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Message from the Editor-in-Chief

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TOJET welcomes you. TOJET would like to thank you for your online journal interest. The online journal system has been diffused very fast for last seventeen years. We are happy to see that almost more than 600000 educators, teachers, parents, and students from around the world have visited for last seventeen years. It means that TOJET has continued to diffuse new trends in educational technology to all over the world since October, 2002. We hope that the volume 18, issue 1 will also successfully accomplish our global educational technology goal.
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TOJET thanks and appreciate the editorial board who have acted as reviewers for one or more submissions of this issue for their valuable contributions.

TOJET will organize IETC 2019 (International Educational Technology Conference) (www.iet-c.net) on August, 2019 at George Mason University in Fairfax, VA, USA (near Washington DC). This conference is now a well-known educational technology event. It promotes the development and dissemination of theoretical knowledge, conceptual research, and professional knowledge through conference activities. Its focus is to create and disseminate knowledge about educational technology. IETC-2018 conference book has been published at http://www.iet-c.net/pubs

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January 01, 2019
Prof. Dr. Aytekin ISMAN
Sakarya University

Editorial Board

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A Model Proposal Regarding the Effect of Adolescents' Psychological Endurance on Internet Addiction and Intermediary Role of Self-Esteem among Related Variables

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ABSTRACT
This research is conducted in order provide a model proposal for supporting the youth's efficient and productive use of education processes by preventing the misuse of information technologies. In this regard, the main purpose of this research is to reveal the effect of psychological endurance on internet addiction and intermediary role of self-esteem among related variables via a proposed model. Research hypotheses was developed based on the research model: H_1: As much as the psychological endurance increases in adolescents, self-esteem increases. H_2: As much as the psychological endurance increases in adolescents, internet addiction decreases. H_3: Regarding the negative relationship between psychological endurance and internet addiction in adolescents, self-esteem has an intermediary function. In order to test the research model, data of 528 students among 540 students, 288 males and 240 females, from 9^{th}, 10^{th} and 11^{th} grades were analyzed from public high school in Kadıköy district of Istanbul. The research is based on structural equation model. CFA analysis was performed with the software AMOS 21.0 and factor structures were analyzed. According to the results of SEM analysis, the students' perception of Family Support negatively affects the Self-Esteem level ($B=-0.294$, $p<0.05$) and the students' Peer Support perception negatively affects the Self Esteem ($B=-0.259$, $p<0.05$). The dimension which meets all three criteria of Baron and Kenny for intermediation test is the Determination to Struggle. According to the SOBEL test results, Self Esteem has a meaningful intermediary role in the effect of Determination to Struggle dimension on Internet Addiction (SOBEL=1.984, $p<0.05$).

KEYWORDS: Adolescent psychological endurance, self-esteem, internet addiction, information technologies

INTRODUCTION
In the age of information, the idea that information technology is moving people away from oneself and other people has been one of the most emphasized topics of almost every discipline in relation to the fact that the involved technologies bring about different problems (Bengshir,1996; Castells, 2000; Akolaş, 2004) . Especially social sciences such as psychology, sociology and human science such as medicine, draw attention to the fact that information technologies make a difference in the interaction among people, can cause health problems related to all areas of life from education to business life (Yücel, 2002; Kocacık, 2003; Koehler, Mishra, Atasoy, 2007; Cain, 2013). The main question that needs to be answered in order to solve such problems probably lies in why people need information technologies. In other words, does information technologies produce problems? Or does it lie in the fact that mankind cannot solve the meaning and value of existence by integrating with others through an ontological perspective. The existence of the human being has depended on the "technology" produced since the ancient times and the source of technology is "information". Knowledge is the product of the mind, which is the most basic function of mankind. The source of everything man produces is based on knowledge and the counterpart of this knowledge in everyday life is based on technology (Isman, 2001). Since Neanderthals, humans have met their needs through "knowledge" in the world that has changed with their own knowledge (Özbek, 2000). What humans need most at the point of 400 thousand years of adventure is a mechanism that can help force and overcome the limits of their capacity along with a structure similar to their own thinking system; a mechanism that will process, organize, store the data of the external world like them and use it in a suitable manner when necessary; a mechanism that exists with the knowledge as life itself (Solso, Maclin, Maclin, 2007), in other words, information technologies. Thus, a multi-factor dynamic produced by human beings and affecting them.

Information technologies are the tools that are required by people in an information society to continue their lives; just like the stone technology created in ancient times for the survival of human beings. Studies emphasizing on the features of information societies which are the third transformation stage of the history of humanity draw attention to the changes that can be seen in every field of life in the world which is turning into a global village (Castells,2013). due to the easy access to data; Such as having unlimited possibilities to differentiate professional competences in addition to attaching importance to the freedom of thought and expression in decision making mechanisms, intellectual capital and service industry in professional life,

supporting personal development of each individual having different competences and interests, forming new profession and business fields by the fact that individuals acquiring values by means of knowledge (Scardamalia, Bereiter,1994). In other words, the information technologies function as a mediator between human and life.
The answer of this question maybe lies in the human nature. Although human, who is a member of the information society, is defined with different notions such as individuality and autonomy, human being is a social entity. The process expressed as socialization refers to the ability to adapt to life by acquiring the qualifications defined by the society. This process requires an individual to be responsible for his or her self-development as an autonomous person and to develop himself or herself by making choices, as well as having an interaction with other people. In other words, the need of autonomy and the need of socialization are the complementary characteristics of a human being.

In addition, sociological opinions in a criticising manner indicate that information technologies cause an increase in terms of differences among social classes day by day and revealing different problems. When we consider Maslow's hierarchy of needs and life quality of World Health Organization in terms of objective and subjective criteria (Sirgy,1986), the definitions of identity, needs and values among the different classes of a society differentiate. Therefore, the reasons of each group for taking advantages of the tools of the information society and using these tools may vary (Castells,1997) . It is seen that individuals in low sociocultural classes are aware of social changes, but they do not have the opportunities of individuals in high socio-economic cultural classes. For the individuals believing that social differentiation and social progress do not make any differences in their own life or having difficulties in keeping up with such changes due to their existing sources, the new social order brings many thoughts and feelings such as distrust, valuelessness, exclusion and failure for them. While the survival of the group benefiting less from the relevant areas of life such social, legal and educational sources and of the group having difficulties in competing with the developing and changing members of the society gets more difficult, the information society offers some opportunities by creating solutions with different means of information technologies bringing this society into an existence (Leung, Lee, 2005; Wan, Chiou, 2006; Raacke, Bonds-Raacke, 2008; Lichtenstein, Christiansen, Elklit, Bilenberg, and Støving, 2014). For instance, meeting and chatting with different people, making himself/herself recognizable (Duran, Özkul, 2015) or gaining information about lives of others, having fun and playing games. At this point, it cannot be ignored that the main purpose of information technologies is to develop systems (Deperlioğlu, Köse, 2010; Baltacı, 2011) which could meet different needs of people; different use of these systems is related with how people and social classes are affected by political, economic, sociological and educational dynamics of society. On the other hand, life satisfaction of individuals thinking that their competencies regarding the basic areas of life such as education, healthcare, social activities and career is different compared to the competencies of the other members of a society and evaluating their lives accordingly becomes different. As their life satisfaction differs, their feelings of hope for the future will decrease. The relevant literature has stated that there is a positive relation among life quality, life satisfaction and feeling of hope. In other words, the life quality and life satisfaction decrease whereas the feeling of hopelessness about the future increases. This case effects the mental health of an individual and direct them to have unhealthy or problematical behaviours (Diener, Lucas, 2000). Individuals facing problems at the basic needs level of Maslow's hierarchy of needs use these stated technologies illegally in order to meet such needs. This sub-discipline of the law within the scope of information technology law leads to an increase on illegal acts through information technologies in an information society and is discussed as aggravated fraud (Broadhurst, Choo, 2011; Gercke, 2011; Koçak, Dandin, 2017). For example, it is noted that frauds performed using different identities at a global scale by means of information technologies is high because of poverty and starvation in Nigeria. Moreover, it is known that this situation poses a threat due to the inadequacy of the laws on information technologies in Nigeria (Adesina, 2017). For individuals who have problems in fulfilling their needs to be loved and the sense of belonging or who are able to meet them in different developing periods of life, the means of the information society may be used for different purposes; It is possible for those people to satisfy their needs for the feelings of love, respect and belonging through a virtual identity which they think that it could be accepted by the community (Selfhout, Branje, Delsing, Bogt, Meeus, 2009; Özmen, Aküzün, Sünkür, 2012) Moreover, being able to be away from their actual problems in different applications may ease the feeling of being unsolved. This process could also be effective in terms of developing behaviours as an addiction (Weinstein, Dorani, Elhadif,… and Dannon, 2015; Liang, Zhou, Yuan, Shao, Bian, 2016). Furthermore, not being able to meet their basic needs like others do with their efforts in real life (which they can testify with technology) (Dedeoğlu,2004; Karslıoğlu,2014) and the gradual decrease on their beliefs that they are safe and will be supported and protected by others lead to an increase in their experiences which could not be acquired by their competencies of love and value. This results in spending more time in such platforms supported by stated technologies where they feel better (Young, Rogers, 1998). Therefore, the more time they spend, the more they get away from the reality. They also stay away from the benefits and effectiveness of their responsibilities for real life (Ni, Yan, Chen, Liu, 2009). The time spent in such environments where they relax and feel good to be away from such problems increase.

When the behavioural characteristics of the members of the upper socioeconomic class of the society are examined, it can be seen that their needs and definitions regarding life differ but their awareness that the information society is at the same time an environment of an increasing competition makes (Castells, 2011) them see it as an important problem to be able to maintain their current conditions. Members of this group also need a sense of safety that the current conditions will not change and can go even better. They need to be loved under all circumstances and to receive a feedback from their groups that will satisfy their feelings of belonging and achievement. The schemes regarding the knowledge and the definition of competency differentiate continually may increase their need to be online (Carlbring, Maurin,Törngren, Linna, ...and Andersson, 2011). This group considered to have more responsibilities in social development and change, can also become estranged to the real life due to the definitions of need and deprivations gradually increasing in the world he or she creates using information technologies (Coulson, 2005; Leung, 2006; Barker, 2009).

As is seen, although the justifications for using information technologies and the practices preferred depending on these reasons are different, the new behaviors that people have developed to adapt to the social differentiation can cause them to face new problems that need to be solved rather than supporting their adaptation. In other words, the problems in terms of the basic needs of the human being in the historical development process are only changing in terms of its form. While people experience similar problems with the dynamics of the period they live in and they try to produce solutions with the methods and tools of that period. This process has also occurred in the members of the information society whereas making it obligatory to consider a new phenomenon explaining the effect of the way the information technologies are used on the individual's life, that is, the "Internet addiction disorder" in the addiction's category of psychological disorders (Young, 1998; Griffiths, 2000; Beard, Wolf, 2001; Ginige, 2017). The Internet addiction behavioral disorder was first used as a concept by psychiatrist Ivan Goldberg in 1995 after being studied by the information technologies and other disciplines with its different dimensions as well as the literature on psychological disorders. And it was with the studies of psychologist Kimberly S. Young that it drew attention as a phenomenon that affects people's lives. The process starting with Young's realizing that Internet users had the behavioral characteristics in the diagnostic criteria of alcohol and substance abuse behavioral disorder started to be discussed within the scope of impulse control disorders as a result of the serious endeavor shown (Young, 2004; Byun, Ruffini, Mills, and Blanton, 2009). Even though Young pioneered the research in this field as well as the studies regarding the definition, Diagnostic and Statistical Manual of Mental Disorders (DSM V) does not include diagnostic criteria for the Internet addiction behavior disorder. In addition, some researchers appreciate the importance of Young's studies and his leadership in making the phenomenon an attention-grabbing one whereas they point out the limitations of her studies and even indicate that his views in his article "Evolution of Internet Addiction" include an incomplete or wrong evaluation that doesn't pay regard to the cultural dynamics of the rest of the world (Griffiths, Kuss, Billieux, Pontes, 2016). The findings of the study show that the problem has multidimensional dynamics as the other addiction problems have (Cash, Rae, Steel, Winkler, 2012). When the relevant literature is reviewed, it is seen that there are increasingly more solution-seeking for the problem (Chakraborty, Basu, Kumar, 2010; Young, 2011; King, Delfabbro,… and Sakuma, 2017) which changes its shape and makes its effect felt more intensely with each new application of the information technologies despite the ongoing discussions about whether it is the specific diagnosis or the determination of the behavioral criteria that is important (Musetti, Cattivelli, Giacobbi, ... and Castelnuovo, 2016). Another remarkable emphasis of the researches is that the problematic use of the Internet is becoming widespread among adolescents (12 to 17 years) and young adults (18 to 29 years) due to the fact that they access the Internet more easily compared to the other age groups (Ko, Yen, Yen, Lin,Yang, 2007).

These age groups are the target mass of the education, which are among the priority areas in the societies' investments related to information technologies. In other words, societies prioritize education while making investments related to the information technologies in order to raise the qualified individuals of the information society because education is both the source and the solution of the problems in a society. A competent human model providing the continuation of societies, understanding the gist of knowledge, and centralizing learning in life can be realized through an education process supported by information and information technologies (Isman, Çaglar, Dabaj, Ersözlü, 2005). Moreover, the young in adolescence period when an individual decides on what kind of a person to become, covering the middle school and high school placed between the childhood and adulthood have a critical importance in terms of developmental aspects as well as being the adult human models of the future. Being able to understand and feel the meaning of education internally depends on the social and emotional characteristics of the young. In other words, for young people to become the qualified workforce of the information society, as ... says, their belief in education being the art of changing one's own destiny and their hopes and efforts in life should be able to keep existing under any circumstances. Whether young people can manage a process effectively in case of any difficulties of life depends on their psychological endurance or resilience. These young people, who have the qualifications to control the factors that can affect their

development when facing the challenges, difficulties and unpredictable dynamics of life have protective factors that can preserve their belief of knowledge and information generation's ability (Isman, Gungoren, 2013) to make a difference in their own lives as well as on other members of their society (Brassai, Piko, Steger, 2011). These factors are in relation to familial and environmental sources. In addition, psychologically enduring young people can differentiate their academic successes by using information production and sharing tools effectively and efficiently and being aware of their educational goals with their competencies such as high self-esteem, being a fighter, and capability of managing personal relationships (Caplan, 2002; Valkenburg, Peter, Schouten, 2006; Kim, La Rose, Peng, 2009; Cardak; 2013).

From these perspectives, the aim of the study was to reveal the mediating role of self-respect and the effect of the psychological endurance in the use of information technologies outside of its purpose in order to contribute to the achievement of the educational objectives of the information society. In this context, the main aim of this research is to put forth the effect of psychological endurance in adolescents on internet addiction behavior and the mediating role of self-esteem among related variables by using a proposed model.

Purpose of the Research

The main purpose of this research is to present the effect of psychological endurance on internet addiction behavior and intermediary role of self-esteem among related variables with a proposed model. Accordingly, the model proposal of this research is as shown in Figure 1.

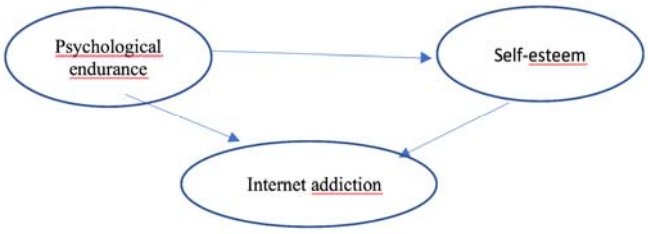

Figure 1. Research model

Research hypotheses developed based on the research model:

H_1: The more psychological endurance increases in adolescents; the more self-esteem increases.

H_2: As much as the psychological endurance increases in adolescents, internet addiction decreases.

H_3: Self-esteem has an intermediary function in the negative relationship between psychological endurance and internet addiction in adolescents.

METHOD

This research has been conducted based on the structural equation modeling. It is used for explaining and interpreting complex relationship models put forward by researchers. As comprehensive statistical techniques, structural equation models test the conformity of the relationship between observable and unobservable variables with the research model. In addition to revealing the relationship between theoretical structures and variables, the model can help acquiring different models which are effective in understanding the casual relationship between observable and unobservable variables in common studies of various fields of science such as information technologies-psychology, organizational administration-psychology, education-psychology etc. Path Analysis Method is frequently used in order to show the relationships in structural equation models. In Path Analysis, regression and correlation analysis coefficients are used for modeling the relationships between observable variables (Raykov, Marcoulides, 2006; Karagöz, 2016).

Study Group of the Research

The research was conducted in 2015-2016 academic year in randomly selected public high schools in Kadikoy district of Istanbul. The study was composed of randomly selected students from the 9^{th}, 10^{th} and 11^{th} grades of these schools with the 25.04.2016 dated and 59090411-44-E.4612197 numbered institutional approval of Istanbul Governorate Provincial Directorate of National Education. Data of … male students and … female students among the … students participated in the research were analyzed. 12^{th} grade students were excluded from the study due to their preparations for higher education examination.

Data Collection Tools

Adolescent Social Endurance Scale

The scale developed by Bulut, Doğan and Altındağ (2013) is prepared as a four-point-likert-scale comprising of six dimensions of family support, peer support, school support, adaptation, determination to struggle and empathy. As a result of construct validated exploratory factor analysis of the scale, 29 items explaining 57% of the scale's total variance have been found. Scale's overnight study was conducted by using scales of Problem-solving inventory, Beck Hopelessness and Focus of control. Correlation coefficients obtained in relation to the related scales were found by problem solving inventory -.47, Beck hopelessness scale -.61, and focus of control scale -.46. During reliability studies, Cronbach alpha internal consistency coefficient was found .87 while alpha values of subscales were found to vary between .61 and .89. The retest reliability coefficient of the scale was found to .87 and the relationship was found to be changing between .59 and .81 as a result of total item correlation analysis. In line with the obtained results, it is stated that Adolescent Psychological Endurance scale is a valid and reliable scale in educational and psychological studies on adolescents.

Self-Esteem Scale:

In order to evaluate the self-esteem of student sample group of the research, Rosenberg Self-Esteem Scale developed by Morris Rosenberg (1963) and adapted to Turkish by Korkmaz and Uysal (1996) was used. The scale comprises of 63 multiple-choice items and 12 sub dimensions: self-esteem, concept of self, trust to people, sensitivity to criticism, depressive emotions, being fantasist, psychosomatic information, feeling threat in interpersonal relations, level of attending to arguments, parental attention, relations with father and psychic isolation. Each correct answer in line with the answer key related to dimensions other than the self-esteem dimension gets 1 point. The scale's reliability coefficient of self-esteem subfield (for 10 items) was calculated according to Gutman formulation and retest reliability was found as .93. It was noted that internal consistency reliability coefficient over the scale's total 63 items in 12 sub dimensions varied between .07 and .70. In this study, Rosenberg Self-Esteem scale's self-esteem sub dimension comprising of 10 questions has been used.

Computer Addiction Scale

Computer addiction scale developed by Ayas, Çakır and Horzum (2011) has two factors as game and internet addiction. Game addiction factor has 26 while internet addiction factor has 28 questions. Load rating in the scale's internet addiction factor varies between .512-795 and explains 29.49% of the scale's total variance. Load rating in the scale's game addiction factor changes between 424-.788 and explains 19.13% of the scale's variance. Internet addiction factor group has been used as a data collections tool for the sample group of this study.

Confirmatory Factor Analysis of the Scale

Confirmatory factor analysis (CFA), is an analysis of how well the factors (latent variables) that are generated from many variables supported with a theoretical basis comply with actual data. In other words, the CFA aims to examine how well a predefined or designed structure is validated by collected data. In the exploratory factor analysis, while the factor structure of the data is determined on the basis of factor loads without a certain pre-expectation or hypothesis, the CFA is based on a test of certain predictions where certain variables predominate over predetermined factors on the basis of a theory (Sümer, 2000).

In order to determine the adequacy of the model tested in CFA, a large number of compliance indexes are used. Due to the strengths and weaknesses compared to each other in the evaluation of the fit indexes between the theoretical model and the actual data, it is recommended to use a number of fit index values to put forth the consistency of the model. The most commonly used ones are; (Cole, 1987; Sümer, 2000) Chi-Square Goodness, Goodness Fit Index (GFI), Adjusted Goodness Fit Index (AGFI), The Comparative Fit Index (CFI) Normed Fit Index (NFI), Root-Mean-Square Error (RMR or RMSE), Root Mean Square Error of Approximation (RMSEA). In the study, DFA analysis was performed using AMOS 21.0 program and factor structures were examined.

Table 1: Fit Indexes of the Scales

Acceptable Fit Indexes	Adolescent Social Support	Self-Respect	Internet Addiction
$\chi 2/sd$ <5	2.57	4.19	3.57
GFI >0.90	0.90	0.96	0.93
AGFI >0.90	0.87	0.92	0.80
CFI >0.90	0.89	0.95	0.88
RMSEA <0.08	0.06	0.08	0.07
RMR <0.08	0.06	0.04	0.07

According to DFA result; it has been seen that fit indexes in Adolescent Social Support, Self-Respect and Internet Addiction scales have almost been ensured.

FINDINGS

In this section, there is the information on the method of information gathering form prepared by the researcher and demographic characteristics of the sample group students, and results of structural equation model analysis.

3.1 Finding of demographic characteristics of the students forming the sample group 30.3% of the students participating in the research were in the 9th grade, 46.6% were in the 10th grade and 23.1% were in the 11th grade (See Table 2).

Table 2. Demographic Characteristics of Students

Gender	F	%	Grade	f	%	Age	f	%
Female	240	45.5	9th grade	160	30.3	14	88	16.7
Male	288	54.5	10th grade	246	46.6	15	120	22.7
Total	528	100.0	11th grade	122	23.1	16	207	39.2
			Total	528	100	17	113	21.4
						Total	528	100.00

During the researches, according to the statements of the students regarding the data obtained from their school success, while clear majority of the students indicated their success as good (43.2%) and not bad (42.4%), the distribution between the ones describing it as very good (6.6%) and bad (7.2%) are close to each other. The distribution of students who indicated their school success as very bad among the sample group is 6% (See Table 3).

Table3: School Success of Students

	Very Bad		Bad		Average		Good		Very good		Total	
	f	%	f	%	f	%	f	%	f	%	f	%
School success	3	.6	38	7.2	224	42.4	228	43.2	35	6.6	528	100.0

Findings of level of education of the parents of the students forming the sample group is given Table 4.

Table 4: Level of Education of Parents of the Students

Level of education	No education		Primary school		Secondary school		High School		University		Total	
	f	%	f	%	f	%	F	%	f	%	f	%
Mother	13	2.5	145	27.5	118	22.3	166	31.8	86	16.3	528	100.0
Father	5	0.9	92	17.4	133	25.2	191	36.2	107	20.3	528	100.0

Findings of working status of the parents of the students forming the sample group is given Table 5.

Table 5: Working Status of Parents of the Students

Working status	Unemployment		Housewife		Retired		Works part-time		Works full-time		Total	
	f	%	f	%	f	%	F	%	f	%	f	%
Mother	-	-	312	59.1	22	4.2	39	7.4	155	29.4	528	100.0
Father	18	3.4	-	-	53	10.0	39	7.4	418	79.2	528	100.0

3.2 Findings of the Analysis of Structural Equation Model (SEM) Performed to Test the Proposed Model

The following model was tested by SEM analysis in the study and the significant effects among the results were presented on the figure

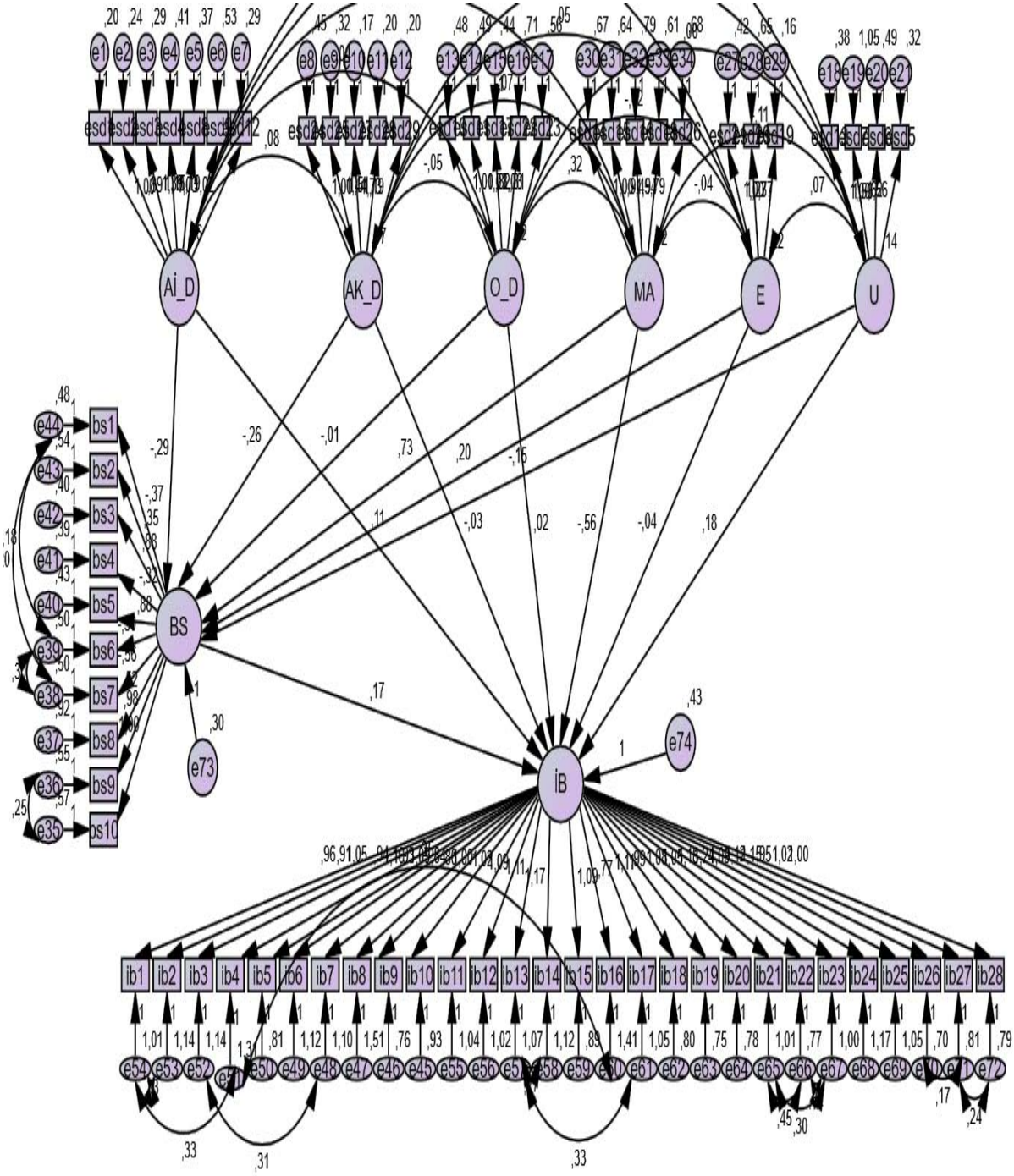

Figure 2: Path Diagram for SEM Analysis

According to the SEM result; it is seen that the fit index of the established model is nearly ensured.

Table 6: SEM Fit Indexes

Acceptable Fit Indexes	SEM
$\chi 2/sd$ <5	2.00
GFI >0.90	0.80
AGFI >0.90	0.88
CFI >0.90	0.86
RMSEA <0.08	0.04
RMR <0.08	0.07

Students' Perception of Family Support affects Self-Esteem level negatively (B=-0,294, p<0.05). Students' Perception of Peer Support affects self-esteem level negatively (B= -0.259, p<0.05).

Table 7: Regression Coefficients Between Variables

Dependent V.	Independent V.	Estimation	sh.	p	Status
Self-Esteem	Family Support	-0.294	0.080	0.000*	Accepted
Self-Esteem	Peer Support	-0.259	0.097	0.008*	Accepted
Self-Esteem	School support	-0.011	0.070	0.871	Rejected
Self-Esteem	Struggling Determination	0.729	0.106	0.000*	Accepted
Self-Esteem	Empathy	0.196	0.097	0.044*	Accepted
Self-Esteem	Adaptation	-0.147	0.157	0.350	Rejected
Internet Addiction	Self-Esteem	0.170	0.082	0.037*	Accepted
Internet Addiction	Family support	0.114	0.082	0.164	Rejected
Internet Addiction	Peer support	-0.028	0.096	0.773	Rejected
Internet Addiction	School support	0.018	0.069	0.795	Rejected
Internet Addiction	Struggling Determination	-0.564	0.131	0.000*	Accepted
Internet Addiction	Empathy	-0.039	0.097	0.690	Rejected
Internet Addiction	Adaptation	0.182	0.156	0.243	Rejected

*p<significance effect, p>no significance effect

Conditions in the Mediation Test
According to Baron and Kenny model;

1. There should be a statistically significant effect between the dependent variable and the independent variable.
2. A statistically significant effect should also exist between the independent variable and the mediator variable.
3. Mediator variable should have a statistically significant effect on the dependent variable (when used in the model with independent variable).
4. The coefficient of the independent variable should be greater (as an absolute value) in the model having an independent variable than the coefficient of independent variable in the model, where the independent variable and the mediator variables are available. However, this could not be enough, and the significance of these coefficient decreases should be tested with the SOBEL test.

For the mediation test, Struggling Determination dimension ensures 3 of the Baron and Kenny criteria. According to the SOBEL test results; Self Respect is a significant mediator in effect of Struggling Determination on Internet Addiction (SOBEL=1.984, p<0.05).

DISCUSSION

The main purpose of this study is to present the effect of psychological endurance and intermediary role of self-esteem among related variables through a proposed model in regard to internet addiction behavior being studied under the category of unhealthy addiction behavior emerging as a result of misuse of information technologies. In model which shows the effect of psychological endurance characteristics of adolescents on internet addiction through proposed model, according to SEM Structural Equation Model analysis results, it is found out that "Determination to Struggle" dimension as one of the adolescent psychological endurance characteristics is the factor effecting internet addiction. Furthermore, significant intermediary effect of self-esteem was seen in the influence of dimension of "determination to struggle" on internet addiction. According to the results of the analysis, a negative relationship was found between "Family Support" and "Peer Support" dimensions of adolescent social endurance and self-esteem.

According to the views and findings related to researches on excessive use of information technologies which threatens psychological health, the person's psychological characteristics and mental health along with insufficiency of environmental sources may cause unhealthy excessive use. The researches emphasizing the

psychological characteristics, while multi-dimensionally; from neurobiological factors (Jang, Hwang, Choi, 2008; Hou, Jia, Hu, Fan, Sun, Sun, Zhang, 2012; Brand,Young, Laier, 2014) to personal characteristics, from gender characteristics to life expectancies; studying excessive use habits of healthy and unhealthy people are also investigating the meaning of communication technologies applications supporting the excessive use in both groups for these individuals (Chak, Leung, 2004; Coulson, 2005; Morahan-Martin, 2005;Yellowlees, Marks, 2007; Shaw, Black, 2008).. In other words, it is mentioned that the applications on internet are not attractive and behavior reinforcer on the same levels for each individual. Especially while healthy and unhealthy use of internet may vary according to many factors like personal characteristics, mental health, self-esteem, social class, life expectancy and goals, preferred applications and time spent also differentiate (La Rose, Eastin, 2004; Tran, Hinh, Nguyen, ... and Ho, 2017).

Findings of the results of SEM analysis, being one of the internal factors of adolescent psychological endurance, the dimension of determination to struggle, being the factor affecting internet addiction have revealed that personal characteristics are effective on reasons of using communication technologies. Despite the differences in living conditions; the confidence, determination and tenacity on the resolvability of these somehow, show that they are effective on the use of technology in line with the purpose (Niemz, Griffiths, Banyard, 2005; Pontes, Szabo, Griffiths, 2015; Wisniewski, Jia, Wang, Zheng, ... and Carroll, 2015).

In all periods of life, existence of supportive sources makes people healthy and resilient. Although supportive sources required may change depending on the development steps, the significance of their existence does not show any changes. Feeling that there will be support or there are the sources to solve it while facing problems, being prepared and feeling powerful when having trouble, helps protecting the mental health. The positive change in behaviors created by power to struggle with difficulties with the existence of individual and environmental sources supporting psychological health has been explained by concepts such as “psychological resilience,” “psychological endurance,” “resilience” since the end of 90s. (Ryff, Singer, 2003). Psychological endurance is addressed in literature in two dimensions as being able to gather yourself up and to adapt under difficult conditions or the processes supporting the generation of these abilities. As for the factors protecting psychological health and endurance, while one dimension is related to the person’s own characteristics, the other dimension is related to the existence of the person (Haggerty, Sherrod, Garmezy, Rutter,1996; Davey, Eaker, Walters, 2003). While external protective factors put emphasis on the meaning and quality of the sources related to family, peer and school environment (Crosnoe, Elder Jr, 2004); internal factors are effective on formation of subsequent experiences as determination to struggle, empathy and feeling of hope, which are developed related to life experiences. When the literature is reviewed regarding the positive psychology, it is observed that psychological endurance is related to many characteristics such as optimism, subjective wellness, hope, creativity, belief (Neff, McGehee, 2010). Related literature emphasizes that power to struggle is related to competence perception and belief based on previous experiences. It is noted that the individual’s dynamic competence perception and belief on capability to do something, to overcome a difficulty, enables them to be successful in education and working life and is a significant supportive factor in reaching goals (Bandura, 2005). Despite the fact that conceptual terminology is used in the perspective of positive psychology thought, it is indicated that the content of the concepts bears the traces of many existentialist, cognitive thoughts. When we evaluate the dimension of determination to struggle related to adolescent psychological endurance in terms of Hierarchy of Needs Theory (Maslow’s theory, even though supported by experimental (empirical) researches in limited levels, it has been one of the reference sources in terms of motivational procedures of fields such as education, organizational behaviour, working psychology, medicine, psychotherapy) (Schultz, Schultz, 2007, 697), it is possible to express that the individuals with high determination to struggle and positive self-esteem can postpone their needs in lower levels for the sake of reaching their upper-level-needs. It has been seen that the support of adolescents’ determination and efforts to struggle related to psychological endurance lets them believe that they have the competence to overcome difficulties by positively affecting their perceived self-values (Glynn, Aultman, Owens, 2005).

The researches related to the theory state that characteristics; self-value, self-confidence and competence feeling; of the individuals with high self-esteem differs from that of with no self-esteem (Pajares, Schunk, 2002). Related to Maslow’s hierarchy of needs, Victor E. Frankl, the representative of Logotherapy, mentions that “it is necessary to distinguish between the needs in lower levels and the needs in higher levels”. In words of Frankl, it is necessary to be able to determine whether each of the needs or goals is a means or ends. At this point, he has noted that the importance of an individual with unfulfilled basic needs, turning towards his higher-level-needs, in other words, search for a meaning, in order to be able to continue his or her living (Park, Park, Peterson, 2010). Regarding his three-year-life in concentration camps in Auschwitz and Dachau, Frankl, “if we accepted all else equal, the ones with higher chance to live (survive) in the camp were the ones who turned towards the future (to the purpose waiting for them in the future, to a human-being, to a meaning to be realized by them in the future)”

meaning that the meaning and goal of life is not a sufficient condition but a necessary condition to live. Therefore, determination to struggle is related to the questions of for what or for whom (Frankl, 1999, p. 15-33). Gary Kasporav's match in New York City in 1997 is an interesting example regarding the importance of determination to struggle for humans. Kasporav was 34 and had kept his title of world champion for 12 years. Although he won the first game of the six-game-match against his competitor whom he won against with a landslide one year ago the same way, it has been observed that Kasporav began to react differently when the match restarted. During the second match, the change in Kasparov's behavior changing with the competitor's moves was astonishing not only for the followers on internet and TV but also for chess grandmasters. After a short while when the game restarted on Monday, following a one-day-break, Kasporav stood up and declared that he withdraws from the game and the match after 19 moves. Kasporav explained the situation with the words "I lost my warrior spirit." after the match (Schultz and Shultz, 2007, p.693). The statement of the world-renowned chess grandmaster is a significant example to support the literature. In the light of these knowledge, the finding on intermediary role of psychological endurance, determination to struggle and self-esteem can be supported by the relevant literature.

In line with the obtained results, the research hypothesis of as much as the psychological endurance increases in adolescents, self-esteem increases, is supported by determination to struggle dimension of adolescent psychological endurance, whereas it has been found out that the other dimensions, family support and peer support, negatively affects self-esteem. No significant relationship has been found between the other dimensions of adolescent psychological endurance; school support, empathy, adaptation; and self-esteem. In this regard, it has been seen that the support of adolescents' determination and efforts to struggle related to psychological endurance lets them believe that they have the competence to overcome difficulties by positively affecting their perceived self-values. Studying the literature on psychology, education and developmental psychology, it has been seen that the adolescent period is stated as the period when conflict between parent and child is the most intense. Parental manners in terms of specific features of the period and family's specific socioeconomic characteristics may create a difference regarding the intensity of the conflicts related to the process (Stoeber, Rambow, 2007). Moreover, while it is emphasized that parental manners may change depending on the education level and socioeconomic factors, it is also stated that democratic parental attitude positively affects development of the youth. Literature emphasizes that family has not lost its significance despite its being perceived as a less used reference source in adolescent period. Adolescence period's characteristic which is described as distancing from the parent and getting close to peers, allows them to experience the feelings of acceptance, being valued along with the sense of belonging (Collins, Brett 2004). Regarding the finding that family support negatively affects self-esteem, it has been thought that it might be due to the parent-youth relationship's quality related to communication and interaction as per the era, as well as due to the sample group's characteristics related to socio-economic cultural features of the families. The studies indicate that the differentiation in parent's level of education may not only have a positive impact on determination of future goals, but it may also create a psychological pressure on the youth. On the other hand, peers and school has a particular importance for the youth for the development through others. Peer relations for the youth, in parallel to emotional and social maturation, gives information on how the relations may be in the adulthood stage (Steinberg, Morris, 2001). On the other hand, school environment plays a supportive role in education quality and development of thought and belief of abilities. The youth's having the thought of being capable of preparing to life with the school sources and being able to gain necessary materials may ensure him to protect the feeling of hope, one of the internal sources (Brown, 2004). Regarding the negative relationship between peer support and self-esteem; while it makes us think that the youth is having difficulties in their friendship relations (Beeri, Lev-Wiesel, 2012) , it draws attention to psychological and physical violence in children's and youth's friendship relations which is called as peer victimization in related literature. Moreover, according to the research findings related to internet addiction, it is emphasized that the problematic use of internet develops with the lack of emotional, social support and behaviors such as love, help, understanding, acceptance, value, appreciation etc. (Chou, Hsiao, 2000; Zhang, Spinrad, Eisenberg, Luo, Wang, 2017; Stavropoulos, Gomez, Beard, Liew, Griffiths, 2017) which are accepted as the proof of the existence of these supports.

CONCLUSIONS

Structural equation model analysis results of the research, trying to present the effect of psychological endurance on internet addiction behavioral disorder and intermediary role of self-esteem among related variables through proposed model, and the hypotheses created in line with the research model, are supported by the determination to struggle dimension of adolescent psychological endurance. According to the analysis results, there is a negative relationship between determination to struggle dimension of adolescent psychological endurance and internet addiction, and a positive relationship to self-esteem. Self-esteem has an intermediary function in the effect of determination to struggle dimension of adolescent psychological endurance on internet addiction.

RECOMENDATIONS

Information society, while trying to diversify qualities of the tools produced, naming the information technologies, and that of psychological health protection factors; it also looks for alternative ways to solve the problems created by the insufficiency of these factors. Among these problems, unhealthy excessive use of technology as a behavior threatening psychological health, affects many daily activities from education to work. Additionally, the solution to this problem also underlies efficient and productive use of information technologies, one of the most important tools of information society, in education. The reason is the fact that education means the future and gets its power from the past and present. As the existentialist philosopher, Kierkegaard said, "life can only be lived in the future, but understood in the past". Thereby, education is the source of solutions as much as it is the source of problems in a society. A competent human model providing the continuation of societies, understanding the gist of knowledge, and centralizing learning in life can be realized through an education process supported by information and information technologies. The awareness on information societies should be created among each member of the society, that the means it produced not being for social class discrimination but for social development and to provide equality of opportunities. Thus, not only the determination to struggle of the youth but also of all individuals from all ages can be supported.

REFERENCES

Adesina, O. S. (2017). Cybercrime and poverty in Nigeria. *Canadian Social Science,* 13(4), 19-29.

Akolaş, D. A. (2004). Bilişim sistemleri ve bilişim teknolojisinin küreselleşme olgusu ve girişimcilik üzerine yansımaları. *Selçuk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, (12), 29-43.

Atasoy, F. (2007). Kültürler üzerinde bilişim devriminin etkileri. *Modern Türklük Araştırmaları Dergisi*, *4*(2), 163-178.

Baltacı, M., & Akpınar, B. (2011). Web tabanlı öğretimin öğrenenlerin üstbiliş farkındalık düzeyine etkisi/the effect of web based instruction on the metacognition awareness levels of learners. *Mustafa Kemal Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *8*(16).

Bandura, A. (2005). Adolescence development from an agentic perspective. Tim Urdan and Frank Pajares (Eds.) *Self Efficacy Beliefs of Adolescence* (1-47). USA: Information Age Publishing.

Barker, V. (2009). Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem. *Cyberpsychology & behavior*, *12*(2), 209-213.

Beeri, A., & Lev-Wiesel, R. (2012). Social rejection by peers: A risk factor for psychological distress. *Child and Adolescent Mental Health*, *17*(4), 216-221.

Beard, K. W., & Wolf, E. M. (2001). Modification in the proposed diagnostic criteria for Internet addiction. *Cyberpsychology & behavior*, *4*(3), 377-383.

Bulut, S., Doğan, U., & Altundağ, Y. (2013). Adolescent psychological resilience scale: validity and reliability study (ergen psikolojik sağlamlık ölçeği: geçerlik ve güvenirlik çalışması. *Suvremena psihologija*, *16*(1), 21-32.

Brand, M., Young, K. S., & Laier, C. (2014). Prefrontal control and Internet addiction: a theoretical model and review of neuropsychological and neuroimaging findings. *Frontiers in human neuroscience*, 8, 375.

Brassai, L., Piko, B. F., & Steger, M. F. (2011). Meaning in life: Is it a protective factor for adolescents' psychological health?. *International journal of behavioral medicine*, *18*(1), 44-51.

Broadhurst, R., & Choo, K.K.R (2011). Cybercrime and online safety in cyberspace. Cindy J. Smith, Sheldon X. Zhang, Rosemary Barberat (Eds*), Routledge Handbook of Criminology*. (153-161).

Brown, B. (2004). Adolescents' relationships with peers. Richard M. Lerner and Laurence Steinberg (Eds.) *Handbook of adolescent psychologhy* (363-394), (second Edition). New Jersey: John Wiley&Sons, Inc.

Byun, S., Ruffini, C., Mills, J. E., Douglas, A. C., Niang, M., Stepchenkova, S., ... & Blanton, M. (2009). Internet addiction: Metasynthesis of 1996–2006 quantitative research. *CyberPsychology & Behavior*, *12*(2), 203-207.

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive–behavioral measurement instrument. *Computers in human behavior*, *18*(5), 553-575.

Cardak, M. (2013). Psychological well-being and Internet addiction among university students. *Turkish Online Journal of Educational Technology-TOJET*, *12*(3), 134-141.

Carlbring, P., Maurin, L., Törngren, C., Linna, E., Eriksson, T., Sparthan, E., ... & Andersson, G. (2011). Individually-tailored, Internet-based treatment for anxiety disorders: A randomized controlled trial. *Behaviour Research and Therapy*, *49*(1), 18-24.

Cash, H., Rae, C. D, Steel, A. H., & Winkler, A. (2012). Internet addiction: A brief summary of research and practice. *Current psychiatry reviews*, *8*(4), 292-298.

Castells, M. (1997). An introduction to the information age. *City*, *2*(7), 6-16.

Castells, M. (2000). Toward a sociology of the network society. *Contemporary sociology*, *29*(5), 693-699.

Castells, M. (2011). *The rise of the network society* (Vol. 12). John Wiley & Sons.

Castells, M. (2013). *Communication power*. OUP Oxford.

