to move constantly, manipulate three-dimensional things, put things together and take apart, be enchanted by stories.

These narratives suggested that pre-service English teachers had the opportunity to keep in close touch with small children by communicating with them and they enriched their experiences about child psychology.

5. Discussion

For the successful teaching of English in kindergartens, it is essential for the teacher to understand the young learners' characteristics, instincts, and interests in their cognitive, linguistic, and emotional aspects, because this will play a crucial role in how the teacher builds a lesson, how he or she can make sure that the young learners are fully involved in the learning process, how he or she achieves the objectives of a lesson, and how they respond.

More than 90% of the participants strongly agreed that doing activities with English, moving around, having fun, and interacting with others in the classroom enrich the learning process. Young learners tend to have short attention spans and a lot of physical energy. In addition, children are very much linked to their surroundings and are more interested in the physical and the tangible. Getting support from the teacher can facilitate students' English learning and students should study with their own learning styles.

Further, most of the participants supported the idea that children learn English not the same way as they learn their mother tongue. The findings from the participants' beliefs about children's English development appear to be compatible with the literature on children's

second or foreign language learning (Brown, 2000; Moon, 2000; Vale & Feunteun, 2003). For instance, Moon (2000) suggested that physical activities such as playing games, making things, action songs, rhymes, and drama can provide excellent contexts for children to learn English.

In addition, participants believed that it may be helpful to view children's native language as a useful resource for checking understanding. Using English in the classroom can be challenging for pre-service English teachers. For this reason, most of the participants indicated that they used English less than 40% of the time during the lessons.

The majority considered the use of role-playing, games, and multimedia equipment to be essential. Most of the participants said that they focused primarily on spoken English and the use of songs and games. It was also stated that play-based activities resulted into an enjoyable climate with a strong focus on communication and movement.

The participating pre-service English teachers complained about the inadequate and inappropriate materials that were available in the classrooms. There are no locally produced materials for this age group of learners so most of the participants said that they looked for materials on the Internet or from other sources. They produced their own worksheets and exercises. The most common topics that the participating pre-service English teachers worked with were colors, numbers, body parts, food, animals, family members and some simple adjectives such as tall / short, big / small.

The participants reported that when students are asked to learn in a way that makes them uncomfortable, they experience stress. In a classroom where a student's learning style is never included, that student is constantly operating under stress, and learning is likely to be seriously affected. Similarly, when students know that you are not going to get angry, you are supportive and understanding, then the reaction from the young learners will be nice and effective in terms of motivation (Lile, 2002). Most of the participants reflected ideas in this way.

Without exception, the participants indicated that community service learning had been valuable for the development of their teaching skills and confidence. All the themes were evident in the data and the results of the analysis indicated that difficulties facing pre-service English teachers in teaching young learners can be eliminated and experiences gained through community service learning will be precious for them in their teaching careers.

6. Conclusion

In recent years there has been growing interest in offering English to children at younger ages. This trend has also taken hold in Turkey and an increasing number of schools and even some preschools are beginning to offer English at early ages. The outcomes of this exploratory study yielded that teaching English to young learners in kindergartens is very fruitful due to the classroom practices through community service learning. These positive findings corroborated with the previous studies (Breslin et al., 2008). The results of these studies indicate that more emphasis needs to be placed on preparing teachers for the challenges of today's English classrooms. It is hugely important that children's first years of English instruction are positive and successful and teachers play a key role in their pupil's learning. So it is essential that pre-service English teachers are well-trained in teaching young learners and are able to make enough practice under appropriate conditions prepared for them.



In this study it is suggested that this chance can be given to them through community service learning. The participating pre-service teachers complained about the crowdedness of the classes and inadequate and inappropriate materials that were available for young learners in their school. Teachers in the youngest grades must deal with the shortage of teaching materials and spend precious time on finding and creating their own materials. The findings in this study reinforced the importance of 'play' which is considered to be a powerful and amusing learning experience promoting oral communication and interaction (Griva & Sivropoulou, 2009). Yolageldili and Arıkan (2010) state that teaching young learners requires special efforts and includes challenges. Moreover, it was highlighted that the students experienced no uncertainty and anxiety when participating in creative games, due to the positive and playful classroom climate.

Regarding the fact that, there have been limited amount of research studies in teaching English to young learners in Turkey, this study attempted to contribute to the field through examining the difficulties facing pre-service English teachers in teaching young learners and reflecting their experiences gained through community service learning. Community service learning appears to have considerable potential as a method to achieve important goals of teacher education. Initial research results, teacher educators and pre-service teachers all suggest that service learning can be a powerful learning experience.

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