Chak, K., & Leung, L. (2004). Shyness and locus of control as predictors of internet addiction and internet use. *CyberPsychology & Behavior, 7*(5), 559-570.
Chakraborty, K., Basu, D., & Kumar, K. G. (2010). Internet addiction: consensus, controversies, and the way ahead. *East Asian Archives of Psychiatry, 20*(3), 123.
Chou, C., & Hsiao, M. C. (2000). Internet addiction, usage, gratification, and pleasure experience: the Taiwan college students' case. *Computers & Education, 35*(1), 65-80.
Cole, D. A. (1987). Utility of confirmatory factor analysis in test validation research. *Journal of consulting and clinical psychology, 55*(4), 584.
Collins, W. A. &Brett, L. (2004). Parent-adolescent relationships and influences. Richard M. Lerner and Laurence Steinberg (Eds.) *Handbook of adolescent psychologhy* (331-361), (second Edition). New Jersey: John Wiley&Sons, Inc.
Coulson, N. S. (2005). Receiving social support online: an analysis of a computer-mediated support group for individuals living with irritable bowel syndrome. *CyberPsychology & Behavior, 8*(6), 580-584.
Crosnoe, R., & Elder Jr, G. H. (2004). Family dynamics, supportive relationships, and educational resilience during adolescence. *Journal of Family issues, 25*(5), 571-602.
Davey, M., Eaker, D. G., & Walters, L. H. (2003). Resilience processes in adolescents: Personality profiles, self-worth, and coping. *Journal of adolescent research, 18*(4), 347-362.
Dedeoğlu, G. (2004). Gözetleme, mahremiyet ve insan onuru. *TBD Bilişim*, 89, 36.
Deperlioğlu, Ö., & Köse, U. (2010). Web 2.0 teknolojilerinin eğitim üzerindeki etkileri ve örnek bir öğrenme yaşantısı. *Akademik Bilişim*, 10-12.
Diener, E., & Lucas, R. E. (2000). Explaining differences in societal levels of happiness: Relative standards, need fulfillment, culture, and evaluation theory. *Journal of Happiness Studies*, 1(1), 41-78.
Duran, O, H., & Özkul, M. (2015). Modern iletişimin arayüzü: sanal iletişim sosyal paylaşım sitelerinin toplumsal ilişki kurma biçimlerine etkisi (facebook örneği). *Journal of Suleyman Demirel University Institute of Social Sciences*, 21(1).
Frankl, E. V. (1999). Duyulmayan anlam çığlığı. *Öteki Yayınları.* Ankara.
Gercke, M. (2011). Understanding cybercrime: a guide for developing countries. *International Telecommunication Union (Draft)*, 89, 93.
Ginige, P. (2017). Internet Addiction Disorder. In Child and Adolescent *Mental Health.* InTech.
Griffiths, M. (2000). Internet addiction-time to be taken seriously?. *Addiction research*, 8(5), 413-418.
Griffiths, M. D., Kuss, D. J., Billieux, J., & Pontes, H. M. (2016). The evolution of Internet addiction: A global perspective. *Addictive Behaviors*, 53, 193-195.
Glynn, S. M., Aultman, L. P., & Owens, A. M. (2005). Motivation to learn in general education programs. *The Journal of General Education*, 150-170.
Haggerty, R. J., Sherrod, L. R., Garmezy, N., & Rutter, M. (Eds.). (1996). *Stress, risk, and resilience in children and adolescents: Processes, mechanisms, and interventions.* Cambridge University Press.
Hou, H., Jia, S., Hu, S., Fan, R., Sun, W., Sun, T., & Zhang, H. (2012). Reduced striatal dopamine transporters in people with internet addiction disorder. *BioMed Research International*, 2012.
Jang, K. S., Hwang, S. Y., & Choi, J. Y. (2008). Internet addiction and psychiatric symptoms among Korean adolescents. *Journal of School Health, 78*(3), 165-171.
Isman, A. (2001). Teknolojinin felsefi temelleri. *Sakarya Üniversitesi Eğitim Fakültesi Dergisi*, (1).
Isman, A., Çaglar, M., Dabaj, F., & Ersözlü, H. (2005). A new model for the world of instructional design: A new model. *Turkish Online Journal of Educational Technology-TOJET, 4*(3), 33-39.
Isman, A., & Gungoren, O. C. (2013). Being digital citizen. *Procedia-Social and Behavioral Sciences, 106*, 551-556.
Karagöz, Y.(2016). SPSS ve Amos 23 uygulamalı İstatistiksel Analizler. Ankara. Nobel Yayınevi.
Karslıoğlu, F. (2014). Siber gözetim: *Toplumsal denetim aracı olarak internetin dönüşümü* (Doctoral dissertation, İstanbul Bilgi University)
Kim, J., La Rose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic Internet use: The relationship between Internet use and psychological well-being. *CyberPsychology & Behavior, 12*(4), 451-455.
King, D. L., Delfabbro, P. H., Wu, A. M., Doh, Y. Y., Kuss, D. J., Pallesen, S., ... & Sakuma, H. (2017). Treatment of Internet gaming disorder: An international systematic review and consort evaluation. *Clinical Psychology Review*, 54, 123-13
Ko, C. H., Yen, J. Y., Yen, C. F., Lin, H. C., & Yang, M. J. (2007). Factors predictive for incidence and remission of internet addiction in young adolescents: a prospective study. *CyberPsychology & Behavior, 10*(4), 545-551.
Kocacık, F. (2003). Bilgi toplumu ve Türkiye. *CÜ Sosyal Bilimler Dergisi*, 27(1), 1-10.
Koçak, H., & Dandin, A. N. (2017). Toplumsal ve yönetsel alanda bilişim teknolojilerinin kriminal etkileri. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi*, 19(1), 137-152.

Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge. *Journal of Education, 193*(3), 13-19.
Korkmaz, M., ve Uysal, Ş. (1996). Yetişkin örneklem için bir benlik saygısı ölçeğinin güvenirlik ve geçerlik çalışması(Yayınlanmamış yüksek lisans tezi). *Ege Üniversitesi Sosyal Bilimler Enstitüsü*, İzmir.
La Rose, R., & Eastin, M. S. (2004). A social cognitive theory of Internet uses and gratifications: Toward a new model of media attendance. *Journal of Broadcasting & Electronic Media, 48*(3), 358-377.
Leung, L. (2006). Stressful life events, motives for Internet use, and social support among digital kids. *CyberPsychology & Behavior, 10*(2), 204-214.
Leung, L., & Lee, P. S. (2005). Multiple determinants of life quality: The roles of Internet activities, use of new media, social support, and leisure activities. *Telematics and Informatics, 22*(3), 161-180.
Liang, L., Zhou, D., Yuan, C., Shao, A., & Bian, Y. (2016). Gender differences in the relationship between internet addiction and depression: A cross-lagged study in Chinese adolescents. *Computers in Human Behavior*, 63, 463-470.
Lichtenstein, M. B., Christiansen, E., Elklit, A., Bilenberg, N., & Støving, R. K. (2014). Exercise addiction: a study of eating disorder symptoms, quality of life, personality traits and attachment styles. *Psychiatry research, 215*(2), 410-416.
Morahan-Martin, J. (2005). Internet abuse: Addiction? disorder? symptom? alternative explanations?. *Social Science Computer Review, 23*(1), 39-48.
Musetti, A., Cattivelli, R., Giacobbi, M., Zuglian, P., Ceccarini, M., Capelli, F., ... & Castelnuovo, G. (2016). Challenges in internet addiction disorder: is a diagnosis feasible or not?. *Frontiers in psychology*, 7, 842.
Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and identity, 9*(3), 225-240.
Ni, X., Yan, H., Chen, S., & Liu, Z. (2009). Factors influencing internet addiction in a sample of freshmen university students in China. *Cyberpsychology & behavior, 12*(3), 327-330.
Niemz, K., Griffiths, M., & Banyard, P. (2005). Prevalence of pathological internet use among university students and correlations with self-esteem, the General Health Questionnaire (GHQ), and disinhibition. *Cyberpsychology & behavior, 8*(6), 562-570.
Özbek, M. (2000). *Dünden bugüne insan*. İstanbul: İmge Kitabevi Yayınları.
Özmen, F., Aküzüm, C., & Sünkür, M. (2012). Sosyal ağ sitelerinin eğitsel ortamlardaki işlevselliği. *Education Sciences*, 7(2), 496-506.
Park, N., Park, M., & Peterson, C. (2010). When is the search for meaning related to life satisfaction?. *Applied Psychology: Health and Well-Being, 2*(1), 1-13.
Pontes, H. M., Szabo, A., & Griffiths, M. D. (2015). The impact of internet-based specific activities on the perceptions of Internet addiction, quality of life, and excessive usage: A cross-sectional study. *Addictive Behaviors Reports*, 1, 19-25.
Raacke, J., & Bonds-Raacke, J. (2008). MySpace and Facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *Cyberpsychology & behavior, 11*(2), 169-174.
Raykov, T., Marcoulides, G. A. (2006). A First Course in Structural Equation Modeling-2nd ed. Lawrance Erlbaum Associates. London: Mahlah-New Jersey, 238.
Ryff, C. D., & Singer, B. (2003). Flourishing under fire: Resilience as a prototype of challenged thriving. *Flourishing: Positive psychology and the life well-lived*, 15-36.
Scardamalia, M., & Bereiter, C. (1994). Computer support for knowledge-building communities. *The journal of the learning sciences, 3*(3), 265-283.
Schultz, D.P.; Schultz,S.E. (2007). Modern psikoloji tarihi. Kaknüs Yayınları.
Pajares, F., & Schunk, D. H. (2002). Self and self-belief in psychology and education: A historical perspective. Improving academic achievement: *Impact of psychological factors on education*, 3-21.
Selfhout, M. H., Branje, S. J., Delsing, M., ter Bogt, T. F., & Meeus, W. H. (2009). Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality. *Journal of adolescence, 32*(4), 819-833.
Shaw, M., & Black, D. W. (2008). Internet addiction. CNS drugs, *22*(5), 353-365.
Sirgy, M. J. (1986). A quality-of-life theory derived from maslow's developmental perspective: 'quality' is related to progressive satisfaction of a hierarchy of needs, lower order and higher. *American Journal of Economics and Sociology, 45*(3), 329-342.
Solso,R.L., Maclin, M.K., Maclin, O.H. (2007). *Bilişsel psikoloji* (Ayşe Ayçiçeği-Dinn, Trans.). İstanbul: Nobel Yayınevi.
Sümer, N. (2000). Yapısal eşitlik modelleri: Temel kavramlar ve örnek uygulamalar. *Türk Psikoloji Yazıları, 3*(6), 49-74
Stavropoulos, V., Gomez, R., Steen, E., Beard, C., Liew, L., & Griffiths, M. D. (2017). The longitudinal association between anxiety and Internet addiction in adolescence: The moderating effect of classroom extraversion. *Journal of behavioral addictions, 6*(2), 237-247.

Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, 52(1), 83-110.
Stoeber, J., & Rambow, A. (2007). Perfectionism in adolescent school students: Relations with motivation, achievement, and well-being. *Personality and individual differences*, *42*(7), 1379-1389.
Tran, B. X., Hinh, N. D., Nguyen, L. H., Le, B. N., Nong, V. M., Thuc, V. T. M., ... & Ho, R. C. (2017). A study on the influence of internet addiction and online interpersonal influences on health-related quality of life in young Vietnamese. *BMC Public Health*, *17*(1), 138.
Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *CyberPsychology & Behavior*, *9*(5), 584-590.
Wan, C. S., & Chiou, W. B. (2006). Psychological motives and online games addiction: A test of flow theory and humanistic needs theory for taiwanese adolescents. *CyberPsychology & Behavior*, *9*(3), 317-324.
Weinstein, A., Dorani, D., Elhadif, R., Bukovza, Y., Yarmulnik, A., & Dannon, P. (2015). Internet addiction is associated with social anxiety in young adults. *Annals of Clinical Psychiatry*, *27*(1), 4-9.
Wisniewski, P., Jia, H., Wang, N., Zheng, S., Xu, H., Rosson, M. B., & Carroll, J. M. (2015, April). Resilience mitigates the negative effects of adolescent internet addiction and online risk exposure. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (4029-4038).
Yellowlees, P. M., & Marks, S. (2007). Problematic Internet use or Internet addiction?. *Computers in human behavior*, *23*(3), 1447-1453.
Young, K. S. (1998). Internet addiction: The emergence of a new clinical disorder. *Cyberpsychology & behavior*, *1*(3), 237-244.
Young, K. S. (2004). Internet addiction: A new clinical phenomenon and its consequences. *American behavioral scientist*, *48*(4), 402-415.
Young, K. S. (2011). CBT-IA: The first treatment model for internet addiction. *Journal of Cognitive Psychotherapy*, *25*(4), 304.
Young, K. S., & Rogers, R. C. (1998). The relationship between depression and Internet addiction. *Cyberpsychology & behavior*, *1*(1), 25-28.
Yücel, D. (2002). *Bilişim teknolojilerinin çalışma yaşam kalitesi üzerindeki etkisi* (Doctoral dissertation, Fen Bilimleri Enstitüsü).
Zhang, H., Spinrad, T. L., Eisenberg, N., Luo, Y., & Wang, Z. (2017). Young adults' internet addiction: Prediction by the interaction of parental marital conflict and respiratory sinus arrhythmia. *International Journal of Psychophysiology*, 120, 148-156.

Augmented Reality to Teach Human Heart Anatomy and Blood Flow

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ABTRACT
This research aimed to develop the augmented reality (AR) in teaching human heart anatomy and blood flow has been designed and developed an AR to study the anatomy of the heart. The AR was evaluated by five experts, who analysed its content consistency by using the Index of Item Objective Congruence (IOC). The content was rated at 0.8. Simultaneously, via Diffusion of Innovation (DOI), the arithmetic mean was determined to be 4.04 with the standard deviation of 0.35; indicating that the AR can be used for publicizing the innovation at a high level. Subsequently, diffusion of the AR teaching tool was tested by sample group of thirty students. These subjects were evaluated pre-test and post-test by the five experts via the content validity index (CVI), with a score of 0.83. Furthermore, when the learning results of the sample groups was evaluated after the training, it showed that the learning result received higher ratings when compared with the ratings prior to using AR tool. The before and after AR learning results were for statistical significance at p value < 0.001 with the use of a T-Test. Then, the effectiveness of the tool was evaluated by users focusing on the acceptance of the AR for teaching the anatomy of the heart; the evaluation of which was based on the theory of Unified Theory Acceptance and Use of Technology (UTAUT) in which the results of the arithmetic mean and the standard deviation were 4.38 and 0.49, respectively. It showed that the users generally accepted the AR for teaching about the heart at a high level. Moreover, when there was a comparison of the learning results of the thirty students who learned about the heart from using hardcopy media, pictures, and videos, and the thirty students using the AR received better scores. The learning results of the two sample groups, tested by the statistical test called T-Test, were statistical significant at p value < 0.001. Hence, it could be concluded that, the AR for teaching heart function can promote more effective learning proficiency while being unanimously accepted by the users.

KEYWORDS: Augmented Reality, Human Heart, Teaching, Biology.

INTRODUCTION

The use of modern learning tools in education assists instructors in improving their quality of teaching, and thus improve the educational experience of the students. Modern technology helps in the production of multifunction and userfriendly media, which assists in developing the learners' proficiency in all aspects (Kaufmann, 2013). The learners tend to understand the content via memorization of pictures and gain visual perception.

Biology, as one important knowledge to learn, being the science of living organisms and consisting of a wide range in content detailing molecular, cellular, and ecological factors. This leads the learners to have a negative attitude towards the subject. Moreover, the teachers might use the methods or media that cannot promote learning. There is a lot of knowledge content to learn, however the fundamentals of biology could be considered the most important in the human body, particularly with the heart and blood system, that is the center of this learning content.

Humans are multicellular living organisms. They made of many tissues, organs and complex systems. The heart is one of many vital organs, supplying nutrients and oxygen by continuously circulating blood to other organs. Any abnormality within the heart can be fatal. Heart disease is one of the main causes of death among the Thai population with the average death rate of one per seven people, annually. Thus the heart, its structural characteristics, and its functions, should be well studied. Generally, the visual presentation of living organism organs can help the learners in better understanding (Jiravarapong, 2010). Heart's shape and function as an internal organ is difficult to illustrate to students. Most textbooks and other resources presented in two

dimensional images in which its characteristics or functions cannot be clearly seen (Tieranabunjong, 2001). Therefore, this potentially affects the proficiency of the learners. Thus, an appropriate form of instructional media can be a good choice for effectively enhancing a student's perception in learning about the heart and blood system.

Computer software can be good instructional media to promote higher efficiency in learning by facilitating the data processing system and the presentation of information, pictures, sound, and messages effectively. For example, virtual technology (Augmented Reality: AR) is one of the innovations that can be applied to the area of education to stimulate, support, and promote learning experiences (Volkan, Bradford & Ruzena, 2016) Lin et al. (2011). In this regard, Izzurracmanhas used virtualization technology applications in chemistry. The chemical bonds with 3D models which allowed students to learn the chemistry fast and easy with the use of the graphic and imaginative content (Izzurrachman, 2012). Ditcharoen et al. used virtualization technology to facilitate the learning of atomic structure and chemical bonding, improving the accuracy and speed of learning when compared with traditional classroom lessons using twodimensional images (Ditcharoen, Polyiam, Vangkahad & Jarujamrus, (2014). Kiourecidou et al has developed a web application which enhances the user's medical knowledge with regard to the anatomy of the human heart by means of augmented reality which helped increase understanding and experiential learning methods aiding online education of anatomy courses (Kiourexidou, Natsis, Bamidis, Antonopoulos, Papathnasion, Sgantzos & Veglis, 2015).

This paper presents the development the AR to teach the human heart anatomy and blood flow, especially the functioning of the heart, with the use of Android operating system which is available on smartphones and tablets. It can assist the students and the interested people in studying about the human body with visual aids and without limitations in location. The tool can enable the students to gain more knowledge and understanding, and ultimately increase their interest in the subject. This study also aims to increase the learning potentiality for the learners to catch up with the digital era. In addition, it can reduce the longterm expenses and contribute to the learning society that stimulates, supports, and promotes education through media. It may also further expand the proficiency of the learners.

METHODOLOGY

The research methods for studying the development of the augmented reality to teach the human heart anatomy and blood flow include the following steps:

1. Preparation of questionnaires and the pre-test and post-test.

1.1 The questionnaires for sample selection were evaluated by five experts who were specialized in the field of information technology and biology using the analysis of Index of Item Objective Congruence (IOC to measure the appropriate sampling of the content validity of items in a questionnaire or at the item development stage.) (Turner & Carlson, 2002) by which the experts to provide scores. If the criteria determined by the IOC value of each indicator was higher than 0.5 (the highest IOC value is 1), it means the questionnaires met the objective, possessed content suitable for educational purposes, and that the questionnaires worked effectively. The IOC value of each indicator was 0.8, indicating that the questionnaires met the objective in content consistency and is suitable for use in sample selection.

1.2 The research team had developed the pre-test and post-test to obtain learning results. The tests had passed the content validity index: CVI (CVI using ratings of item relevance by content experts. which an instrument has an appropriate of the content domain of items for the construct being measured and is an important procedure in content validity of development for questions.) (Polit & Beck, 2008) evaluated by the five experts from the assessment of CVI evaluated by all the experts, it was determined that the CVI value was 0.83 as there were ten questions out of twelve questions receiving the scores at 3 or 4. As the result was higher than 0.8 (the highest CVI value was 1), ten questions had passed the CVI. Pre-test questions 1-5 are related to human heart anatomy and question 6-10 related to blood flow. post-test questions had the same questions as the pre-test, but the order of questions and the answers were changed. IOC value by using the formula as shown in the equation.

$$CVI = \frac{Nc}{N}$$

Nc is the sum of the scores that the experts rated.

N is the number of the experts.

T

he experts were able to rate by using the assessment criteria as in Table 1.

Table 1: The rating criteria for the CVI

Rating criteria	Meaning
4	Very consistent: Can be used to test.
3	Quite consistent: Can be used to test.
2	Some consistent: Can be used to test.
1	Not very consistent: Can not use the test

2. Demographic survey and sample selection. The research team surveyed the need for training and the qualification questionnaire for students who wanted to attend primary school in Bangkok Metropolitan Region. The deadline for submitting the survey is 1 month. Research has defined sampling criteria. Selected samples were 30 primary schools.

3. Documentary Research. The analysis and the data collection on human heart function were performed by the research team by reviewing related theories and previous studies on human function. The human heart is comprised of four chambers (Noonchu, 2016): 1) The chamber on the top right (Right Atrium) 2) The chamber at the bottom right (Right Ventricle) 3) The chamber on the top left (Left Atrium) 4) The chamber at the bottom left (Left Ventricle). The human heart anatomy and blood flow such as heart components, heartbeat and the circulation of blood is shown in Figure 1.

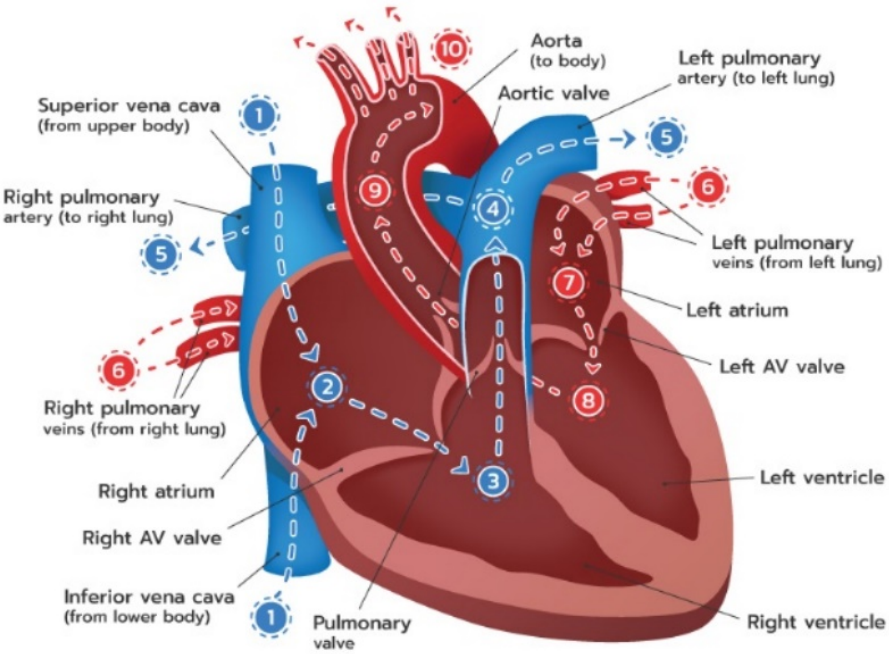


Figure 1: The human heart anatomy and blood flow

4. The design, development and implement the augmented reality to teach human heart anatomy and blood flow. 4.1 Based on collected information about human heart function, the heart components, heartbeat, and the blood circulation, the AR model was constructed and installed in the system (Noonchu, 2016). The subjects were able to use their smartphones or tablets to scan the images used for enhancing the memorization process on the heart structure. After scanning, the heart structure showed up in the form of 3D picture. The flow chart illustrating the design of the AR showed in Figure 2.

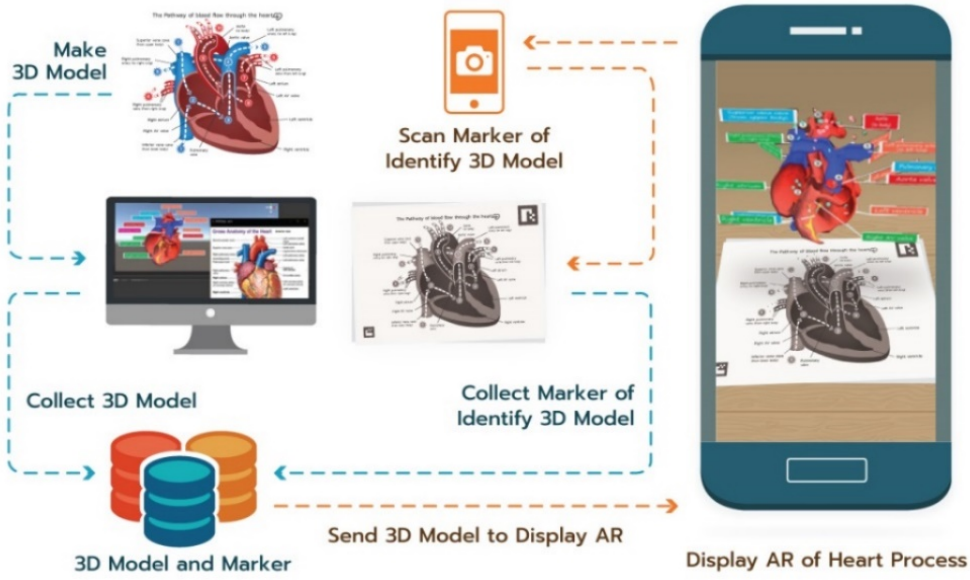


Figure 2: The Design of the augmented reality to teach the human heart anatomy and blood flow

4.2 Based on the design of the augmented reality to teach the human heart anatomy and blood flow, the information about the heart components, the heartbeat and the blood circulation in each chamber were used for constructing the model of the AR as a tool to teach about the heart anatomy (Dreamstime, 2016) show in Figure 3

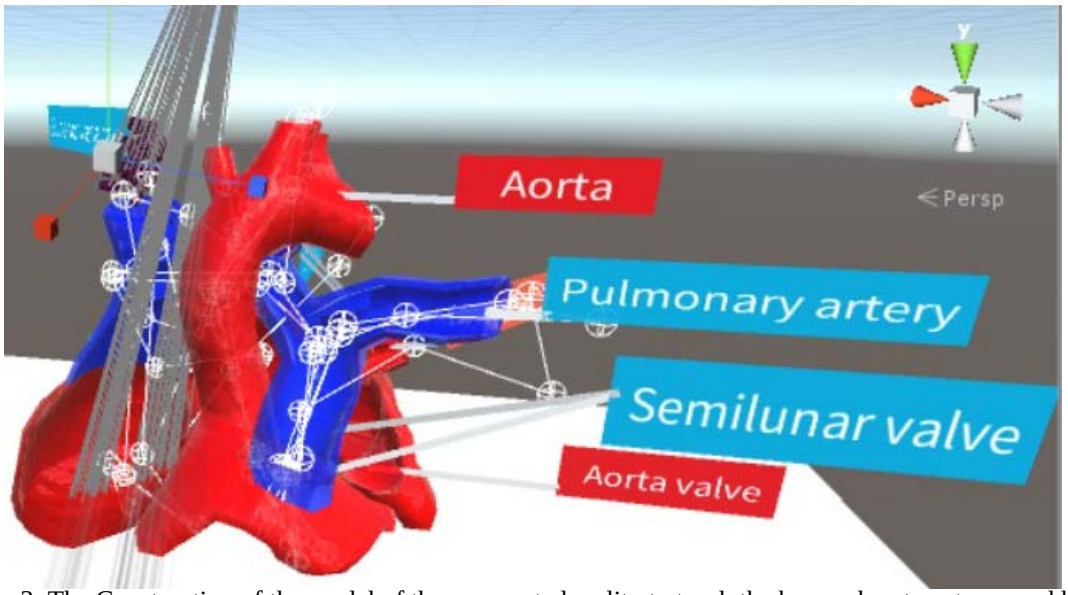


Figure 3: The Construction of the model of the augmented reality to teach the human heart anatomy and blood flow

4.3 Subsequently, there was a construction of the contents promoting memorization skills by linking pictures together into the model of a heart. The users could use the AR via smartphones or tablets with a scanning application to scan the heart pictures for virtual memorization the structure, the heartbeat in each chamber, the blood circulation, and other functions of each chambers show in Figure. 4

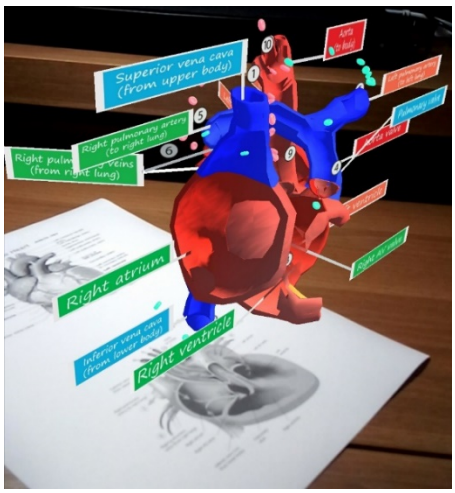


Figure 4: Display 3D of the augmented reality to teach the human heart anatomy and blood flow

4.4 The effectiveness of the augmented reality to teach the human heart anatomy and blood flow was evaluated by five experts who specialized in the field of information technology and biology. The evaluation used content consistency (IOC) to give scores. If the criteria determined by the IOC value of each indicator was higher than 0.5 (the highest IOC value is 1), it means the AR met the objective, possessed content suitable for education purposes, and therefore, the AR worked effectively. The IOC value of each indicator was 0.8, indicating that the developed AR met the objective and is suitable for using in education about the heart. The experts were able to rate by using the assessment criteria as in Table 2.

Table 2: The rating criteria for the content consistency

Rating criteria	**Meaning**
+1	sure that there is content consistency and it can work
0	not sure that there is content consistency and not sure if it can work
1	sure that there is not content consistency and it cannot work

Subsequently, take the information from the consideration of the experts and find IOC value by using the formula as shown in the equation:

$$IOC = \frac{\Sigma R}{N}$$

ΣR is the sum of the scores that the experts rated.
R is the score that the experts rated.
N is the number of the experts.

4.5 Subsequently, the experts also used the diffusion of innovation theory (DOI) (Roger, 1995) to evaluate five parameters, 1) more advantageous or have better performance, 2) usability, 3) noticeability, 4) consistency with the demand or experiences of the learners who would potentially adopt the innovation and 5) the result of which could be shown in advance (Agarwal & Prasad, 1997). It was necessary to find out if the innovation could be adopted by the sample group (Chaveesuk & Jaturapa, 2012). The data was analysed to find the mean value and the standard deviation value in order to assess the innovation dissemination of the AR to teach about the heart according to the scoring criteria of Likert Scale to rate the DOI form as shown in Table 3.

Table 3: The scoring criteria of the DOI form

Scoring Criteria		Meaning
Quantitative	Qualitative	
4.51 - 5.00	the highest	The AR can be published at the highest level
3.51 - 4.50	the high	The AR can be published at the high level
2.51 - 3.50	the medium	The AR can be published at the medium level
1.51 - 2.50	little	The AR can be published at the little level
1.00 - 1.50	the least	The AR can be published at the least level

The evaluation results of the DOI in all five aspects evaluated by the experts were: 1) the arithmetic mean and the standard deviation of “more advantages or better performance” were 4.00 and 0.00, respectively. It showed that this criterion was rated at a high level. 2) The arithmetic mean and the standard deviation of “usability” were

4.20 and 0.45, respectively. It showed that this criterion was also rated at a high level. 3) The arithmetic mean and the standard deviation of "noticeability" were 3.80 and 0.45, respectively. It showed that this criterion was rated at a high level. 4) The arithmetic mean and the standard deviation of "the consistency with the demand or experience of the subjects who would potentially adopt the innovation" were 4.20 and 0.45, respectively. It showed that this criterion was rated at a high level. 5) The arithmetic mean and the standard deviation of "the result which could be shown in advance" were 4.00 and 0.00, respectively. It showed that this criterion was rated at a high level. The arithmetic mean and the standard deviation of the overall image of the innovation dissemination were 4.04 and 0.35, respectively. It showed that the augmented reality to teach the human heart anatomy and blood flow was accepted to be used at a high level.

4.6 The dissemination of the augmented reality to teach the human heart anatomy and blood flow to Samples. The research team tested the augmented reality to teach the human heart anatomy and blood flow with 30 students. The students were at elementary level. Research Permission was obtained prior to the study. Training was provided via a lecture and workshop presentation (Nuanmeesri & Jamornmongkolpilai, 2018) to use the AR tool.

5. The evaluation of the effectiveness of the augmented reality to teach the human heart anatomy and blood flow.

5.1 Before being trained, the sample group had to finish ten question pre-test . Subsequently, they would enter the training session with the AR. It took three hours. After the training, the subjects did the post-test. After collecting the post-test, the trainers provided the subjects with the correct answers. Completed tests were assessed, scores recorded, and data analysis were performed by using the T-Test to find comparisons between the pre-test and post-test learning results. Moreover, when there was a comparison of the learning results of the thirty students (control group) who learned about the heart from the use of hardcopy pictures and videos, and the thirty students using the AR by using the T-Test.

5.2 To evaluate the effectiveness of the augmented reality to teach the human heart anatomy and blood flow based on the unified theory of acceptance and use of technology (UTAUT is a technology acceptance model for user feedback of information technology: Toward a unified view. The UTAUT aims to explain user acceptance, decisions and intentions to use technology.) (Chaveesuk, & Jaturapa, 2012). The research team developed a questionnaire on the acceptance of the AR to teach the sample group about the heart and evaluate the four aspects of the tool which are: 1) the anticipation on the performance, 2) the anticipation on the effort, 3) the social influence, and 4) the condition of facilities in the application. There were two questions for each aspect in the test. Subsequently, the data was analysed to find the arithmetic mean and the standard deviation values to determine the assessment effectiveness on the acceptance of the AR according to the scoring criteria of Likert Scale to rate the UTAUT form as shown in Table 4.

Table 4: The scoring criteria of the UTAUT form

Scoring Criteria		Meaning
Quantitative	Qualitative	
4.515.00	the most	The user has the most acceptance
3.514.50	much	The user has the much acceptance
2.513.50	moderate	The user has the moderate acceptance
1.512.50	little	The user has the little acceptance
1.001.50	the least	The user has the least acceptance

RESULTS

1. The result of the data analysis of the sampling group, the sampling group who were used in this research was sixty persons. The profile of the survey respondents was established from the demographics section of the survey with the following general information shown in Table 5 and Table 6.

Table 5: Sampling Group Demographics

Gender	**n**	**Percent**
sampling group		
Male	18	60%
Female	12	40%
control group		
Male	16	53.33%
Female	14	46.67%

Table 6: The scoring criteria of the satisfaction evaluation form

Age	n	Percent
sampling group		
below 13 years	25	83.33%
equal or more than 13 years	5	16.67%
control group		
below 13 years	23	76.67%
equal or more than 13 years	7	23.33%

2. The Test Results of the augmented reality to teach the human heart anatomy and blood flow. The pre-test and post-test results after training, using the augmented reality to teach human heart anatomy and blood flow revealed that the post-test results of the sample group after training was better than their pre-test results. The results were analysed by comparing the number of the students who could answer the questions correctly with their individual results. The learning results showed that the subjects had more correct answers after the training. The comparative test results collected before and after the training, showed that there was a statistically significant difference at the level of 0.05 according to the statistical test of the following hypothesis:
The hypothesis was assumed as followed:

H0: The learning result before and after using the AR were not different.

H1: The learning result before and after using the AR were different.

Statistically tested by T-Test, the main hypothesis (H0) was rejected because the significance value was lower than the significance level (α) which was previously determined. In this study in which $\alpha = 0.05$, the H0 was rejected and the H1 was accepted. The efficiency of the developed model was different in their methods. From the table of the pair sample testing, the significance value was analysed to consider whether the mean values of the two groups were different. In fact, it was found that the significance value was lower than the predetermined significance value. Therefore, the mean values of the two groups were different. Considering the comparative differences of the learning results both before and after the use of the AR, it was found that the statistical significance p value < 0.001.

Subsequently, the learning results were assessed by comparing the scores between the post-test results of the thirty students (control group) who had learned about the human heart from the hardcopy media, pictures, and videos and the post-test results of the thirty students that had learned using the AR. The learning results of the sample group that used the AR were clearly better than the sample group that learned from the use of hardcopy media, pictures, and videos show in Figure 6. It was found that there were differences at the statistical significance level of 0.05 according to the statistical test of the following hypothesis:
The hypothesis was assumed that:

H0: The learning results of the subjects who learned from hardcopy media, pictures, and videos and the subjects who learned via AR were not different.

H1: The learning results of the subjects who learned from hardcopy media, pictures, and videos and the subjects who learned via AR were different.

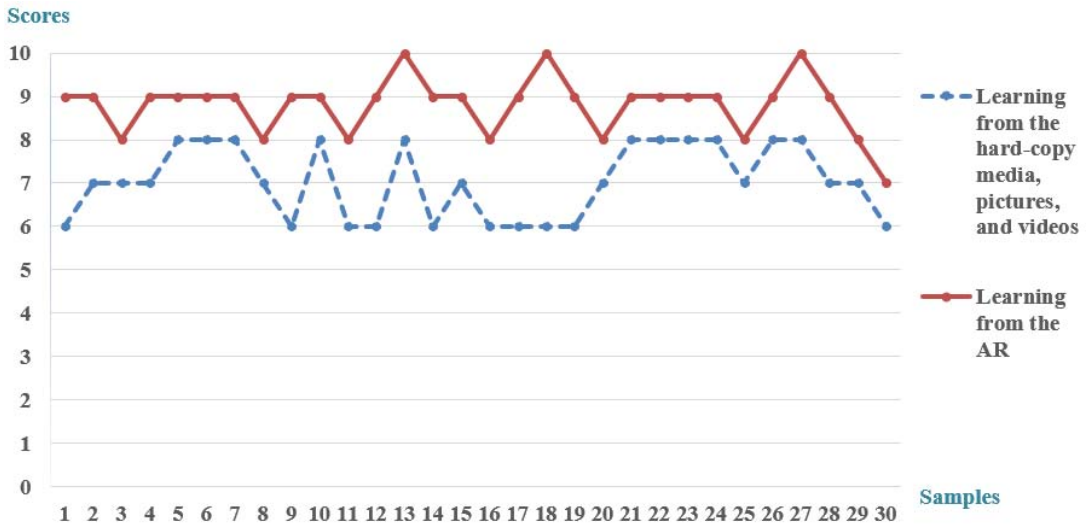
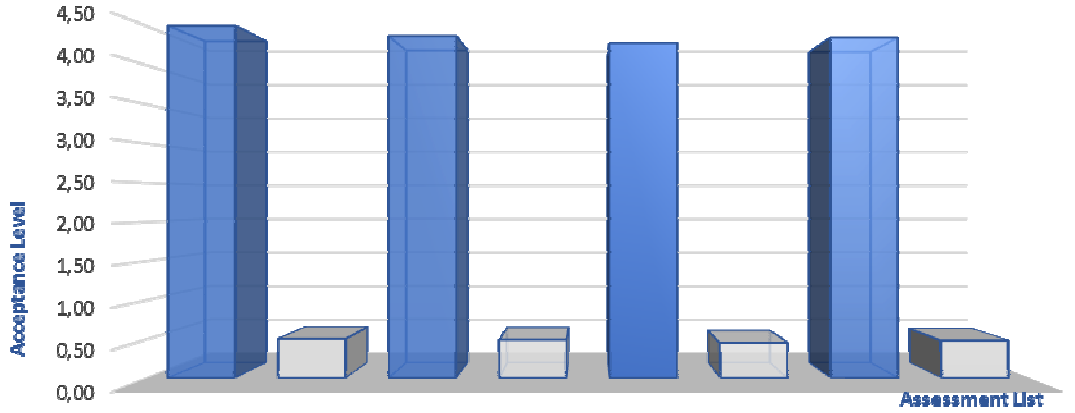


Figure 6: Comparing the scores between the post-test results of the thirty students (control group) who had learned about the human heart from the hardcopy media, pictures, and videos and the post-test results of the thirty students that had learned using the AR

Statistically tested by T-Test, H0 was rejected because the significance value was lower than the predetermined significance level (α). In this study, it was determined that $\alpha = 0.05$, so the H0 was rejected while the H1 was accepted. The efficiency of the developed models was different in their methods. From the Table of the Pair Samples Testing, the significance value was analysed to consider whether the mean values of the two groups were different or not. In fact, it was found that the significance value was lower than the predetermined significance value. Therefore, the mean values of the two groups were different. the comparative differences of the learning results before and after the use of AR, were different at the statistical significance of p value < 0.001.

3. The evaluation results of the acceptance and the use of the augmented reality to teach the human heart anatomy and blood flow. The results of the acceptance and the use of the augmented reality to teach the human heart anatomy and blood flow were evaluated in four aspects which were: 1) the anticipation of the performance; its arithmetic mean was 4.50 and the standard deviation was 0.50which showed that the acceptance of the performance was rated at a high level; 2) the anticipation of the effort; the arithmetic mean was 4.37 and the standard deviation was 0.49. It showed the anticipation of the effort was rated at a high level; 3) the arithmetic mean and the standard deviation of the social influence were 4.28 and 0.45, respectively. It showed that the social influence was accepted at a high level. 4) The arithmetic means and the standard deviation of the condition of facilities for the application were 4.35 and 0.48, respectively. So, the acceptance of facilities in application was rated at a high level. The overall image of the evaluation effectiveness results on the acceptance of the users in regard to the AR had the arithmetic mean value of 4.38, and its standard deviation was 0.49. this revealed that the users accepted the augmented reality to teach the human heart anatomy and blood flow at high level show in Figure 7.



	The Anticipation on the Performance		The Anticipation on the Effort		Social Influence		The Condition of the Facilities during the Application	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Results	4,50	0,50	4,37	0,49	4,28	0,45	4,35	0,48

Figure 7: The evaluation results of the acceptance and the use of the augmented reality to teach the human heart anatomy and blood flow

CONCLUSION AND DISCUSSIONS

In this research, the augmented reality (AR) to teach the human heart anatomy and blood flow. It was evaluated by five experts who had the experiences in teaching and researching about the virtual biological technology using the content consistency analysis (Index of Item Objective Congruence: IOC). The IOC value of each content was 0.8. The results indicated that the constructed AR was consistent with the objective and correspondent with the anatomy of the heart. The results with the arithmetic mean valued at 4.04 and the standard deviation at 0.35. clearly showed that the AR was accepted for the dissemination at a high level. Furthermore, the results of the study showed that the students who used the AR got better understanding than those who used other media for learning at the statistical significance of p value < 0.001. Comparing the learning results of sample group base on the post-test with control group (learned about the heart with hardcopy media, pictures, and videos) showed that the learning results of the sample group were better than the control group at the statistical significance of p value < 0.001. Correspondingly, there are four aspects of the effectiveness evaluation focusing on the acceptance of the AR as a tool to teach about the human heart measured by the theory of Unified Theory Acceptance and Use of Technology (UTAUT). The overall image of the effectiveness assessment results on the acceptance of the users was rated at a high level as the arithmetic mean and the standard deviation were 4.38 and 0.49, respectively. To conclude, the development of the augmented reality to teach human heart could contribute to the effective learning process and better results in understanding. Finally, it could increase the proficiency of the learners.

The augmented reality to teach the human heart anatomy and blood flow: from the research result, it showed that the virtual technology helped in disseminating and promoting the learning which caused the learning to be easier and also quicker to understand. It promoted the participation and the creation of imagination which was correspondent to the research work of Lin et al. (2011), Izzurrachman (2012), Ditcharoen et al. (2014). Kiourexidou et al. (2015). In the near future the augment reality and virtual technology will not be limited only to the creating of interest but also to be a part of the elaboration of knowledge, the survey exploration, and the collaborative learning which were also correspondent to the learning of this century.

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REFERENCES

Agarwal, R., & Prasad, J. (1997). The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. Decision Science, 28(3), 557-582.

Chaveesuk, S., & Jaturapa, S. (2012). Theory of acceptance and use of technology. KMITL Information Technology Journal, 1(1), 1-21.

Ditcharoen, N., Polyiam, K., Vangkahad, P., & Jarujamrus, P. (2014). Development of Learning Media in Topics of Atomic Structure and Chemical Bond with Augmented Reality Technology. Journal of Research on Science Technology and Environment for Learning, 5(1).

Dreamstime. (2016). The pathway of blood flow through the heart. Retrieved from https://www.dreamstime.com/stock-image-pathway-blood-flow-heart-image.

Kaufmann, H. (2013). Collaborative Augmented Reality in Education. Instituted of Software Technology and Interactive Systems. Vienna University of Technology.

Izzurrachman, F. (2012). Particle effect on augmented reality for chemical bond learning. Department of Electrical Engineering, Faculty of Industrial Engineering, Sepuluh Nopember Institute of Technology.

Jiravarapong, B. (2010). Augmented Reality. Journal of Education Naresuan University, 12(3), 1-6.

Kiourexidou, M., Natsis, K., Bamidis, P., Antonopoulos, N., Papathnasion, E., Sgantzos, M., & Veglis, A. (2015). Augmented Reality for the Study of Human Heart Anatomy. International Journal of Electronics Communication and Computer Engineering. 6(6), 658-663.

Lin, H.C.K., Hsieh, M.C., Wang, C.H., Sie, Z.Y., & Chang, S.H. (2011). Establishment and usability evaluation of an interactive AR learning system on conservation of fish. Turkish Online Journal of Educational Technology (TOJET), 10(4), 181-187.

Noonchu, S. (2016). Heart Process, Retrieved from http://fat.surin.rmuti.ac.th/teacher/songchai/circulatory/Circulatory%20index.htm.

Roger, E. (1995). Diffusion of Innovations. New York: Free Press.

Nuanmeesri, S., & Jamornmongkolpilai, S. (2018). The Development of the Virtual Learning Media of the Sacred Object Artwork. (2018). Turkish Online Journal of Educational Technology (TOJET), 17(1), 197-209.

Polit, D., & Beck, C. T. (2008). Nursing research: Generating and assign evidence for nursing practice, Philadelphia: Lippincott.

Tieranabunjong, Y. (2001). Knowledge of multimedia for education. Bangkok: Kurusapa Press.

Turner, R. C., & Carlson, L. (2002). Index of Item Objective Congruence for Multiple Objective Measures. Unpublished manuscript, University of Arkansas.

Volkan, I., Bradford, W., & Ruzena, B. (2016). Building a 3D Virtual Museum of Native American Basket. Retrieved March 27, 2016, from http://www.users.cs.umn.edu/~isler/pub/.

Curriculum Development Competencies of Form Teacher Candidates

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ABSTRACT
It can be stated that education plays a critical role at shaping the future of the nation. Designed curriculum and teachers as a developers and practitioners of the curriculum are accepted as a major drivers to increase the quality of the education. From this perspective, classroom teachers should have necessary competencies to develop curriculum. The current study aims to examine 222 participants in context of curriculum development competencies in the third and fourth forms who are studying in form teacher program at Cyprus International University (CIU), Near East University (NEU), European University of Lefke (EUL) and lastly Eastern Mediterranean University (EMU). The current study employed the scale which proposed by Duman (2006) to investigate curriculum development skills of the participants. The data which collected from participants was analyzed through SPSS. Moreover, it could be expressed that curriculum development competencies of the participants was tested by appointing arithmetic mean analysis and Independent Samples T test and One Way Anova Analysis were employed to investigate statistical differences among participants in context of curriculum development competencies with the light of ($p<0,05$). Study revealed that gender, class and university in which participants are studying were found statistically significant in context of curriculum development competencies. Moreover study recommended to revize the releated cources which would increase the competencies of participants thus would be helpful to overcome their incompetencies particularly on preparing the course plans with the light of multi-course theory, capability to use different methods and techniques to increase the capacities of the students at the highest level, diversifying the teaching-learning process by considering individual differences of the students, capability of organizing learning sphere by considering different preliminary experiences. Study also advised to increase sample size and conduct TUKEY analysis for obtaining more accurate results.

KEYWORDS: Education, form teacher candidates, curriculum development competencies

INTRODUCTION

Nowadays, educational institutions are considered as one of the key ingredients of education process. However, it could be stressed that education does not only existing in educational institutions. To be more precise, In addition to educational institutions, there are also various institutions that transmit vocational knowledge to the learners.

No doubt that, education t might take place within the family, workplace and in social groups. It could be stated that education is one of the vital tools used to perform "enculturation" within the community. It can be argued that enculturation is shaped through the character tics of the individuals and the culture in which they are born and grown. Moreover, communities convey the culture in which they possess to the new generations. In that sense, community influences individuals with cultural values which is called as enculturation. Therefore, it could be indicated that education is the deliberate way of enculturation (Fidan, 2012).

The term of education is identified by various authors in different ways. Tyler, who is considered as one of the pioneers of educational scholars, described education as a process of changing the behaviors of the individuals (Senemoğlu, 2012). Moreover, Çilenti, (1984) defined the term of education as a process of shaping behaviors of individuals which is desired by society. Education in a broader sense; is described as a process that boosts self-development by improving skills, knowledge, moral values, decision making of the individuals (Öztürk, 2005). Furthermore, Tezcan (1985) expressed the term of education as a process which prepares individuals to adult life and injects them necessary talents and perspectives for the future life.

Besides of these, educators have stressed that education takes place through formal and informal education. Formal education could be indicated that providing education to the learners with the light of the education plan which shaped by the certain purpose. In formal education system, teaching and learning facilities are designed by the teachers from the beginning to the end of the education. It can be mentioned that education which provided to the learners through educational institutions is named as formal education. Informal education, .could be indicated as the education which shaped by daily routines. Moreover, in contrast to formal education, informal education is not planned. In informal education context leaners learn from their experiences (Fidan, 2012).

Şişman (2007) discussed that education is consisting from various disciplines. These disciplines can be stated as social theories, social strata, ranks, roles and responsibilities, culture and law. Malthus (1820) mentioned that education is one the vital elements for the individuals to live well. Furthermore, Kruguer and Lindahl (2001) have stated that education has a prominent role at declining crime rate and maintaining stability both in political and economic fields.

Baykul (1992) had stressed that education is a system which shaped by certain elements. These elements could be indicated as input, process, output and lastly evaluation. To be more exact, financial resources, educational tools and equipment, qualifications of the learners, educational programs which are designed to inject desired behaviors to the learners, laws and procedures which are appointed for educational purposes, social values and structure of culture which are related with education are constituting the inputs of education whereas; courses which are formed to inject desired behaviors to the learners and educational activities which planned for the learners are constituting process of education. Output consists from the outcomes of the process. Lastly, decisions about students and activities to explore deficiencies and root of these deficiencies could be referred as evaluation.

It could be emphasized that transmitting necessary knowledge and skills to the individuals are considered as one of the key ingredients to form qualified community which in turn would trigger social development. Moreover, it might be argued that one of the prerequisites of formulating qualified community is to plan an education system which is favoring creative and competitive motives and injecting the importance continuous life learning to the individuals. No doubt that, teachers are one of the most crucial elements of the education. From this framework, degree of success of educations system is closely associated with the skills and competencies of the teachers (Gül, 2004). Moreover, it is believed that skills and competencies of the teachers play important role for achieving educational goals. To be more precise, teachers should have adequate knowledge at designing learning sphere, planning teaching and learning activities to inject desired behaviors to the learners and lastly evaluating the impact of all these facilities on learners (Kuzgun, 1991). Schreglmann (2016) also dictated that form teachers competencies on curriculum development are critical for stimulating the effectiveness of education.

Aim of the Study

It could be lamented that primary education is considered as one of the cornerstones of life and education as it plays a prominent role at shaping the character of the individuals. In that sense, form teachers should have necessary skills and competencies. In other words, the inadequacy of form teachers in educational sphere will negatively influence students which in turn it would be quite difficult to compensate this negativity during the ongoing education process. Moreover, it could be stressed that curriculum development is one of the vital mechanisms for building effective education. Therefore, to trigger influential education for the students, form teacher candidates and form teachers should be trained through pre-service and in-service training programs to advance their competencies towards to the curriculum development. The main objective of the current study is to explore curriculum development competencies of form teacher candidates who will serve as form teachers in the Turkish Republic of Northern Cyprus (TRNC)

Significance of the Study

The current study can be considered significant in several ways. First, since the present literature fails to provide sufficient research on the curriculum development competencies of form teacher candidates, the findings of the study are expected to help to recognize the level of curriculum development skills of form teacher candidates in the third and fourth forms who are studying in form teacher program at Cyprus International University (CIU), Near East University (NEU), European University of Lefke (EUL) and lastly Eastern Mediterranean University (EMU). Secondly, it may be considered as one of the initial research regarding in North Cyprus in this context. Therefore, the current study is expected to add to the scholarly research and literature about curriculum development competencies of form teacher candidates as well as deepen understanding towards to the efficiency of pre-service training programs.

METHODOLOGY

Research Model (pek gerekmeyebilir makalelerde)

Descriptive scanning method was employed for the current study. Descriptive scanning is the preferred method for determining the current situation. However, quantitative data collection tools are appointed in descriptive scanning methods. In this context, the descriptive screening method was accepted as the most appropriate research method for the current study as it aimed to discover the curriculum development competencies of the form teacher candidates in the 3rd and 4th grade during the 2017-2018 education periods

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Research Questions of the Study

The research questions of the current study could be expressed as follows;

- What is the level of cirriculum development competency of form teacher candidates?
- Is there any statistical significance among gender of form teacher candidates and their cirriculum development competencies?
- Is there any statistical significance among the grade of form teacher canditates (3rd and 4tth form) and their cirriculum development competencies?
- Is there any statistical any statistical significance among university which of form teachers are educated and their cirriculum development competencies?

Sample of the Study

The sample of the study was constituted from 222 form teacher candidates who are educated in the 3rd and 4th classes of the form teacher department in CIU, NEU, EMU and EUL during 2017-2018 education year. Moreover, sampling method of the study could be stressed as convenience sampling.

Data Collection Tools

It can be discussed that data which is associated with the study would be gathered by executing the Personal Information Form and Cirriculum Development Competency Scale

Personal Information Form: The form attempts to collect information about the socio-demographic profile of the participants such as gender, grade and lastly university which form teacher candidates are educated.

Cirriculum Development Competency Scale: The current study employed the scale which proposed by Duman (2006) to investigate curriculum development skills of the participants.

It could be mentioned that while Duman (2006) was proposing the scale, expert opinions were obtained from the academicians working in the faculty of education. Furthermore, reliability analysis of the developed scale relies within accepted limits (α = 0,91). In that sense, it could be stressed that there is no obstacle for the use of the scale used in the study in academic researches

In addition to that, sample statements which the curriculum development scale outlines could be stated as “knowledge and the skill required for the curriculum development", “understanding the importance knowledge and skill which are required for developing a curriculum, "ability to determine content of the courses by considering the competencies and learning styles of the students” " having a knowledge on the basic characteristics of teaching methods", " having a knowledge to perform assessment and evaluation for the education” etc

Moreover, it could be mentioned that 4-point scale was appointed for the current study.1 = "Weak"; 2 = "Medium", 3 = "Good", 4 = "Very Good". The weight range which appointed for the present study was computed as 0.75. The Rating scale and their expressions could be indicated by the following table.

Table 1. Ranges and competency of curriculum development

Ranges	Competency of Curriculum Development
1.00-1.74	Poor
1.75-2.49	Moderate
2.50-3.24	Good
3.24-4.00	Very Good

Data Analysis

SPSS (Statistical Package for Social Sciences 24,0 software program was used to analyze the data. Moreover, frequency, cornbach alpha, desriptive, Independent Samples t test, and lastly One-Way Anova analysis were conducted to interpret findings of the study.

Conclusion and Discussion

It could be mentioned that education is one of the most critical driving force to accelerate economic growth. Therefore, education plays an important role to inject qualified individuals to the workforce. In that sense, it is believed that teachers have a great responsibility at creating qualified communities.

Furthermore, it might be stressed that from their birth to a certain age individuals are educated by their parents then they attend to the educational institutions to learn social values. Form teachers could be identified as an educators who are inoculating the basis of teaching and learning to the students. Therefore, their competency to transmit information to their students plays critical role at educational context.

In addition to these, form teachers should have competency to develop a curriculum for effective education. In other words, form teachers should have necessary skills to formulate curriculum by considering the needs and area of interests of their students while shaping the contents and assesing the curriculum. Besides of these, form teachers are expected to have competency to evaluate and revize the curriculum in case of necessity.

As previously indicated, the current research has been conducted with 222 form teacher candidates. The most remarkable findings of the research are listed below

- Findings of the study revealed that cirrucilum development competency of form teacher candidates were poor at" preparing course plans which are paralel to the multi-course theory", "determining course contents by considering the students'", "special education needs", "using various approaches to accelerate capacities of the students," "diversifying the teaching and learning process by considering individual differences","being able to arrange learning sphere by considering various previous experiences".
- Apart from these, result of the study also showed that form teacher candidates had a moderate competency on " having a knowledge to develop a curriculum " having a knowledge of measurement and evaluation in educational context", " having a knowledge on social-historical-philosophical foundations of curriculum development for education", " having a knowledge to evaluate curriculum development process ", " having a knowledge on learning and teaching by considering - collaborative learning and constructivist learning philosophies etc.) and lastly "preparing a unitized annual plan" From this framework, it could be mentioned that the findings of the study was partially compatible with the findings of Duman (2006). Duman (2006) found that form teacher candidates determined the having a knowledge to develop curriculum is weak.
- Beside of these current study also signified that , participants were good at " determining the content of the courses by considering the skills and learning styles of the students", " formulating a measurement tool by relying contemporary approaches", "Adapting teaching strategies for the students with specific learning difficulties", " having a knowledge on the basic features of teaching methods" "to be able to identify appropriate measuring instruments for purpose"; "designing the course contents by relying readiness of the students "; " having a knowledge on instructional strategies"," arranging the course objectives with the light of the level of students. ", "rearranging teaching-learning process by considering the outcomes of measurement and evaluation", "determining the limits of content of courses by considering regional characteristics", "preparing learning centered course plans", " formulating goals for the educational program", "matching the content of the courses with the features of the course, "content order, analysis knowledge" "can match the level of the education program with the needs of the students; " critically evaluating educational programs"; " Having an adequate knowledge and skill to develop curriculum" and lastly " having an ability to prepare table of specifications", They were found to be at a good level in curriculum development issues such as "preparing table of specifications". This finding of the current study was partially parallel with the study of Duman (2006). In other words, Duman (2006) also found particularly on methodological issues, competency of form teacher candidates were at good level.
- Results of the study also signaled that participants' curriculum development competencies were very good on " establishing relationship among educational program items (purpose, content, teaching process, evaluation)", "formulating goals at different levels during curriculum development process" (Cognitive, Affective, Psychomotor), "understanding of the importance of knowledge and skill which required for curriculum development ", "using technology (overhead, data show etc.) which is necessary for learning-teaching process ".

- Independent samples T test were employed to discover statistical significances among curriculum development competencies of form teacher candidates and their gender. Gender and curriculum development competencies were found statistically significant on “understanding the importance of skills and knowledge which is required curriculum development”, “matching the level of the curriculum with the needs of the students”, “determining the contents of the curriculum by relying the talents and learning styles of the student”, “capability of organizing learning sphere by considering different preliminary experiences“. To create better understanding, results revealed curriculum development competencies of male form teacher candidates were very good at “understanding the importance of skills and knowledge which is required curriculum development”, “matching the level of the curriculum with the needs of the students” whereas female form teachers candidates’ curriculum development competencies were found moderate at “capability of organizing learning sphere by considering different preliminary experiences” This finding of the current study is parallel with the findings of several scholarly researches on relevant field (Yıldız and Baycan, 2012; Baş, 2016).
- As previously mentioned independent samples t test was employed to determine statistical significance among grade of form teacher candidate and their curriculum development competencies. Results revealed that statistical significance was existed on “having knowledge on social-historical-philosophical foundations of curriculum development in educational context", " having knowledge on teaching-learning approaches", " identifying the most appropriate measurement tools for objectives", "re-arranging teaching and learning process with the light of the outcomes of measurement and evaluation". To be more precise, it was found that form teacher candidates in the last grade had a good level of competence, whereas grade 3 form teacher candidates had moderate competency. This finding of the current study is consistent with the Duman (2006) study. One of the reasons for this result may be indicated as that form teacher candidates who are studying in the 4th grade are having chance to deepen their understanding about curriculum development through courses and have opportunities to have internship.
- One Way Anova test was conducted to investigate statistical significances among university of participants’ and their curriculum development competency. It was found that participants were statistically significant particularly on “ having knowledge and skill which are required for curriculum development”, “ understanding the importance of knowledge and skill which are required for curriculum development”,” knowledge on tha main philosophies which are closely related with currucilum development”, “having a knowledge on social-historical-philosophical foundations of curriculum development in educational context”, “having ability to match the level of curriculum with the needs of the students”, " establishing relationship among educational program items (purpose, content, teaching process, evaluation”, “organizing learning sphere by considering different preliminary experiences”, “having sufficient information on the features of teaching approaches”, preparing learning centered course plans”, ”having a knowledge to evaluate critically the education programs”. The findings of the present study are consistent with the findings of Duman (2006). One of the reasons behind of this finding could be signified as a depth of knowledge and experience that academicians obtained through attending various symposiums / seminars or having publications on the related field effects the way of transmitting necessary information to the form teacher candidates to promote their curriculum development competencies.

Recommendations

The fundemental aim of this part of the study is to provide recommendations with the light of the findings.

Recommendations to departments of participants

With the light of the findings it could be stressed that participants of the study are poor below-mentioned cirruculum development competencies;

- preparing course plans which are paralel to the multi-course theory,
- determining course contents by considering the students’ special education needs,
- Using various approaches to accelerate capacities of the students,
- Diversifying the teaching and learning process by considering individual differences.
- Being able to arrange learning sphere by considering various previous experiences

Therefore, courses that related with curriculum development should be revised in a way to mitigate with the shortcomings which were mentioned above.

Moreover, it is necessary to diversify curriculum development sources that are taught so that the form teacher candidates could be equipped on the following competencies

- Knowledge of measuring and evaluating the quality of education
- Knowledge of social-historical and philosophical foundations of curriculum development in educational context.

- Knowledge to evaluate curriculum which had been developed.
- Knowledge to prepare united annual plan
- Knowledge to design learning and teaching approaches by considering collaborative learning and constructivist philosophies.

Recommendations for the Future- Related Studies

Future related studies could be designed as comparative basis to create better understanding in terms of similarities and differences among curriculum development competencies of form teacher candidates in different nations. Moreover, comparative studies could also generate opportunities to present different perspectives on curriculum development courses and activities thus will add the different insights to the relevant literature besides of these, increasing the sample size and employing post hoc. tests such as TUKEY could generate chances to obtain more reliable findings.

REFERENCES

Alberty, B.H ve Alberty J.E (1962). *Reorganizing the high-school curriculum*, New York, The Macmillan Company.

Baş, G. (2013). Öğretmenlerin eğitim programı tasarım yaklaşımı tercih ölçeği: Geçerlik ve güvenirlik çalışması. *Kuram ve Uygulamada Eğitim Bilimleri, Educational Sciences: Theory & Practice, 13*(2), 965-992.

Baş, G. (2016) sınıf öğretmenlerinin program geliştirme yeterliliklerine ilişkin görüşlerinin bazı değişlenler ışığında incelenmesi. *Marmara Üniversitesi, Atatürk Eğitim bilimleri Dergisi sayı 43, 21-32*

Başar, M. A., (2017). Program Tasarımı Yaklaşımı ve Modelleri. <http://www.mabasar.com/epg3.pdf> erişim tarihi 07/12/2017.

Baykul, Y. (1992). Eğitim sisteminde değerlendirme. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi, 7*(7), 85-94.

Beckner, W., & Cornett, J. D. (1972). *The secondary school curriculum: Content and structure*. Intext Educational Publishers.

Brubacher, J. S. (1962). *Modern philosophies of education*, Mc Graw-Hill, New York.

Büyükkaragöz, S. S. (1997). *Eğitimde program geliştirme.* Konya.Kuzucular Ofset.

Cai, J. ve Cirillo, M. (2014) What do we know about reasoning and proving. Opportunities and missing opportunities from curriculum analysis, *International Journal of Educational Research, 64,132,140*

Clark, L. H., Klein, R. L., & Burks, J. B. (1972). *The American secondary school curriculum*. Macmillan College.

Çilenti, K (1984) *Eğitim Teknolojisi ve Öğretim*, Ankara, Gül Yayınevi

Çubukçu, Z.(2008) Eğitim programının tasarımı ve geliştirilmesi B. Duman (Ed) Öğretim İlke ve Yönetimleri içinde (2. Baskı,s. 132-174) Ankara: Maya Akademi.

Demirel, Ö (2015) *Eğitimde program geliştirme:* Kuramdan uygulamaya, Ankara, Pegem Akademi Yayınları

Demirel, Ö. (1994) *Genel Öğretim Yöntemleri*, USEM Ankara.yayınları

Demirel, Ö. (2005). *Eğitimde Program Geliştirme.* (8. Baskı). Ankara: Pegem A Yayıncılık.

Doll, R.C (1986) *Curriculum Improvement: Decision making and Process* 6th Edition, Boston: Allyn and Bacon.

Duman, E. (2006). Sınıf öğretmeni adaylarının program geliştirme yeterlikleri hakkındaki görüşlerinin belirlenmesi (Ankara üniversitesi ve Kırıkkale üniversitesi örnekleri). *Ankara Üniversitesi, Ankara*.

Erişen, Y. (1998). Program geliştirme modelleri üzerine bir inceleme. *Kuram ve Uygulamada Eğitim Yönetimi, 13*(13), 79-97.

Ertürk, S. (1972). *Eitimde Program Geliştirme*, Ankara: H.Ü. Yayınları.

Ertürk, S. (1975). *Eğitimde program geliştirme*. Ankara: Yelkentepe Yayınları

Fidan, N. (1986). *Okulda öğrenme ve öğretme*. Ankara: 3. Baskı Pegem Akademi Yayınları.

Good, C.(1973) *Dictionary of education* 3rd Edition, New York: Mc Graw-Hill.

Gül, G. (2004). Birey toplum eğitim ve öğretmen. *Hasan Ali Yücel Eğitim Fakültesi Dergisi, 1*(1), 223-236.

Henson, K. T. (2006). *Curriculum planning*. Illinois, *Waveland Press Incorporation*.

Hunkins, F. P., & Ornstein, A. C. (1988). Curriculum: Foundations, principles, and issues. *New Jersey: Prentice Hall Englewood Cliffs, 98-199.*

Hutchings, R.W (1963) *The higher Learning in Americ*. New Haven, 1963.

Kara, A. (2003). *Duyuşsal boyut ağırlıklı bir programın öğrencilerin duyuşsal gelişimine ve akademik başarısına etkisi.* (Adıyaman Ili Örneği), Yayımlanmamış Doktora Tezi, Fırat University, Elazığ.

Karamustafaoğlu, S. (2011). Öğretmen Adaylarının Ölçme ve Değerlendirme Alanına Yönelik Yeterlik Algı Düzeylerinin İncelenmesi. *Journal Of Faculty Of Educational Sciences, 44*(2),

Kıcır, K. (2004) *Eğitimde yeniden yapılandırmacılık* Marmara Üniversitesi Eğitim Bilimleri Enstitüsü Yüksek Lisans Programı, Yayımlanmamış Yüksek Lisans Tezi.

Kneller, G. F (1971). Introduction to the Philosophy of Education John Wiley and Sons Australia Limited.

Korkmaz, İ. (2007). Eğitim programı: Tasarımı ve geliştirilmesi. A. Doğanay editor *Öğretim ilke ve yöntemleri*, içinde *2*. Baskı Pegem Akademi Yayınları.
Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964*). Taxonomy of educational objectives, handbook ii: affective domain*. New York: David McKay Company. Inc. ISBN 0-679-30210-7, 0-582-32385-1.
Krueger, A. B., & Lindahl, M. (2001). Education for growth: Why and for whom?. *Journal of economic literature*, *39*(4), 1101-1136.
Kuzgun, Y. (1991). Öğrencilerin öğretmenlerden bekledikleri ve gözledikleri davranışlar. *Eğitimde Arayışlar*, *1*. Sempozyumunda sunulan bildiri, Kültür Koleji Eğitim Geliştirme Merkezi Yayınları, İstanbul, 73-77.
Külahçı, Ş. (1995). *Öğretmen yetiştirme modül serisi, D-mikro Öğretim*. Ankara. Özışık Ofset M.
Laska, J. A. (1984). The relationship between instruction and curriculum: A conceptual clarification. *Instructional Science*, *13*(3), 203-212.
McNeil, J. D. (2006). *Contemporary curriculum: In thought and action*. Hoboken, John Wiley & Sons, Inc.
Morris, V. C. (1963). *Becoming An Educator*. An Introduction by Specialists to the Study and Practice of Education, Houghton Mifflin, Boston.New Jersey: Prentice Hall.
Oliva, P.F (1988) *Developing curriculum.* Boston: Scott, Foreseman and Company.
Oliver, A. I. (1965). *Curriculum improvement: a guide to problems, principles, and procedures*. Dodd, Mead.
Oliver, A.I (1977) Curriculum Improvement: A Guide to Problems, Principles and Process, 2nd Edition New York: Harper-Row.
Ornstein, A. C., & Hunkins, F. P. (1993). Curriculum: Foundatıons, Prıncıples and Issues, 2nd Edition Needham Heights, MA: Allyn and Bacon.
Öztürk, N. (2005). İktisadi kalkınmada eğitimin rolü. *Sosyoekonomi*, *1*(1), s.27-44.
Özütürk, G. (2016) Mobil Desktekli Dil Öğretimi Amacıyla Geliştirilen Programın Etkililiğinin Belirlenmesi, Yakındoğu Universitesi Eğitim Bilimleri Enstitüsü Eğitim Programları ve Öğretim Anabilim Dalı, Doktora Tezi, Lefkoşa, KKTC.
Posner, G.J (1995) Analyzing the curriculum 2nd Edition, Mc Graw Hill, Inc. New York.
Program Geliştirme Dersi Web Sitesi (2017). https://programgelistirme.files.wordpress.com/2011/03/program-gelic59ftirme modelleri-ceyhun-ozan.ppt Erişim tarihi: 08/12/2017.
Robert, M. T. (1820). *Principles of Political Economy*. London: John Murray.
Rodgers, T.S (2014) *Approaches and Methods in language teaching*. England: Cambridge University Press.
Saylor, J. G., & Alexander, W. M. (1954). *Curriculum planning for better teaching and learning*, 4th Edition Halt, Rinehart and Winston Inc.
Schreglmann, S. (2016). 220; Türkiye'de Program Geliştirme Konusu Ile Ilgili Yapilan Yüksek Lisans ve Doktora Tezlerinin Içerik Analizi. *Journal Of International Social Research*, *9*(43), 1492-1500.
Senemoğlu, N. (2012). *Learning and Teaching, From Theoretical To Practice.* Ankara:Pegem Akademi.
Sezgin, S. İ. (1994). *Mesleki ve teknik eğitimde program geliştirme*. Ankara:Gazi Büro Kitapevi.
Skinner, B.F (2014) Verbal behavior, BF. Skinner foundation. US: Harward Univerity Press.
Sünbül, A.M. (2001). *Bir meslek olarak öğretmenlik: Öğretmenlik Mesleğine Giriş.* Ankara: PEGEM Akademi Yayıncılık
Şişman, M. (2007). *Eğitim bilimine giriş (3. Baskı). Pegem.* Ankara:Akademi Yayınları.
Taba, H. (1962). *Curriculum development: Theory and practice,* New York: Har Court Brace and World.
Tan, Ş. (2012) *Öğretim ilke ve yöntemleri.* Ankara: PEGEM A. Yayıncılık.
Tanner, D., & Tanner, L. N. (1995). *Curriculum development: Theory into practice*.
Taşdemir, M. (2006) Sınıf Öüretmenlerinin Planlama Yeterliliklerini Algılama Düzeyleri, *Journal Of Turkish Educational Sciences, 4*(3),1-21.
Tezcan, M. (1985). Eğitim Sosyolojisi, 4. Baskı Ankara Üniversitesi, Eğitim Bilimleri Fakültesi *Yayınlar No:150, Ankara*.
Tyler, R.W (1950) *Basic Principles of Cirriculum and Instruction.* Chicago:University of Chicago Press.
Urevbu, O.A (1991) *Curriculum Studies Singapore*. Singapore:Longman Singapore Publishers.
Varış, F. (1989). Eğitimde program geliştirmeye sistematik yaklaşım. *Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi*, *22*(1), 7-12.
Varış, F. (1994) *Program geliştirme teori ve teknikleri.* Ankara:Alkım Yayınları.
Yaratan, H.(2017). *Sosyal Bilimler için Temel İstatistik:SPSS Uygulamalı.* Ankara:Anı Yayıncılık.
Yıldırım, A. (1994). Temel program geliştirme modelleri ve ülkemizdeki program geliştirme çalışmalarına etkileri. *I. Ulusal Eğitim Bilimleri Kongresi*, Çukurova Üniversitesi Eğitim Fakültesi, Adana.
Yıldız, S. ve Baycan, D. (2012) Sınıf öğretmenlerinin program geliştirme yeterlilikleri hakkındaki görüşleri, *II. Ulusal Eğitim Programları ve Öğretim Kongresi*, Abant İzzet, Baysal Üniversitesi Eğitim Fakültesi, Bolu.
Yüksel, S. (1998). Program geliştirme sürecine öğretmen katılımı. *Kuram ve Uygulamada Egitim Yönetimi Dergisi*, *13(13)*, 99-106.

Effect of Reflective Teaching Practices on the Performance of Prospective Teachers

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ABSTRACT
The present research aims to examine the effect of reflective teaching practices on prospective teachers' performance. Reflective teaching practice helps teachers to plan, implement and improve their performance by rethinking about their strengths and weaknesses. An experimental study within an action research was conducted by the researchers. All prospective teachers of sixth semester in a women university's teacher education program were the population of the study. From total 40 students, 20 students were taken as experimental group and the rest of 20 students were taken as the control group. During the action research, a cyclic process of producing a module, training teachers for the reflective practices and then observing them during their practicum for replication of reflective practice was done by the researchers. The researchers used a set of tests and a rubric for assessing prospective teachers' performance before, during and after their training as well as their teaching practice. Finally, the module was modified with the help of findings. It was found that the training had improved the skills and performance of teachers during training as they revised and modified their teaching strategies through reflective practice. However, they were not able to practice all of the reflective skills in their practicum. The training module was revised in the light of findings and microteaching strategies were further improved. The study has implications for teacher training programs to include reflective practice training modules as part of their course work for refining their practicum.

KEYWORDS: Reflective practices, performance, prospective teachers, teaching practice

INTRODUCTION AND BACKGROUND
Reflective teaching practice is one of the important processes in teacher education. It stimulates teachers and students to develop various skills like decision-making, metacognition and logical thinking (Goodley,2018). The pioneers of reflective practices, Dewey(2001), previously in 1916, defined reflection as a complete systematic process of decision making to solve a given problem whereas, Cruickshank et al.(1995), Jay & Johnson (2002), Pollard (2002), Pollard & Tann (1995), Posnanski (2002), Tang (2002), Wilson & Jan (1993) identified thatreflective thinking involves taking a systematic & thoughtful action through consistent self-inquiry where teachers thoroughly review their classroom experience through a complete cyclic procedure towards high quality standards of learning & teaching methodology.

Atherson (2005) argues that reflective practitioner invigorates the classroom by making it interesting, challenging and motivating for pupils.Reflective teaching practice isa valuable approach in advanced teaching where teachers use their perceptions and experience to evaluate their teaching progress. They observe themselves, criticize their teaching practices &admit other's criticism with open-heart. It makes teachersself-evaluatorsfor their own teaching practices.
Reflection as a notion, in educational perspective, has its derivation from the philosophy of Dewey(1933), a significant 20th century educationist who distinguished between a 'daily' action determined by practice, authority and habit and 'reflective' action which includes a readiness to participate in continuous self-review and professional development (Harrison& Denton, Lee, 2011).

According to Dewey (1938) as quoted by (Grant and Zeichner, 1984), reflection is the performance of an individual where one actively and consistently involves in contemplationof related experience and practice to make it more meaningful and successful. Eryama (2007) explained the concept of 'reflection' as a special connotation which should not be taken as a typical dictionary word which means simple thinking or deliberation. Richards (1990) statesreflection as a process or an activity in which an event is recalled, considered, &assessed, generallyfor a larger purpose.Reflective practice is a latest and advanced method for teacher's trainingwhere all teachers can assess themselves before class using their intuitions &reflective skills. They also criticize on their

teaching during and after class with the help of their colleagues and students and then accept criticism as a positive feedback. Its helps teachers to enhance their teaching performance effectively.

Reflective teaching practices also provide prospective teachers with power to overcome their academic issues,teaching methodologies and subject content thatwas delivered in the classroom (Rarieya,2005).

The major aim of any 'Teacher Education Program' is to explore the gaps in theory and practice. In the past centuries, planning and presenting the lessons were taken as the basic skills for prospective teachers. But in the modern era, the teaching activities are more complex, refined, goal oriented and competitive. Different disciplines need specific strategies to teach. Therefore, a teacher's task has become manifold with respect to using diverse instructional techniques, maintaining class room environment, developing and administering assessment tools, integrating technology and capturing students' interest (Khanam, 2015).Only reflective teachers are able to refine and modify their practices for improved learning. They are able to accommodate diverse learning styles of students and contribute in quality teaching learning process (Afghani, Ferdeowsi, 2015). Akbari (2008) stated that reflective practice is distinct by way of pacing back & following one's owns thoughts/actions, that occur in a routine. In the area of teacher education, this concept is new in teaching methodology and it has gradually changed the traditional teacher training theory.

A study by Azeem (2011)in Pakistan, reported that in most of the teacher education institutions,novice teachers were not properly trained about their first classroomexperience. Most of the teachers were unaware of reflective teaching practices and they did not know how to reflect on their methodology before during and after conducting a lesson. Even the subject, 'reflective practice' suggested by HEC for teacher education programs was not taught in many universities of the country.

Therefore, a comprehensive reflective teachers' training programme is needed to sensitize prospective teachers about latest standards of teaching and assessing their own performance as per national and international benchmarks to match the objectives and outcomes consistently and efficently. Prospective teachers should be able to sort out the gaps in achieving the objectives and identify whether they have met the goals of equality and equity in classroom practices or not. Teaching is anart, that requires both feeling&thinkingfor those who can reflectively feel&thinkabout their classroom activities in a more worthwhilemanner and to make it more effective.So, there is a need for good reflective teachers to explore ways to listen and to assimilate their passion & judgement about their methodology (Zeicher & Liston, 2014).

Related Literature

Defining reflective teaching practice

Reflective teaching is defined as looking backfor teacher's own teaching. It includesthinking and rethinking about one's performance before, during and after class activities.Instructorshave toreflect about the problems of students which are likely to happen during achievement of targeted goals. Teachers have to ponder about the teaching strategies they will need to consider in delivering the expected lesson. (Artzt, Curcio, Gural, Thomas,2015).

The development of reflective practice

While human beings have reflected on their actions for as long as we know, a further detail we find inKolb's writings and thenin Lewin (1957)who led to the formalization of the process of reflective practices. In 1957, Lewin and a number of colleagues worked on the development of training approaches forguidance and organized a dynamic group for the Connecticut State Interracial Commission. Group discussion was encouraged among the participants and the staff and records of the meetings were kept and later discussed by the staff without the involvement of the participants. However, the participants were concerned that they were not involved with this discussion and approached Lewin requesting permission to be involved. It was observed that a remark made by an observer was challenged by the participant whose views differ from the observers as per following reflection:

> "*Lewin, felt that it had been a valuable contribution rather than an intrusion, enthusiastically agreed to their return. The next night at least half of the 50 or 60 participants were there as a result of the grapevine reporting of the activity by the three delegates.The evening session from then on became the significant learning experience of the day, with focus on actual behavioral events and with active dialogue about difference of interpretation and observation of the events by those who participated"*(Lippit, Kolb, 1984 :p9)

Kolb (1984 :p9) stated that studiesproved that learning isat toppriority in academic environment where criticism is involved in analysis of actual and the expected action. To put it rather less academically, the pupilis freed to reflect about events/situations that occur in order to make their logic.

Previously, Dewey (1938) had also developed the stance that reflective thinking is active and persistent thinking based on logic that originates from the ground reality. It also contains a sensible & intended action to modify the existing practice on the basis of learned experience.

Reflection in Action &Reflection-on-Action

A famous social scientist Schon (1983)differentiatesbetween what he termed Reflection-in Action &Reflection-on Actionin order to investigate how people use their experience to analyze their practices.He elaborated that iterative approach of considering the chain of actions during an activity for consistent improvement is reflection-in action and thinking about overall outcome of the activity in a logical way is reflection-on action.

Reviewing self-practice

The word reflection is suggestive of a number of mirror images of our actions, peaceful pondering about our experiences and making our past an asset for our future, thinking meaningfully about past periods, and thememoriesthat come inour mind and become a learning experience. In education and training, the term is often used specifically to indicate an essential stage in the learning process where a difficult and deliberate process of thinking and inferring a situation is undertaken in order to arrive at a deeper understanding of event and our position there(Khanam ,2015).

Kramer (2018) found positive effect of reflective practice on teachers' professional development.
Therefore, novice prospective teachers need a repetitive process of planning, acting and reflecting to improve teaching strategies. Collaborative reflection also helps students to minutely analyze their practice with multiple angles and find collective solutions. It is a collective learning process with manifold opportunities of correction and improvement (Foong et al,2018).

In experiential practices, learning from doing is basic principle of gaining concept, but doing is different from learning because by doing individual can more effectively involve in reflective process and the deliberation & consciousness occur as an important act (Hunt,2005).Hunt reviews the nature of unspoken, tacit knowledge, where practitioners 'just know' even though it cannot be described or written about and considers the dangers of not defining and bounding practice.

Reflective practice, in its gist is not just a set of practical practice neither a clearly recognizable group of academic skills but has slightly a critical aspect. Reflective practitioners go beyond mere abilityof havingreadiness and willing to criticize their own practices, but they think for reasoning of their actions and evaluate their processes and outcomes. They strive for perfection and consistent improvement. A reflective practitioner may involve in thoughts like:

- Anoptimistic experience
- An event when her involvements seemed to have made anactual difference to someone's knowledge
- Anadverse experience where things have gone badly incorrect
- Asituation which she thinks hard to control
- Something inconsequentialnevertheless which made her think, what's going on here?

Continuous Professional Development (CPD) containsanorganized maintenance, enhancement and maturity of knowledge, skills and personal abilities necessary for execution of professional and practicalresponsibilities in proficient working life. Self- review is an essential element of CPD. Benson (1987) recommends that maintaining and developing professional competences and sharing expertise is important in (CPD) process.He proposed reflective practices as essential component of CPD for in service teachers also. Benson suggested that such reflection and reviewsinvolveattentiveness, perseverance and hard work. Benson advisees a process of ongoing recording of action for a group observation as microteaching process is conducted. This would allowparticipants/practitioners to observeindividual and group performance to become good reflective experts by developing dialogue among themselves to illuminatefeelings, appraise practice, express moods, increase a deeper consciousness and then improvethemselves (Beard, Wilson ,2007).

Identifying the current need of reflective teaching in the teaching programme of a women university, the action research in hand has been designed to help out prospective women teachers to think about their teaching pedagogies and their personal skills like reading, writing, speaking and critical thinking in a reflective manner and to use these skills during their teaching practice at the community schools.

Objective of Research

The objectives of the study were to:

- Develop a module for prospective teachers' reflective teaching practice
- Train group of prospective teachers through reflective teaching practices
- Observe the prospective teachers during training and during classroom teaching practice for the use of reflective teaching practices
- Determine the effect of reflective practices on the performance of prospective teachers.

Research hypotheses

- Ho 1= There is no significant difference in the performance of experimental groups taught through reflective teaching practices and control group taught through conventional teaching practices after training (through researcher's constructed module).
- Ho 2=There is no significant difference in the performance of experimental and control group prospective teachers during teaching practice.

Research methodology

An action research was conducted by the researchers to improve teaching practice strategies of prospective teachers enrolled in a women university teacher training program. During the action research, a cyclic process of producing a module, training teachers for the reflective practices and then observing them during their training and teaching practice for reflective practice for refining the module was executed by the researchers.

Phase I

The researchers prepared a one and a half month's, (30 credit hours) training module after extensive review of literature about reflective practices. The module was consisted of following personal and pedagogical reflective skill activities:

- Reflective reading, writing & listening skills
- Reflective and evaluative lesson planning and presentation
- Critical and creative thinking skills
- Classroom management &
- Self-reflection

Phase II

An experimental study was designed for the phase II of this action research. Forty prospective teachers of an intact group at a women university were distributed in two equal randomly selected groups.Twenty prospective teachers of experimental group were trained through reflective teaching module and the rest of 20 prospective teachers were taught through traditional (already ongoing) method. Several sessions of microteaching as per students' pedagogical interest were conducted for reflective practices. In addition, there were sessions of reflective reading, writing and communication. Cumulatively, there were six reflective skills which were observed and measured through a set of post-tests after the training.

Phase III

In phase III, all of the prospective teachers (experimental and control) were sent for their teaching practice in the schools.The researchers observed them through a self- constructed rubric three times during their teaching practice session of one and a half month. Out of 20, 15 participants of experimental group were available for observation during teaching practice. Therefore, 15 participants from controlgroup were observed parallelly.
The prospective teachers were observed for incorporating reflective practices in their lesson planning, presentation, assessment, class management and for assigning extended work. Cumulatively, 3 observations were made during classroom teaching. The control group of 15 prospective teachers were teaching through conventional method.

Instrumentation and data collection

The data were collected during on campus training and during the field teaching practice of prospective teachers through researchers made instruments. A post test having six types of reflective skills related to teaching including; reflective reading, writing and listening skills, critical thinking skills, content knowledge and classroom management was administered to all participants those who were trained and those who were taught through conventional methods.

The other instrument was a rubric measuring 16 indicators of reflective teaching practice. The rubric had 4 levels;Level 4: completely fulfilling the compliance condition, Level 3: completes the compliance condition to a large extent, Level 2: partially fulfilling the compliance condition and needs improvement, Level 1: fulfills no compliance condition. Thus, the score obtained was from 1-4. The rubric held detail of reflective actions under each level.

Both of the instruments were validated trough expert opinion.The split half reliability of the rubric was α =.913.

RESULTS

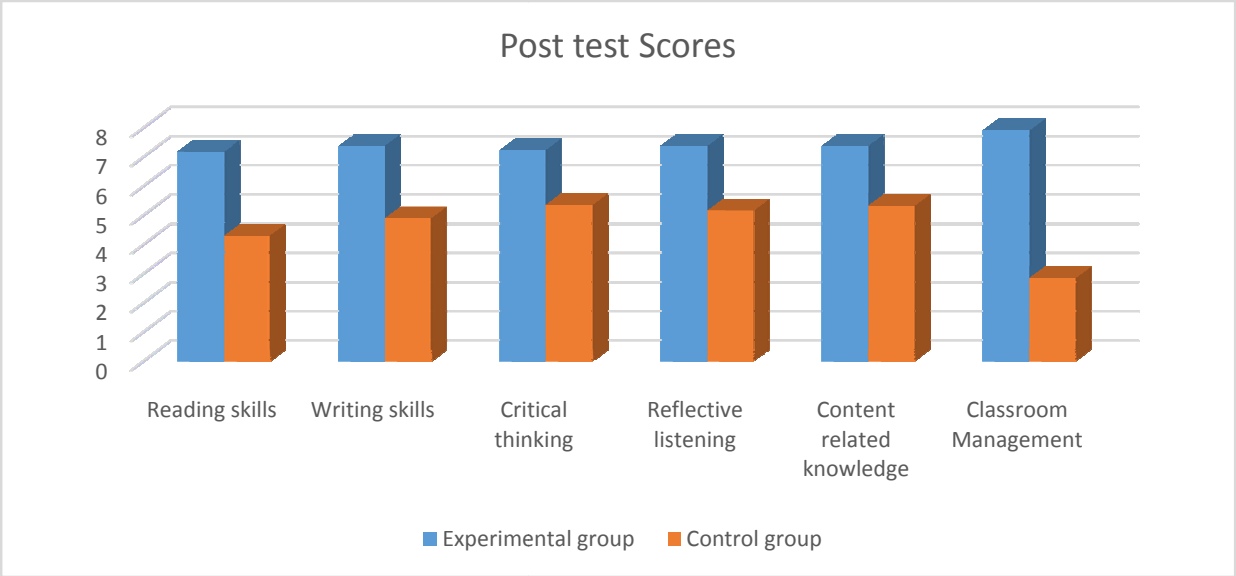
A set of post-tests, constructed by the researchers, comprising assessment of reflecting reading, writing and listening skills, critical thinking, content related knowledge and classroom management was administered after training to the 20 experimental and 20 control group participants. Each segment (skill) held 10 marks. Following are the detailedscores obtained by the two groups.

Table 1: Cumulative mean score of experimental and control group in post test of reflective practice training.

	Groups	N	Mean	Std. Deviation
Reading skill	Experimental group	20	7.17	.76
	Control group	20	4.29	2.05
Writing skills	Experimental group	20	7.36	.57
	Control group	20	4.88	1.06
Critical thinking	Experimental group	20	7.22	.57
	Control group	20	5.35	.92
Reflective listening	Experimental group	20	7.37	.61
	Control group	20	5.15	.99
Content related knowledge	Experimental group	20	7.37	.43
	Control group	20	5.32	.94
Classroom management	Experimental group	20	7.90	.76
	Control group	20	2.84	1.71

The table above shows that the participants of experimental group scored higher with (M = 7.17, SD=.76) as compared to students of control group (M = 4.29, SD=2.05) in reflective reading skills. Likewise, they scored higher in reflective writing skills with (M =7.36, SD=.57) as compared to control group with mean (M=4.88, SD=1.06). The experimental group performed better with mean (M=7.22, SD=.57) and (M=7.37, SD=,.61) in critical thinking and reflective listening respectively. While control group performed (M= 5.35, SD=.92) and (M= 5.15, SD=.99) in the same variables. The experimental group obtained (M=7.37, SD=.61) as compared to control group in the content related test who got (M=7.37, SD=.43) as compared to control group with (M=5.32, SD=.99). Moreover, the experimental participants scored higher on reflective classroom management strategies with (M=7.90, SD=.76) as compared to students who were not trained for reflective management with (M=2.84, SD=1.71).

Below is the graph presenting improvement of experimental group’s reflective teaching skills after training.



Graph No.1: Graphical representation of posttest mean score of experimental and control groups

The graph above shows maximum improvement of experimental group in skills of classroom management and least improvement in critical thinking as compared to the control group. All other skills were improved approximately with the same ratio.

Table No. 2: T-test for comparison of post-test of experimental and control groups after training session

		Levene's Test for Equality of Variances					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Reading skill	Equal variances assumed	11.959	.001	5.87	38	.000	2.88
	Equal variances not assumed			5.87	24.159	.000	2.88
Writing skills	Equal variances assumed	5.670	.022	9.18	38	.000	2.48
	Equal variances not assumed			9.18	29.115	.000	2.48
Critical thinking	Equal variances assumed	4.371	.043	7.68	38	.000	1.87
	Equal variances not assumed			7.68	31.758	.000	1.87
Reflective listening	Equal variances assumed	3.871	.056	8.48	38	.000	2.22
	Equal variances not assumed			8.48	31.584	.000	2.22
Content related knowledge	Equal variances assumed	8.107	.007	8.84	38	.000	2.05

	Equal variances not assumed			8.84	26.677	.000	2.05
Classroom management	Equal variances assumed	12.355	.001	12.03	38	.000	5.06
	Equal variances not assumed			12.031	26.291	.000	5.06

For identifying the significance of the difference in the performance of experimental and control groups, an independent sample t-test was run. It was found that there was a significant difference, with t(38)=5.87, p =.001<0.05 in the reading skills of experimental and control group scores. The experimental group also performed significantly better than control group in reflective writing with t(38)=9.18, p =.022<0.05. Both groups were found significantly different at their performance on critical thinking test with t(38)=7.68, p=.043< 0.05. There was no significant difference in reflective listening skills in both experimental and control group with t(38)=8.48, p= .056> 0.050. However, there was found significant difference in the content related knowledge and classroom management skills of experimental group with t(38)=8.84, p=.007<0.05 and t=12.03, p =.001<0.05 respectively. The results declare that the first hypothesis, 'There is no significant difference in the performance of experimental groups taught through reflective teaching practices and control group taught through conventional teaching practices after training (through researcher's constructed module) is rejected.

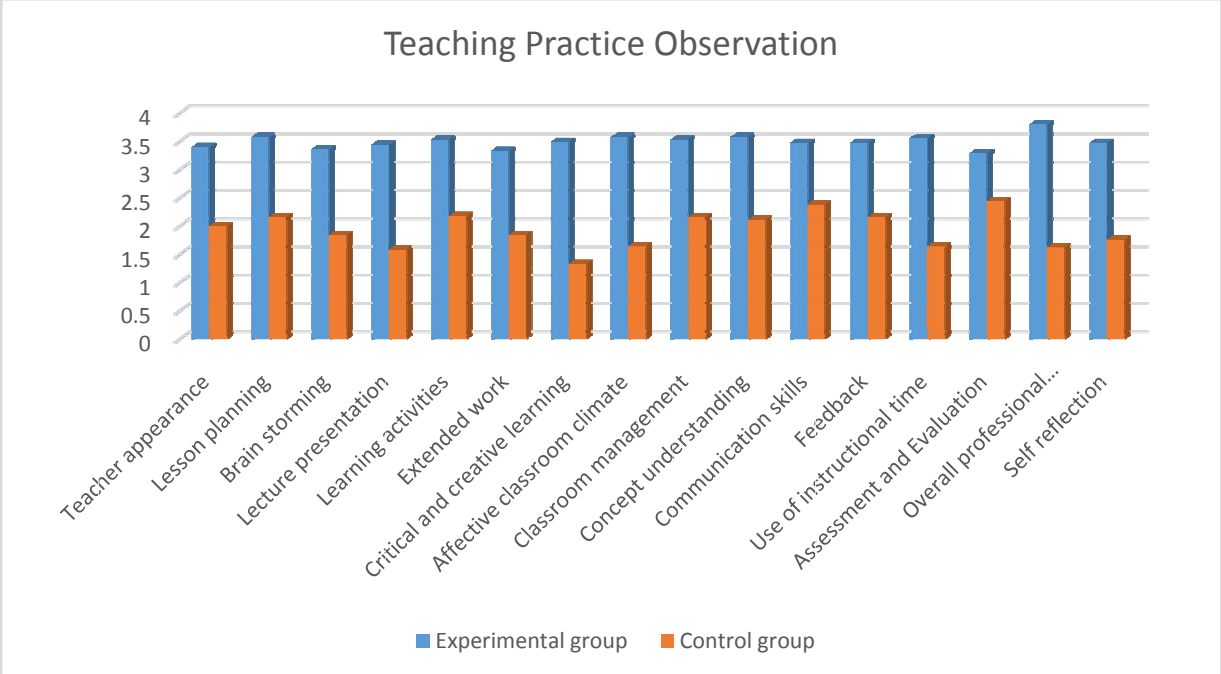
Table No.3: Mean score of three observations of 15 experimental and 15 control group participants

Group Statistics

	Group	No of observations	Mean	Std. Deviation	Std. Error Mean
Teacher Appearance	experimental group	45	3.40	.539	.080
	control group	45	2.00	.826	.123
lesson planning	experimental group	45	3.58	.543	.081
	control group	45	2.16	.928	.138
brainstorming	experimental group	45	3.36	.830	.124
	control group	45	1.84	.737	.110
lecture presentation	experimental group	45	3.44	.546	.081
	control group	45	1.58	.657	.098
learning activities	experimental group	45	3.53	.625	.093
	control group	45	2.18	.716	.107
extended work	experimental group	45	3.33	1.066	.159
	control group	45	1.84	.673	.100
critical & creative learning	experimental group	45	3.49	.549	.082
	control group	45	1.33	.640	.095
Affective classroom climate	experimental group	45	3.58	.657	.098
	control group	45	1.64	.773	.115
classroom management	experimental group	45	3.53	.548	.082
	control group	45	2.16	.638	.095
concept understanding	experimental group	45	3.58	.543	.081
	control group	45	2.11	.682	.102
communication skills	experimental group	45	3.47	.548	.082
	control group	45	2.38	.747	.111

feedback	experimental group	45	3.47	.661	.098
	control group	45	2.16	.520	.078
use of instructional time	experimental group	45	3.56	.624	.093
	control group	45	1.64	.679	.101
Assessment and evaluation	experimental group	45	3.29	.549	.082
	control group	45	2.44	.785	.117
overall professional development of teacher	experimental group	45	3.80	.457	.068
	control group	45	1.62	.777	.116
self-reflection	experimental group	45	3.47	.625	.093
	control group	45	1.76	.570	.085

Table No. 3 above presents the results of three consecutive observations made by the researchers of 15 experimental and 15 control group prospective teachers. It shows that meanscores for all reflective practice indicators for experimental group are higher than the control group. The mean score for teacher's appearance, lesson planning and brain storming with M=3.40, 3.58 and 3.36 were higher as compared to control group with mean, M = 2.00, 2.16 & 1.84 respectively. The students from experimental group presented better lectures with M=3.44, while students from control group obtained M=1.58. The experimental group assigned better extended work with M=3.33 as compared to teachers of control group with M=1.88. Likewise, teachers from experimental group performed well in critical thinking, creating affective classroom climate and classroom management with M= 3.49, 3.58 and 3.53 vs control group with M=1.33, 1.64 and 2.16 respectively. The trained prospective teachers had better concept with M= 3.58 while control group showed M=2.11. The experimental group reflected more in communicational skills, feedback and use of instructional time with mean M=3.47 vs M=2.38, M=3.47 vs M=2.16 and M=3.56 vs M=1.64 of control group. Finally, the experimental group had greater mean in assessment and evaluation, overall professional performance and self-reflection with M= 3.29 vs M=2.44, M=3.80 vs M=1.62 and M=3.47 vs M=1.76 of control group.



Graph No. 2:*Mean score on the rubrics of reflective teaching practice performance*

The graph above reveals that the experimental group performed well in teaching practice as compared to the control group. The performance was measured on a rubric having four levels from 1-4. The fourth level was assigned to the full compliance of the reflective practices. The maximum reflective practice was exhibited in overall professional performance while the least practice was shown in the use of assessment and evaluation.

Rest of the skills were applied to the third level approximately. Most of the participants could not achieve the highest level of reflective performance. On the other hand, most of the prospective teachers in the control group could not achieve even the third level of performance.

Table No. 4: T-test for the difference in teaching practice performance of experimental and control group.

		Levene's Test for Equality of Variances					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Teacher Appearance	Equal variances assumed	4.506	.037	9.522	88	.000	1.400
	Equal variances not assumed			9.522	75.764	.000	1.400
Lesson planning	Equal variances assumed	25.831	.000	8.871	88	.000	1.422
	Equal variances not assumed			8.871	70.964	.000	1.422
Brainstorming	Equal variances assumed	2.748	.101	9.131	88	.000	1.511
	Equal variances not assumed			9.131	86.791	.000	1.511
Lecture presentation	Equal variances assumed	2.398	.125	14.663	88	.000	1.867
	Equal variances not assumed			14.663	85.154	.000	1.867
Learning activities	Equal variances assumed	.210	.648	9.564	88	.000	1.356
	Equal variances not assumed			9.564	86.420	.000	1.356
Extended work	Equal variances assumed	9.094	.003	7.924	88	.000	1.489
	Equal variances not assumed			7.924	74.247	.000	1.489
Critical & creative learning	Equal variances assumed	.272	.603	17.160	88	.000	2.156
	Equal variances not assumed			17.160	86.008	.000	2.156
Affective classroom climate	Equal variances assumed	2.090	.152	12.783	88	.000	1.933
	Equal variances not assumed			12.783	85.752	.000	1.933
classroom managment	Equal variances assumed	.773	.382	10.991	88	.000	1.378
	Equal variances not assumed			10.991	86.027	.000	1.378
concept understanding	Equal variances assumed	.009	.923	11.289	88	.000	1.467
	Equal variances not assumed			11.289	83.817	.000	1.467
communication skills	Equal variances assumed	4.110	.046	7.883	88	.000	1.089
	Equal variances not assumed			7.883	80.682	.000	1.089
feedback	Equal variances assumed	10.421	.002	10.460	88	.000	1.311
	Equal variances not assumed			10.460	83.421	.000	1.311
use of	Equal variances	.087	.769	13.901	88	.000	1.911

instructional time	assumed						
	Equal variances not assumed			13.901	87.361	.000	1.911
Assessment and evalution	Equal variances assumed	7.171	.009	5.915	88	.000	.844
	Equal variances not assumed			5.915	78.707	.000	.844
overall professional development of teacher self-reflection	Equal variances assumed	27.671	.000	16.201	88	.000	2.178
	Equal variances not assumed			16.201	71.202	.000	2.178
	Equal variances assumed	2.758	.100	13.564	88	.000	1.711
	Equal variances not assumed			13.564	87.267	.000	1.711

An independent t-test was calculated to find the statistical significance of above differences between experimental and control group. The difference in teacher's appearance and lesson planning was found significant with t (88)=9.52, p=.037< 0.05 and t (88)=8.87, p=.000<0.05 respectively. There was a significant difference in communicational skills, mechanism of feedback and assessment strategies of experimental group with the control group with t(88)=7.80, p=.046<0.05, t(88)=10.46, p=.002<0.05 and t(88)=5.91, p=.009<0.05 respectively. The performance of trained and untrained prospective teachers was significantly different in assigning extended work with t(88)=7.92, p=,003<0.05. The overall professional performance of trained teachers was also significantly different from untrained teachers with t(88)=16.20, p=.000<0.05.

However, no significant difference was found in the performance of experimental and control group in reflective brainstorming, lecture presentation and conducting learning activities with t(88)= 9.13, p=.10> .05, t (88)=14.66, p=.124>0.05 and t (88)=9.56, p=.648>0.05 respectively.There was no significant difference in critical thinking skills, creating affective classroom climate and classroom management of trained and untrained teachers with t (88)=17.16, p=.603>0.05, t (88)=12.78, p=.152 and t (88)=10.99, p=.382>0.05 respectively. Moreover, there was found no significant difference in experimental and control group teachers in concept clarity, self -reflection and using instructional time with t (88)=11.28, p=.923>0.05, t (88)=13.564, p=.10>0.05 and t (88)=13.90. p=.769>0.05. The second hypothesis, 'There is no significant difference in the teaching performance of students trained for reflective practice and those who were not trained for reflective practice' was partially accepted as per above findings.

DISCUSSION AND CONCLUSION

The research aimed to identify the impact of reflective teaching practices on the teaching performance of prospective teachers. A training module was prepared by the researchers for one-and-a-half-month training (30 credit hours) by the researchers. The intact group of 40 BS Education students were distributed in two equal groups of experimental and control group. The experimental group was trained with the help of module with several microteaching sessions. A post test was conducted in the end of training of both groups. All prospective teachers went to different schools for teaching practice. The researchers recorded three observations of 15 available students from each group. The findings revealed that after training, there was a substantial difference in the performance of trained and untrained teachers for reflective skills. The experimental group however, when worked in the field, was not able to practice all of the taught skills in their classroom better than the control group as per expectations. There was a significant difference in teacher's appearance, lesson planning as described by (Mclaughin,2016) communicational skills, mechanism of feedback(Mckeachie, Syinicki,2011) and assessment strategies of experimental group as compared to the control group. The present study has supported the notion of these previous researches that reflective thinking improves quality of teaching skills. The performance of trained and untrained prospective teachers was also significantly different in assigning extended work as predicted by (Zakhareusi, 2018)and overall professional performance as observed by (Huang's,2008,Kavoshian et al.,2016).

However, no significant difference was found in the performance of experimental and control group in brainstorming, lecture presentation and conducting learning activities There was no significant difference found in critical thinking skills of both groups, as contrary to (Rao,2007)who mentioned that reflective practice helps teachers in thinking critically. Likewise, there was no significant difference in creating affective classroom climate and classroom management of trained and untrained teachers. Moreover, there was found no significant difference in experimental and control group teachers in concept clarityin contrast of (McGee&Fraser,2005),

findings, self–reflection (Boud,2007: Singh,2008) findings and using instructional time (Tomalis, 2015 & Meador, 2017) study. These previous researchers found that reflective teachers improved their performance after reflective thinking training. It was concluded that the prospective teachers performed much better in reflective teaching practices after training but while working in the field, where they had improved several skills like communicational skills, lesson planning and assessment strategies, they could not implement reflective practice in developing critical thinking, concept clarity, using instructional time and self-reflection. The researchers modified the module in the light of findings and added more microteaching activities for effective practicun reflective practices to the prospective teachers' students in the above mentioned skills.

However, the classroom observations revealed that trained teachers kept writing regular reflective journals in which they recorded their experiences on daily basis. They could solve the problems of students and guide them in acompetent way. Trained group of reflective teachers were more able to resolve their student's classroom problems more confidently. On the basis of the present study, it can be concluded that reflective teaching practice helps teachers to develop their teaching and learning skills. Reflective teaching practices should be the integral component of professional development of teachers. It is recommended by the researchers that the reflective teacher training needs to be focused on the deliverance of reflective skills to the classroom which could be possible through metacognitive microteaching sessions and prospective teacher's self-reflection practices. The study suggests longer training sessions with diverse group of prospective teachers to generalize the advantages of reflective skills.

REFERENCES

Akbari, R., Imani Naeeni, M., KarimiAllvar, N., &Kiany, G. R. (2008). Teachers' Teaching styles, sense of efficacy and reflectivity as correlates of students' achievement outcomes. *IJAL*, 11 (1), 1-27.

Artzt,A. F.,Thomas,E.Armpour-Frances ., Curcio,R.Gural.,(2015). Becoming a Reflective mathematics teacher 2nd edition A guide for observation and self – assessment Lawrence erlbauamAssociates ,*Taylor&Francis Group* 270,Madison avenue ,New York.

Artherton,J.S.(2005).Learning and teaching :Reflection and Reflective Practices: Retrieved by 10/03/2018; from www.learning and teaching.info

Azeem, M.(2011).Problem of Prospective Teachers during Teaching Practice .*Academic Research international (2).*Retrieved from www. Journals. savap. Org .Pk

Beard, C. Wilson, J.P, (2006). Experiential learning 2nd edition, London United Kingdom

Benson,S.(1987). The Evolution of the outward bound process, Green Witch out ward Bound, USA.

Boud, D. (2007). Using journal writing to enhance reflective practice. In L. English & M. Gillen (Eds.), *Promoting Journal Writing in adult Education.* San Francisco: Jossey -Bass.

Cruickshank, D. R. (1996). Uses and benefits of reflective teaching. Phi Delta Kappan, 66(10), 704-706. http://www.jstor.org/stable/20387492

Denton, D. (2011) Reflection and Learning: Characteristics, Obstacles, and Implications. Educational Philosophy and Theory, 43 (8), 838-852.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process.* New York: D.C. Heath and Company.

Dewey, J. (1938). Experience and Education ,New York : MacMillan.

Dewey, J. (2001). Democracy and education. Pennsylvania: A Penn State Electronic Classics Series Publication (First Published in 1916). http://www.naturalthinker.net/trl/texts/Dewey,John/Dewey,_John_-_Democracy_And_Education.pdf

Eryaman, Y. (2007). From Reflective Practice to Practical Wisdom: Towards a Post Foundational Teacher Education. *International Journal of Progressive Education*, 3(1), 87-107

Ferdowsi,M, Afghari, A. (2015). The Effects of Reflective Teaching on Teachers' Performance,*International Journal of Educational Investigations*, Vol.2, No.6: 20-31

Foong, Y.Y.L., Nor, M.B.M., & Nolan, A. (2018). The influence of practicum supervisors' facilitation styles on student teachers' reflective thinking during collective reflection, Reflective Practice.Vol,18. pp, 225-242.

Goodley, C. (2018). Reflecting on being an effective teacher in an age of measurement. *Reflective Practices*,Vol,19,pp,167-178.

Grant, C., &Zeichner, M. (1984) On Becoming a Reflective Teacher. In C. Grant (ed.), Preparing for Reflective Teaching (pp.1-18), Boston: Allyn& Bacon

Harrison, J., & Lee, R. (2011). Exploring the Use of Critical Incident Analysis and the Professional Learning Conversation in an Initial Teacher Education Programme. *Journal of Education for Teaching*, 37(2), 199–217.

Huang, H. (2008). Professional development through reflection: A study of preservice teachers' reflective practice. *International Electronic Journal for Leadership in Learning*, 5(6). http://iejll.synergiesprairies.ca/iejll/index.php/ijll/article/view/499

Hunt, David. (2005). "A Model for Analyzing the Training of Training Agents." Merrill Palmer Quarterly. 12: 137-155;.

Jay, J. K.,& Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching and Teacher Education*, 18(1), 73-85.

Kavoshian,S.,Ketabi,S.,Tavakoli,M.,(2016).Reflective Teaching Through Videotaping in an English teaching course in Iran. *Journal of teaching language skills*, vol:35, No:2,1-38.

Khanam, A. (2015).A practicum solution through reflection: An iterative approach. *Reflective Practice,International and Multidisciplinary Perspectives. Volume 16*. No. 5. pp. 677-687.

Kolb, D. A. (1984). Experiential learning, Prentice hall, Englewood Cliffs, NJ

Kramer,M. (2018). Promoting teachers' agency: reflective practice as transformative disposition, *Reflective Practice*, Vol:19.pp,211-224.

Lewin, K. (1957). Action research and minority problems. In G. W. Lewin and G. Allport(eds) Resolving social con¯icts. Selected papers on group dynamics (New York : Harper & Brothers), 201-216.

Lippitt, Kolb. (1984). Experiential Learning Experience as the source of learning and development. Englewood cliffs, NJ: Prentice Hall.

Meador, D. (2017). The most essential qualities of a good teacher [Blog post]. Retrieved from https://www.thoughtco.com/the-most-essential-qualities-of-a-goodteacher/ Effective Teacher Characteristics: Future Teachers' Voices Gavrielle Levine, Ph.D. NERA 2017

McGee.C.,Fraser.(2005).The Professional Practice of Teaching 2nd edition .Thomson, Dunmore press.

Mclaughin,B. (2016). The importance of lesson plan in ESL teaching Oxford seminars.

Pollard, A. & Tann, S. (1995). Reflective teaching in the primary school. London: Redwood Books

Pollard, A. (2002). Readings for reflective teaching. New York: Continuum Books.

Posnanski, T. J. (2002). Professional Development Programs for Elementary Science Teachers: An analysis of teacher self-efficacy beliefs and a professional development model. *Journal of Science Teacher Education*, 13(2), 189-220.

Rao,Z.(2007). Training in brainstorming and developing writing skills.*ELT Journal*, Volume 61, Issue 2, P,100-106.

Rarieya, J. (2005) Promoting and Investigating Students' Uptake of Reflective Practice: A Pakistan case. Reflective Practice, 6(2), 285-294. *The Journal of Reflective Practices* , vol 6.issue 2,Tylor &Francis, London, UK,

Richards, Jack C. 1990. The Teacher as Self-observer. In Jack C. Richards, The Language Teaching Matrix. New York: Cambridge University Press (pp. 118-143

Schon, D. (1983) The Reflective Practitioner: How Professionals Think in Action. New York: Basic Books.

Singh, V. K. (2008). Teaching Practice: Lesson Planning. New Delhi: APH Publishing Corporation.

Tang, C. (2002). Reflective diaries as a means of facilitating and assessing reflection. (retrieved on 8/5/2018) http://www.tcd.ie/Nursing_Midwifery/ assets/directorstaff-edu dev/pdf/ReflectiveDiaries-CatherineTang.pdf

Tomalis,T.R., Dumuresq,C.C., Tommasisini,J.J., Hozella,P.,(2015).Teachers Desk References: Practical information for Pennsylvania teachers. Pennsylvania training and technical assistance network.

Wilson J. & Wing Jan, L. (1993). Thinking for themselves: Developing strategies for reflective learning. Australia: Eleanor Curtain Publishing

Zakhareuski, A . How to Assign Highly Effective Homework your Students will actually enjoy. Retrieved by : 3/5/2018

Zeicher, K.M. Liston, D.P. (2014) *Reflective Teaching: An introduction* Routledge . New York

Integrating a Computer-Based Flashcard Program into Academic Vocabulary Learning

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ABSTRACT
The main goal of this study is to investigate the extent to which a computer-based flashcard program, Anki, can help college-level ESL learners improve their vocabulary as well as the learners` perceptions about the program. The vocabulary targeted for the study consisted of Coxhead`s (2000) *Academic Word List*, including the most common words in university textbooks. An academic vocabulary dictionary which encompasses 210 academic words was designed for the study and thirteen students coming from two ESL classes used the Anki dictionary for ten minutes every day during the three week intervention process. Pretest and posttest scores of students were compared to evaluate the effectiveness of the learning process. Learners` perceptions about the training were investigated by means of surveys, interviews and observations. The results present the benefits that might be gained from the integration of flashcard programs into a language classroom, as well as the perceptions of learners about the process.

KEYWORDS: Anki, computer-based flashcard program, ESL learner

INTRODUCTION

Second language (L2) learners are generally conscious of the fact that the limitations in their vocabulary knowledge affect their fluency both in spoken and written language, but they are not sure about how to improve their vocabulary. Language teachers also do not know the best way to incorporate vocabulary learning into their teaching (Read, 2004). Research has suggested that explicit vocabulary teaching should be a part of regular language classrooms and that flashcard learning as an effective way of explicit teaching where learners can memorize many words in a short time (Fitzpatrick, Al-Qarni, & Meara, 2008; Nation, 2001). It was also mentioned in the research that various flashcard programs were gaining popularity for vocabulary learning and they were extensively used around the world (Nakata, 2011). Anki was one of those flashcard programs that had been increasing its users and suggested as a more effective program, providing its users with different possibilities compared with other available flashcard programs (Godwin-Jones, 2010).

The term ‘learning from word cards’ is defined as “the formation of associations between a foreign language word form (written or spoken) and its meaning (often in the form of a first language translation, although it could be a second language definition or a picture or a real object)” (Nation, 2001, p. 296). In the process of learning from word cards, a learner writes a new word on one side of a card and its first language translation on the other side. Then, the learner goes through these cards trying to retrieve the meanings of new words.

Word card strategy, one type of a paired-associate learning, has typically been ignored in the area of vocabulary learning and teaching because it is considered an example of the behaviorist learning model (Hulstijn, 2001). Several studies show that flashcard learning is an important learning activity in terms of helping learners memorize large number of words in a short time (Fitzpatrick, Al-Qarni, & Meara, 2008; Nation, 2001). Some recent studies also demonstrated that learners can transfer flashcard learning to normal language use (Elgort, 2007; Webb, 2002, 2009a). However, Nation (2001) indicated that the extent of learning with flashcards depends upon the way that the word cards are used and suggested some effective strategies for learning with word cards.

According to experimental studies in the area, simultaneous presentation of a word form and its meaning is best for the first encounter, but delayed presentation is more effective later on because there will be a chance for learners to make an effort to recall the new words which will presumably lead to better learning of them (Nation, 2001). In one study, both each foreign word and its English translation were encountered by the learners on the first trial and then, learners were expected to guess the target words to recall them on following trials (Baddeley, 1990). The study showed that the recalling procedure helped learners to acquire more new words. Instead of simply encountering words again and again, retrieving increases the chances that target words will be remembered better later on because it will require much greater effort similar to performance during normal use.

Word cards can be given as a good example of the retrieval process while learners see both the word and its meaning at the same time by using word lists.

Teachers should make learners more aware of the importance of retrieving for their vocabulary learning and encourage them to integrate this repetition technique into their learning activities (Nation, 2001). Retrieval plays an important role in the strategy of using word cards for vocabulary learning and it makes the word cards more favorable for learners compared to other strategies such as notebooks or lists of vocabulary items (Schmitt & Schmitt, 1995; Waring, 2004). Because the target words and their meanings are put on different sides of word cards, retrievals with them will be easier for learners compared with word lists where L2 words and their meanings are presented at the same time.

So, learners using flashcards should be encouraged to retrieve the meaning of the target word from memory, which leads to a more permanent learning (Barcroft, 2007; McNamara & Healy, 1995; Nation, 2001). In addition to the retrieval process, the order of the flashcards is another factor which affects the learning process. According to Baddeley`s (1990) primacy and recency effects, the items at the beginning and the end of a list are memorized better than the words in the middle. Taking into account this finding and also the fact that learners have the freedom to change the order of words if they study with flashcards, learners should put difficult words near the beginning, so these words can get more attention. Nation (2001) also suggests that learners put target vocabulary in a phrase or sentence. Studies looking into the effect of a single sentence on vocabulary learning show that the use of an example sentence in vocabulary learning supports both the learning process and retention in the long run (Baicheng, 2009; Cobb, 1997; Laufer & Shmueli, 1997). Based on the elaboration process, Baicheng (2009) states that sample sentences cause learners to increase their information processing load as they reflect on the syntactic feature of target vocabulary given in an example sentence. This load facilitates the retrieval process later on because learners can find various paths to access new items in their memory.

It is possible to find many different strategies for using flashcards effectively in the literature. However, Mondria and Mondria-de Vries (1994) propose a practical way of using flashcards with spaced repetition which is a ‘hand computer’ divided into five sections. To be able to use this ‘hand computer’, words to be learned are written on cards and put into section 1. When a word is known by the learner, it goes into section 2. When section 2 fills up, the words are reviewed again and those that are known are put into section 3 and those not remembered go back to section 1. The same process occurs for section 4 and 5 with words not learned going back to section 1.

Based on memory research and second language vocabulary learning research, Nation (2001) cites several researchers whose results have shown that spaced repetition is much more effective than massed repetition. Massed repetition requires learners to spend a continuous period of time paying attention to a target word. On the other hand, spaced repetition means spreading the repetition sessions across a long period of time. For example, the target vocabulary might be reviewed for three minutes now, another three minutes a few hours later, three minutes a day later, three minutes two days later and finally three minutes a week later instead of reviewing a new word for fifteen minutes a day as in the massed repetition. The total time reviewed is fifteen minutes again, but that time is spread across ten days which ensures a more permanent learning. Nation (2001) explains the general principle behind spaced repetition with these words:

> After a piece of learning, the forgetting is initially very fast and then slows down. On the second repetition, a piece of learning is older than it was on the first repetition and so the forgetting on the second repetition will be slower than it was. On the third repetition the forgetting will be even slower. The right probability of recall level is one where the learner has forgotten enough to feel that repetition is worthwhile attending to and yet not forgotten too much so that there is still a good chance of recalling and thereby strengthening the form-meaning connection. (p. 75)

On the other hand, memory research supports the effectiveness of spaced repetition with physical changes in the brain. Baddeley (1990) stated that spacing repetitions allow time for the regeneration of neuro-chemical substances that make changes in the brain. Massed repetition does not allow enough time for these substances to regenerate and thus they cannot continue to make the physical changes needed for learning.

There are various memory schedules applying this basic principle of ‘spaced repetition’ in the literature. However, the memory schedule that Pimsleur (1967) proposes as a guide for the size of the spaces between the repetitions is the one most commonly cited one in the literature (Nation, 2001; Schmitt, 2000). His schedule uses an exponential scale, so if the first interval between interactions with a new word is five seconds, then the next intervals should be 5^2 = 25 seconds, then 5^3= 125 seconds (about 2 minutes), the next 5^4=625 seconds (about 10

minutes) and so on. Although Pimsleur`s schedule is well-known in the literature, Nation (2001) considers his schedule as a rough guide and says that “there is no particular reason why the spacing between the repetitions should be a matter of precise measurement” (p. 77).

It is true that using word cards gives learners a chance to implement expanded rehearsal more easily, compared with other strategies like word lists. However, learners should be knowledgeable about different strategies to use word cards effectively, such as planning a review schedule and monitoring their learning. If they do not have those skills, word card learning can even cause inefficient learning (Nakata, 2011). On the other hand, a computer program can easily help learners with areas such as planning and monitoring regardless of their abilities (Hulstijn, 2001; Nation, 2001).

There are numerous numbers of flashcard programs available for vocabulary learning in a second language and some of them are widely used around the world. While Nakata (2011) states that 50 universities and hundreds of schools all over the world use *vTrain* (a flashcard program), more than one million people have access to *Quizlet*. It is also reported that Nintendo DS, a flashcard program for English learning, is integrated into English curriculum in all the public junior high schools in Kyoto, Japan (Tamaki, 2007).

Based on the methods and strategies used for word card learning discussed in the previous section, the features of an ideal flashcard program include presentation and retrieval modes, scheduling ability, flexibility about block size and ability to help learners increase retrieval effort (Barcroft, 2004; Nation, 2001; Pyc & Rawson, 2007). Many researchers support the widespread use of flashcard programs and claim that they are more effective than paper-based ones because of the following reasons. The first benefit of a computer-based flashcard program is that it can record a learner`s improvement over a period of time and it can arrange the order of words that can help learners study difficult words more often than easy items (Nakata, 2008; Pyc & Rawson, 2007). Also, computer-based flashcard programs can offer numerous ways for the presentation of new words by means of their multimedia capabilities which can in turn increase learners` motivation and autonomy (Allum, 2004; Hulstijn, 2001; Nakata, 2006; Nation, 2001). With computer programming, retrieval can be practiced more easily by second language learners (Allum, 2004).

The idea behind many current electronic flashcard programs such as *SuperMemo, Anki, StudyProf, Teachmaster* is based on the Leitner system (Godwin-Jones, 2010). In 1940, Sebastian Leitner created a 5-step process by using index cards in a box. This box is divided into five sections and flashcards are moved from the first section to next one on a daily basis if learner can remember them well. If cards are not remembered, they stay in the same section. Each following section has a longer time lag and if words are remembered in the final section after a longer interval, they do not need to stay in the system anymore. At this point, it is assumed that the words are stored in the learner`s long term memory. Today, the electronic systems use a scale system instead of a box, but the action is still designed according to the user`s actions. The user chooses an option from a scale of 0 to 5 according to how well s/he remembers the word. Then, the system arranges a schedule to review this item again based on the score (Nakata, 2008).

In spite of the recent popularity of electronic flashcard program, emprical evidence of the advantages of these programs is quite limited in the second language learning area (Nakata, 2008). Besides, to what extent they are really helpful for the learning process of vocabulary knowledge is still not known by researchers. Recently, some researchers have tried to test their usability and compare them with some traditional vocabulary learning tools such as notebooks, word lists, etc. (Özer & Koçoğlu, 2017; Dizon, 2016; Hirschel & Fritz, 2013). Özer and Koçoğlu (2017) investigated the effectiveness of two vocabulary learning tools (Quizlet and vocabulary notebook) in a vocational high school setting in the Turkish learning context. They study consisted of four classes with total 89 participants. Two classes were utilized as the treatment groups; one class using Quizlet which is an online learning tool that helps learners memorize and recall vocabulary items and one class using the traditional vocabulary notebooks. The remaining two classes were served as control groups without any treatment. The results revealed no significant differences among the tool type groups. On the other hand, significant differences were found between pre-test/post-test and pre-test/delayed post-test results of the Quizlet group. These differences were explained in terms of the effectiveness of using online flashcard program. In a similar vein, Dizon (2016) tested the effectiveness of using Quizlet to improve English vocabulary with 9 Japanese university EFL students. The results of the participants' vocabulary tests after treatment revealed that Quizlet was a useful tool for vocabulary learning. In an educational setting of the United Arab Emirates, Jackson III (2015) compared Quizlet and Educreations, which is a mobile application for sharing educational videos. For vocabulary learning, Quizlet was favored over Educreations due to the availability of L1 translation, the games after sessions and receiving a grade after each session. On the other hand, Hirschel and Fritz (2013) utilized

specially adapted version of Praxised.com (n.d.) which is another Computer Assisted Language Learning (CALL) Program with speaced repetition. They compared this CALL program with traditional vocabulary notebooks through two treatment groups and one control group. Although increases in vocabulary scores for both the CALL and vocabulary notebook groups were similar initially, the vocabulary scores of the CALL group in the delayed post-test were found to be slightly higher in the delayed post-test. As a result, researchers suggest that teachers should prefer CALL programs rather than traditional vocabulary notebooks, but they emphasize that they should take into consideration different factors while choosing these tools.

As can be seen above, the number of the studies in this area is limited and most of these studies tested the effectiveness of the same program "Quizlet" despite many other options such as *SuperMemo, Anki, StudyProf, Teachmaster*. They generally claimed its effectiveness by comparing it with some traditional vocabulary learning tools. Also, they were mostly relied upon quantitative data such as vocabulary test scores which do not provide information about the perceptions or preferences of learners.

In the light of these issues, this study will investigate the effect of another popular electronic flashcard program "Anki" on learners' vocabulary knowledge both quantitatively and qualitatively. With Anki, word cards can be designed in a variety of ways. Different from other flashcard programs, Anki is much more flexible and it provides users with the opportunity to change the directions of the word cards easily and create various kinds of cards. Instead of creating their own cards, users can also import ready-made card decks into their Anki program and start reviewing the cards right away. It is also possible for users to share their own card set with other users. Another good feature of anki is that learners can access their card decks with free online website by using desktop syncing or using it with their mobile phones (Godwin-Jones, 2010).

Thus, the main goal of this study is to gain a deeper knowledge about learners' experiences about using Anki, their perceptions about its effectiveness as well as its effect on learners' vocabulary scores.

Purpose of the Study

The purpose of this study is to describe the effects of using Anki (i.e., spaced repetition software) in ESL classes on students` academic vocabulary knowledge. In general, learners are unaware of vocabulary-learning strategies that play an important role in their language learning. Although they acquire new vocabulary incidentally while engaged in different language learning activities, a more direct and systematic way of learning is also necessary for the improvement of vocabulary (Read, 2004). Hence, the aim of this study is to discover to what extent Anki, which is a spaced repetition tool, impacts students` vocabulary learning and, how it might help them to gain some vocabulary-learning strategies. The goal will be to see if this approach affects their overall language learning as well as learners` perceptions about the learning process.

The research questions addressed in this study:

1. How does the use of Anki (spaced repetition software) affect the academic vocabulary learning of college-level ESL students?
2. What are the college-level ESL students` perceptions about learning academic vocabulary with Anki?
    a. Do learners find learning academic vocabulary with Anki *useful*?
    b. Do learners find Anki *useable*? Are the content and organization clear?
    c. Do learners find using Anki for academic vocabulary learning *enjoyable*?

METHODOLOGY

Both quantitative and qualitative instruments were used to collect data to address the research questions.

Table 1. Research questions and data collection instruments

Research Questions	Data Collection Instruments
1. How does the use of Anki (spaced repetition software) affect the academic vocabulary learning of college-level ESL students?	Students` pre-test and post-test vocabulary scores
2. What are the college-level ESL students` perceptions about learning academic vocabulary with Anki? a. Usefulness b. Usability	Likert-scale survey Interviews Informal observations

c. Enjoyment

Participants

Participants in this study included 13 intermediate-level students in ESL reading and writing classes in the Intensive English and Orientation Program (IEOP) at a Midwestern University who were studying English to pass TOEFL (Test of English as a Foreign Language) or IELTS (International English Language Testing System) to begin their academic classes at different universities in the United States. In addition, most of them had been in the U.S. for less than a year and had been studying English for several years. According to their pre-test vocabulary scores (see table 2), learners were proficient at the 2000 word level which includes the lexical items necessary for basic everyday oral communication. Based on the claims of many researchers indicating that learners need to study subtechnical vocabulary occurring across a wide range of academic texts after mastering the General Service List (GSL) (Coxhead 2000; Nation & Hwang, 1995; Read, 2004), it can be said that the participants in this study were ready to learn academic vocabulary.

Table 2. Test results of learners at 2000 word level part of the Schmitt, Schmitt, and Clapham's (2001) Vocabulary Levels Test, Version 2

Participants	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean
2000 word level test results	23	21	28	25	18	16	25	26	30	22	25	24	*	23.5

* Stands for missing data

According to their responses to pre-project survey (results are summarized in Table 3), learners felt comfortable using computers and internet, and agreed that computers and the internet could help them improve their vocabulary (mean = 4.0, SD = 0.9). They also reported that they were using online sources to improve their English (mean = 4.1, SD = 0.7). Although they all completely agreed that vocabulary is an important part of language learning (mean = 4.8, SD = 0.3), their responses showed that they did not enjoy learning vocabulary (mean = 2.6, SD = 1.3) and they found learning vocabulary difficult (mean = 2.3, SD = 1.2). In addition, they were unsure about how to study vocabulary effectively (mean = 3.3, SD =0.8).

Table 3. Pre-project survey responses

	Mean	**SD**
1. I feel comfortable using computers.	4.4	0.9
2. I feel comfortable using the Internet.	4.5	0.5
3. I often use online resources to improve my English.	4.1	0.7
4. I feel comfortable studying English independently.	3.8	0.9
5. I think vocabulary is an important part of language learning.	4.8	0.3
6. I know how to study vocabulary effectively.	3.3	0.8
7. I enjoy learning vocabulary.	2.6	1.3
8. Learning vocabulary is easy.	2.3	1.2
9. I think computers and the Internet can help me improve my English vocabulary.	4.0	0.9

Instructional Materials

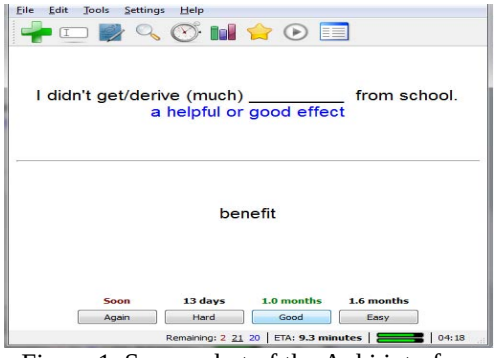

Figure 1. Screen shot of the Anki interface

A spaced repetition program, Anki, was used in two IEOP (Intensive English and Orientation Program) classes to help academically oriented college-level ESL learners improve their academic vocabulary. According to the creator of Anki, Damien Elmes, Anki is a program which makes remembering things easy. He indicates that it is much more efficient than traditional study methods, so learners can increase the amount that they learn and decrease the time that they generally spend studying to remember things. Users can study with Anki on their own computer, online, on their cell phones or other devices such an iPod touch. It is possible to access to numerous numbers of free flashcards called „decks on different topics and also users can create their own decks on different topics. It`s basically based on a paper flashcard system with the question on one side and the answer on the back. However, the outlook of Anki does not look like the paper flashcards. When you click on "Show Answer" button, the question part is also seen by default (see figure 1).

Anki Academic Dictionary

Considering the empirical studies that state the effectiveness of flashcards for vocabulary learning (Fitzpatrick, Al-Qarni, & Meara, 2008; Nation, 2001), an Anki dictionary which includes only academic words appropriate for the level of students was created for this study. Pre-project test results showed that students in both reading and writing classes mastered GSL (General Service List) and they were ready to learn academic vocabulary which consists of 540 words, so the researcher decided to create an academic vocabulary dictionary for these learners by using Anki. Two hundred words were chosen from Coxhead`s (2000) Academic word list to create a new deck for both classes which also included 30 words that were tested both at the beginning and the end of the study. Researcher chose the target words mainly from list 7, 8, 9 and 10 which includes the most difficult words for learners. When the study started, the researcher had enough knowledge about the proficiency level of the students, so she had the responsibility to choose the necessary vocabulary for them.

Anki provides two formats to prepare flashcards that are "recognition" cards and "recalling" cards. In the recognition card format, learners are given some written part of a language and are tested if they can understand it. In vocabulary learning, a new word is presented to learner and s/he is expected to remember the meaning. It is stated on Anki`s website (http://ankisrs.net/docs/manual.html) that recognition cards are easier to do and more materials can be covered in a short time. However, the drawback of these types of cards is that words may not be included into active vocabulary of learners while they can easily recognize them.

Recalling cards, on the other hand, requires learners to produce an answer in the language they are studying. With this format, the definition of a word or expression of it in the learner`s native language will be given first and s/he will try to find the correct word in the target language. It is stated on the website that recalling cards can be more difficult compared with recognition cards and can take more time to complete, but words that are learned with recalling method will become more memorable in the long term and it is highly possible for learners to use them actively.

Based on the explanation above, the academic dictionary designed for learners adopts recalling card format which will help them to learn new words more effectively and encourage them to use them actively in other contexts instead of just recognizing them. At first, a cloze example sentence and the definition of the word is presented to learners on the front page of the flashcard. The definitions and example sentences are all taken from Cambridge Dictionaries Online (http://dictionary.cambridge.org/).

Only the first definitions of the words were included and the example sentences were chosen according to their easiness to understand for intermediate level learners and to what extent they are explanatory about the use of the target words in a context. As it is stated in the literature, it is very important for learners to see target words in a phrase or sentence (Nation, 2001). First of all, example sentences will help learners to notice the target word, which is the first step of learning vocabulary (Nation, 2001; Ellis, 1991; Schmidt, 1990). Also, they will make the learning process easier for learners and affect the retention process in a positive way (Baicheng, 2009; Laufer & Shmueli, 1997; Cobb, 1997).

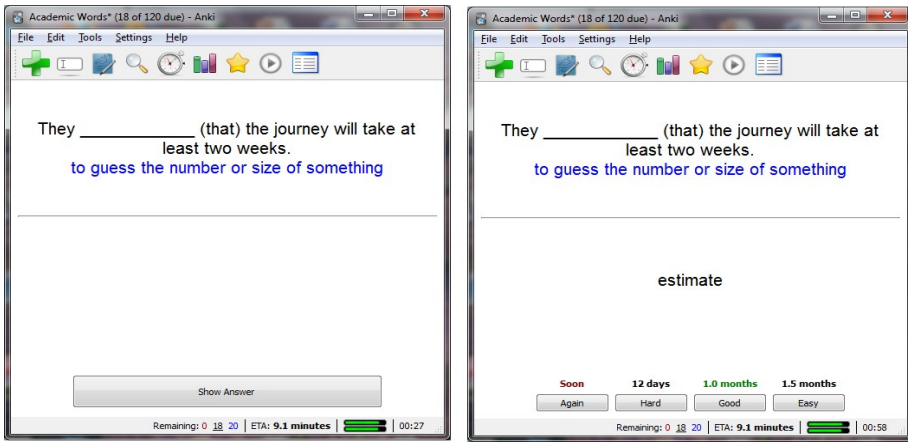

Figure 2. Design of the Anki Academic

By means of example sentences, learner will learn more about the word such as its syntactic feature, which will facilitate the retrieval process later on (Baicheng, 2009). After students look at the cloze example sentence and the definition of a new word, the target word is only presented on the back part of the flashcard when learners click on "Show Answer" button. This ensures that they have enough time to think about the fill-in-the-blank questions and the definitions to find the correct word for each blank.

Data Collection Instruments

Vocabulary Levels Test

Version 2 of the Schmitt, Schmitt, and Clapham's (2001) vocabulary levels test was used for the study, since it was the most widely used vocabulary test in vocabulary learning area and the validity and the reliability of the test was proven in the research.

The Cronbach`s alpha coefficient of the vocabulary levels test was 0.95 which showed that the test had good reliability. Learners` vocabulary size at each four frequency levels of word knowledge and also at academic word level can be learned with this test. For this study, the 2000 level and academic vocabulary parts of the test were used.

As a first step, learners took the 2000 level and academic vocabulary parts of the vocabulary levels test designed by Schmitt, Schmitt & Clapham (2001), considering the fact that academically oriented ESL learners should master the most common 2000 words as a first priority because they include the most of words in the reading texts and then they should start learning academic words, which are supportive of the topics (Coxhead, 2000). So, the 2000 level part of the test helped the researcher see if learners were ready for academic vocabulary learning and the pre-test academic vocabulary test results were used to determine the background academic vocabulary knowledge of the students in both classes. After the intervention, learners took only the academic vocabulary part of the Vocabulary Levels Test again to see the effect of the process on students` academic vocabulary knowledge.

Pre-project questionnaire

Before the project, a pre-project questionnaire was given to all 13 students both in reading and writing classes. The first three questions were designed to gather some demographic data including age, gender, L1. This part also included two questions asking about the participants` length of stay in the United States and the duration of their English learning.

The second part of the questionnaire contained nine Likert-scale items (1 = "strongly disagree", 2 = "disagree", 3 = "not sure", 4 = "agree", 5 = "strongly agree") that measured learners` ability to use computer or internet, their perceptions about vocabulary learning and the role of the technology in this process. Learners` comfort levels of using computer or internet were assessed with two items, "I feel comfortable using computers." and "I feel comfortable using the Internet." Five items were created to evaluate learners` perceptions about vocabulary learning, such as "I think vocabulary is an important part of language learning." and "I know how to study vocabulary effectively." Learners` perceptions about the use of technology for language learning were measured by two items, "I think computers and the Internet can help me improve my English vocabulary." and "I often use online resources to improve my vocabulary."

After the questionnaire was administered the learners in reading and writing class, the results were into the SPSS program and the reliability of the questionnaire was checked with Cronbach`s alpha coefficient which was 0.83.

According to George and Mallery (2003), this value indicated that there was a good internal consistency of items in the survey.

Postproject Survey
Immediately after the end of the project, students completed a survey about the effectiveness of the intervention, which was adapted from Ranalli (2009). The original survey was designed to evaluate the effectiveness of a web-based vocabulary training under three subcategories -- *usefulness, usability and enjoyment* (Ranalli, 2009). The 20 Likert-scale items (1 = "strongly disagree", 2 = "disagree", 3 = "not sure", 4 = "agree", 5 = "strongly agree") for this study were also created according to those three categories to reveal the perceptions of the learners about the learning academic vocabulary with Anki.

The *usefulness* theme of the survey included seven questions evaluating the perceived usefulness of the program, such as "I think Anki can help me improve my vocabulary" and "My academic vocabulary has improved since I started using Anki." Learners` perceptions about the usability of the program were assessed with six items such as "I understood the purpose of Anki clearly." and "The explanations and definitions of words were clear enough for me to understand new words." On the other hand, enjoyment theme encompasses seven items to measure learners` perceptions about the interest found in using the Anki, such as "Using Anki for vocabulary learning is enjoyable" and "I would use Anki again in the future after this class is over."

The postproject survey was administered at the end of the three-week intervention process. The reliability of the postproject survey was checked with Cronbach's alpha coefficient for the survey that was 0.79 showing that the reliability of the survey was good according to George and Mallery (2003).

Interviews
In the following two weeks after the invention, 15-minute interviews were conducted with all 13 students to learn more about their experiences and perceptions about academic vocabulary learning with Anki. The discussions were carried out within a reach of a laptop running the Anki program. Participants were expected to elaborate on what they found useful or least useful with Anki academic dictionary, what they liked or disliked about the program and suggest new ways to improve it, so that it could help them better. Interviews were recorded and transcribed later for analysis process.

Observations
During the intervention process, the researcher, who was also the teacher of both classes, observed the learners using the program at the beginning of each class and took notes on everything that they had done with Anki related to the research question on a daily basis. At some points during observations, participants and the researcher was engaged in dialogues about the use of the program. Observations helped the researcher to understand how the program corresponded to the needs of the different participants.

Research Context
This study was conducted in two same level IEOP (Intensive English and Orientation Program) classes at a large Midwestern university. These classes are designed for international students who want to continue their further education in the US. There are four different skill classes in IEOP which are writing, reading, grammar and listening/speaking. Each skill class meets for 50 minutes every day and the target book for each specific class is followed throughout the classes.

After learners take placement tests for each skill at the beginning of each semester, they are divided into different proficiency levels according to their test scores. Thus, participants in each class are homogenous in terms of their proficiency levels, ages, ranging from 18 to 21, and their native languages, since most of them are from China and are native speakers of Mandarin Chinese. The following section describes how participants were selected for this study.

Data Collection Process
The participants practiced academic vocabulary with Anki every day for 3 weeks. Both the reading class and the writing class meet for 50 minutes every day. At the beginning of each class, learners reviewed 10 words during the first ten minutes of each class. They were also expected to continue reviews on the weekends.

On the first day of the intervention, the pre-project questionnaire and vocabulary test were administrated. Then, the importance of academic vocabulary learning was discussed in both classes by the teacher, who was also the researcher. Coxhead`s (2000) academic vocabulary list was introduced to them and explained how the list was

created to help academically oriented ESL learners. Also, the teacher briefly introduced learners to 'Anki' as a tool that could help them learn academic words that Coxhead`s (2000) list includes, and announced that they were using Anki in the class during the semester. It was explained that Anki could be used on a laptop as well as on other mobile devices such as cellphones, iPods or iPads. Because each class has only one lab day, students were asked to bring either their laptops or any of those mobile devices to class every day.

In the following class, a detailed presentation was given to students about how to use the tool and different features of it. Then, students downloaded 'Anki' to their own devices and imported the academic words dictionary that the researcher prepared for them to their Anki. Except for one student who decided to use his iPad, all students in the reading class decided to use their laptops. On the other hand, the situation in the writing class was different. While three students were using their laptops, the other four was using their cellphones. After downloading the dictionary, they were ready for the reviewing process. The students were told to review at least 10 new words each day for ten minutes at the beginning of each class. They got used to that idea very soon and then the reviewing process continued for another two weeks. Each reading and writing class started with 10-minute reviewing session for three weeks. During those three weeks, the researcher took notes of her observations as well as the reflections on them.

After a three-week learning process, the academic vocabulary part of the vocabulary levels test designed by Schmitt, Schmitt & Clapham (2001) was given to learners again to be able to evaluate the effect of intervention on students` academic vocabulary knowledge. In addition, the participants completed the Likert-scale survey about the usefulness and usability of the tool and, the enjoyment of the process. During the week following the intervention, 15-minute interviews were conducted with students and they shared their experiences of learning academic vocabulary with Anki. The data from the survey and interviews were triangulated with the data from observations to check the accuracy of instruments and to prepare more accurate and reliable answers for research questions.

Analysis of the Data

To answer the first research question, the study made use of the quantitative data from the vocabulary level test that was given before the study and at the end of the study. A paired samples t-test was conducted using the SPSS computer analysis program to examine the differences in means that may be present between pre-test and post-test scores.

To address the second research question about learners` perceptions about the usefulness, usability and enjoyment of the program, data were compiled from the post-project survey, interviews and observations. Survey results were entered into SPSS program and descriptive statistics were used for the analysis of each Likert-scale item. Mean scores and standard deviation of each survey item were used to answer the research question investigating the learners` perceptions.

The data obtained from interviews and observations were analyzed by means of a coding scheme, namely the data providing similar types of information were grouped together (Parson & Brown, 2002). The research suggests that as the researcher read through transcripts or other documents, s/he notices narrative categories under some common themes. The researcher should make note of each category and code the narrative data according to these categories which is specifically carried out by searching for words or phrases that begin to repeat themselves (Mills, 2003; Parsons & Brown, 2002). Hence, the researcher in this study searched for utterances that revealed learners` perceptions about the learning process with Anki as she read through the interview transcripts and observation notes, and highlighted words or phrases related to the perception of usefulness, usability and enjoyment with different colors as it was suggested by Schwalbach (2003), who indicates that it is important for researchers to find some mechanism for coding that works for them. After coloring the narrative data according to these three themes, the data with the same color were grouped together under the subheadings of usefulness, usability and enjoyment, and used as a supportive evidence for survey results.

RESULTS

This section deals with the issue of the extent to which Anki academic dictionary used in the study has affected learners` academic vocabulary and learners` perceptions about academic vocabulary learning process with Anki.

Research Question 1: How does the use of Anki (spaced repetition software) affect the academic vocabulary learning of college-level ESL students?

In order to examine if there were significant improvements in the participants` academic vocabulary knowledge after the intervention process, the academic vocabulary part of the vocabulary test developed by Schmitt, Schmitt and Clapham (2001) was administrated both before the training and at the end of the study. The general aim of

the vocabulary level test used for the study is to get an accurate record of what learners know, including both completely mastered words and words they have partially mastered. Learners` scores at the academic word level represent the proportion of all the words known at that level. So, if a learner scores 15 out of 30 on the academic word level, it can be said that 50% or 285 out of 570 words are known at that level.

Although there were 13 participants in the study, 12 participants` vocabulary test results were analyzed because one of the participants did not take the pre-test (see table 1). While the mean of the pre-test was 19.3 (SD = 6.8), it increased to 23. 6 on the post-test (SD = 5.3). Five participants` pre-test scores out of 12 showed that they did not know more than half of the academic word list which consists of 570 word families because their scores were below 15 out of 30 questions. After the intervention process, all of the learners scored at least 15 out of 30 which indicated that almost all of the learners became proficient in at least 50% percent of the *Academic Word List.* Although all learners increased their scores compared with the pretest scores, only two learners (10 and 12) showed a much better improvement compared with the other learners. The motivation of those learners could be the reason for this great increase in their test results. During class hours, learners 10 and 12 was sitting together and always in the first row.

Table 4. Pre-test and Post-test Scores

Participant	Academic word level pre-test scores	Academic word level post-test scores
1	13	19
2	14	15
3	28	30
4	22	26
5	12	16
6	12	18
7	26	28
8	23	26
9	29	30
10	10	24
11	23	24
12	20	28
Mean	19.3	23.6
Standard deviation	6.8	5.3

Due to the small sample size, the Wilcoxon signed rank test was conducted on data obtained from pretest and posttest results. As a non-parametric test, the Wilcoxon converts scores to ranks and compares them at Time 1 and Time 2 instead of comparing means (Pallant, 2007). A Wilcoxon Signed Rank Test revealed a statistically significant increase in academic vocabulary knowledge of college-level ESL learners following the three-week training with Anki, z = -3.068, p= 0.002. Table 5 indicates that the median score of the vocabulary level test increased from pre-test (Md = 21) to post-test (Md = 25). The results implied that learning academic vocabulary with Anki facilitated an increase in academic vocabulary knowledge of college-level ESL learners.

Table 5. Descriptive Statistics of Pre-test and Post-test

	N	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25th	50th (Median)	75th
pretest	12	19.33	6.81	10.00	29.00	12.25	21.00	25.25
posttest	12	23.66	5.36	15.00	30.00	18.25	25.00	28.00

Research Question 2: What are the college-level ESL students` perceptions about learning academic vocabulary with Anki?

a- Do learners find learning academic vocabulary with Anki useful?

The question asking whether participants found learning academic vocabulary with Anki useful was answered mainly from data gathered from participants` responses on the survey given at the end of the study and interviews. Participants indicated that they found the learning experience with Anki useful for their academic vocabulary learning.

On a Likert-scale of 1 to 5, with 1 showing 'strongly disagree' and 5 showing 'strongly agree', they showed a clear agreement that their academic vocabulary has improved since they started using Anki (mean = 3.9, SD = 0.7) and Anki can help them to improve their academic vocabulary knowledge (mean = 4.0, SD = 0.8). Although they showed less than complete agreement, the participants also reported that Anki could help other language learners to learn new words easily (mean = 3.6, SD = 0.7). The relatively weak agreement (mean= 3.6, SD = 0.7) that participants indicated about their familiarity with vocabulary learning strategies before studying with Anki implied that Anki could be a helpful tool for learners by presenting them a new strategy to acquire vocabulary.

Regarding the questions evaluating the usefulness of different components of the Anki academic dictionary, the results showed that participants found the example sentences useful (mean = 3.8, SD = 0.8) and they indicated that example sentences facilitated the learning process (mean = 3.7, SD= 5.9). Compared with the usefulness of example sentences, there was a slightly less agreement with the ratings about the usefulness of the definitions for their academic vocabulary learning (mean = 3.6, SD = 0.8).

Table 6. Perceptions of Usefulness

Survey Items	Mean	SD
5. Example sentences were useful for me to remember new words.	3.8	0.8
8. I learned many new words by looking at the explanations of words.	3.6	0.8
9. I learned many new words by using example sentences.	3.7	0.5
14. I have already known how to arrange my vocabulary study.	3.6	0.7
15. I think Anki can help me improve my vocabulary.	4.0	0.8
17. Anki can help language students learn new words easily.	3.6	0.6
18. My academic vocabulary has improved since I started using Anki.	3.9	0.7

These results were also in tune with the data from interviews. In general, the positive comments about the usefulness of the program were mentioned throughout the interviews. Some of them indicated that they learned new vocabulary that they had never seen before and they understood academic texts more easily since they started learning academic vocabulary with Anki.

> Oh, yeah…it was useful. Maybe, for the first three or four times I was not clear about words and their meanings. Later on, I found that I learned many words and are familiar with many words. As soon as I saw the definition, I was able to find the word. (S1)
>
> Yeah. I think it is useful because some academic words are on the Anki. Maybe, before I was not sure about the English definition, but I used Anki and learned English definition better. (S5)

During the interviews, participants elaborated on the usefulness of the Anki by indicating the different aspects of Anki they found most useful. Generally, they stated that the repeating option, which made them see the same words again and again, was very helpful for them to remember those words later on which shows that they were clear about the purpose of the program.

Their responses about the improvement of their academic vocabulary were also very positive, similar to survey results. They stated that reviewing sessions helped them to remember more academic words in a short time.

> Yes, I improved a lot. Before I learned Anki, I read some passages like academic reading. Sometimes, I cannot really understand it. But after I learned Anki, I did it again and found it very helpful. (S1)
>
> The first time I saw the word, I didn`t know the word. Later on, I realized that I learned more words as I reviewed them again and again. (S10)

In terms of usefulness of example sentences or explanations, interview data also showed that learners generally found them useful. Some of the participants indicated that they used both example sentences and definitions of words to learn new words. While explanation of a new word gave them the first idea about the word, they learned how to use words in their language by means of example sentences.

> I used both because sometimes if you just read definition, you may not know like what is the word. With the example sentence, it is easier to remember words. (S6)
> When I used Anki, I used both sides. First I saw the definition and then example sentence. I learned how to use the word by looking at the example sentence. (S8)

The learners who stated that they used both example sentences and definitions of words also indicated that their dictionaries helped them a lot at points where they did not understand the exact meaning of the words.
During my classroom observations, I also saw that some of learners were regularly using their electronic dictionaries to check the meanings of the words in their native language. While some of the learners indicated during interview sessions that seeing the words in their native language helped them to learn and recall new words more easily, others said that they used their dictionaries because definitions and example sentences had some unknown words.

> Sometimes, example sentences and sometimes, definitions because there are some new words in definitions for me. So, I need to search for the dictionary. When I use Anki, if there is a new word in the example sentence or definition, I looked up the Chinese meaning. I think Chinese meaning is helpful, but it is not easy job for you to add Chinese meaning because there are other students from different countries. (S10)
> Yeah, I used both definitions and example sentences. Sometimes, I was not sure about the definition and I used my dictionary to find the word. Yes, I checked them because I learn better if I see the meaning in my native language. (S9)

However, interview data also noted that there could be some individual differences regarding their perceptions about the usefulness of example sentences and definitions. Some of the participants emphasized the importance of knowing how to explain words in English and they indicated that they often used definitions to remember words instead of example sentences.

> Definition part helped better. I really think if you know a word, you need to know how to explain it to somebody else. I think it is very important. Not just remembering. If you have somebody who does not know this vocabulary, you really need to know how to explain it. (S6)
> Actually, I didn`t use example sentences to learn words. I just checked their meanings and tried to remember. (S1)

On the other hand, some learners indicated how important to see new words in example sentences and different advantages to learn words with example sentences such as

> Sometimes, the definitions are not very clear and I got confused. Example sentence is very important. It helped me to learn the how to use the word. Also, if it is a noun or a verb. (S7)

In sum, participants found the academic learning process with Anki useful and indicated that their academic vocabulary improved since they started using Anki which also supported the findings of the first research question. However, not all of the participants used the Anki academic dictionary in the same way. Some of them preferred to use only explanations to learn new words, while some of them emphasized the importance of example sentences for vocabulary learning. Explanations of the words were criticized by some learners because they were not clear enough. The next section will focus on more issues about the usability.

b- Do learners find Anki useable? Were the content and organization clear?

To answer this question, the data obtained from the survey about learners` perceptions, interviews and observations were analyzed. In general, their answers indicated that they found the Anki usable and easy to navigate although some parts of the program were criticized by the participants.

Table 7. Perceptions of Usability

Survey Items	Mean	SD
2. It was easy to use Anki.	4.6	0.5
3. I understood the purpose of Anki clearly.	4.3	0.5
4. The explanations and definitions of words were clear enough for me to understand new words.	3.6	0.7

6. I used 'again', 'hard', 'good' and 'easy' options of Anki to arrange my vocabulary study.	4.4	0.5
7. I have not experienced any technical difficulty with Anki.	3.7	0.8
16. I think using Anki on the internet is helpful.	3.8	0.8

Results showed that participants were all in clear agreement that Anki was easy to use (mean = 4.6, SD = 0.5) and the purpose of it was clear (mean = 4.3, SD = 0.5). Most of them did not experience any technical difficulty (mean = 3.7, SD= 0.8). They indicated that they used the review options of Anki to arrange their vocabulary review (mean = 4.6, SD = 0.5) and the accessibility of Anki dictionary on the internet was helpful (mean = 3.8, SD = 0.8). However, there was less than a complete agreement about the clarity of the definitions and example sentences given in their Anki academic dictionary (mean = 3.6, SD = 0.5).

The observational data also supported these findings, indicating that most of the learners understood the purpose of Anki easily and felt very comfortable using the Anki dictionary. After the researcher showed learners how to download the program to their laptops or use it on their cellphone, most of the learners easily downloaded it and set it up. Because the researcher wanted to make all learners use the same dictionary, she exported the dictionary prepared for this study and sent it to participants as an e-mail attachment. Learners had a little difficulty only during the process of importing this dictionary to their own Anki programs because it required them to follow many steps. However, special help was given to each learner by the researcher and they were able to open the academic dictionary file on their programs. During the rest of the study, they started and used the program very easily.

Although most of them did not have any technical difficulty during the rest of the study, a couple of issues arose as some of the learners mentioned in the interviews. A couple of learners complained that starting Anki took a lot of time for them every class which diminished the time for them to review new vocabulary. One learner commented, "Every time I turn on my laptop, I clicked on Anki and I had to wait for a long time. It was really slow" (S6). Another learner mentioned that she did not start Anki every day because it was opening very slowly (S8).

In addition to some technical problems, interviews shed light on some of the problems about the definitions of the words. Although participants did not state any issue about example sentences, they indicated that some definitions were unclear and confusing at some points.

> I didn`t understand the meanings. Meanings were unclear. Example sentences were OK. Most of them were clear, but not all of them. (S2)
> Meaning are not clear enough. You also need to include more details. For example, when I look at a dictionary, definition is very specific. Definitions in Anki are not very specific. (S7)

These data correspond with the researchers` observations during the class hours. It was difficult for some learners to understand the meaning of a new word by looking at the English definitions. Some of learners were regularly checking their electronic or online dictionaries to see the meaning of the words in their native language. During interviews, they indicated that they used dictionaries because the definitions given on Anki were not clear and explanatory enough for them. They also mentioned that they wanted to see more meanings of a new word, but Anki was showing them only one definition, which also caused some confusion for the learners who know another meaning of the same word.

> Sometimes, definitions were confusing because I checked some words in the dictionary and found that it had many more meanings, but I saw only one meaning on Anki. (S9)
> If there is no new word for me, they are clear. However, I generally searched for Chinese meanings of words. Definitions were not clear sometimes. (S12)

While survey results show that learners feel comfortable using the Anki, the interviews and the observation data indicate some problems regarding the usability of different components of the dictionary, such as slow openings and the clarity of definitions.

c- Do learners find using Anki for academic vocabulary learning enjoyable?

Responses to the questions related with the 'enjoyment' of the site showed that participants generally found using Anki for vocabulary learning enjoyable (mean = 3.6, SD = 0.9). However, the lowest mean scores of the

questions 10 and 11 (mean = 3.3, SD = 0.9; mean = 3.4, SD = 0.7) indicated that learners were not sure if Anki was interesting or motivating for vocabulary learning.

Table 8. Perceptions of Enjoyment

	Mean	SD
1. Using Anki for vocabulary learning is enjoyable.	3.6	0.9
10. Learning vocabulary with Anki is interesting.	3.3	0.9
11. It is motivating to use Anki to learn new words.	3.4	0.7
12. I liked seeing example sentence and definition first.	3.8	1.0
13. I liked the fill-in-the-blanks exercises for vocabulary learning.	3.6	0.8
19. I would use Anki again in the future after this class is over.	3.7	0.9
20. This kind of tools should be included in language courses.	3.7	1.0

My observations also coincide with these findings. Trying a new way of learning words caught learners` attention from the first day. Most of them got used to the idea of reviewing vocabulary with Anki very soon and they were very careful about bringing their laptops or cellphone to classes. In the interviews, several participants expressed how they felt about using Anki for their vocabulary learning. Some of them indicated that they liked it because it was a new way of learning and they used it for a limited time every time. Although they stated that the Anki is not interesting or motivating during the interviews, they enjoyed trying a different way of learning new words and seeing that they were really improving their vocabulary.

Sometimes, I felt bored, but it is OK. Learning is boring, so that`s fine. Sometimes, I found it enjoyable. When I saw that I was learning, I found it very enjoyable. (S3)

Learning vocabulary is not interesting. Process is boring, but when you see that you have learned something, then it is very interesting. (S7)

In addition to the general enjoyment of the Anki dictionary, survey results also indicated that learners liked the design of flashcards (mean = 3.8, SD = 1. 06) and the fill-in-the-blanks strategy used to present new words on the first sides of flashcards (mean = 3.6, SD = 0.8). However, they provided some suggestions to make Anki academic dictionary more interesting and effective for their learning. They stated that it would have been better if the dictionary were enriched with more information, such as pronunciations of new words, the meanings of words in learners` native language or pictures.

> I think there are many things that can help to improve Anki. Sometimes, you know I ask you the pronunciations of words. That should be on that. If you add pronunciation, it can be more interesting. If I don`t know the pronunciation, I cannot spell the word. Also, definitions can be clearer and more meanings can be added. (S2)
> I think you can show some pictures to explain definition. You know, some people remember the words by imagining them and also you can also add some pronunciation about the word. So, some people can read it and speak it. Just know the definition, they cannot speak. (S6)

Some of the participants indicated that Anki could have helped them better if it had a ‘typing’ feature. They said that they did not find any chance to practice the spelling of the works and just reading the flashcards could not help them.

> We should type it. If I type the word, I can learn it better. If I type ‘indicate’ without ‘i’, it should show answer ‘indicate’ so that I can learn spelling. (S4)
> But I prefer to write down the word, I used to write down. It`s my personal problem. Sometimes, I try to write essays in my laptop, but I cannot write. If I have a pen and paper, I can write down, but I cannot write by using laptop. It`s my problem. At first, I need to write down and then type it. (S8)

Although there were some suggestions given by learners to make the Anki dictionary more effective, the participants indicated that they would use Anki again in the future for their vocabulary learning (mean = 3.7, SD = 0.9) and they were positive about the integration of this type of tool into language classrooms (mean = 3.7, SD = 1.09). The observational data also supported these findings. Although it was obvious to me that participants were not using the Anki academic dictionary outside of the class, they were careful about bringing their laptops to classrooms and reviewing vocabulary regularly in the classroom. Learners did not have enough motivation to use Anki on their own, but they were trying to keep up with reviewing during the class hours. When they were asked whether they would Anki in the future, their responses were;

> I think I will use it if I have examples like this. If the teacher gives us the example dictionary, because I am lazy. If I need to type everything, I will be too difficult for me. (S1)
> Actually, it depends. If there is a word list suitable, I can do that. But I think……Because you know, I cannot find the right word list for me. I do not know which word list I need to study. Also, I am a little bit lazy, so probably I will not do because it will take a lot of time to put words into Anki. If teacher prepares a dictionary, I can study it (S4)

Most of the learners stated that they would think about using other Anki dictionaries in the future if they were prepared by teachers. However, learners indicated that preparing their own dictionary by using Anki would take a lot of time and they were not knowledgeable enough to decide which words to study. So, most of them were hesitant to give a positive answer when they were asked whether they would prefer to create their own dictionary. One of the learners stated that he was not interested in creating his own dictionary because it was very complex for him (S4), while another student said, "If I read the word like the definition and example sentence, I think it is fine but if I put definitions and example sentences by myself, it is hard. It needs to take long time" (S7).

To sum up, learners found learning academic vocabulary with Anki enjoyable and liked trying a new learning strategy. They want to use it again in the future if they can find some good dictionaries prepared by others, but they are not willing to prepare their own dictionaries. So, they are positive about integration of the tool into language classrooms if the teacher prepares the dictionary for them. Although they indicated that Anki academic dictionary was not interesting enough for them, they liked the design of the dictionary. They suggested that it could be improved with different options such as a pronunciation option, pictures and more detailed information about new words.

CONCLUSİON

There were two research questions in this study. The second research question was investigated under three subcategories. So, findings are discussed in four sections. The first research question was "How does the use of Anki (spaced repetition software) affect the academic vocabulary learning of college-level ESL students?" The vocabulary levels test results showed that the process of learning academic vocabulary with Anki helped college-level ESL students to improve their academic vocabulary. This finding corresponds with the claims of Laufer (2005) and Schmitt (2008), who indicate that explicit vocabulary learning helps learners to gain greater amount of vocabulary in a short period of time in addition to a better chance of retention. Learners practiced about two hundred academic words in three weeks and their scores increased significantly. Although the intervention process affected each learner`s success at different rates, all learners scored at least 15 out of 30 which means that they become proficient in almost half of the *Academic Word List.*

The second research question was "What are the college-level ESL students` perceptions about learning academic vocabulary with Anki?" Learners` perceptions about use of the flashcard program for vocabulary learning were categorized under three subheadings: *usefulness, usability, and enjoyment.*

Regarding the learners` perceptions about the usefulness and usability of the program, the results suggested that learners found learning academic vocabulary with Anki useful and they found the program useable. These findings support many researchers` claims about the usefulness of such flashcard programs in terms of keeping the record of learners` improvement for a certain amount of time and arranging the order of words which enable learners to see and practice difficult words more often (Nakata, 2008; Pyc & Rawson, 2007). By using Anki, learners did not spend time arranging review schedules. Anki organized the reviewing process and presented the words in a planned manner according to the review options chosen by each learner.

In addition, learners also found different components of the Anki dictionary useful, such as example sentences and definitions of the words. The findings showing that example sentences facilitated the learning process coincides with other researchers` findings indicating that example sentence in vocabulary learning supports both

the learning process and retention in the long run (Baicheng, 2009; Laufer & Shmueli, 1997; Cobb, 1997). These results were also in line with the findings of the preproject questionnaire. Before the intervention, there was a clear agreement among learners with the notion that computers and internet could help them improve their vocabulary. At the end of the project, learners also reported that they found Anki useful and they had improved their academic vocabulary since they started using Anki.

Although learners reported that example sentences and definitions were useable in general, interview data shed light on some possible problems regarding the usability of definitions. Some of the learners complained that the definitions were long and the unknown words made the understanding difficult for them. So, some of the learners were checking their bilingual dictionaries during review sessions which decreased the number of words seen by them every class. This finding implies that special attention should be given to the clarity of the definitions and they should be checked with learners not clear what you mean here before they start reviewing.
In general, learners agreed that Anki was easy to use and they did not report that they had serious technical problems. However, observations and interview data showed that a few of the learners had to wait for a long time to start Anki, which made them review fewer words than other. So, the reasons for this problem should be investigated to provide learners with equal time to review.

Regarding learners` perceptions of enjoyment, learners indicated that they enjoyed learning academic vocabulary with Anki. The findings showed that the intervention process affected learners` enjoyment of learning vocabulary in a positive way, because they were very sure of the fact that they did not enjoy vocabulary learning before the project as it was shown by the preproject questionnaire (See table 3.2). Integration of a computer-based flashcard program into the academic vocabulary learning process changed learners` attitudes toward vocabulary learning to a great extent. Hence, language teachers should be aware of the fact that ESL learners think that learning vocabulary is both a difficult and boring process, but they can change their learners` negative perceptions about vocabulary learning by adopting new strategies, such as technology integration into learning and teaching as in this study. This finding is also supported by other researchers who indicate that students love to use different technologies and technology use can create positive attitudes in learners (Oblinger, 2005).

Even though technology integration into vocabulary learning changed learners` perceptions and helped them to enjoy learning, survey results showed that they were not so sure about whether learning vocabulary with Anki is interesting or motivating. This may result from the limitations of the Anki academic dictionary that the researcher created according to the needs of this specific group of learners. The research suggests that computer-based flashcard programs can increase learners` motivation to a great extent by presenting various multimedia possibilities (Nakata, 2006; Allum, 2004; Hulstijn, 2001; Nation, 2001). However, this study focused on the spaced repetition aspect of the flashcard program and the flashcards used in this study did not integrate multimedia capabilities. The participants also indicated this deficiency stating that program could be more interesting for them if the pronunciations of words were provided in addition to the definitions of the words and example sentences. This finding implies that flashcard programs to be used in language classrooms can be made more interesting and motivating for learners if multimedia options of them are adapted according to the needs of learners. Language teachers can integrate audio files for pronunciation or pictures into flashcards according to the proficiency level of their learners.

Overall, this study found out that flashcard programs are promising for vocabulary learning in terms of giving ESL learners a chance to organize their vocabulary learning based on the spaced repetition (Baddeley, 1999; Nation, 2001). Language teachers can integrate a recycling process into vocabulary learning by means of Anki, based on Schmitt`s (2008) suggestion that language teachers and material writers think about vocabulary learning in longitudinal terms and recycle new words in an organized way. The spaced repetition tool used for this study, Anki, helped academically oriented college-level ESL students improve their academic vocabulary and changed their negative perceptions about vocabulary learning. Learners found Anki useful, usable and enjoyable. However, learners prefer to use it with the guidance of a teacher instead of creating their dictionaries for their future study. As a result, language teachers should be aware of the potential of these programs and have their students notice that these kinds of tools are available for their vocabulary learning.

LİMİTATİONS OF THE STUDY

The study has limitations related to the design of the study. First of all, only one-group pretest/post-test scores were compared. Even though test results indicated that the learning process with Anki improved learners` academic vocabulary knowledge, it is not possible to say that Anki was the only reason why learners` test results increased considering that these learners attended four different language classes every day to prepare them for their future academic study and they lived in a community where English is spoken. So, there is a high possibility that these other factors might also have affected the overall post-test scores.

Also, a convenience sample which came from the researcher`s own classes was used and there was a limited number of participants, which lead to use of descriptive statistics instead of inferential statistics. As a result, it is difficult to generalize the findings to a broader population.

SUGGESTİONS FOR FURTHER RESEARCH

Based on the results of this study, several suggestions for future research arise. First of all, as only receptive vocabulary knowledge of learners was measured in this study, further research is needed to investigate the effect of the intervention on learners` productive vocabulary knowledge. For this purpose, other assessment instruments need to be included in the study, where learners can use the words for productive purposes. Second, since the findings of the study suggested that the integration of different multimedia options into the Anki dictionary could change learner`s perceptions, it is important to investigate the possible effects of these options on learners` overall success and perceptions. Thus, a new Anki dictionary should be designed based on the recommendations of the learners and it should be tested with another group of participants.

Third, the effect of learning vocabulary with Anki on learners` language proficiency in different language skills such as speaking or reading should be evaluated. For example, the pronunciation of words can be recorded and incorporated into the dictionary by using the audio feature of Anki and its effect on learners` speaking ability can be assessed with various speaking activities.

In addition, the effectiveness of the flashcard program can be investigated in a study in which learners design their own Anki dictionaries by using different options and then review their dictionaries instead of the one created by the teacher. As some learners indicated that they could learn better if they typed the words themselves, this type of a study can make learners explore the tool better and prepare them for autonomous learning process.

All in all, although the data revealed that flashcard programs are effective for vocabulary learning, necessary changes to the design of the dictionary should be made and further research is recommended to be carried out with a larger sample size so that the findings can be generalized to the population.

REFERENCES

Allum, P. (2004). Evaluation of CALL: Initial vocabulary learning. *ReCALL*, 16(2), 488-501.

Baddeley, A. (1990). *Human Memory*, London: Lawrence Erlbaum Associates.

Baicheng, Z. (2009). Do example sentences work in direct vocabulary learning? *Issues in Educational Research*, 19(2), 175-189.

Barcroft, J. (2004). Effects of sentence writing in second language lexical acquisition. *Second Language Research*, 20(4), 303-334.

Barcroft, J. (2007). Effects if opportunities for word retrieval during second language vocabulary learning. *Language Learning*, 57(1), 35-56.

Bryman, A. (2008). Why do researchers integrate/combine/mesh/blend/mix/merge/fuse quantitative and qualitative research. *Advances in mixed methods research*, 87-100.

Cambridge Dictionaries Online. (n.d.). Retrieved from http://dictionary.cambridge.org/

Carr, W., & Kemmis, S. (1983). *Becoming critical: Knowing through action research*. Deakin University.

Cobb. T. (1997). Is there any measurable learning from hands-on concordancing? *System*, 25, 301-315.

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly 34*(2), 213-238.

Coxhead, A. (2008). Phraseology and English for academic purposes. In F. Meunier & S.

Day, R.R., Omura, C., & Hiramatsu, M. (1991). Incidental EFL vocabulary learning and reading. *Reading in a Foreign Language*, *7*, 541-551.

Creswell, J.W. (2005). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (2nd ed.). New Jersey: Merrill Prentice Hall.

Day, R. R., Omura, C. and Hiramatsu, M. (1991) Incidental EFL vocabulary learning and reading, *Reading in a Foreign Language*, 7, 541-551.

de Groot, A. M. B. (2006). Effects of stimulus characteristics and background music on foreign language vocabulary learning and forgetting. *Language Learning*, 56(3), 463-506.

Dick, B. (2002). Action research: Action and research. Action learning and action research, URL (consulted Jan 2011) http://www.scu.edu.au/schools/gcm/ar/arp/aandr.html.

Dizon, G. (2016). Quizlet in the EFL Classroom: Enhancing Academic Vocabulary Acquisition of Japanese University Students. *Teaching English with Technology*, *16*(2), 40-56.

Dupuy, B. & Krashen, S. D. (1993). Incidental vocabulary acquisition in French as a foreign language. *Applied Language Learning*, 4 (1+2), 55-63.
Elgort, I. (2007). *The role of intentional decontextualized learning in second language vocabulary acquisition: Evidence from primed lexical decision tasks with advanced bilinguals* (Unpublished doctoral dissertation). Victoria University of Wellington, Wellington, New Zealand.
Elliott, J. (1991). *Action research for educational change.* London: Open University Press.
Ellis, R. (1990). *Instructed Second Language Acquisition*. Basil Blackwell: Oxford.
Ellis, R. (1991). The interaction hypothesis: A critical evaluation in E. Sadtono (ed.), *Language Acquisition and Second/Foreign Language Classroom* (179-211). RELC Anthology; Series 28.
Elmes, D. (2011, February 26). Anki User Manual. Retrieved from http://ankisrs.net/docs/manual.html
Fitzpatrick, T. Al-Qarni, I., & Meara, P. (2008). Intensive vocabulary learning: A case study. *Language Learning Journal*, 36(2), 239-248.
Foster, P. (1999). 'Never mind the quality, feel the impact': A methodological assessment of teacher research sponsored by the Teacher Training Agency, British Journal of Educational Studies , 47 (4), 380–398.

Glopper, K. (2002), Lexical Retrieval: An Aspect of Fluent Second–Language Production That Can Be Enhanced. *Language Learning*, 52, 723–754.
George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update* (4th ed.). Boston: Allyn & Bacon.
Godwin-Jones, R. (2008). Emerging technologies mobile-computing trends: Lighter, faster, smarter. *Language Learning & Technology*, 14(2), 4-11.
Grundy, S. (1995) Action Research as Professional Development. Murdoch: Innovative Links Project.
Hirschel, R., & Fritz, E. (2013). Learning vocabulary: CALL program versus vocabulary notebook. *System*, *41*(3), 639-65
Horst, M., Cobb, T. & Meara, P. (1998). Beyond a Clockwork Orange: acquiring second language vocabulary through reading. *Reading in a Foreign Language*, 11, 207-223.
Hulstijn, J. H. (2001). 'Intentional and incidental second-language vocabulary learning: a reappraisal of elaboration, rehearsal and automaticity', in P. Robinson (ed.), *Cognition and Second Language Instruction*. Cambridge: Cambridge University Press.
Jackson III, D. B. (2015). A Targeted Role for L1 in L2 Vocabulary Acquisition with Mobile Learning Technology. *Perspectives (TESOL Arabia)*, *23*(1).
Kemmis, S., & McTaggart, R. (1988). *The action research reader*. Geelong. Victoria: Deakin University Press.
Krashen, S. (1989). We acquire vocabulary and spelling by reading: Additional evidence for the Input Hypothesis. *The Modern Language Journal*, *73*, 440-464.

Laufer, B. (2005). Focus on form in second language vocabulary learning. *EUROSLA Yearbook*, 5, 223-250.
Laufer, B., & Hulstijn, J. H. (2001). Incidental vocabulary acquisition in a second language:The construct of task-induced involvement. *Applied Linguistics, 22*, 1-26.
Laufer, B. & Shmueli, K. (1997). Memorizing new words: Does teaching have anything to do with it? *RECL Journal*, 28, 89-108.
McNamara, D.S., & Healy, A.F. (1995). A generation advantage for multiplication skill training and nonword vocabulary acquisition. In A.F. Healy & J.L.E. Bourne (Eds.), *Learning and memory of knowledge and skills: Durability and specificity* (pp. 132-169). CA: Sage.
Meara, P., Lightbown, P. & Halter, R. H. (1997). Classrooms as lexical environments. *Language Teaching Research*, 1, 28-47.
Mills, G. E. (2003). *Action research: A guide for the teacher researcher* (2nd ed.). upper Saddle River, NJ: Merrill/Prentice Hall.
Mondria, J-A & Modria-de Vries, S. (1994). Efficiently memorizing words with the help of word cards and 'hand computer': theory and applications. *System*, 22, 47-57.
Nakata, T. (2008). English vocabulary learning with word lists, word cards and computers: Implications from cognitive psychology research for optimal spaced learning. *ReCALL*, 20(1), 3-20.
Nakata, T. (2011). Computer-assisted second language vocabulary learning in a paired-associate paradigm: a critical investigation of flashcard software. *Computer Assisted Language Learning*, 24(1), 17-38.
Nation, I. S. P. (2001). *Learning vocabulary in another language.* Cambridge: Cambridge University Press.

Nation, I. S. P. (1990). *Teaching and Learning Vocabulary*, Massachusetts: Newbury House.

Nation, I. S. P. & Hwang K. (1995). Where would general service vocabulary stop and special purposes vocabulary begin? *System*, 23, 35-41.
Oblinger, D. (2005). Learners, learning & technology. *EDUCAUSE Review*, *40*(5), 67-75.

Ou, Y. S. (1999). Action research and innovation in school education. *Elementary education*, 39(5), 2-12.

Özer, Y. E., & Koçoğlu, Z. (2017). The Use of Quizlet Flashcard Software and Its Effects on Vocabulary Learning. *TÖMER*, 168(1), 061-082.
Parson, R. D., & Brown, K. S. (2002*). Teacher as reflective practitioner and action researcher.* Belmont, CA: Wadsworth/Thomson Learning.
Pallant, J. (2007). *SPSS survival manual*, 3rd. Edition. McGrath Hill.
Pigada, M., & Schmitt, N. (2006). Vocabulary acquisition from extensive reading: A case study. *Reading in a Foreign Language*, *18*, 1-28.

Pimsleur, P. (1967). A memory schedule. *Modern Language Journal*, 51, 73-75.
Prensk, Marc (2001). Digital Natives, Digital Immigrants. *NCB University Press*, 9(5).

Pyc, M.A., & Rawson, K.A. (2007). Examining the efficiency of schedules of distributed retrieval practice. *Memory & Cognition*, 35(8), 1917-1927.
Read, J. (2004). Research in teaching vocabulary. *Annual Review of Applied Linguistics*, 24, 146-161.
Ranalli, J. (2009). Prospects for Developing L2 Students` Effective Use of Vocabulary Learning-Strategies via Web-based Training. *CALICO Journal*, 27(1), 161-186.
Rott, S. (1999). The effect of exposure frequency on intermediate language learners` incidental vocabulary acquisition through reading. *Studies in Second Language Acquisition*, 21, 589-619.
Schmitt, N. (2000). *Vocabulary in language teaching.* Cambridge: Cambridge University Press.
Schmitt, N. (2008). Instructed second language vocabulary learning. *Language Teaching Research*, 12(3), 329-363.
Schmitt, N. & Schmitt, D. (1995). Vocabulary notebooks: theoretical underpinnings and practical suggestions. *ELT Journal*, 49, 133-143.
Schmitt, N., Schmitt, D & Clapham, C. (2001).Developing and exploring the behavior of two versions of the Vocabulary Levels Test. *Language Studies*, 18(1), 55-58.
Schmidt, R. W. (1990). The role of consciousness in second language learning. *Applied Linguistics*, 11, 129-158.
Schwalbach, E. M. (2003). *Value and validity in action research: A guidebook for reflective practitioners.* Lanham, MD: Scarecrow Press.
Smith, B. (2004). Computer-mediated negotiated interaction and lexical acquisition. *Studies in Second Language Acquisition*, 26(3): 365-398.
Swanborn, M. & de Glopper, K. (2002). Incidental word learning while reading: a meta-analysis. *Review of Educational Research*, 69, 261-285.
Tamaki, K. (2007). Incorporating Nintendo DS into the curriculum leads to marked improvement in English vocabulary: Yawata City Board of Education, Kyoto. *Mainichi Newspaper*, p. 28.
Tang, E., & Nesi, H. (2003). Teaching vocabulary in two Chinese classrooms: Schoolchildren`s exposure to English words in Hong Kong and Guangzhou. *Language Teaching Research*, 7, 65-97.
Vidal, K. (2003). Academic listening: A source of vocabulary acquisition? *Applied Linguistics*, 24(1), 56-89.
Waring, R. (2004). A study of receptive and productive learning from word cards. *Studies in Foreign Languages and Literature*, 21(1), 94-114.
Waring, R., & Takaki, M. (2003). At what rate do learners learn and retain new vocabulary from reading a graded reader? *Reading in a Foreign Language*, 15, 1-27.
Webb, S.A. (2002). *Investigating the effects of learning tasks on vocabulary knowledge* (Unpublished doctoral dissertation). Victoria University of Wellington, Wellington, New Zealand.
Webb, S.A. (2009). The effects of pre-learning vocabulary on reading comprehension and writing. *Canadian Modern Language Review*, 65(3), 441-470.
Webb, S. (2007). The effects of repetition on vocabulary knowledge. *Applied Linguistics*, *28*, 46-65.
West, M. (1953). *A general service list of English words*. London: Longman, Green.

Investigating the Students' Experimental Design Ability toward Guided Inquiry Based Learning in the Physics Laboratory Course

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ABSTRACT
The goals of this advanced physics laboratory course emphasized not only to improve students' physics knowledge but also spectrum scientific abilities in particular for preparing their future-ready competencies. One of those scientific abilities was initiated to study that was "the ability to design experiment". It was the fundamental ability in help enhance students' higher order thinking in solving problems and self-operating their own labs scientifically. Besides, this corresponds to a crucial national policy of Thailand. There has been promoted innovative thinking skills to step onward driving the Thailand economy. This study was a preliminary report on the students' experimental design ability towards the students' learning engagement in a guided inquiry lab which involved to the physics concept of heat transfer. To investigate the ability, 18 senior-physics students enrolled the course were required to work in three groups of 4to 6. In the investigation, a guided-inquiry lab set and worksheets were substantially designed and validated by three physics university lecturers who had teaching experiences for over 10 years. The guided worksheets were straightforwardly structured by considering five sub-abilities dealing with the ability to design experiment. Those worksheets were viewed as a lab report and also used as a main research tool to help follow and collect data about the students' experimental design ability. The key format of the worksheets was that guided inquiry questions and black spaces were contained. This aimed to actively engage the students in the experiment since (1) linking physics concept, (2) defining measurement variables, (3) clarifying an experimental procedure, (4) selecting equipment and materials, and (5) minimizing errors. In each of the five abilities, the students had to individually investigate the answers of guided-inquiry questions and then shared ideas with their groups till they could solve the main problem of the lab. Additionally, video recordings were collected to triangulate qualitative data of the students' learning engagement. From observation, we found that the students spent about 6 hours in total (3 hours for designing the experiment by working on answering the guided-inquiry questions and 3 hours for doing the experiment) to complete the experimentation. The most time-consuming (about an hour) was in the step of linking physics knowledge to formulate a situation in order to solve the problem. The result found that there were no students who could design the experiment to solve the problem correctly but all of them were able to formulate the situations relating to the solving problem. All experiments designed could be practical. The main difficulty was from the students' misunderstanding of heat transfer. They did not determine the heat transfer from all objects in the closed system. This was the most difficult point in enhancing this ability. Moreover, there were many unexpected sub-abilities: basic measurements, using scientific equipment, and also identifying variables. Besides, the students were required to self-assess their proficiency on a 4-point rubric test. The first-two lowest average scores were in items relating to the sub-abilities to link physics knowledge and to clarify an experimental procedure.

INTRODUCTION
The several goals of physics laboratory courses are to develop students' understanding underlying physics principles, laws, or conceptions together with spectrum basic skills which involve to the art of experimentation—carrying out experiments and designing investigations to solve problems, data analysis—interpretations, and collaborative learning—social exchanges and expansion of ideas (AAPT, 1998; Hofstein & Lunetta, 2004). Such those skills are viewed as scientific practice. These are processes or methods that scientists use when they

construct knowledge and solve experimental problems (Etkina et al., 2006; Etkina et al., 2006; Karelina & Etkina, 2007).
In addition, in this twenty-first century, science educators and researchers have awaked to disseminate a focus on preparing learners' future-ready competencies. These particularly cite to four of these—creativity, critical thinking, collaboration, and communication (Tan et al., 2017). These correlate to the competencies having been driven in Thailand. Nowadays, there has been launched a government policy concerning to enhance economics by science, technology, and innovations called Thailand 4.0 policy (Jones & Pimdee, 2017) as Thailand has been trapped in a middle-income level. This will then affect Thailand's education reform by promoting innovative thinking and problem solving abilities.

Furthermore, based on the context of this study, to monitor an advanced physics laboratory course, the goal was covered specialized skills for working on advanced physics apparatus and challenging experiments. However, many universities in which are not leading universities in Thailand have been not ready for administering advanced lab apparatus for students as they are facing budget constraints. Under this condition, we lacked any advanced physics lab sets. Therefore, this condition reinforced us to think about how to gain support student learning efficiently and mutually took into account of the national education policy of Thailand. Then, we had an agreement to arrange the course in help students prepare some abilities for their future career or future learning which aimed to enhance innovative thinking abilities. One of the crucial abilities we referred to that was the experimental design ability. This aligned with the summary of introductory physics laboratory goals of the American Association of Physics Teachers (AAPT) (AAPT, 1998). This would affect an improvement of students' higher order thinking in solving problems and self-operating their own labs scientifically.

Consequently, to get deep understanding of students' the experimental design ability that will be a useful guideline to further help improve students' scientific learning process abilities substantially. The main purpose of this study is to primarily investigate students' experimental design ability in the advanced physics laboratory course. A strategy that was selected to help track the students' ability was inquiry.

Inquiry based learning has been disseminated to several laboratory classes and viewed as an alternative approach to enhance students' scientific inquiry skills and attitudes towards science instruction (Myers & Burgess, 2003). It is an inductive approach. The inquiry learning is generally expressed as four-levels of carrying on scientific investigations. As our participants were seniors, they were considered to get involve with a high level of carrying on scientific investigations called 'guided inquiry' (Banchi & Bell, 2008; Domin, 1999). The students would be provided with a problem or a question. They would be required to plan how to solve an experimental problem or to test a hypothesis. Therefore, the students have to formulate an investigation procedure to find an undetermined outcome by themselves. This allows the students to think like scientists. Later they will acquire knowledge and develop their own understanding of concepts, principles, or even theories.

RESEARCH METHODOLOGY

PARTICIPANTS

The participants were 18 fourth-year physics students from a university in Bangkok. They enrolled an advanced physics laboratory course. For the four-year study curriculum, the students had not learned physics labs since they became juniors. They were enrolled two fundamental physics laboratory courses for first-year students and two electronics lab courses for sophomore students. The teaching style of these courses was in a format of cookbook labs. The experiments were mostly selected and adapted from physics Olympics labs used for training high-school physics Olympics students. The labs involved challenging physics ideas and using basic measurement tools and simple physics apparatus. In each lab, students would be given a cookbook handout and then follow the direction of the lab till they completed and sent their individual lab report.

RESEARCH DESIGN

Defining sub-abilities relating to the ability to design experiment

We initiated this study by defining sub-abilities which were relevant to the experimental design ability. Reports from Hantula *et al.* (2011) and Etkina and Murthy (2006)' research about analyses and interpretations of teaching and learning in physics laboratories, we later used to clarify the relevant sub-abilities as follows:
(1) the ability to link physics concepts, principles, or laws in order to develop an experimental situation(s) for solving a problem or testing a hypothesis. This covers applying correct physics knowledge which corresponds to the problem solving;
(2) the ability to identify measurement variables which relate to such that experimental situation defined;
(3) the ability to clearly clarify an experimental procedure that can be used in the real practice;
(4) the ability to use available equipment and materials for experimentations and measurements; and
(5) the ability to minimize errors of experimentation. This relates to techniques used for setting-up an experiment or methods designed for collecting data.

Designing the research tools for data collection: a guided-inquiry lab, worksheets, and a 4 point rubric test
After clarifying such those sub-abilities, we then developed a guided-inquiry lab underlying the concept of heat transfer. It was about finding "the specific heat capacity of a one-baht coin"**.**

Besides, guided-inquiry worksheets were developed to employ while students conducted the heat-transfer experiment. These guided-inquiry worksheets were not only used as a guideline to assist the students' active engagement in the laboratory but also used as a survey for investigating students' the five-experimental design sub-abilities. The lab consumed 6 hours to complete: first-three hours for planning and designing their experimental situation for solving the problem and left hours for conducting the experiment, collecting and interpreting data, summarizing results, and communicating their findings and shortcomings. The students were required to collaborate on designing an experiment in groups of 4 to 6 throughout the lab class. Then, all of the students' individual worksheets would be collected to analyze research data. Lastly, the students were required to self-assess their five sub-abilities on the 4 point rubric test.

DATA COLLECTION

To assess the students' experimental design abilities, we collected the students' individual lab worksheets and the students' self-assessment about their sub-abilities by using the four-point rubric.

The guided-inquiry lab worksheets about heat transfer
The guided-inquiry lab worksheets were developed to be relevant to the five sub-abilities and then validated content and wordings by three physics teachers who had experienced in teaching for many several years. To assist student learning, the guided-inquiry lab worksheets were proposed and used during the lab class with the hidden reason about the key feature of using the worksheets. They included some key questions for guiding how to design the procedure for solving the problem and information with blank spaces as well as were embedded with the guided-inquiry approach. Many reports found that this could encourage students' interactive engagement of learning, improve their comprehension, and retention of the content (Sujarittham et al., 2016; Tanamatayarat et al., 2017)

In the worksheets, the students were initially given the information about a brief physics theory, a problem, and available equipment as follows;
Part1: Short-physics theory that is "*heat gained by an object resulting a high or low temperature change depends on its own specific heat capacity"*.
Part2: Problem statement that is "*what is the specific heat capacity of a one-baht coin?"*.
Part3: Equipment and materials which consist of "*one-baht coins, a calorimeter, a mercury glass thermometer, water at room temperature, hot water, and ice"*.

After the students were given the above information. They would then have to design how to solve the given problem. Here is the structure of inquiry activities about "Heat transfer" contained in the worksheets.

Step1: Sketch and describe the experimental situation(s) that will be used to solve the problem based on the available equipment and materials.
For this step, we prepared two hint cards for the students who had no ideas and need teacher's guides. The hint cards consisted of card 1: need to set at least two objects with different temperatures and card 2: need to define which objects will be gained or lost heat.
Step 2: Connect the situation designed to a physics concept and formulate the corresponding formula which will be used to find the specific heat capacity of a one-baht coin.
The hint cards will be contributed to the students who need help. Card 1: Heat Gained is equal to heat Lost and card 2: Heat gained by object(s) will be (the black space left for the students' response) and Heat lost by object(s) will be (the black space left for the students' response).
Step 3: Share ideas with your own groups, rethink whether you will change your ideas if 'yes' please inform your reason(s), and lastly summarize the experimental situation and the formula will be used to solve the problem.
Step 4: Identify the measurement variables.
Step 5: Identify the experimental procedure and the technique(s) will help minimize the errors of experimentation. In this step, we emphasized the students to write for letting someone else duplicate their experiment exactly.
Step 6: Select the measurement tools according to the experimental procedure and give the reasons of the selections.
In this step, we allowed the students to walk around the laboratory room to search for the measurement tools they needed.

Step 7: Create a table for collecting and recording experimental data.

All students were asked to carry out each step by themselves before exchanging ideas with their groups. The experiment would be then conducted following what they had designed on the worksheets.

Four-point rubric assessments

The rubric assessment had 5 items designed in line with Karelina and Etkina (2007). There were: Item 1- linking physics concept, Item 2- defining measurement variables, Item 3- clarifying an experimental procedure, Item 4- selecting equipment and materials, and Item 5- minimizing errors. Each rubric item had a 4-rating scale from 'missing', 'inadequate', 'needs improvement', to 'adequate'. Examples of criteria are "Is able to link physics knowledge to design a reliable experiment that solves the problem?" and "Is able to use available equipment to make measurements?". Each student was asked to evaluate their own sub-abilities after completing the experimentation.

RESULTS AND DISCUSSION

The results from the preliminary study were from observations of the students' practices in the laboratory, the analysis of the students' individual lab worksheets, and the students' self-assessment about their experimental design ability. Mostly the students seemed awkward in designing the experimental situation. They took over 30 minutes to think individually about formulating the situation(s) and the formulas which linked to such that designed situation(s). About 30 minutes were consumed for brainstorming with their groups.

Summary of the situations designed from 3 groups of the students

For the first group, the students designed three situations and created the wrong equation for calculating the heat of a coin and water as shown in Table 1. The students planned to put a coin at the room temperature into a calorimeter containing water at the room temperature. Another one was putting a coin at the room temperature into the hot water and the last one was putting a coin into the cool water contained in the calorimeter respectively. Besides, we found that the students planned to pour out the water from the calorimeter to measure the final temperature of the coin. They did not think of the thermal equilibrium between the coin and the water.

For the second group, this group found themselves had a big problem about determining the temperature of a coin at the room temperature. They realized that it could not be measured by directly touching a glass thermometer on the surface of a coin. Even though, they could not find a way to determine that even they paid most of time to brainstorm with their group. They skipped that and moved to propose two situations for solving the problem. One was putting a coin into the cool water contained in the calorimeter and the other one was quite similar to but it was pouring hot water instead of the cool water. They also formulated two equations with misconceptions of heat transfer as follows;

heat gained by the coin = heat lost by the hot water; Equation (1)
heat gained by the cool water = heat lost by the coin. Equation (2)

The initial temperature of the coin was calculated from these equations. The same equations also were then used to find the specific heat capacity of the coin.

Table 1: The examples of students' difficulties corresponding to the five sub-abilities

Sub-ability	Students' difficulties	Group No. (Number of students)
1. Linking to physics concepts	-Found heat of an object by using the formula $Q = mct$.	Group1 (4)
	-Do not include the calorimeter as a system of heat transfer.	Group1 (4) Group2 (6) Group3 (4)
	-Did not setup the heat transfer equation by corresponding to the created situation.	Group1 (4) Group3 (4)
2. Identifying measurement variables	-Did not consider to measure the temperature of a calorimeter.	Group1 (4) Group2 (6)
	- Defined heat (Q) as a variable to be measured from a calorimeter.	Group1 (4) Group3 (4)
3. Clarifying an experimental procedure	- Designed an incompletion procedure.	Group1 (4) Group2 (6) Group3 (4)

	- Could not define the practical method to measure the coin's temperature.	Group2 (6)
4. Employing available equipment and materials	- Planned to measure heat directly from a calorimeter.	Group1 (4) Group3 (4)
	- Did not record data according to the resolution of equipment.	Group1 (4) Group2 (6) Group3 (4)
	Did not use ice because of the change of its state.	Group3 (4)
5. Minimizing errors	Used a coin (mass of a coin = 3 grams) with a large amount of water (e.g. 50 ml or greater) to find heat transfer.	Group1 (4) Group2 (6) Group3 (4)
	Did not repeat the experiments.	Group1 (4)

For the third group, we found that this group had much no understanding of physics knowledge. They created the same situations as mentioned in groups 1 and 2. One was putting a coin into the water at the room temperature contained in the calorimeter and next there was pouring hot water instead of the water at the room temperature. Even all of them asked for the guided cards, they could not help recall any physics idea. They suddenly created the formula of $c_{coin} = \frac{Q}{m\Delta t}$ to find the specific heat capacity of a coin. They thought that they could measure heat (Q) from a calorimeter and a temperature change (Δt) from a thermometer. Anyway, they confused which mass of water or of coins should be substituted in the above equation. Therefore, they could not achieve a procedure for experimentation.

The students' difficulties in designing the experimental situations for solving the problem

To interpret the students' difficulties according the 5 defined sub-abilities, the observations of the students' practices in the laboratory and the students' individual lab worksheets were analyzed. The examples of the students' difficulties were presented in Table 1.

Sub-ability 1: Linking to physics concepts. The result shows that all of the students still had misunderstanding of the physics concept about heat transfer. All students could not think that the calorimeter should be included in the system of heat transfer. 8 students from groups 1 and 3 could not setup the heat transfer equation s which conformed to their created situations. This implied that the students did not understand about the conservation of energy and the thermal equilibrium. Furthermore, there were 4 students from group1 had an alternative conception about calculating the heat. They believed that they could calculate the heat of an object at any temperature (See the equation in Table 1). These results informed that the students had difficulties in designing the reliable experiment in order to solve the problem.

Sub-ability 2: Identifying measurement variables. All students could list the unknown variables that they had to find out but there were 8 students from groups 1 and 3 had misunderstanding of using a calorimeter. They thought that it could be used to measure heat. In addition, 10 students from groups 1 and 2 neglected to measure the temperature of a calorimeter.

Sub-ability 3: Clarifying an experimental procedure. All group still had a missing or incompletion procedure. We observed that students took long time to argue what they should do exactly during they conducted their experiment. For example, they did not clarify how many coins and the amount of water would be used and weighted. The students did not aware of when the system would reach to the thermal equilibrium state. Consequently, they did not mention to stirring the water in the calorimeter or estimating the time for eventually reaching to the final temperature. We found some groups took just a moment to observe the temperature change and suddenly recorded the value.

Sub-ability 4: Employing available equipment and materials. Unexpectedly, there were 8 students from groups 1 and 3 could not remember or had not ever known about the function of a calorimeter. They thought that the calorimeter could be used to determine heat of an object directly. Furthermore, the third group decided not to use ice because it would be changed the state. Besides, the second group had waited ice melting and decided to measure the temperature of cool water only. To weight water and a coin, all groups used a digital balance with the resolution of 0.1 grams but all of them recorded the mass without the decimal numbers.

Sub-ability 5: Minimizing errors. All groups used only a coin for transferring heat from or to water. Even the students found that putting a coin into the water caused a little change of temperature, they still did not increase the number of coins. The third group also provided a comment about the technique that was "we should pour just 3 grams of water into the calorimeter to cover the height of the coin in order to measure the changing of temperature. About repetition, there was only the first group who did not think of repeating the measurements.

Students' self-assessments about their experimental design ability

The result from the self-assessments found that the students thought themselves had quite low sub-abilities in particular for the sub-ability to link the physics concept to solve the problem (Sub-ability 1) and to clarify the experiment procedure (Sub-ability 3). This result also relates to our observation (See Figure 1).

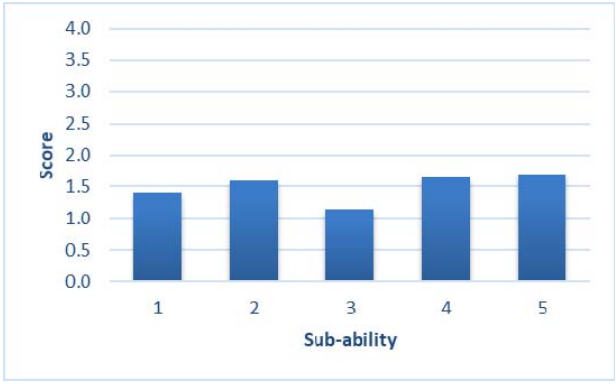

Figure 1: The students assessed their own sub-abilities after completing the experiment(s).

CONCLUSIONS AND IMPLICATION

The goal of this study was to investigate the students' experimental design ability in the advanced physics laboratory course, which involved to the five sub-abilities: linking physics concept, identifying measurement variables, clarifying an experimental procedure, selecting available equipment and materials, and minimizing errors, respectively. To elicit the students' sub-abilities, a guided-inquiry lab and worksheets were substantially designed which were involved to the physics concept of heat transfer. Even all students had prior experiences in physics laboratory courses, they could not provide correct or even satisfactory responses on the worksheets. The results showed that the students spent about 6 hours to complete the experimentation. They took about 3 hours for designing the experiment by working on answering the guided-inquiry questions and left 3 hours for doing the experiment.

The step of linking physics knowledge to formulate at least a situation in order to solve the problem was the most time-consuming which took an hour to complete. This indicated that the linking physics concept was the most difficult process for the students. The major difficulty was from the students' alternative conceptions of heat transfer about incompletely determining the heat transfer in their designed system. This also led to the impractical procedures causing the unreasonable results. Furthermore, there were many unexpected difficulties such as lacking of basic measurements, using scientific equipment, and also identifying variables. Besides, the result from the students' self-assessments their proficiency showed that the lowest average scores were in items relating to the sub-abilities to link physics knowledge and to clarify an experimental procedure.

This report will be availed to the teachers and general educators in order to develop laboratory courses. Instructors can use these results to create or to develop effective instructional materials or teaching strategies for enhancing students' experimental designed ability.

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REFERENCES

American Association of Physics Teachers. (1998). Goals of the introductory physics laboratory. *American Journal of Physics, 66*(6), 483-485.

Banchi, Heather, & Bell, Randy. (2008). The many levels of inquiry. *Science and children, 46*(2), 26.

Domin, Daniel S. (1999). A review of laboratory instruction styles. *Journal of chemical education, 76*(4), 543.

Etkina, Eugenia, Murthy, Sahana, & Zou, Xueli. (2006). Using introductory labs to engage students in experimental design. *American Journal of Physics, 74*(11), 979-986.

Etkina, Eugenia, Van Heuvelen, Alan, White-Brahmia, Suzanne, Brookes, David T, Gentile, Michael, Murthy, Sahana, . . . Warren, Aaron. (2006). Scientific abilities and their assessment. *Physical Review special topics-physics education research, 2*(2), 020103.

Hofstein, Avi, & Lunetta, Vincent N. (2004). The laboratory in science education: Foundations for the twentyfirst century. *Science education, 88*(1), 28-54.

Huntula, J, Sharma, MD, Johnston, I, & Chitaree, R. (2011). A framework for laboratory pre-work based on the concepts, tools and techniques questioning method. *European Journal of Physics, 32*(5), 1419.

Jones, Charlie, & Pimdee, Paitoon. (2017). Innovative ideas: Thailand 4.0 and the fourth industrial revolution. *Asian International Journal of Social Sciences, 17*(1), 4-35.

Karelina, Anna, & Etkina, Eugenia. (2007). Acting like a physicist: Student approach study to experimental design. *Physical Review Special Topics-Physics Education Research, 3*(2), 020106.

Myers, Marcella J, & Burgess, Ann B. (2003). Inquiry-Based Laboratory Course Improves Students'Ability To Design Experiments And Interpret Data. *Advances in physiology education, 27*(1), 26-33.

Sujarittham, T, Emarat, N, Arayathanitkul, K, Sharma, MD, Johnston, I, & Tanamatayarat, J. (2016). Developing specialized guided worksheets for active learning in physics lectures. *European Journal of Physics, 37*(2), 025701.

Tan, Jennifer Pei-Ling, Koh, Elizabeth, Jonathan, Christin Rekha, & Yang, Simon. (2017). Learner Dashboards a Double-Edged Sword? Students' Sense-Making of a Collaborative Critical Reading and Learning Analytics Environment for Fostering 21st Century Literacies. *Journal of Learning Analytics, 4*(1), 117-140.

Tanamatayarat, J, Sujarittham, T, Wuttiprom, S, & Hefer, E. (2017). *A guided note taking strategy supports student learning in the large lecture classes.* Paper presented at the Journal of Physics: Conference Series.

Portrayal of Perception of Women in Domestic Series and its Comparison with the Real-Life Woman's Figure, From Woman's Perspective

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ABSTRACT

Aim and Importance of the Study: TV series play a key role in shaping the society. In this study, the aim is to identify the authenticity of the woman's roles portrayed in the series with the real life and make comparison of with the real-life woman's figure as well as to review the image of woman from woman's perspective, which is represented to the public and determine to what extent this image can be perceived as role model. This study intends to raise awareness in resetting and redesigning women's roles in TV series.

The Research Method: In this study, out of Qualitative Research Methods, the method of interviewing was applied. Stewart and Cash (1985) described interviewing as "*a process of dyadic, relational communication with a predetermined and serious purpose designed to interchange behavior and involv- ing the asking and answering of questions*". From woman's perspective, 10 women professionals got involved in the research conducted on the portrayal of perception of women and its comparison with the real-life woman's figure and their responses were analyzed using the qualitative research methods. The relevant resources in literature were also reviewed and the woman's figure in TV series was examined.

The Study's Aim and Research Questions: In today's broadcasting, TV series have great importance. This study aims to assess the perception of woman in TV series followed by a great majority of public from woman's perspective and examine the presented perception through comparison with the real-life woman's figure, and these research questions were asked such below:

1) How do you think are women portrayed in domestic TV series?
2) What extent is that model of woman authentic with the real life?
3) What would you say when asked to characterize the women that you have viewed in the series?
4) Do the economic statuses of the women portrayed in TV series correspond to those in the real life?
5) How should the woman's figure be in those series when considering its potential implications in the society?

Findings and Conclusion: As a result of this study, it was observed that there are limited similarities between the serial female characters and the real life figures. It is observed that they are portrayed as powerless, weak, whiny and under male dominance, or class- and power-focused, wealthy, ambitious, dominant and intriguing and with beautiful physicalities.

Keywords: Perception of women, domestic series, television

INTRODUCTION

Women have a very powerful, important and determinant role in society. To identify social attitudes and behaviors, education given within the family or in the education system undoubtedly has great importance. Education might be very determinant of the social structural analysis, particularly family education. Another concept of these determinants is media, one of the key figures in social engineering.

In any individual's whole life or only specific part of it, women have always played a vital role. They shaped a big part of the physical, psychological and educational development of each of us, regardless of gender. The women, as mother, sister, and/or partner, are moulders of the set of human behaviors that these social determinants are often learnt unconsciously and transformed into characteristic structures.

The female role is very critical that they are one of the key determinants in family or society because every individual is grown up with a female model. However, we need to mention another dynamics that are moulded

by women within the community. Undoubtedly that is media which is one of the main factors shaping the society whether deliberately or unintentionally.

Since 1950's, media has emerged as the principal actor in the formation of social dynamics including the investigation of the ideological structure and behavioral pattern of the public and the role model structures of the individuals. Out of various media instruments, television is major one with its influencing power. In this sense, the fact that TV programs are shaping our society has for long been taken as given.

In TV broadcasting, the series and the behaviors referred to the female characters in these, and the extent to which their characteristics correspond to the real life woman's image can be designed as a research topic. It has been mostly recognized that TV has the dominant role in the opinion leadership for society or the thought determinant, however one of the key contributing factors is rating and audience measurements.

TV series are one of the elements capturing the highest ratings in broadcasting, which provide key economic inputs. It may not be admittedly very realistic in terms of both ratings and attention that the female characters in the series are supposed to jibe with the women's image in reality.

Notwithstanding all this, this study aims to recognize how a female character portrayed in TV series is viewed from the women's perspective in the real life and try to see what the perception of women is and should be in these series which are moulding and caring for the society in female's eyes.

"We should take into consideration that media not only shapes the views and attitudes of men and boys towards women and girls to some extent but also consolidates the women's negative thoughts about themselves." (Özerkan, 2004; 21)

In Turkey, women's social contributions were considered when the role of their determinant and moulding elements was recognized, and some media roles were attributed in this way. The women's role have been re-established, which was seen as bringing up kids to be good family members and being an effective instiller of moral and humanistic values with abstract social rules. In social understanding, woman's figure very often takes place as guiding the family unity, catalyzing intrafamily mechanism, and acting as a natural unifier. Female in TV series is a visual icon of the society and however rather associated with the virtue-oriented behaviors moulding the family and being out of the basic needs of the public such as moral and humanistic values and abstract social rules. The media reflection and the public acceptance of such perception also could possibly be come across in these days (e.g. Ekmek Teknesi (*Bread and Butter*), Perihan Abla (*Sister Perihan*), Bizim Mahalle (*Our Neighbourhood*).

"In Turkey, the programs for women was first originated with "Ev Saati" (Home Time) on radio in 1939, which would continue under the name of "Ev İçi" (Intra-House) on the matters including child care, health, and family, in general. In broadcasting objectives for such programmes, women are described as one of the basic elements to realize the happy aspects of society. Although women are specified as good partners and mothers in family as well as humanbeing in the world and citizen in the society, they cannot get out of the identity of housewives restricted within the walls of home (Akbulut, 2004:159).

Society is like a living organism which is living, transforming, developing, and improving itself. The behavioral ways of individuals in the community and their responses to phenomena and statuses can be regarded as the mechanism that is keeping the society alive and developing and changing it. The role of media has a very substantial role in shaping the public opinion. TV channels, radio broadcasts, newspapers, magazines, periodicals, and all publications are the most important part of this formation and perception, as well as digital media and social networks that are increasingly getting more important.

In this sense, TV broadcasts, the principal actor of media, have undertaken a serious role in the perception of women since they were launched in public. It can be acclaimed that TV's impact might have continued almost unabated from then on. Shaping and shifting the society, TV programmes gave a role to women especially in the earliest years. This consists of a whole of referrences characterizing women and cyristallizing how the community should read the perception of women. The perception of women who are fond, lenient, altruistic, devoted, value family unity above all, bring up good boys and at the very core of their characteristics, include the notions of chastity and selflessness, was manifesting itself in almost all programmes (e.g. Kaynanalar (Mothers in law), Bizimkiler (Our Family), Yedi Numara (Number Seven)).

"Once TV broadcasting commenced following radio, many programs have been made for women. In these, traditional roles of women, such as a self-sacrificing mother, a good wife, and a housewife, were highlighted. Most effective and common instrument of culturization in modern societies, television is major one of the mass media putting their stamp on our age. Women represented in series, films, ads, music clips, magazine programmes are mostly portrayed with their sexuality and become exploited by media. Females in TV shows have to be well-groomed and good-looking, that's the most important one of the required qualifications is that they have beautiful physical appearance. It would not be exaggerated to say that females are currently transformed to visual objects on TV." (Büyükbaykal, 2011)

The perception of women portrayed in domestic series from mid 1990's till the earliest 2000's gave way to a modern, ambitious and agressive model of women with a substantial change experienced in the early 2000's. Female characters in the series of 1990 had the stories in which she was just stuck in the middle of a large family and sometimes the oppression of tribal culture and also had went through the trials and tribulations while she had difficulty in adaptation phase to those traditions and seldomly made uprising (e.g. Asmalı Konak (Vine Villa), Zerda (*a female name*), Beyaz Gelincik (White Weasel), Sıla (*a female name*)).

Many stereotyped codes used for male and female characters in Yeşilçam (Turkish) melodramas now reappear in disguise with the modified screens of our domestic series (sometimes undisguised, exactly the same). The traditional patriarchal discourse is getting more powerful in time."(Özsoy, 2018)

Of the female image in these series, passivity as a common approach almost never changed. Women was not rulers but obedients, or not playmakers but always defenders or guards against intrigues. The study of TÜSİAD (*an NGO in Turkey*) on the perception of women over 12 series noted the standardized female model.

In a relevant news, Özlem Gürses from Sözcü Newspaper reported: "TÜSİAD releases the study findings of 'Perception of Women in TV series'. This suggests that 'women are portrayed in 12 series most popular in Turkey much apart from reality and unfortunately in one single stereotype: like the creatures which are never businesslike, always whinny, flabby, and mopy.' In this study conducted by TÜSİAD in partnership with a university, 12 out of the most popular series in Turkey was sampled and each one of them was analyzed frame by frame during the month of May. That news is going on like: "*The results are sobering! We often use a language to feed these stereotypes and prejudices even regardlessly. Whereas the intelligents engaged particularly in the ad and series sectors are highly creative and exceptional, and even they have freshly recognized by means of our these studies.The same problem is also valid for males; as much as one man is persistently portrayed in series as aggresive, red-hot, violent, this bad image sticks on men. Above all, females are jammed with physical shapes, and while males are represented at every point of the spectrum, they are all imaged as under 39, skinny or fleshy and matronly. Here is the thing that is "rendering the diversity" in every respect. Women are romantic, it's alright, but how about men? Or vice versa..."*

The image of women who are always suffering, aggrieved and underdog due to her devotion to etnic group or tribal order and sometimes obliged to be quiet, got changed across several series with female image, a "headstrong woman" who sets up the rules on her own and modifies traditions as a clan leader or under the matriarchal structure, or a powerful, cunning and intriguer woman in historical series (e.g. Hanımın Çiftliği (Lady's Ranch), Kara Melek (Black Angel), Hürrem Sultan (*a figure from Ottoman Dynasty*).

One model of the female characters in domestic series that TV broadcasters used includes the figures who are always oppressed, suffering, downtrodden and having few friends around (e.g. Fatmagül'ün Suçu Ne? (What fault could Fatmagül have?), Acı Hayat (Living Death), O Hayat Benim (This is My Life), Aliye (*a female name*)). From the early 2000's, a new woman's image reappeared that she was financially more independent, social, prestigious, having more active status and sometimes under the pressure of matriarchal structure.

"Females are used as sexual object particularly in magazine programmes or foreign series, and domestic TV series have more conservative image of women. Represented in accordance with Turkish traditions and customs, they are featured by their role of good mother and wife. In domestic series which portray the conventional roles of women, their real statuses are reflected in some respect." (Büyükbaykal, 2011)

All these series have common point of non-concordant characters with normal course of real life, implausible, exceptional coincidences, non-fictionalizable unusual incidents, and unrealistic female characters. From the early 2010's, gorgeous, attractive women with beautiful physical features are seen on the screen in the series. Female models who are care and make-up even when she has just got up, have luxurious autos, work for holdings and in plazas, and have no financial problems are embodied in series over the theme of love and affairs, and intrigue.

These non-productive women who are not featured by their professional qualifications take place with the image intrepid, unabstainer from telling lies and obsessive to reach their goals.

"The characters (starred couples) in domestic TV series that permeate into our lives in the adventure of domestic series from past to present and deeply affect many parts of the society gain popularity with their lives of violence, loves and conflicts. Male characters of domestic series have got their women and envy them to die while female characters are always ready to sacrifice anything that they own any time. It means that they can immediately throw away their facilities and equipment that they have earned in life for the sake of their love. Self-sacrificing for their purity, family and children and fidelity are less than nothing for them." (Özsoy, 2018).

The images included in communication codes of media apparantly serve the conventional ideology consolidating women's dependency and secondary status. A number of TV series broadcasted on prime-time lay emphasis upon the priority of the women's roles relating to their home and family (Kalan, 2010:81).

In their most of life the individuals must have had at least one woman. People's physical and psychological developments are characterized by the presence of women. Female in the figure of mother, sister and wife is the moulder of the set of behaviors which specify the social dynamics, are often learnt unwittingly and transform into characteristic structures.

There are sexual identities accepted by every culture, and their social norms determine how either one man or one woman should appear, act and relate to each other (Yılmaz, 2007:144).

Story line and distributed characteristic structures can be regarded as usual when considering the overwhelming portion of men in the group of senarists of serial films. However, the scenarios typed from men's perspective sometimes may not represent as true the roles in life, the viewpoints to happenings, the situational assessments, and then character formation. This can also be one of the reasons why female image portrayed in the series is questioned.

The narrations that made by male story-tellers are the stories of man and mannishness that provides men with symbolic power. Modern communication instruments have an explicit role and been employed in functioning the gender-based process of representation and interpretation (Kotaman et al., 2011:78).

FINDINGS AND CONCLUSION

At between the years of 20 and 50, 10 females attended this study on "portrayal of the perception of women in domestic series and its comparison with the real-life women's figure from women's perspective". The participants who are professionals and regularly watching TV (at least one hour a day) were demanded to answer the questions asked related to the perception of women in TV series. A proper environment was provided so that they can explicitly express their feelings and thoughts under no influence in response to the general, understandable and clear questions directed. The respondents' answers were coded in the way of S:1 (for Speaker 1), S:2 (for Speaker 2), etc., and the given responses were examined with the method of content analysis and released below.

First a question was asked to the attendants such as: **"How is do you think the women's model in domestic series represented?"** The respondents' answers are such below:

(S:1) "*In TV series, there are female characters who are passive, directed and easily guided, and naive or lead any of their surroundings, try to figure all humans and events towards their request, desire to get their way and are quite malicious. That's, a portrayal of character was made by power distribution; powerless women are portrayed as naive and directed, and powerful ones as ruling and villainous.*

(S:2) "*They are intrigue-oriented or meek/weak-oriented. The message in the intrigue-oriented group is the motto of "everything in love is fair" while those in the meek/weak-oriented need a man shakening and awakening her for meaningful life, actual renaissance, and controlled life. Apart from this main tendency, other side characters have its various levels in general. Triumphant women to gain a footing have traumas with accompanying and degrading somebodies and need a man safeguarding her to leave her troubles behind and become happy.*"

(S:3) "*The impression that I have got is that the theme in the series is usually, you know, that women who are downtrodden and uninfluential characters if it is Anatolian/chieftain/clan thematic one. In urban series, the*

profile of city women is such that seducers and coquette addicted to men or much intriguing and cunning females.
(K:10) *"There are women's models who we do not come across in real life. Too intriguer or too altruistic women"*

The respondents who assess the way of representation of female characters in domestic series made notable observations. Women are portrayed in series as passive, underdog, weak, battered, and tormented or intriguer, gossiper, and lustful for power over others. Or they can be perceived as meek, weak with a character whose course of life suddenly shifts when she falls in love with a well-off and powerful man and who must require a masculine body to safeguard themselves so as to make achievements in life and recover from her troubles. Out of current series with high ratings, the one named "Ufak Tefek Cinayetler" (Little Murders) has four starred female characters. The series narrates the life story full of intrigues and lies belonging to these women living a prosperous and luxurious life, and the character with the name of Oya the doctor, whose college and personal life is turned into a living hell after she is slandered by her friends, despite being an idealist doctor, is portrayed as meek, weak, and non-self-advocate. Expected to have a key status in social life as a doctor, the character of Oya is taken under his wigs and looks to him as a safe harbor not until she is in love with a married man, which is the result of the mentality to portray women as passive.

It is also not different for the series of "Sen Anlat Karadeniz" with high ratings. This is about the incidents happened to the character of Nefes who is sold for money to a man by his own father and tormented, and then took shelter in Karadeniz (Black Sea) and had much trouble. This series which is attention-grabbing with too many scenes of violence has been criticized by audiences for the reason of "normalization of violence against women". The starred female character, Nefes, is portrayed as battled, weeping, tormented and exposed to many other misdoings.

The respondents have negative thoughts about "**the consistency of the model represented in TV series with the real life".** One stated that extreme troubles and emotions are normalized and economic class is highlighted that the reality concept in the public have been changed and reshaped by senarists: *"I think many cases in TV series are excessive in quantity and exaggerated. Again they, I think, are trying to create sense of familiarity and normalize such extreme negativities as they make the public view all these hyperbolic violence and excessive negative emotions, thoughts and actions persistently. The stories always make arguments on the subject of social class that the problems and conditions of humanbeings are differentiated according to socio-economic classes as much as I see, that's the emphasis is too much on the class issue. By keeping similar stories told, people's sense of reality in the society is rebuilt or reengineered by senarists and producers every day …as well as male and female character models."* (S:1)

Another respondent pronounced that the life represented in the series has no association with the real life: *"These series lead to adopt the reality in different and nonconstructive way. It is seen as though the achievements are subject to that sort of actions. And also, they emphasize the discrimination in social gender roles and created an effect like single woman is somehow defect. On the side of men, a new identity of classical men that has appeared within the modern version of traditional masculine model help people internalize the role of dominance and determination."* (S:2)

One of the respondents pointed out the gap between the female model portrayed in the series and the real-life women's model: *"In my opinion, it's irrelevant. We can even see this when we look at houses and settings that these serial films are shot. The culture of extravagant consumption is overwhelming in the series. All environments are luxurious places. The houses are not normal, they are like the residents of palaces or residences. Hidden ads are embedded into the series cause a bad impression."* (S:8) and another replied "*Although the characters in the scenarios can be sometimes simulated to the women in the lives of ours or our friends', the series include exaggerations: the characters may live on the edge."* (S:4)

*The respondents replied to the question of "**How would you describe the characteristics of the females that you have watched in series?"***

(S:1) *"They are characterized by a social class and power-focused structure. Exceptionally, there are some characters including the women wealthy but more naive as well as the others deprived but highly passionate and thus desperately struggling to attain money and power."*

(S:2) "*Having to pay off being powerful, weak, dependent on a man to deal with drawbacks in her life, usually downtrodden if not an intriguing character, oriented towards being like extension to a man rather than being individualistic.*"

(S:5) "*The women sex-oriented, male-dominant, oppressed, male-dependent, femme fatale, secret plots in closer kinship, yenta, and low brow. In short, the females who got there using their intelligence are unlikeable and in supporting roles. Yet, it depends on the series. For example, I mostly like two series... I am watching them because they are preponderantly psychological: Tehlikeli Karım (My Dangerous Wife) and Fİ. The female characters in those series draw my attention.*"

(K:10) *Beatiful, well-groomed, intriguer, self-sacrificing, lover, sneaky, brave, smart, gossiper, hypocritical, two-faced*

The respondents make physical and behavioral assessment for the female roles in domestic series and highlight that women are intriguing, eagerly attached to a man, sneaky, self-sacrifing, highly courageous, downtrodden, dependent on husband, class- and power-focused, non-individualistic, weak, slim, beautiful, made-up, well-kept and manivured even if tormented. The warm-hearted characters are also represented as the secondary characters who are shy, diffident, and taking a backseat.

The responses to the question of "**What is the authenticity of the economic conditions of the women portrayed in the series?"** are such below:

(S:1) "*The female characters' economic attributes are characterized by the patterns of social and economic class. They are portrayed as being in the economic status, very high or very low. Apart from its trueness, persons in middle, middle-low and middle-high income groups have far less chances to be viewed on the screen, I think.*"

(S:2) "*By the fashion of poor girl to rich guy, which is considerably going on, a female character is featured, who sets for life by means of mad love of a wealthy man or makes a marriage of convenience with a rich person and gets out of her financial troubles. When she is possibly a woman who can stand on her own feet, she is in the position of paying a heavy price for it, being downtrodden, oppressed or isolated. Namely, there is like an inclination as if the woman had to receive a nasty blow from her sufeguarding attached man in order to realize that goal.*"

(S:3) *It doesn't mean that plaza women all are making good money. We may sometimes see them in high managerial positions in plazas but this won't shift the real thing. Dreams and Realities. With the theme of sub-culture, some series may be a bit closer to reality.*

(S:7) "*Some are too rich or too poor.. There is no normal as family figure. Except for the series of Çocuklar Duymasın (Don't Let the Kids Hear)*"

(S:4) "*The characters who generally mentioned in the series are financially easy and even sometimes got attention with their too much luxurious lives. They can be the exaggerated lives that do not correspond to the common social understanding.*

To such question as "**What would you like the female character in series to be when considering their social contributions?"**, one replied "The female characters that I would like to view in the series are who come from any socio-ekonomik sub-structures in the society, are well-educated, coherent of their feelings, thoughts and actions, able to go through and cope up with their problems, suffering from their troubles without much dramatization, having positive personal characteristics, doing good things not only for themselves and their families but also for the community and the globe, working and earning their financial independence, self-aware and self-conscious as women, conscious of equal and democratic citizenship, and good role model to other girls and women in the society." (S:1) and another respondent stated "*There are such studies on as human relations, mate selections, individuality, self-identity formation, sexual roles, etc., but they are informed exclusively to a certain part. These can unfortunately not be addressed to general public and reached out low socio-economic levels through transformation into real life form. The series need to be designed with experts' views from psychology, psychiatry and sociology, and the findings are embodied with the serial characters. The message made by the series can be that in order to stand on one's own feet and be an individual, there is no need to pay a heavy price for it, for plots or submission to realize it, and provide insight with how is making choice, awareness*

of gaining from freedom, and how one can be able to differentiate the useful alternative from the useless one." (S:2) Other respondents' answers are such below:

(S:7) "Firstly I would like the series to be genderles; that's, without any discrimination of men or women, just a humanbeing. Women should have to stand on their own feet alone, intelligent, smart, and simultaneously funny. In other words, the female intelligence should be featured by the series."

(S:10) "I would like to view females in the series who are workers, developers, good lovers, producers, readers and achievers while their sons and daughters must be happy mostly by such a women's model. These perceptions should be focused in TV series.. affection and performance inside women won't be oppressed but on the contrary will be uncovered. "

(S:5) "There should be female characters to be exemplar, away from twisting men around their fingers and exalted but not disparaged from men's perspective."

Starting from all these observations, the perception of women in TV series have unequivocally great importance with its critical role in shaping the society. When considering the role of women in the development of individuals in the society, the responsibility that should be undertaken by TV serial broadcasters is overtly substantial. As a result of the present study, it has been observed that there are not significantly any similarities between the serial female characters and the real-life women's figures. The female characters are portrayed as powerless, weak, whinny, under male dominance, or class- and power-focused, wealthy, ambitious, dominant, intriguing and with beautiful physicalties.

The respondents indicated that the female model portrayed in TV series are rarely consistent with the real-life women's figure. It is observed that the incidents characterized by female characters contain exaggerated, extreme and negative emotions and these thoughts and actions have been gradually normalized. In the series, the reality is made to be adopted in a different and unconstructive way, and the presence of single woman is explicitly portrayed as defect in minds by emphasis of the discrimination on social sexual roles. Regardless their jobs, the females are represented as the characters who are safeguarded by men and finally, fall in love with him and so have a meaningful life. In the scenarios overwhelmed by consumption culture, female characters live in waterfront residences, villas in much luxury, or in shantyhouses in destituteness rather than modest real-life models.

Those attending the study pronounced that the female image represented in the series is not authentic and re-engineered by producers. The female characteristics that they would like to view can be listed as: originated from any socio-economic sub-structures in the society, well educated, coherent in her actions, keeping in touch with reality, not dramatizing her troubles, having positive personality, working and financially independent, able to be a good role model for other girls and women in the society, not require paying a heavy price for being an individual, aware of not having to resort to any intrigue to deal with issues, producer, reader, intelligent.

REFERENCES

Akbulut, TN. (2004) Türk Televizyonunda Kadın Söylemi. Kadın Çalışmalarında Disiplinlerarası Buluşma, Cilt:2,79-86

Büyükbaykal, C. (2011) Medyada Kadın Olgusu. İletişim Fakültesi Dergisi

Güngör, N., (2011). İletişim Kuramlar Yaklaşımlar. Ankara: Siyasal Kitabevi.

Kalan, Ö. G. (2010). Reklamda Çocuğun Toplumsal Cinsiyet Teorisi Bağlamında Konumlandırılışı: 'Kinder' Reklam Filmleri Üzerine Bir İnceleme. İstanbul Üniversitesi İletişim Fakültesi Dergisi, 38, 75-90

Kotaman, A., Samav Uğursoy, A., Artun, A. (2011). Televizyonda Hikâye Anlatıcılığı. İstanbul: H2O Kitap.

Özerkan, Ş. A(2004) Bir Toplumsallaşma Aracı Olarak, Medyanın Kadın İmajına Yaklaşımı. Kadın Çalışmalarında Disiplinlerarası Buluşma, Cilt:2,21-29

Stewart, C. J. & Cash, W. B. (1985). İnterviewing: Principles and Pratices (4. Baskı) Dubuque, IO:Wm. C. Brown Pub.

Yıldırım, A. ve Şimşek, H (2006). Sosyal Bilimlerde Nitel Araştırma Yöntemleri. Ankara: Seçkin Yayıncılık, s:152

Yılmaz, R.A. (2007). Reklamlarda Toplumsal Cinsiyet Kavramı: 1960-1990 Yılları Arası Milliyet Gazetesi Reklamlarına Yönelik Bir İçerik Analizi. Selçuk İletişim, 4(4), 143-156

http://www.aljazeera.com.tr/gorus/yerli-dizilerin-urettigi-siddet-cinsiyetcilik-ve-kadin-cinayetleri

https://www.sozcu.com.tr/2018/gundem/dizilerdeki-kadin-algisi-degismeli-2309881/

Pre-Service Preschool Teachers' Opinions about the Formative Assessment

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ABSTRACT
Formative assessment is based on the principle of determining students' learning needs and teaching them with their needs in mind. The main goal of formative feedback is to strengthen students' knowledge, specific skills, understanding in certain contents, and general skills such as problem solving. The aim of this study is to determine pre-service preschool teachers' opinions about the use of formative assessment. This is a case study, a qualitative research method. This study was conducted with 63 pre-service teachers who were juniors in the education faculty of a public university in the west of Turkey's Black Sea Region in the 2016-2017 academic year. The study data were collected using an opinion form which included open-ended questions as well as interview questions. Pre-service teachers' written explanations to the open-ended questions were analyzed using content analysis, a qualitative analysis method. In addition, the study used descriptive analysis to assess the data that were collected during interviews with the purpose of obtaining further information. The research results show that a majority of pre service teachers' had positive opinions about formative assessment. They stated that formative assessment has many advantages such as enhancing efficiency, providing experience and self-evaluation.

KEYWORDS: Formative assessment, teacher training, preservice teachers.

INTRODUCTION
Education aims to train individuals in a form ideally suited to meet the needs of the time. All of the works corresponding to this aim serve to constitute a qualified education. One of the most important elements governing the capacity to improve the quality of education is the "evaluation" stage, which acts as a control mechanism (Taras, 2002, 2003), as it serves to identify the extent to which the aims are achieved and the success of the elements (student, teacher, teaching method, teaching materials etc.) constituting the learning process. There are two types of assessment, product assessment, which is an assessment conducted at the end of units to determine what the students have learned, and formative assessment, which is an assessment conducted to determine the learning needs of the students (OECD, 2005; Liu & Carless, 2006). Recent results have shown that the product assessment methods, which are commonly used in schools and require the students to achieve predetermined standards in order to earn a diploma, are insufficient (OECD/CERI, 2008). Formative assessment methods, whose function is focused on preventing students from failing to continue their education in the future, serve as an alternative to the product assessment methods. Formative assessment is based on the principle that the needs of the students are determined in the process and that teaching is modified according to those needs. According to Shute (2007), the main objective of formative assessment is to increase the students' knowledge and skills, like drawing inferences or problem-solving in certain content areas. In this sense, the quality of learning can be increased through formative assessment (Higgins, Hartley, & Skelton, 2002). Gagne (cited in: Gibbs & Simpson, 2004) lists the effects of formative assessment in a learning environment as follows: activating and reinforcing background information and learning, ensuring that mainly active learning strategies are used, and enabling opportunities for the students to reinforce and implement their skills before introducing new information and materials to them. In addition to these, the following could be included: providing students with information and corrective feedback on the learning outcome, ensuring that the students are aware of their learning, and helping them develop self-evaluation skills, all of which will serve to give students the opportunity to experience the feeling of success.

Rubrics are one of the most important tools used in formative assessment. They are applied in the assessment process to identify the learners' knowledge and skills, study habits, efforts, and values according to predetermined criteria (Kan, 2007). In many studies conducted on the use of rubrics in the learning environments, it has been stated that the use of rubrics improves the quality of learning (Andrade, 2005; Andrade & Du, 2005; Panadero, Alonso-Tapia, & Huertas, 2012; Panadero, Alonso-Tapia & Reche, 2013; Reddy &

Andrade, 2010). In a study by Panadero and Jonsson (2013), rubrics were found to be capable of positively affecting the learning of the learners. Additionally, Wollenschlager, Hattie, Machts, Moller and Harms (2016) found in their study that rubrics had a positive effect on performance. Teachers too have found rubrics to be quite useful (Kutlu, Bilican, & Yıldırım 2010).

A high-quality, up-to-date education requires practices that improve both skills and knowledge. Studies that seek to understand how individuals internalize and use information in line with their aims and how they provide effective solutions to problems have therefore gained importance in the respective literature. Moreover, as it relates to pedagogy, taking applied classes during undergraduate education is of major importance. The acquisition of knowledge and skills that pre-service teachers can achieve by taking responsibility for their learning and doing self-evaluations plays a key role in improving their future teaching abilities. In the applied classes taken during undergraduate education, the quality and accuracy of the application are particularly important. In applications involving formative assessment, theory and practice are able to be bridged and self-evaluations are made possible through accurate performances. By offering applied classes during undergraduate education, there would be an improvement in the quality of the practices applied by pre-service teachers and they would be able to accurately employ the formative assessments, as they will have gained experience in how it is used and been given the opportunity to test its effectiveness. It is believed that the results of this study shall contribute to improving the quality standards in teacher training.

Purpose of the Study

The purpose of this study is to investigate the views held by pre-service preschool teachers on the formative assessment process. This study was performed within the "Creativity and Its Improvement" class offered to second-year students under the Preschool Teacher Education Department. The participants' opinions on the use of formative assessment (rubrics, and verbal-written feedbacks), which they had learned about during the process of applying creative thinking techniques in actual classroom environments, were canvassed.

The following research questions were developed for the study:

1. What are the views of pre-service teachers regarding the advantages of formative assessment?
2. What are the views of pre-service teachers regarding the disadvantages of formative assessment?
3. What are the views of pre-service teachers regarding the use of rubrics in formative assessment?

a) What are the views of pre-service teachers regarding planning rubric?
b) What are the views of pre-service teachers regarding application rubric?
c) What are the views of pre-service teachers regarding finalization rubric?

4. What are the views of pre-service teachers regarding whether formative assessment contributes to professional development or not?

What are the views of pre-service teachers regarding the use of formative assessment in other courses?

METHODOLOGY

Study Design

This study adopted a qualitative case study design. The most important characteristic of a qualitative case study is its ability to perform an in-depth investigation of one or several cases (Yıldırım & Şimşek, 2008). Additionally, according to Büyüköztürk, Çakmak, Akgün, Karadeniz, and Demirel (2012), case studies are a type of study in which a phenomenon is described in a single space and time. In case studies, the researcher(s) is/are responsible for qualifying the case to be examined, and the cases are not restricted to only certain persons and objects that have a specific identity (such as a group, a person, a class, or an institution) but can also be an incident, an activity, or a process (Johnson & Christensen, 2014). The case investigated in this study is the evaluation process of pre-service teachers' practices in actual classroom environments using formative assessment.

Participants

A total of 63 second-year pre-service preschool teachers, who were studying at the Ereğli Faculty of Education of Zonguldak Bülent Ecevit University in the 2016-2017 academic year, participated in the study. The participants were between the ages of 19 and 21, and 60 were female and 3 were male. All of the participants were taking the "Creativity and Its Improvement" class for the first time.

Procedure

Within the scope of the "Creativity and Its Improvement" class, the participants were presented the general concepts of brainstorming, creative drama, analogy, and case study techniques, and model practices were demonstrated. After being provided the theoretical knowledge on these concepts, the participants were asked to conduct group work on one of these techniques and to plan an “application”. Next, three rubrics (planning, application, and finalization rubrics) were given. The rubrics and the criterion governing them were explained,

and it was made clear that the evaluation of the works would be conducted according to these rubrics. The pre-service teachers performed the implementation in the following three stages:

1st Stage: In the planning of the application process, the pre-service teachers plotted the procedure by considering the criterion in the "planning rubric". Each of the pre-service teachers presented their planned applications during their practice and in their classes (at the university). After the presentations, they were given verbal feedback by the instructor regarding the application plan of the techniques and the suitability of the techniques in terms of grade level and creativity. A sample criterion for the planning rubric used by the pre-service teachers is given in Table 1.

Table 1: Sample Criterion for Planning Rubric

CRITERION	**ACHIEVEMENT LEVELS**		
	5 points	10 points	20 points
The nature of the technique	The technique is not planned properly	The technique planned partially conforms to the rules	The technique is planned properly

2nd Stage: The pre-service teachers started the implementation phase of their works which had been planned after receiving feedback. At this stage, the participants used an "application rubric", and they implemented the subjects that they had selected by considering the criterion of the rubric in the classroom environment. The criterion in the application rubric covers the points that need to be paid attention to and taken into consideration during the implementation of the creative thinking techniques in the classroom environment. The techniques that the pre-service teachers were provided training on and given feedback for were implemented in 2-hour sessions in a preschool classroom (authentic classroom environment) with 5-6-year-old children. Each technique was implemented in a different school with different contents. A sample criterion for the application rubric is given in Table 2.

Table 2: Sample Criterion for Application Rubric

CRITERION	**ACHIEVEMENT LEVELS**		
	2 points	5 points	10 points
Imagination	None of the students used their imagination during the application.	Only a few students used their imagination during the implementation.	Many students used their imagination during the implementation.

3rd Stage: At this stage, the groups finished their application, prepared a PowerPoint presentation, which they presented to their instructors and classmates in the classroom environment (at the university), and prepared a report for their study. At this stage, the pre-service teachers used the finalization rubric. A sample criterion for the finalization rubric is given in Table 3.

Table 3: Sample Criterion for Finalization Rubric

CRITERION	**ACHIEVEMENT LEVELS**		
	5 points	10 points	20 points
Relating the collected data	The relations between the collected data are not shown and only seldom are inferences drawn from the application.	The collected data are only related to the rubric, making the inferences only partly sufficient.	Since the collected data are related based on the data received from multiple sources, the inferences drawn are quite sufficient.

Data Collection Tools

In this study, the data were collected from pre-service teachers through an open-ended questionnaire. This open-ended questionnaire was prepared in line with the research questions by the researcher. To confirm the content validity of the form and the interview questions, they were reviewed by two field experts and one assessment expert. When the actual classroom applications were completed, the form was administered to all of the participants, who filled it out individually. It took approximately 35 minutes for the participants to complete the form.

A sample question from the open-ended questionnaire:
What do you think are the advantages of formative assessment?
Interviews were used as another data collection tool for this study. The interview questions were prepared in line with the research questions. The interviews were conducted face-to-face with eight of the pre-service teachers from among the participants in order to investigate the research questions in-depth.

A sample question from the interviews:
Would you prefer the use of formative assessment in your other classes as well? Please explain your answer with reasons.

Data Analysis
The participants' answers to the open-ended questionnaire were analyzed using qualitative analysis techniques. The data obtained from the interviews were analyzed through descriptive analysis and investigated in line with the categories of the study, which were as follows: the advantages of formative assessment, the disadvantages of formative assessment, the use of rubric in formative assessment and the views on rubrics (planning rubric, application rubric, finalization rubric), contributions of formative assessment to professional development, and the use of formative assessment in other classes. The data were analyzed through content analysis, with two different raters analyzing the data, whose Miles-Huberman (Miles and Huberman, 1994) reliability value was found to be 93.67.

FINDINGS
In this section, the findings from the study are presented in categories arranged in tables. Direct quotations from the views of the pre-service teachers were included as well.
The codes related to the "Advantages of Formative Assessment" category are given in Table 4.

Table 4: The Codes and Frequencies of the Advantages of Formative Assessment

Code	Frequency	Code	Frequency
Experience	35	Effective learning	5
Opportunity to perform application in the classroom environment	21	Motivation	5
Permanent learning	14	Guiding	4
Transferring theoretical knowledge into practice	12	Effective communication	3
Learning by doing	12	Awareness of the deficiencies of the class	3
Communication with students	9	Gaining experience by observation	3
Receiving feedback	7	Originality	3
Improving creativity	7	Knowing students	3
Mastery learning	7	An important activity	2
Individual evaluation	7	Critical thinking skill	2
First experience opportunity	6	Process evaluation	2
Awareness of different assessment techniques	6	Cooperation	2
Self-evaluation	6	Enjoyable	2
Gaining a different perspective	6	Socialization	1
Exchange of ideas	5		

According to Table 4, the pre-service teachers stated that among the advantages of formative assessment were that it provided experience and facilitated permanent learning by giving them the opportunity to practice in the classroom environment. Additionally, the participants thought that the application allowed them to transform theoretical knowledge into practical knowledge, contributed to learning by doing, and provided them the opportunity to communicate with the students. Pre-service teacher (PT -1) offered the following views on the advantages of formative assessment: *Formative assessment gives the pre-service teachers experience. It enables us to form our own ideas about our profession. Most importantly, it enables the person who thinks and feels that he/she should work as a teacher to definitively make that decision before the process is over*. Pre-service teacher (PT-6) added the following: *It enables active participation. Since each student has a role, the aim of the class is understood better. Any deficiencies in the studies are able to be identified during the presentation, and the views*

of other pre-service teachers are listened to and discussed. Group participation enables learning to take place together. PT-2 offered the following views on communicating with students: *This is the first time that I have ever been to a kindergarten. I have practiced and spent time with children. This was a valuable opportunity for me to understand whether this profession is appropriate for me or not. I am quite happy; it was very important for me to participate in practicum and see the actual classroom environment.* It can be stated that the pre-service teachers gained professional development and experience in the use of assessment instruments.

The codes related to the "Disadvantages of Formative Assessment" category are given in Table 5.

Table 5: The Codes and Frequencies of the Disadvantages of Formative Assessment

Code	Frequency
No disadvantage	27
First-time application	7
Time-consuming	6
A difficult process	6
A stressful process	3
Unequal distribution of the responsibilities	3
Group work	3
Evaluation of the process	2
Insufficient experience regarding practice	2
Difficulty in controlling the process	2
Classroom management	1
The high number of evaluation criteria	1
Group evaluation during the process	1
Communication with students	1
The feeling of inadequacy in the process	1

According to Table 5, the majority of the pre-service teachers stated that formative assessment did not have any disadvantages. Some of the pre-service teachers cited their first time experience with the practice and the time-consuming and difficult nature of the process as disadvantages. Regarding this latter view, PT-5 stated the following: *This was my first practice and I hadn't worked at a preschool institution before, and I did not have any experience, therefore, I may not be able to demonstrate my full performance.* Similarly, PT-7 stated: *The application process was sometimes long and time-consuming.* During the process, group work was mentioned as a disadvantage, as expressed by PT-4, who stated: *'Group work was definitely challenging. I could not fully implement what I thought because of the differences in opinions. There was no other disadvantage.* Although the formative assessment process is a time-consuming application, the majority of the pre-service teachers did not perceive this as a disadvantage.
The codes related to the "Use of Rubric in Formative Assessment" category are given in Table 6.

Table 6: The Codes and Frequencies of the Rubric Use in Formative Assessment

Code	Frequency
Guiding	26
Planning and organizing the process	13
Facilitates application and planning	6
Limits the process	5
Evaluates the process	5
Enables identification of the details	4
Enables identification of the deficiencies	4
Effective in the details of the process	3
Too detailed	3
Guide	3
Self-evaluation	3
Facilitating	2
Multidimensional thinking	2

Gaining points	2
Instruction	1
Making the process efficient	1
Guide	1
Objectivity	1

According to Table 6, the pre-service teachers thought that the rubrics used in formative assessment were guiding, that they helped in planning and organizing the process, and that they were necessary for limiting and evaluating the process. PT-1 had the following thoughts on the use of rubrics: *Rubrics made the process easier. We evaluated both ourselves and our process, so we became conscious and could think more critically.* Regarding the guiding feature of rubrics, PT-3 stated: *Having a rubric guided us in implementing the technique. Although we had learned the assessment in the class, the rubric helped us to understand why we did the assessment.* PT-5 added: *The use of the rubric is very important because it directs and enables awareness on the deficiencies. Additionally, we become aware of the points that we need to be careful about.* The positive views that the pre-service teachers had about rubrics and their characterization of them as guiding can be considered as the main reasons they adopted the formative assessment instrument and were willing to use it.

The codes related to the "Planning Rubric" category are given in Table 7.

Table 7: The Codes and Frequencies Regarding the Planning Rubric

Code	**Frequency**
Designing the process	14
Guiding	13
Organizing the process	11
Helps application	9
Showing the parts that need attention	9
Appropriate	6
Sufficient	5
Successful	4
Directive	3
Noticing the asking questions category	3
Beneficial	3
Necessary	3
Demonstrating the process step-by-step	3
Educational	3
Preparation for the application	2
Facilitating	2
Improving creativity	2
Detailed information	2
Self-confidence	1
A written framework of the process	1
Effective	1

According to Table 7, the pre-service teachers felt that since the planning rubric showed the points that needed attention, it helped them to perform the application and organize the process. Moreover, the pre-service teachers consider the rubric to be appropriate for the application, sufficient, and successful. PT-8 had the following thoughts on the planning rubric: *It acted as a blueprint to the questions of "How should I act?", "What should my application be like?", "What are my objectives?", and "How should I express them?", and it guided well.* PT-2 added: *It was important for us regarding the order of the plan and the points that need attention during the plan.* Finally, PT-3 stated: *When all was said and done, we had organization. In the absence of organization, discipline cannot be mentioned, and in the absence of discipline, success cannot be mentioned. We thought about what to do and what the questions should be.* From these opinions, it is clear that the planning rubric used in the formative assessment was guiding.

The codes related to the "Application Rubric" category are given in Table 8.

Table 8: The Codes and Frequencies Regarding Application Rubric

Code	Frequency
The inclusion of the practical aspect of the profession	13
Helpful in the classroom environment	12
The inclusion of the implementation stages	9
Planning the implementation process	8
Guides the application	7
Observing the students	7
Communication with students	7
Including the points that need attention in application	5
Changing according to the process	5
Successful	5
Fully sufficient	5
The most important part of the process	3
Appropriate	3
Note taking	2
The inclusion of the evaluation type	2
Beneficial	2
Has application aim	2
Effective	2
Improves creativity	2
School experience	2
Facilitating	1
Self-confidence	1
Internship	1

According to Table 8, the pre-service teachers stated that since the application rubric used in the formative assessment process includes application stages, it acted as a guide in the planning of the application process, and it provided an opportunity to observe and communicate with the students in the classroom environment. PT-5 expressed the following views regarding the application rubric: *It provided answers to my questions about how to do the application so that it enables use of the creative thinking technique. It helped us to make the right plan and act in the right way.* PT-6 added: *The application rubric provided an advantage by enabling the use of creative thinking skills and included the possible problems that may be faced during the application.* Finally, PT-1 stated: *Providing an application rubric is good; it provided information about how to do the application, which was nice, considering that I did not have previous experience.* The application rubric can be seen as a supplementary resource in the classroom environment, since it includes practical information on teaching.

The codes related to the "Finalization Rubric" category are given in Table 9.

Table 9: The Codes and Frequencies Regarding Finalization Rubric

Code	Frequency
Self-evaluation	10
Evaluation of the application process	10
Interpreting the results	7
Evaluating the activity	6
Appropriate	5
Seeing the objectives	5
Sharing the results	5
Evaluating the group	4
Awareness of the errors and deficiencies	4
Map of the products	3
Guide of the results	2
Effective reporting of the results	2

Raising awareness on the possible problems	2
Planning the evaluation	2
Beneficial	2
Planning the presentation	2
Sufficient	2
Revision	2
Critical thinking	2
Creativity	1
Successful	1

According to Table 9, the participants felt that the finalization rubric was effective in the evaluation of the application process and interpretation of the results. Additionally, they thought that the rubric was appropriate for the process and effective since it included the objectives. PT-2 offered the following views on the finalization rubric: *At the end of the application part, everything was finalized. As a result, the better I do this part, the better I can reflect my homework.* Regarding self-evaluation, PT-4 stated: *It is quite an important step in terms of evaluating the activity. It helped us by enabling us to ask the following questions to ourselves: "What did we do?", "What did we expect?", and "How did it happen?".'* Additionally, PT-7 stated: *The finalization rubric enabled me to see what I have done in the application and the objectives.* From these statements, it is clear that the finalization rubric used in the formative assessment process provided an opportunity for self-evaluation.
The codes related to the "Contribution of the Formative Assessment to Professional Development" category are given in Table 10.

Table 10: The Codes and Frequencies Regarding Whether Formative Assessment Contributes to Professional Development

Code	**Frequency**	**Code**	**Frequency**
It contributed to professional development	23	Motivation	3
School experience	14	Developing original ideas	3
Preparation for the profession	13	Effective learning	3
Learning by doing	9	Enables permanence	2
Practicing in a real classroom environment	9	Seeing the results of methods and techniques	2
Transferring theoretical knowledge into practice	8	Making observation	2
Self-evaluation	8	Evaluation in the classroom environment	2
Evaluation	6	Beneficial	2
Communication with students	6	Classroom management	2
Awareness	6	Considering individual differences	1
First experience	5	Self-efficacy	1
First time communication with students	5	Reaching the objectives	1
Learning how to design a lesson procedure	5	Encouraging	1
Critical thinking	5		

According to Table 10, the participants felt that formative assessment contributed to professional development in terms of providing school experience, enabling the opportunity for practice in an actual classroom environment, transferring theoretical knowledge into practice, and enabling the opportunity of self-evaluation. On this issue, PT-8 stated: *It would be very pleasing to move from simple memorization to this system.* PT-3 added: *It certainly contributed to my professional development. Practicing with children in the real classroom environment moved the techniques outside the limits of formal information; it will enable us to conceptualize and conduct similar activities in the future*. Finally, PT-1 had the following to say on the subject: *This is the first time I have ever come across this type of assessment. I wish we had this assessment for each course. I wish that we could apply everything we learned so that the information would be more permanent.*

The codes related to the "Use of Formative Assessment in Other Course" category are given in Table 11.

Table 11: The Codes and Frequencies Regarding the Use of Formative Assessment in Other Courses

Category	Code	Frequency
Yes (41)	Turning theoretical knowledge into application	9
	Increasing permanence	8
	A beneficial application	7
	Learning by doing	6
	Applied system instead of memorization	5
	In applied classes	5
	In pedagogy classes	3
	Professional development	3
	Learning the subject comprehensively	3
	Communication with students	2
	Self-evaluation	2
	Cooperation	2
	Performance-based learning	2
	A different evaluation	2
	Facilitates learning	2
	Practice in the actual classroom environment	2
	Training experienced teachers	2
	Improving creativity	2
	Responsibility	1
	Developing ideas	1
	Embodying	1
	Practical courses	1
	Experience	1
No (4)	Not appropriate for each course	2
	Stressful process	1
	Time-consuming	1
In certain courses (13)	Permanence	3
	In field courses	2
	In applied classes	2
	Experience	1
	Educative	1
	Preparation for the profession	1
	Depends on the content of the course	1

According to Table 11, the majority of the participants felt that formative assessment should be used in other courses as well, particularly because it transforms theoretical knowledge into practice, increases permanence, is an educative application, and provides an opportunity to learn by doing rather than memorizing. Regarding its use in other courses, PT-2 said: *'Yes, I would definitely want it because it is an extraordinary evaluation method.* PT-6 stated: *'Yes, I would. I think its use, especially in the applied classes, will be beneficial for us.* Additionally, regarding its use in other written courses, PT-4 stated: *'Yes, I would want it. We won't teach by memorization, we will teach by doing. So, I think we need to learn by doing.'*

CONCLUSIONS, DISCUSSION, AND IMPLICATIONS

This study revealed that the views of the majority of the pre-service teachers regarding formative assessment were positive. Among these views, gaining experience, enabling permanence learning, and turning theoretical knowledge into practice stood out. Additionally, they felt that this application facilitated their professional development and provided them with a chance to communicate with the students in the classroom environment. The findings of other studies in the literature support the results of this study. Formative assessment is an application that includes various approaches capable of being used to support a student's learning (Van der Kleij, Vermeulen, Schildkamp, & Eggen, 2015; Briggs, Ruiz-Primo, Furtak, Shepard, & Yin, 2012). Decristan et al. (2015) conducted an experimental study on curriculum-embedded formative assessment and its effect on classroom quality and found that the curriculum-embedded formative assessment's impact on class quality for a science course taught on floating and sinking helped to facilitate the students learning. Bulunuz and Bulunuz (2013) noted in their study that the use of the formative assessment approach in science courses has high potential in terms of supporting conceptual learning. In a report by Jones (2005), it was stated that in order to progress in a specific activity it is necessary to provide feedback, which is an element of formative assessments, to the students. When the students are provided with feedback to improve the task that they are working on, the

value they derive from it is perceived as a motivator. Studies conducted in various fields of education have revealed that the formative assessment process needs to be actively employed in education.

Rubrics, which function as an element of formative assessment, was also addressed in this study. The pre-service teachers viewed the rubrics that they used in the process of formative assessment as guiding and directive. Additionally, they felt that the rubrics were beneficial and important insofar as they helped in planning and organizing the process. In terms of each specific rubric, the participants expressed that the planning rubric they used guided them by helping them to design and organize the process, that the application rubric helped to improve the practical aspect of the teaching profession and included the application steps for the classroom environment, and that the planning rubric facilitated their self-evaluation by interpreting the results and evaluating the process. Other studies in the literature that were conducted on the effectiveness of rubrics in the learning environments support the findings of this study. In education, rubrics are an effective tool for teacher training, scientific contents, and assessment processes (Alsina, Ayllón, Colomer, Fernández-Peña, Fullana, Pallisera, Perez-Burriel, & Serra, 2017; Harrison & Lee, 2011; Timmermann, Strickland, Johnson, & Payne, 2011; Ward & McCotter, 2004; Panadero & Jonsson, 2013).

The following implications were drawn from the findings of this study:

1. In faculties of education, formative assessment should be included as part of applied undergraduate courses. Additionally, even in theoretical courses, formative assessment can be used by including application as part of the course.
2. In-service teachers can be trained on formative assessment by means of in-service training.
3. Rubrics, which are one of the elements of formative assessment tools, can be implemented at every level of learning, from primary school to higher education. In this respect, different application types may be used for many courses.
4. In teacher training, formative assessment types can be tested on different sample groups with different applications and instruments.

Similar studies may be conducted in different teaching branches and with a higher number of participants.

REFERENCES

Alsina, Á., Ayllón, S., Colomer, J., Fernández-Peña, R., Fullana, J., Pallisera, M., Perez-Burriel, M., & Serra, L. (2017). Improving and evaluating reflective narratives: A rubric for higher education students. *Teaching and Teacher Education, 63*, 148-158.

Andrade, H. G. (2005). Teaching with rubrics: The good, the bad, and the ugly. *College Teaching, 53*(1), 27–30.

Andrade, H., & Du. Y. (2005). Student perspectives on rubric-referenced assessment. *Practical Assessment, Research & Evaluation, 10*(5), 1–11.

Briggs, D. C., Ruiz-Primo, M. A., Furtak, E., Shepard, L., & Yin, Y. (2012). Meta-analytic methodology and inferences about the efficacy of formative assessment. *Educational Measurement: Issues and Practice, 31*(4), 13-17.

Bulunuz, M., & Bulunuz, N. (2013). Fen öğretiminde biçimlendirici değerlendirme ve etkili uygulama örneklerinin tanıtılması. *Türk Fen Eğitimi Dergisi, 10*(4), 119-135.

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş. & Demirel, F. (2012). *Bilimsel araştırma yöntemleri.* Ankara: Pegem Akademi.

Decristan, J., Klieme, E., Kunter, M., Hochweber, J., Büttner, G., Fauth, B., Hondrich, A.L., Rieser, S., Hertel, S., & Hardy, I. (2015). Embedded formative assessment and classroom process quality: how do they ınteract in promoting science understanding? *American Educational Research Journal, 52*(6), 1133-1159.

Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education, 1*, 3-31.

Harrison, J. K., & Lee, R. (2011). Exploring the use of critical incident analysis and the professional learning conversation in an initial teacher education programme. *Journal of Education for Teaching: International Research and Pedagogy, 37*(2), 199-217.

Higgins, R., Hartley, P., & Skelton, A. (2002). The conscientious consumer: reconsidering the role of assessment feedback in student learning. *Studies in Higher Education, 27*(1), 53-64.

Johnson, B., & Christensen, L. (2014). *Eğitim araştırmaları: nicel, nitel ve karma yaklaşımlar.* (S. Demir, Trans.). Ankara: Eğiten Kitap.

Jones, C. A. (2005). Assessment for learning (Vocational learning support programme:16–19). *London, UK: Learning and Skills Development Agency*, Retrieved February 20, 2018, from http://dera.ioe.ac.uk/7800/1/AssessmentforLearning.pdf.

Kan, A. (2007). Performans değerlendirme sürecine katkıları açısından yeni program anlayışı içerisinde kullanılabilecek bir değerlendirme yaklaşımı: Rubrik puanlama yönergeleri. *Kuram ve Uygulamada Eğitim Bilimleri / Educational Sciences: Theory & Practice, 7*(1), 129-152.

Kutlu, Ö., Bilican, S., & Yıldırım, Ö. (2010). A study on the primary school teachers' attitudes towards rubrics with reference to different variables. *Procedia Social and Behavioral Sciences, 2*(2), 5398–5402.

Liu N. F., & Carless, D. (2006). Peer feedback: the learning element of peer assessment. *Teaching in Higher Education, 11*(3), 279-290.

Miles, M. B., Huberman, A. M., Huberman, M. A., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook*. sage.

OECD, (2005). Formative assessment: Improving learning in secondary classrooms. *Policy Brief*, Retrieved February 28, 2018, from http://www.oecd.org/publications/Policybriefs/ **.**

OECD/CERI, (2008). *Assessment for learning: Formative assessment. International Conference, Learning in the 21st Century: Research, Innovation and Policy.* Paris: CERI/OECD, Retrieved March 20, 2018, from http://www.oecd.org/dataoecd/19/31/40600533.pdf.

Panadero, E., Alonso-Tapia, J., & Huertas, J. A. (2012). Rubrics and self-assessment scripts effects on self-regulation, learning and self-efficacy in secondary education. *Learning and Individual, Differences, 22*(6), 806–813.

Panadero, E., Alonso-Tapia, J., & Reche, E. (2013). Rubrics vs. self-assessment scripts effect on self-regulation, performance and self-efficacy in pre-service teachers. *Studies in Educational Evaluation, 39*, 125–132.

Panadero, E., & Jonsson, A. (2013). The use of scoring rubrics for formative assessment purposes revisited: a review. *Educational Research Review, 9*, 129–144.

Reddy, Y. M., & Andrade, H. (2010). A review of rubric use in higher education. *Assessment & Evaluation in Higher Education, 35*(4), 435–448.

Shute, V. J. (2007). *Focus on formative feedback.* Research Report. Princeton, NJ: Educational Testing Service, Retrieved April 2, 2018, from https://onlinelibrary.wiley.com/doi/pdf/10.1002/j.2333-8504.2007.tb02053.x.

Taras, M. (2002). Using assessment for learning and learning from assessment, *Assessment & Evaluation in Higher Education, 27*(6), 501–510.

Taras, M. (2003). To feedback or not to feedback in student self-assessment. *Assessment & Evaluation in Higher Education, 28*(5), 549-565.

Timmermann, B., Strickland, D. C., Johnson, R. L., & Payne, J. R. (2011). Development of a "universal" rubric for assessing undergraduates' scientific reasoning skills using scientific writing. *Assessment & Evaluation in Higher Education, 36*(5), 509-547

Van der Kleij, F. M., Vermeulen, J. A., Schildkamp, K., & Eggen, T. J. H. M. (2015). Integrating data-based decision making, Assessment for Learning, and diagnostic testing in formative assessment. *Assessment in Education: Principles, Policy & Practice, 22*(3), 324-343.

Ward, J. R., & McCotter, S. S. (2004). Reflection as a visible outcome for preservice teachers. *Teaching and Teacher Education, 20*(3), 243-257.

Wollenschlager, M., Hattie, J., Machts, N., Moller, J., & Harms, U. (2016). What makes rubrics effective in teacher-feedback? Transparency of learning goals is not enough. *Contemporary Educational Psychology. 44*, 1–11.

Yıldırım, A., & Şimşek, H. (2008). *Nitel araştırma yöntemleri*.(7. Baskı). Ankara: Seçkin Yayıncılık.

School Autonomy in France According to Talis 2013: The Importance of Educational Leadership

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ABSTRACT
In recent years, school autonomy in France has become a central issue for the improvement of students´ outcomes. French principals, who have a significant responsibility for learning tasks, play an active role in decision-making. The purpose of this study is to explore the correlation between the type of school (publicly or privately-managed) and the significant responsibilities of French principals which participated in TALIS 2013. The sample consisted of 174 participants. Descriptive data were generated for all variables (percentages and means). Pearson's chi-square test was used to determine if there is an association between the type of school and principals´ responsibilities for some tasks. All analyses were carried out using SPSS, version 22. Findings suggest a significant correlation between the type of school and principals´ responsibilities for dismissing teachers and establishing teachers' salaries. This study adds to a growing body of research that school-based management has an influence on principals´ responsibilities for deciding which courses are offered and choosing learning materials.

KEYWORDS: Leadership, principals, professional autonomy, school autonomy, school-based management.

INTRODUCTION

In France, not all schools assume the same responsibilities legal or administrative. Hence the fact that people who administer schools receive different names. Principal is the name of Lower Secondary Education directors and Proviseur, in the Lycée, of Higher Secondary Education. French principals of Secondary Education can make decisions to authorize expenses, modernize the equipment and make some items of the budget more flexible (Oria, 2009). A qualitative study by Tulowitzki (2013) described how five Parisian principals had spent their work time. Most of them put a low emphasis on school improvement. They had to face many tasks and responsibilities with a demanding level of complexity. Their activities were related to administration and relationship.

In France, the transition from lower secondary education to upper secondary education is particular: families are involved in a process of dialogue with the school. In the first step, families make a request. In the second step, the staff meeting formulates a proposal. Barg (2013) found that school staff's decision-making depended on families´ requests and, therefore, had reproduced the differences between social classes. Parental involvement had a great influence on school staff's decision-making. From a legal point of view, French principals can make decisions related to the organization of teaching in their school, but not with their methods and contents. This task is carried out through a division of responsibilities between the administration, the year head and its team and the pedagogical area (teachers) (Normand, 2015). French public schools are managed through a centralized system in which all teachers and principals are government employees. Elementary schools have principals who teach in and manage their schools, whereas principals work full time in middle and high schools (Supovitz, 2013).

The administrative accountability has influenced schools in the long term, although it has not had important consequences on teaching responsibilities. There is a limited autonomy for schools, a framework for school choice of limited dimensions and an unsatisfactory decentralization (Derouet, Normand &Pacheco, 2015).

School principals have the right to be both leaders and spokespersons for their schools. An effective management of human resources requires the recognition of directors as leaders, which does not agree with the pedagogical autonomy and professionalism demanded by teachers (Dutercq, 2015).

In 2005, an accountability policy was implemented in the French educational system, but it remains bureaucratic, centralized and descending, without taking school improvement into account. French principals have limited autonomy because their tasks are limited by the national standards in the curricula, teaching and schedules in schools (Normand, 2016).

French students 'scores in PISA tests are close to the average of the OECD countries in all subjects. The government created two action plans. One plan is intended to provide personalized assistance to students with learning difficulties. Another plan aims to give schools more autonomy to manage its budget (Baird et al., 2016). After the publication of PISA results in France, the French government implemented national standards, an evaluation based on the PISA methodology for eighth grade students (Hugonnier, 2017).

The growing inequality of student performance in the last 15 years, confirmed by PISA results and the fact that this inequality is the highest in Europe, has been the reason why school autonomy remains limited. Many teachers and parents believe in traditional teaching and question political measures that advocate the learning diversity (Michel, 2017). In a study investigating principals´workload in France, Leithwood & Azah (2014) reported that school improvement is related to highly motivated principals who perfect their leadership over time, take advantage of their abilities in different contexts and work with other principals.

OBJECTIVE

This paper investigates the factors that influence French principals´ decision-making. The purpose of this study was to explore the relationship between the type of school (publicly or privately-managed) and the significant responsibilities of French principals for some tasks to improve school management.

THE STUDY

Teaching and Learning International Survey (TALIS) is an international survey that offers the opportunity for principals to provide information about their professional development, practices, beliefs and school leadership. The questionnaire, which asks for information about policy matters and education, was completed by French principals (OECD, 2013).

Data were collected from TALIS 2013 results in France.

A variable is a construct or concept which is assigned to numerical values (DePoy & Gitlin, 2011).
A qualitative or nominal variable, which involves non-numerical observations, describes an individual by putting it into a group or category such as man or woman (Brase & Brase, 2016).

The values of a categorical or nominal variable are expressed as some categories, stated in words. If a categorical variable has two values is called a dichotomous variable. If it has more than two values, it´s called a polytomous variable (Quader, 2016).

Pearson's chi-square test was used to determine if there is an association between the type of school and the significant responsibilities of French principals. The chi-square test of independence is conducted to determine whether the frequencies´ distribution for one categorical variable is independent of another variable (Tokunaga, 2015). It´s used to test the null hypothesis that the outcomes´ proportions are the same all compared groups. The alternative hypothesis states that the proportions of outcomes are different (Hanneman, Kposowa & Riddle, 2013). The null hypothesis claims that there is no difference between compared groups or no relationship between variables. In contrast, the alternative hypothesis claims that there is a difference between compared groups or relationship between variables (Allen, 2017). If the P-value is less than 0.05, the null hypothesis is rejected and the alternative hypothesis is true. Then the result is statistically significant. If the P-value is equal to or greater than 0.05, the null hypothesis is accepted and the result is not statistically significant (Defusco et. al, 2015; Epstein & Martin, 2014).

In general terms, the alpha level or the level of significance is a probability level set before beginning hypothesis testing and determines the standard to reject the null hypothesis (Smith, Gratz & Bousquet, 2009). The alpha level sets the boundaries that separate high-probability samples (those that are likely to be obtained) from low-probability samples (those that are unlikely to be obtained) if the null hypothesis is true (Gravetter & Wallnau, 2009). In social sciences, it´s commonly used an alpha level = 0.05. The normal curve of the sampling distribution, which represents 95% of its area, is included within1.96 standard deviation units. Any score farther away from the mean falls within the 5% region (2.5% on either extreme of the sampling distribution) (Meyers, Gamst & Guarino, 2006).

All analyses were carried out using SPSS, version 22.

FINDINGS

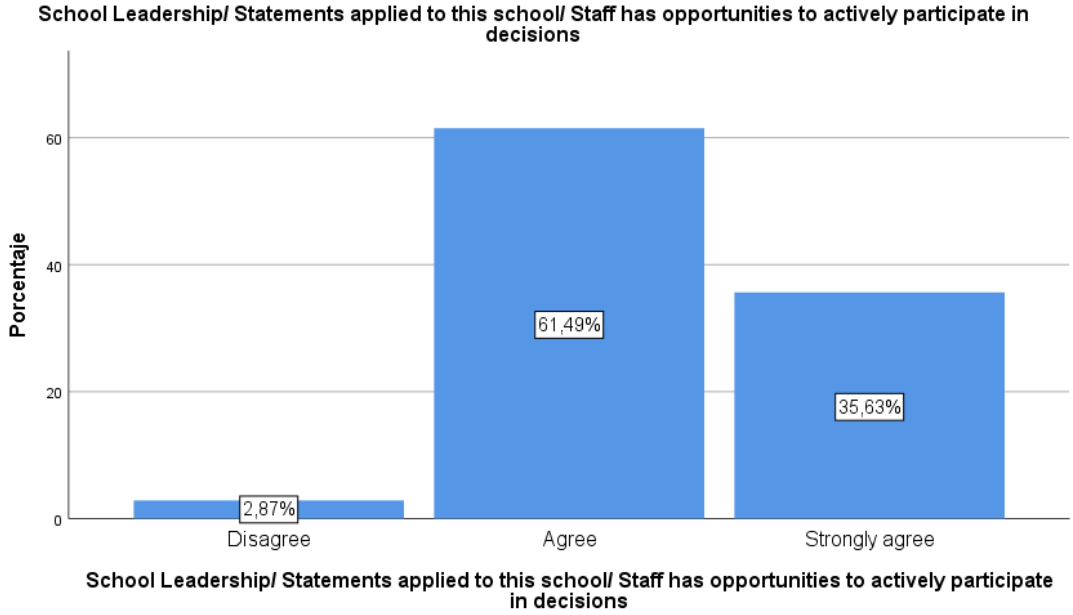

Chart 1. Percentage of French principals who answered the question "How strongly do you agree or disagree with this statement: This school provides staff with opportunities to actively participate in school decisions".

Of two hundred and four French principals, one hundred and seventy four completed the questionnaire. 61.49% of French principals provide staff with opportunities to actively participate in school decisions, 35.63% of the respondent strongly agreed with the statement. A minority of participants (2.87%) disagree with the statement.

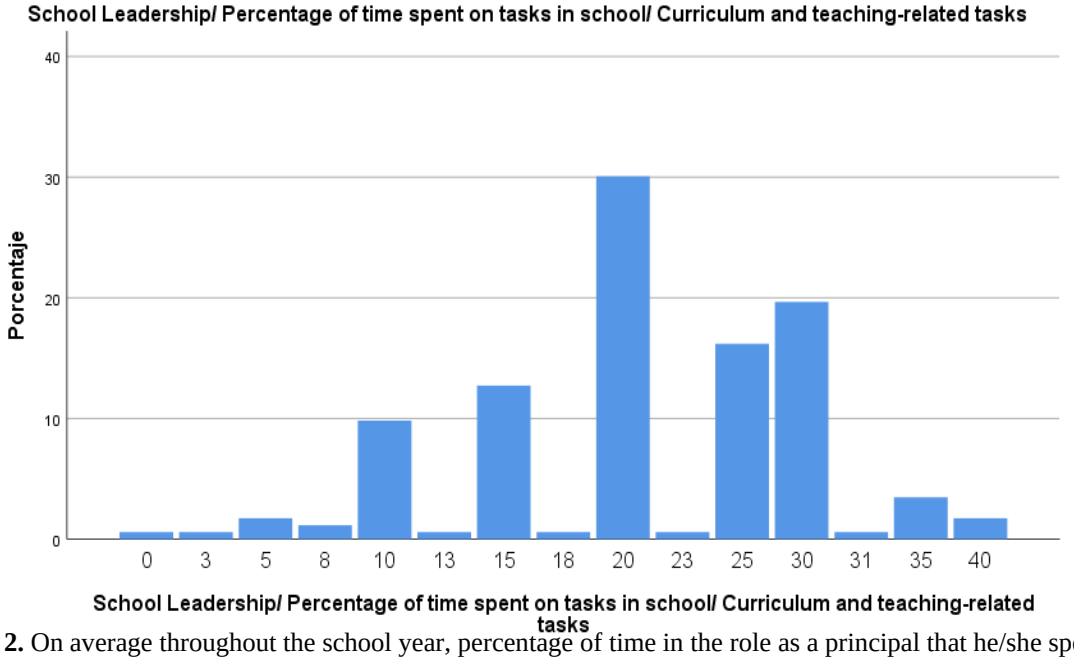

Chart 2. On average throughout the school year, percentage of time in the role as a principal that he/she spends on Curriculum and teaching-related tasks in school (Including developing curriculum, teaching, classroom observations, student evaluation, mentoring teachers, teacher professional development).

From the Chart 2 it can be seen that 30% of French principals have spent 20% of their time on Curriculum and teaching related tasks in school, 19.6% of them have spent 30% on their time, 16.9 of them have spent 25% of

their time. 12.8% of French Principals have spent 15% of their time and 9.8% spent 10% of their time on Curriculum and teaching-related tasks. A minority of participants (less than 3%) have spent different percentages of their time on these tasks; for instance, 3%, 5%, 8%, 13%, 18%, 31%, 35% and 40%

Chart 3. Percentage of French principals who had a significant responsibility for deciding which courses were offered.

From the Chart 3 it can be seen that 37.8% of French principals had a significant responsibility for deciding which courses are offered, whereas 62.2% oh them hadn´t this responsibility.

Chi-Square distribution

The null hypothesis is accepted if the P-value is equal to or greater than 0.05 (the two variables are independent)
The alternative hypoyhesis is true if the P-value is less than 0.05 (the two variables are related)

Table 1. P-Value of the correlation between the type of school and principals´ responsibilities for dismissing teachers.

	Value	df	P-value
Chi-square Distribution: Is there a correlation between the type of school (publicly or privately managed) and principals´ responsibilities for dismissing teachers?	10,272[a]	1	0.001

As Table 1 shows, there is a statistically significant correlation between the type of school (publicly or privately managed) and French principal´s responsibility for dismissing teachers. The alternative hypothesis is true, so there is a difference between compared groups (public/private school principals) in relation to that task.

Table 2. P-Value of the correlation between the type of school and principals´ responsibilities for deciding which courses are offered.

	Value	Df	P-value
Chi-square Distribution: Is there a correlation between the type of school (publicly or privately managed) and principals´ responsibilities for deciding which courses are offered?	23,023[a]	1	0.00

Table 2 shows a P-value = 0. There is a statistically significant correlation between the type of school (publicly or privately managed) and French principals´ responsibilities for deciding which courses are offered. The alternative hypothesis is accepted, so there is a difference between compared groups (public/private school principals) in relation to that task.

Table 3. P-Value of the correlation between the type of school and principals´ responsibilities for deciding on budget allocations within their school.

	Value	Df	P-value
Chi-square Distribution: Is there a correlation between the type of school (publicly or privately managed) and principals´ responsibilities for deciding on budget allocations within their school?	4,647[a]	1	0.031

Table 3 presents a P-Value = 0.031. There is a statistically significant correlation between the type of school (publicly or privately managed) and French principals´ responsibilities for deciding on budget allocations within their school. The alternative hypothesis is true, so there is a difference between compared groups (public/private school principals) in relation to that task.

Table 4. P-Value of the correlation between the type of school and principals´ responsibilities for choosing learning materials.

	Value	Df	P-value
Chi-square Distribution: Is there a correlation between the type of school (publicly or privately managed) and principals´ responsibilities for choosing learning materials?	4,548[a]	1	0.033

As Table 4 shows, the P-value is less than 0.05. There is a statistically significant correlation between the type of school (publicly or privately managed) and French principal´s responsibility for choosing learning materials. The alternative hypothesis is true, so there is a difference between compared groups (public/private school principals) in relation to that task.

CONCLUSIONS

The findings of this study suggest that nearly 62% of French principals provide staff with opportunities to actively participate in decisions, but they can´t decide which courses are offered in their schools. It has confirmed the findings of Iftene (2014) which found that French principals do not have any autonomy for raising private funds through donations, sponsorships and revenue from space rental.

The results indicate that 30% of French principals spend 20% of their time on curriculum and teaching-related tasks, whereas nearly 20% of them spend 30% of their time.

Overall, this study strengthens the idea that principals´ responsibilities for dismissing teachers or establishing teachers' salaries is related to the type of school (public or private). It has complemented the findings of an earlier study conducted by Maroy, Pons & Dupuy (2017), which reported that in France there was a

"globalization by discursive internalization", in which transnational imperatives are integrated in official discourses on the regulation of the education system.

The results suggest that the type of school (publicly or privately-managed) plays a vital role in principals´ responsibilites for deciding which courses are offered and choosing learning materials. It has provided a deeper insight into the school autonomy. Pons, Zanten & Da Costa (2015) reported that the introduction of New Public Management approaches and instruments in the field of education had not exerted a significant influence either on the public management of State-controlled private schools or on the coupling between the public and the private sector. The management of Catholic schools is still mainly based, on the one hand, on regulation through inputs and limited intervention by public authorities and, on the other hand, on a complex system of internal moral controls by the private authorities themselves.

REFERENCES

Allen, M. (2017). *The SAGE Encyclopedia of Communication Research Methods.* Thousand Oaks, CA: Sage Publications.

Baird, J., Johnson, S., Hopfenbeck, T., Isaacs, T., Sprague, T., Stobart, G., & Yu, G. (2016). On the supranational spell of PISA in policy. *Educational Research, 58(2),* (pp.121-138). doi:10.1080/00131881.2016.1165410.

Barg, K. (2013). The Influence of Students' Social Background and Parental Involvement on Teachers' School Track Choices: Reasons and Consequences. *European Sociological Review,29(3)* , (pp.565-579). doi: 10.1093/esr/jcr104.

Brase, C.H. & Brase, C.P. (2016). *Understanding Basic Statistics.* Boston, MA: Cengage Learning.

Defusco, R. (2015). *Quantitative Investment Analysis, 3rd Edition.* Hoboken, NJ: Wiley.

Derouet, J.L.; Normand, R. & Pacheco, R. (2015). La modernización del sistema educativo en Francia: la Nueva Gestión Pública entre la afirmación del Estado y la gobernanza descentralizada. *Educação & Sociedade, 36(132),* (pp. 723-741).

Dutercq, Y. (2015). Contemporary Models of Legitimacy of French School Principals. *Recherche & Formation, 78,* (pp. 35-50).

Epstein, L., & Martin, A. (2014). *An Introduction to Empirical Legal Research.* NY: Oxford University Press.

Gravetter, F.J. & Wallnau, L.B. (2009). *Statistics for the Behavioral Sciences.* Belmont, MA: Cengage Learning.

Hanneman, R., Kposowa, A., & Riddle, M. (2013). *Basic Statistics for Social Researc.* San Francisco, CA: Wiley.

Hugonnier, B. (2017). France and PISA: An Unfinished Dialogue. En A. Wiseman, & C. Stevens, *The Impact of the OECD on Education Worldwide (International Perspectives on Education and Society, 31* (pp.3-15). Bingley, UK: Emerald Publishing.

Iftene, C. (2014). Educational Systems' Autonomy. Facts and Analysis. *Procedia - Social and Behavioral Sciences, 42,* (pp.47–53). doi:10.1016/j.sbspro.2014.07.586.

Leithwood, K., & Azah, V. (2014). *Elementary Principals' and Vice-Principals' Workload Study. Final Report.* Ontario, CDN: Ontario Ministry of Education.

Maroy, C., Pons, X., & Dupuy, C. (2017). Vernacular globalisations: neo-statist accountability policies in France and Quebec education. *Journal of Education Policy, 32(1),* (pp.100-122). doi: 10.1080/02680939.2016.1239841 .

Meyers, L.S.; Gamst, G. & Guarino, A.J. (2006). *Applied Multivariate Research: Design and Interpretation.* Thousand Oaks, CA: Sage Publications.

Michel, A. (2017). The contribution of PISA to the convergence of education policies in Europe. *European Journal of Education, 52(2),* (pp.206-216). doi: 10.1111/ejed.12218.

Normand, R. (2015). French Principals in Secondary Education: Towards New Roles and Responsibilities? *Journal of Educational, Cultural and Psychological Studies, 11,* (pp.135-152). doi: 10.7358/ecps-2015-011-norm.

Normand, R. (2016). France: Between Civil Service and Republican Ethics – The Statist Vision of Leadership Among French Principals. In H. Ärlestig, C. Day, & O. Johansson (Eds.), *A Decade of Research on School Principals. Cases from 24 countries* (pp.357-374.). NY: Springer.

Oria, M.R. (2009). Is school autonomy possible? The role of headmasters and educational projects in French, Italian and Spanish education systems. *Educación XX1, 12* (pp.151-180).

Pons, X.; Zanten, A.V.; Da Costa, S. (2015). The national management of public and Catholic schools in France: moving from a loosely coupled towards an integrated system? *Comparative Education, 51(1),* (pp. 57-50). doi: 10.1080/03050068.2014.935580.

Quader, A. (2016). *Applied Statistics for Social and Management Sciences.* Thousand Oaks, CA: Springer.

Smith, L.F; Gratz, Z.S & Bousquet, S.G. (2009). *The art and practice of Statistics.* Belmont, MA: Cengage Learning.

Supovitz, J.A. (2013). Leadership lessons for French educators. *Phi Delta Kappan, 95(1)*, (pp. 74-76).
Tokunaga, H. (2015). *Fundamental Statistics for the Social and Behavioral Sciences.* Thousand Oaks, CA: Sage Publications.
Tulowitzki, P. (2013). Leadership and school improvement in France. *Journal of Educational Administration, 51 (6)*, (pp.812-835). doi: 10.1108/JEA-03-2012-0026.

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Teachers and students' perceptions of teaching and learning English in small classes: a case of Ecuador

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ABSTRACT
The English language teaching learning process in small classes may turn challenging for some teachers but also rewarding because of the results obtained. In our country, the majority of high schools have a big number of students in the English courses and this may be one of the causes for language low achievement. For this reason, this study is aimed at exploring teachers and students' perceptions on the benefits, strategies and resources, students' feelings, and the possible limitations the teaching and learning of English in small classes may yield to promote changes in the number of students in Ecuadorian English classrooms. The findings show that small classes help teachers design, apply activities, use strategies, and resources that make it easier for students to interact, participate, and receive appropriate feedback. Regarding students, they feel relaxed and motivated to learn English among few students; however, the fact that teachers' control of the small class allows them to address students more frequently, make students feel anxious.

KEYWORDS: small classes, teachers and students' perceptions, benefits, strategies and resources, students´ feelings, limitations

1. INTRODUCTION
One of the most common obstacles that English teachers face in Ecuadorian high schools is the amount of students per class, which may have a positive or negative influence on the teaching and learning of the English language. The average number of students per class in public high schools is 40. In this sense, teachers make efforts to improve their teaching skills in order to overcome problems that appear in relation to the assigned class size. According to Harmer (2007) large classes present bigger challenges than small ones. But working with small groups may imply a necessity to overcome some specific challenges since as it is stated by Schreiner (as cited in Zayed 2016) working with small classes increases student anxiety. Despite the fact that the problem mainly lies on large classes, this study focuses on small classes. For this reason, the purpose of this paper is to identify teachers and students' perceptions of the benefits, strategies and resources, students' feelings, and the

possible limitations in teaching and learning English in small classes. These results will be presented to our society as a contribution for the improvement of this field.

2. LITERATURE REVIEW

2.1 Small classes

Deciding on the appropriate number of students in an English class has been discussed by field experts for some time. According to Finn, Pannozzo, and Achilles (2003) cited in Bray and Kehle (2011), when a class has less than 20 students, it is considered to be a small class. In fact, most EFL instructors prefer teaching groups of about 15 students which is similar to the above mentioned number. Folger (1989) cited in Bray and Kehle (2011) highlights that the benefits of small classes are reflected in students' learning behaviors; students' social behaviors; and student-teacher interactions. Regarding students´ learning and social behaviors, students demonstrate more academic commitment which results in higher achievement. In addition, the author states that small classes provide opportunities for more active students' participation in regards of discussions and question-answer activities. In relation to student-teacher interactions, Folger (1989) reports that there are more opportunities for personalized instruction which helps to identify students' weaknesses.

Likewise, Exley and Dennick (2004, p. 3) state that "in a small group, students can be encouraged to talk, think, and share much more readily than in a large group. Communication is at the heart of small group teaching of any kind and a crucial first step is the willingness of the students to speak to the tutor and to each other." In addition, the authors claim that teachers benefit from small groups because they can provide feedback to all students; this support can be given during whole group or individual performance by providing advice on personal problems or in any issue that students may face.

2.2 Managing learning in small classes

Success in the teaching-learning process involves different aspects; it goes from the design and implementation of good and flexible lesson plans to the application of accurate classroom management strategies.

The current literature review focuses on some of the aspects that are more relevant at the moment of teaching a lesson; aspects such as: instruction, feedback and timing. Regarding instructions, Harmer (2007) assures that there are two general rules that teachers have to consider when providing instructions because they must be as simple and clear as possible, and they must be logical. Nunan (1996) highlights that providing clear instructions is an ability that teachers have to develop to improve ESL, and EFL learners' performance.

Consequently, before an instruction is given, teachers have to consider students' previous knowledge, the message they want to convey, and the order in which the information must be used and presented; afterwards, the teacher must confirm students´ understanding by requesting a student to explain the activity to be performed.

The time set for students to complete tasks is also an important aspect in managing learning. In this sense, Levin and Long (1981) have identified a subdivision. First, allocated time which is the space of time that teachers consider enough to develop the activity. Second, time on task which is the amount of time that students are engaged during the assigned task. Finally, academic learning time that is the moment in which learners develop the activity, and reach a high level of productivity.

Another aspect that is relevant to be included in managing learning is feedback; to this regard, Harmer (2011) states that in order to increase motivation, and enhance learning environment, it is important to provide feedback to students. In this sense, Ackerman and Gross (2010), affirm that both positive and negative feedback lead to successful performance. The authors highlight that the nature of feedback is negative since it focuses on the weak points of students' performance and motivates improvement. On the other hand, Ackerman and Gross point out that positive feedback emphasizes on positive aspects of an assignment which will increase students' sense of achievement, but it is important to consider that pupils will not improve much if they only receive positive feedback.

2.3 Learning environment in English classes

Dornyei and Murphey (2003, p. 77) have emphasized that being creative and flexible in the classroom build a relaxing learning environment; for instance, the arrangement of desks promotes interaction and communication which at the same time conveys powerful effects on students' participation, leadership opportunities and affective potential of group member. The authors highlight that it is not easy to suggest an ideal seating arrangement since it will depend on the purpose and needs.

In the same regard, Harmer (2001) states that the physical appearance of the classroom and the emotional atmosphere of lessons have positive results on students' motivation to learn. Thus, it is important to present an attractive classroom that generates an appropriate atmosphere where students can work on different activities without having problems when moving around the classroom if working individually or in groups. In the same fashion, Zubizarreta (2010) states that the environment in small classes allows collaboration, mentoring, active learning, and community building which are benefits used by teachers and learners to reach their goals.

2.4 Strategies and resources to teach English

Regarding strategies, Robert, Kaplan, and Richard (1997) affirm that the use of the target language, group work and pair work are considered useful strategies that contribute to enhance communication in small classes. Another technique suggested by Wilbert and Marilla (2010) is discussion which can be used with any group size but it is more effective when used in smaller classes. By applying discussions, students are expected to integrate, apply, and think. These skills allow teachers to understand students´ point of view.

2.5 Teacher-student, and student-student interaction in small classes

According to Exley and Dennick (2004) teaching small groups allow instructors to boost students´ interaction. By interacting, students share their opinions and help each other understand difficult concepts and explanations. In addition, Johnston (1990) (as cited in Bray and Kehle, 2011) states that small classes let students have frequent interaction with their teachers. As a result of the interaction among teachers and students in small classes, Zahorik (1999) (as cited in Bray and Kehle, 2011) explains that students get positive outcomes which increases enthusiasm and self-confidence.

2.6 Previous Studies

Previous studies have been devoted to discover whether or not small classes benefit English language teaching and learning. Blatchford, Russell, Bassett, Brown, and Martin (2006) conducted a longitudinal research design study aimed at determining the effects of class size on teaching in English primary schools of pupils aged 8-11 years. The sample for this study involved 202 schools, chosen by stratified random sampling. The data was gathered by using a multi-method approach, integrating qualitative information from teachers' end-of-year accounts and data from case studies with quantitative information from systematic observations. The authors concluded that there was more individual attention in smaller classes, a more active role for pupils, and beneficial effects on the quality of teaching.

A similar study conducted by Din (1999) focuses on the functions and benefits of small classes to both teachers and students. For the purpose of this study, full-time teachers with five or more years of experience in a school district were selected. A questionnaire that contained open-ended questions related to Chinese rural teachers' perceptions regarding class size was applied to each of the selected teachers. The results permitted to reach to the conclusion that Chinese rural teachers think that there is not a relation between class size and student achievement. Nevertheless, they consider that small classes promote classroom management, interaction between teacher and students, and personalized feedback from teachers; and reduce teachers' working time.

Harfit (2012) conducted a small-scale exploratory study that aimed at examining whether and how class size reduction might help to alleviate language learning anxiety, which has long been seen as an obstacle to second language acquisition. To develop the study, the author applied multiple case studies in 4 Hong Kong secondary schools. Each case study involved one teacher teaching English language to first language Chinese students in a reduced-size class and a large class of the same year grade, and of similar academic ability. Multiple interviews were applied to four teachers and 231 students. Students' interview focused on their perspectives and experiences of studying in large and reduced-size classes. The research findings revealed that students' sense of anxiety can be reduced in smaller classes.

Galton and Pell (2012) conducted a study with the purpose of establishing the benefits of teaching in a small class. In addition, the study sought to find if there was improvement in the student's´ participation and quality of teaching in a reduced class. For this research, 37 primary schools participated voluntarily. In order to gather the information, the sample was divided in 3 cohorts that were observed and recorded in a 3 year period. During the first 2 years, reduced classes were chosen to be observed. In the last year of the study, both normal and reduced classes were observed. In addition to the observation, researchers recorded the student-student and student-teacher interaction. The authors concluded that students in small classes do not get more of the teachers´ complete attention, than students in regular classes. Also, teacher-student interaction in normal classes is really brief compared to interaction in small classes where interaction is longer.

3. METHOD

Participants

This study was conducted in Ecuador. The sample consisted of 1146 students and 84 teachers from three regions of the country, Coast, Highlands, and Amazon. The participants belonged to different schools, high schools, and language academies where English is taught as a foreign language. The sample included learners from diverse socio-economic status.

Procedures

A mixed method research design was selected to conduct this study. In order to collect the data, 2 instruments were designed, a questionnaire for teachers and students; and an observation sheet. The questionnaires were designed in English and were aimed at gathering teachers and students' opinions regarding the teaching and learning of English in small classes in Ecuador.

The observation sheet included questions to support what teachers and students answered in the questionnaires. These questionnaires and the observation sheet were validated by experienced teachers. Secondary researchers of around the country were trained in order to apply these instruments.

4. ANALYSIS

Table1: Teachers and students' perceptions of teaching English in small classes in Ecuador

	Description	Teachers' perceptions				Students' perceptions			
		Totally disagree	Disagree	Agree	Totally agree	Totally disagree	Disagree	Agree	Totally agree
		%	%	%	%	%	%	%	%
Benefits of teaching and learning English in small classes	1. The designed activities help students to apply what they have been taught.	2.44	2.44	31.71	63.41	0.88	5.1	39.93	54.09
	2. The students are attentive and participate in class activities.	2.44	3.66	32.93	60.98	1.32	12.05	50.75	35.88
	3. Classroom space allows students to properly do the activities designed.	3.66	6.1	30.49	59.76	1.58	7.3	37.03	54.09
	4. Appropriate feedback can be given.	2.44	3.66	31.71	62.2	1.85	8.88	35.88	53.39
	5. Activities that allow more interaction among students are performed.	2.44	6.1	26.83	64.63	2.64	8.27	40.55	48.55
	6. There is more interaction between the teacher and the students.	2.44	1.22	30.49	65.85	1.32	5.54	30.87	62.27
	7. It is easier to remember students' names.	2.44	2.44	24.39	70.73	1.23	7.39	23.48	67.9
resources that favor the English teaching	8. Design and apply activities that allow student to practice listening, speaking, reading, writing skills.	0.31	4.27	29.56	65.85	1.3	7.72	33.07	55.43
	9. Design and apply group work activities.	0	3.65	34.14	62.19	1.85	11.96	37.82	48.37
	10. Design and apply individual activities.	1.22	3.66	21.95	73.17	1.5	6.07	32.1	60.33

	11. Use technological tools	3.66	12.2	30.49	53.66	11.26	2.9	32.54	34.3
	12. Use didactic materials.	0	10.98	30.49	58.54	5.36	18.56	37.03	39.05
Students' feelings when learning English in small classes.	13. They are relaxed when speaking in front of their classmates.	1.22	6.1	43.9	48.78	2.9	10.47	36.94	49.69
	14. They feel part of the class because the teacher gives them more opportunities to participate.	1.22	1.22	20.73	76.83	2.11	9.94	37.82	50.13
	15. They are motivated to participate because of the small number of students.	1.22	7.32	28.05	63.41	1.5	10.2	38.87	49.43
	16. They are at ease because they can healthy compete with their classmates.	0	4.88	30.49	64.63	2.02	9.41	37.82	50.75
Limitations of learning English in small classes.	17. There is anxiety among students because there is more control form the part of the teacher.	12.2	26.83	46.34	14.63	11.52	21.11	37.38	29.99

Findings in table 1 reveal that an important number of teachers 63.41% and 31.71% totally agree and agree in relation to item 1. In the same way, 54.09% of students totally agree and a 39.93% of them agree on the fact that the activities applied in classes help students to practice what they have been taught. These results indicate that the small number of students in the class allows teachers to design activities that enhance students to move from theory to practice, thus reinforcing their knowledge; resulting in the achievement of English language goals. On the contrary, 2.44% of teachers totally disagree and disagree respectively and a small percentage of students 0.88% totally disagree and 5.1% disagree. These results indicate that a small amount of students believe that they do not benefit from the activities their teachers apply during the lessons because of the level of difficulty of the types of activities used do not allow learners to improve their knowledge of the English language.

The positive results obtained in item 1 were also confirmed through classroom observations where most of the activities used were well designed considering the contents studied during the lessons and the different learning preferences; that is the reason why students seem to be motivated and feel confident to participate. These findings are supported by Folger (1989) cited in Bray and Kehle (2011) who argue that students in small classes participate in activities such as discussions and question-answer providing them opportunities for applying what they have learned. Similarly, Exley and Dennick (2004) claim that students may be engaged in activities that allow them to talk, think and share. Through this strategy they can demonstrate their competence in the English language.

In regard to item number 2, the results presented in table 1 show that 60.98% and 32.93% of teachers totally agree and agree respectively. Similarly, students' responses show that 50.75% and 35.88% of them agree and totally agree on the fact that in small classes, students respond attentively and with enthusiasm to the planned activities, they are keen to participate with more confidence with their peers. In contrast to these positive results, table 1 also shows that a small percentage of teachers 3.66% and 2.44% disagree and totally disagree, in that order; in the same perspective 12.05%, and 1.32%, disagree and totally disagree respectively to the aspects mentioned above. In addition to the results above, the class observation evidenced that classrooms with a small number of students allow teachers to manage the class better and also facilitate students to actively participate in

class, and be attentive most of the time during the lesson. In regard to students' responsiveness and willingness to participate in small classes, Exley and Denneck (2004) emphasize that in small classes, teachers can easily motivate students to think and share among them and participate in class. Regarding motivation, Zahorik (1999) (as cited in Bray and Kehle, 2011) emphasizes that when students get positive outcomes, their enthusiasm and self-confidence boosts. Besides, the authors emphasize that communication is inherent to small classrooms. Based on the aforementioned information, teaching in small classes not only promotes students motivation but also enhances enthusiasm and self-confidence; therefore, it is more productive to work with small classes.

As it can be seen, 59.76% and 30.49% of the teachers agree and totally agree respectively on the statement presented in item 3; likewise, a high percentage of students (54.09% totally agree and 37.03% agree) perceived that in classrooms with a low number of students, the space can be used effectively for different activities. There is enough room to arrange seats in different ways which at the same time suits the performance of a variety of activities. On the other hand, a low percentage of teachers (3, 66 % totally disagree and 6, 1% disagree) and a low percentage of students (1.58% totally disagree and 7.3% disagree) think that classroom space does not influence in the performance of activities in small classes. In addition to the above results, through the observations, it was evidenced that students were eager to collaborate when teachers asked to arrange seats according to the activities. These results are supported by Dornyei and Murphey (2003, p. 77) who highlight that the arrangement of desks promotes interaction and communication which enhances students' participation, leadership opportunities and group work.

As it is observed, 62.2% of teachers totally agree and 31.71% of them agree with the issue stated in item 4. Comparably, 53.39% of students totally agree and 35.88% of them agree on the fact that in classes with a small number of students it is possible to provide effective and timely feedback as part of the learning process. As a result, students benefit from small classes since teachers have enough time to address personal students´ mistakes by giving them immediate feedback favoring meaningful learning. These results are aligned with Harmer's ideas (2011) who states that in order to promote motivation, and to enhance learning environment, it is important to provide feedback to students. On the other hand, a small percentage of teachers, 3.66% disagree and 2.44% totally disagree, and a similar small percentage of students, 8.88% disagree and 1.85% totally disagree on the fact that appropriate feedback is given. In addition to the above mentioned results, the observation corroborated that teachers give appropriate feedback in classes with a reduced number of students by solving each student concerns. In this sense, Ackerman and Gross (2010), affirm that both positive and negative feedback lead to successful performance. The authors highlight that the nature of feedback is negative since it focuses on the weak points of students' performance and motivates improvement. On the other hand, these authors point out that positive feedback emphasizes on positive aspects of an assignment which will increase students' sense of achievement, but it is important to consider that pupils will not improve much if they only receive positive feedback.

The results show that in item five 64.63% of teachers totally agree, and 26.83% of the teachers agree on the fact that carrying out activities in small classes allow more interaction amongst students. Moreover, the results also show that 48.55% of students totally agree and 40.55% of students agree on the same fact. In this regard Exley and Dennick (2004) state that interaction increases in small classes because students are able to share their thoughts and help each other when facing difficulties. At the same time, results in item 5 show that 2.44% of the teachers totally disagree and 6.1% disagree on this same item. Furthermore, 2.64% of students totally disagree and 8.27% disagree on the fact that activities in small classes permit interaction among students. These results concur with the class observation where the majority of students had the opportunity to share ideas and participate in discussions; while just a few number of students did not participate at all when working in groups. Indeed, they did not use the target language at all.

Regarding item 6, there is more interaction between teachers and students when working in small classes, the statistical analysis provided the following results; 65.85% and 30.49% of participant teachers totally agree and agree, correspondingly. In the same line, 62.27% and 30.87% of participant students totally agree and agree, in that order. Conversely to positive results, table one shows that a small percentage of teachers and students do not agree on the fact stated in item 6. In this sense, 2.44% and 1.22% of teachers totally disagree and disagree, respectively; likewise, 5.54% and 1.32% of students disagree and totally disagree, correspondingly.

It is important to highlight that the statistical results presented above are closely related to the anecdotic data gathered during the class observation, in which it was evident that interaction between teachers and students was more frequent and productive in the sense that teachers were able to personalize the information.

Not only statistical results and observation data confirm the increase of interaction between teachers and students in small classes, but also authorities in the field highlight the fact that students interact more frequently with their teachers in small classes (Johnston, 1990 in Bray & Kehle, 2011). The improvement of interaction in small classes takes place among students, and also between teachers and students. In the first case, the interaction is a means to share information and support learning while in the case of student teacher interaction, the teacher use it to encourage students participation, as Exley and Dennick (2004) concluded. From all of the evidence, it is clearly inferred that small classrooms become an appropriate environment for interaction to take place.

As shown in item seven, 70.73% and 24.39% of teachers totally agree and agree respectively. A similar percentage of students, 67.90% and 23.48% totally agree and agree. These results suggest that a big amount of teachers and students consider that learning students' names in small classes is not a problem because a small group of students make the task of learning students' names easier. On the contrary, a small percentage of teachers (2.44% totally disagree and disagree respectively) while 7.39% and 1.23% of students totally disagree and disagree. From the observations conducted, it was encountered that in most of the lessons, teachers call students by their names. It was also evident that calling students by their names is a good strategy that provides some benefits in the classroom; for example, the students who participated in this study feel more comfortable and confident during the development of each activity.

The statistical data obtained from teachers in item 8 show that 65.85% and 29.56% totally agree and agree respectively; this is confirmed with students' data, 55.43% and 33.07% totally agree and agree on the fact that in small classes, teachers can design and apply activities that allow students to strengthen the listening, speaking, reading, and writing skills. On the other hand, a low percentage of teachers, that is 4.27% totally disagree and 0.31% disagree and a similar tendency among students that represents 7.72% who totally disagree and 1.3% who disagree correspondingly. In addition to the above results, the class observation evidenced that classrooms with a small number of students offer an appropriate environment to develop the four skills but mainly the speaking skill because all students have the same opportunities to participate in the activities which is challenging when teaching large classes. To this respect, Ur (1996) states that speaking is the most important skill among the four language skills because people who know a language are referred to as speakers of that language. Thus, students in small classes are exposed to a vast amount of practice that help them to achieve the communicative competence.

With regard to item 9, findings show that 62.19% and 34.14% of teachers totally agree and agree respectively. Regarding students responses, 48.37% and 37.82% of them totally agree and agree correspondingly. These results signify that a large percentage of teachers and students consider that group work activities are easy to develop in small classes. On the other hand, a small percentage of teachers 3.65% disagree and 1.85% and 11.96% of students totally disagree and disagree on the fact that group work activities are applied in small classes. In addition to these results, the observations conducted in the sample classrooms confirm that most of the activities applied during the lesson are developed in groups where students can have more opportunities for verbal interaction, they help each member of the group to accomplish the assigned tasks and enjoy participating in every group work activity. In this respect, Robert, Kaplan, and Richard (1997) claim that group work is an excellent strategy that benefit teachers and students in small classes in the sense that communication is enhanced.

Results in item ten show that 73.17% of teachers totally agree and 21.95% agree that designing and applying individual activities favor the English teaching is small classes. In addition, 60.33% of students totally agree and 32.1% agree on the same fact. Contrary to the previous results 1.22 % of teachers totally disagree and 3.66 disagree on the fact that designing and applying individual activities favor the English teaching in small classes. A similar tendency was obtained from the students in which 1.5% of them totally disagree and 6.07% disagree. Contrasting the results with the observations, it can be affirmed that making students work on individual activities allows them to give more thought, participate and express their ideas; thus, favoring English learning.

Results in table 1, item 11 demonstrate that 53.66% and 30.49% of teachers totally agree and agree respectively with the fact that small classes allow the use of technological tools. Similarly, 34.3% (totally agree) and 32.54% (agree) of students agree with this fact. On the other hand, 3.66% and 12.2 % of teachers (totally disagree and agree respectively) do not consider that technological tools are used in small classes to teach English; likewise, a low percentage of students (11.26% totally disagree and 2.9% disagree) have the same perception. These results have been supported by the observations done in the classrooms where technological resources such as laptops, cd players, digital books, and overhead projectors were used to present the different topics as well as to involve students in a wide variety of activities. The use of technology provides positive advantages; for this reason, Bonilla and Espinoza (2014) suggest its use in order to make students be more interested in the subject, to decrease the time that is spend in learning , and to offer more opportunities to learn in untraditional ways.

In regard to the use of didactic material, the results obtained in item 12 are the following: 58.54% and 30.49% of teachers totally agree and agree respectively on the fact that it is easier to use a variety of didactic materials in a small class; this fact is corroborated by 39.05% of students who totally agree and 37.03% of students who agree. In contrast to these positive results, 10.98% of teachers totally disagree as well as 5.36% and 18.56% of students (totally disagree and disagree) consider that small classes do not favor the teaching and learning of English by using didactic materials. The observations confirmed the results provided by the majority of teachers and students since didactic materials such as flashcards, pictures, dictionaries, photocopies, posters, maps, and books were used to teach different contents.

Considering that speaking skill is one of the most difficult skills to be developed; in the current analysis, item 13 aims to prove if the statement 'In small classes, students are relaxed when speaking in front of their classmates,' is right or wrong. Taking as the base the information gathered from the statistical report, it is seen that 48.78%, and 43.9% of teachers totally agree and agree, respectively; in the same regard, 49.69% and 36.94% of students totally agree and agree with the fact that 'In small classes, students are relaxed when speaking in front of their classmates'. On the other hand, 6.1% and 1.22% of teachers disagree and totally disagree to the fact that 'In small classes, students are relaxed when speaking in front of their classmates;' in the same line, 10.47% and 2.9% of students disagree and totally disagree on the statement being analyzed. In regard to the influence of class size on the development of the speaking skill, it is stated that a small class is the perfect place for learners to develop willingness to improve their speaking skills (Yashima, 2002). The results of the current analysis plus the fact presented by the expert on the field have contributed to confirm that 'in small classes, students are relaxed when speaking in front of their classmates.'

In the case of item 14, the trend is that the majority of the teachers, that is 76.83% of them, totally agree and 20.73% who agree on the fact that small classes favor students´ language learning because they can be provided with more opportunities to participate in class. These opinions are corroborated by students´ perceptions since 50.13% of them totally agree and 37.82% agree that in small classes there is more likelihood of student active participation in the learning process which fosters a high level of energy and enthusiasm in the classroom learning environment. It is evident that in small classes it is feasible to ask each student to participate. The percentage of teachers who totally disagree and disagree on the statement posted in item 14 is only 1.22%; the same happens with the students who totally disagree since it reaches only 9.94% and the ones who disagree is only 2.11% who consider that in small classes they do not feel part of the class because teachers do not provide them equal opportunities to participate. The class observations corroborated what was mentioned by the majority of students because it was evident that students feel part of the class because the teacher is constantly calling on their names for interactive participation. According to Harfitt (2015) it is clearly noticeable that small classes seem to be characterized by more collective identity through increased participation.

Motivation is a crucial aspect in the teaching learning process of the English language; motivation can be intrinsic or extrinsic, and it can be triggered by many different factors: affective, physical, among others. In the analysis of item 15 from the current study, the influence of a physical aspect in the motivation to learn English is observed: 'Students are motivated to participate because of the small number of students.'

In regard to the fact stated in item fifteen, an amount of 63.41% and 28.05% of teachers express that they totally agree and agree, in that order, on the fact that students are motivated to participate because of the small class size. The same positive results are seen on the student's side 49.43% and 38.87% of students responded that they totally agree and agree respectively on the fact that students feel motivated to participate because of the small number of students. Conversely to positive results, it is seen that 7.32% and 1.22% of teachers disagree and totally disagree on the fact that students are motivated to participate because of the small number of students. In the same sense, 10.2% and 1.5% of students disagree and totally disagree, to the statement being analyzed, accordingly. In regard to small classes as an aspect that motivates students' participation, Exley and Dennick (2004, p. 3) state that in small groups, "students can be *encouraged* to talk, think, and share much more readily than in a large group." The authors also state that "Communication is at the heart of small group teaching of any kind and a crucial first step is the *willingness* of the students to speak to the tutor and to each other."

All in all , it can be assured, based on the information above, that there is a direct relation between motivation and number of students in class which means the smaller the number of the students, the higher the degree of motivation, and vice versa.

With respect to item 16, 30.49% and 64.63% of teachers totally agree and agree and 37.82% and 50.75% of students totally agree and agree respectively on the fact that small classes provide an adequate environment in which students can healthy compete. On the other hand, 4.88% of teachers disagree and a small percentage of

students 2.02% and 9.41% totally disagree and disagree respectively. The positive results obtained in this item were verified with the observations performed in the classrooms where teachers apply activities in which students can healthy compete. While the activities were performed, it was perceived that students work collaboratively and the different groups compete in a healthy environment. As it is stated by Zubizarreta (2010), the environment in small classes allows collaboration, mentoring, active learning, and community building which help teachers and students to accomplish their goals.

Nevertheless, working with a small number of students can also generate students' anxiety as it is demonstrated in the results obtained in item 17 which show that 14.63% of teachers totally agree on the fact that in small classes students are more controlled, which may them feel anxious when working in the classroom, and 46.83% of them affirmed that they agree. Comparing these results with students´ perceptions, it was found that 29.99% totally agree and 37.38% agree; on the contrary, 12.2 and 26.86 of teachers totally disagree and disagree while 11.52% and 21.11% of students totally disagree and disagree that there is anxiety among students because there is more control from the teachers' side. During the class observations, it was confirmed that some students do not feel comfortable in small classrooms due to the fact that the teacher monitors them all the time. It is aligned with Schreiner (as cited in Zayed 2016) point of view who states that working with small classes increases the level of anxiety in students.

CONCLUSIONS

Teaching English in small classes provide more benefits than limitations. Teachers have the opportunity to apply varied resources, strategies, and activities that involve working in groups or individually. They allow students to put into practice what they have been taught in a more interactive manner without worrying about space limitation. Another benefit is that students feel more confident to interact among them because of the sense of empathy and respect that builds up in small classes; additionally, communication between students and teachers becomes at ease because teachers are capable to personalize feedback which helps to increase students' sense of belonging. On the other hand, it was found that small classes increase students' anxiety when they feel that teachers control or monitor them all the time which inhibits them at times. This represents a limitation to be considered for further studies.

REFERENCES

Ackerman, D. S. and Gross, B. L. (2010). Instructor feedback: How much do students really want? Journal of Marketing Education, 32 (2), 172-181.

Blatchford, P., Russell, A., Basset, P., Brown, P., & Martin, C. (2006). The Effect of Class Size on the Teaching of Pupils Aged 7–11 Years. School effectiveness and school improvement, 18, 147-172.

Bray, M., & Kehle, T. (2011). The Oxford handbook of school psychology. New York: Oxford University press.

Din, F. (1999). Functions of class size perceived by Chinese rural school teachers. National Forum of Applied Educational Research Journal, 12(3), 1-6.

Dornyei, Z., & Murphey, T. (2003). Group dynamics in the language classroom. New York, N.Y.: Cambridge University Press.

Exley, K., & Dennick, R. (2004). Small group teaching. London, UK: Routledge Falmer.

Galton, M., Pell, T. (2012). Do class size reduction make a difference to classroom practice? The case Of Hong Kong primary schools. International Journal of Educational Research, 53, 22-31

Gower, R., Phillips, D., & Walters, S. (2005). Teaching Practice : A Handbook for Teachers in Training. Oxford: Macmillan Education.

Harfitt, GJ. (2012). Class size and language learning in Hong Kong: the students' perspective. The HKU Scholars Hub, 54 (3), 331- 342. Retrieved from http://hub.hku.hk/bitstream/10722/152922/1/Content.pdf?accept=1

Harfitt, G. J. (2015). Class size reduction: Key insigts from secondary school classrooms. Singapore:Springer Verlag,

Harmer, J. (2001). The practice of English Language Teaching. England: Pearson Education Limited.

Harmer, J. (2007). How to teach English. Oxford: Ocelot Publishing.

Harmer, J. (2011). How to teach English. Essex, UK: Pearson Education Limited

Lockhart, C., & Richards, J. (1996) Reflective Teaching in Second Language Classrooms. New York, NY: Cambridge University Press.

Nunan, D. (1996). The self- directed teacher. United Kingdom: Cambridge University Press

Ur, P. (1996). A course in language teaching.Cambridge: Cambridge University Press.

Ellis, R. (2003). Task-based language learning and teaching. Oxford: Oxford University Press.

Yi, H. (2008). The effects of class size reduction on foreign language learning: a case study. Language and Linguistic compass, 2 (6), 1089-1108.

Yashima, T. (2002). Willingness to communicate in a second language: The Japanese EFL context. The Modern Language Journal, 86 (1), 54-66.
Zayed, N., M. (2016). The Pros and Cons of Teaching a Small-Sized Class. International Journal of Education and Research, 4 (11), 271-276.

Technology Acceptance in the Use of Social Networks by Teachers and Employees of Education Offices in Ahwaz

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ABSTRACT
Educational systems and stakeholders embark upon changes and adaptation with changes on the basis of social and historical developments. One of the influential factors in current world is emerging technologies like social networks that can affect educational systems and stakeholders. This research deal with studying the acceptance of social networks by those involved in the educational system of Ahwaz. For this purpose, a sample of 523 people was selected by random sampling from among teachers and administrative employees and analyzed by a 53-question questionnaire with Cronbach's alpha coefficient of 0.88 based on the TAM2 model and SEM method. The results showed that teachers did not have high acceptance for using social networks, but administrative employees welcomed this phenomenon.

KEYWORDS: Technology Acceptance, Social Networks, Teachers, Educational employees, Ahwaz

INTRODUCTION
Face-to-face and individual education in real-life education space, home and school, has gradually given way to virtual space. On the other hand, in today's hasty world, many traditional teaching methods are inefficient and lack the power to transfer new concepts to learners. The perspective of education in this decade is dominated by information technology; digital users are the same students who have grown up with digital technologies such as computers, smartphones, iPods, and have gradually lost their relationship with books and newspapers (Sadeghi, 2014; Hjenaabadi, 2017).

One of the things that nowadays is being discussed a lot is the reduction of the amount of physical relations in the interest of online communications. On the other hand, teachers of schools belong at least to one generation ago and are alien partly to these technologies in comparison with students. In addition, administrative regulations in education do not allow teachers and students completely to have access to social networks, while technology not only supports key operations and effective decision-makings in education, but also it has the potential to change and transform different knowledge transfer methods(Fry et al, 2014).

Virtual social networks are formed as the communities resulting from the interactions between like-minded groups of friends and have an openness and decentralization feature; so the damage of a group or a member of a network does not disrupt the entire network. Social networks are constantly rebuilding and repairing. These networks, in addition to the intra-network interconnection, also interact externally. In short, the willingness of individuals to engage with other people on social networks, including the teachers, the staff, consultants, classmates, etc., depends on the network orientation. Two important dimensions of this orientation are the level of trust of individuals to other people, such as the trust of teachers in students, or the trust of students in teachers and headmasters, and the expectation of people from the future is; in fact, its psychological dimension (Forsyth et al, 2011).

In other words, educators with the use of modern and superior technology can provide competitive advantage and benefit from these tools for the sake of creativity and educational innovation (Fry et al, 2014).

The most important social networks used in Iran (with an estimated population of users) are the Club site (2.5 million), WhatsApp (14 million), Telegram (20 million), Instagram (20 million), Hammihan (1 million), and FaceAdam (1.3M), Facenama (1.3 million), facebook (undetermined) and Soroush (10 million).

On the other hand, social networks are becoming increasingly common as new communication technologies. Technology, by itself, has several definitions. The technology is a compound phenomenon consisting of logical processes and systematic and targeted physical communications that are embodied in physical objects (such as machines and tools) (or human creatures) such as the knowledge of engineers or technicians. The used knowledge is associated with the physical processes in technologies of Production, or the process. On the other

hand, technology is the rational process of knowing how to set up a tool. Although the skills and expertise of installing, setting up, repairing and maintaining tools and machines are considered as to be the know-how or advanced skill (Al-Obaidi, 1993).

Technology is a system that combines (revealed and hidden) knowledge, specialties, skills, processes and their inputs; thereby it becomes practical the increasing perceptions, production, operations, marketing management and service delivery, and organizational capabilities (Nazmun, 2000).

Technology is an instrument or skill, product or process, physical equipment, or the method of execution and construction, by which the ability of the human being increases. In the field of operations, the technology is technical knowledge that improves the ability of an organization to create products and services (Stock, 2000). The concept of technology is a concept between science and new products (Asghari & Pakhshanikia, 2013). Khalil (2014) sees technology as commodities, services, systems, and processes that are used to produce higher-quality, less costly products.

EFFECTIVENESS OF TECHNOLOGY IN ORGANIZATIONS

Information technology has a significant impact on all organizations, especially the education organization. This technology brings together the individuals and groups needed, such as virtual teams, virtual communities, virtual knowledge, and shared ideation. Ivanović & Jain (2013) found that easy and extensive access to shared data would make virtual organizations more flexible. Information exchange, easy access to data and telecommunications enable an organization's employees to dynamically create their work units in geographical and temporal contexts. Therefore, an organization can have a better chance of becoming a world class by being flexible and virtual (Mohemed et al, 2006). For this reason, in the education organization, virtual communication space' creation in the form of social networks can create a profound transformation in the tasks and results of the educational organization.

But it is important that technology should not be considered as the ultimate goal (Ashraf al-Oqhalai, 2002). Of course, it is worth considering Rogers's (2010) view, who believes that not all knowledge management tools are computerized (Chitsazan, 2006).

Rogers divides knowledge management tools into three categories:
1 .The first is for the production and regulation of knowledge, including the creation of a new idea, the design of new models, the combination of various disciplines and the development of new processes in the organization.
2. The second is Application of this category of tools and technologies in the regulation of knowledge. These categories of tools allow knowledge to be publicly accessible and transferable between individuals and organizations.
3. The third category is the tools used to share knowledge (Chitsazan, 2006).
Therefore, the use of social networks as a communication technology is applied in the organization of education in its various dimensions, at administrative, managerial and executive levels, namely, classroom education, and so on. In general, different models have been used to establish and use technology by organizations and individuals. Some of these models are theoretical and others are directly derived from studying literature, observations and experiences. Theoretically based models are often based on theories of change or generally constructed behavioral theories; they consider the adoption and establishment of a new information technology to be resulted from an attitude, or a behavioral intention, or, finally, a behavior that leads to acceptance of changes. The instance of a model derived from experiences and observations, a well-known model with a history of application in a variety of domains, is the model of propagating innovation, first introduced in 1983 (Rogers, 2010). It has been used over the years to test the acceptance and application of new and varied technologies, including information technology. In the case of theoretical models, the technology acceptance model (TAM) and its revised version as TAM2 is one of the most popular models.

Based on this theory (the theory of reasonable action), Davis presented the technology adoption model. Based on the initial model of technology acceptance, two beliefs play an essential role in the acceptance of information technology. These two beliefs, which, in turn, can be influenced by exogenous variables, include the perceived usefulness and the perceived ease of use(Anni et al, 2018). These two beliefs, in general, create an attitude to the use of the intended system and in turn affect the intentions and intentions of use and ultimately determine the level of actual use. The Davis model can be displayed as follows.

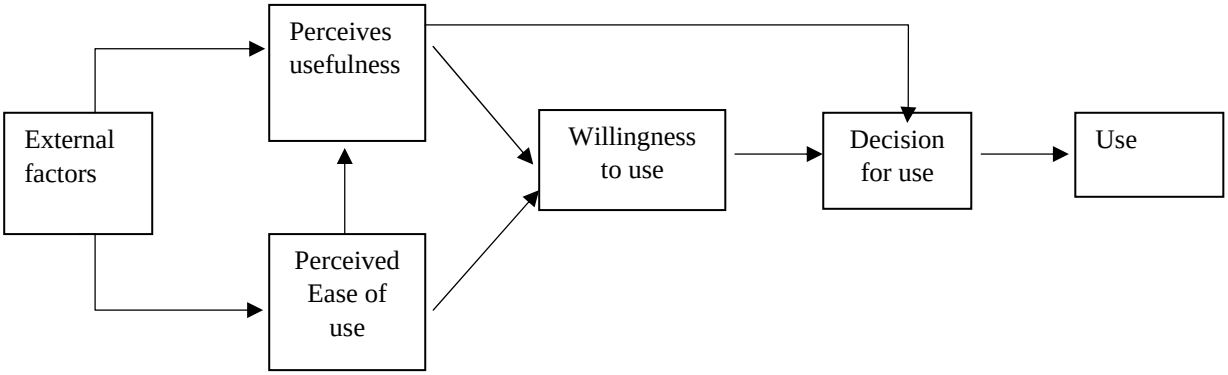

Figure 1: Initial Model of Technology Acceptance (TAM) (Davies, 1989: 320)

The perceived usefulness is defined as "the degree to which a member of the organization believes that the use of a particular system will improve his career performance" (Davis, 1989). The perceived ease of use is defined as the extent to which an organization member believes that using a particular system is without difficulty or great effort.

In 2000, Venkatesh and Davis tried to develop it by adding new structures to the technology acceptance model (Venkatesh and Davis, 2000). These new structures include social impact processes (subjective norm, candidateship and external reflection), and cognitive instrumental processes (job relationship, output quality, explicability of results, and ease of use). First, based on Taylor and Ted's findings who have founded the mental norms of a meaningful effect (Taylor & Todd, 1995), the subjective norms have been modeled in the main form of the theory of reasonable action (TRA); secondly, candidateship versus the compulsory use has been considered, and also, thirdly, the external reflection of the use of the system. In the domain of cognitive tools processes, Venkatesh and Davis also have added the job relationship (the extent to which each person feels that the system in question is applicable to his job), the quality of output (the evaluation of individuals from the way the tasks are performed by the technology) and the explicability of the results. The Technology Acceptance Model (TAM 2) is presented in the following figure.

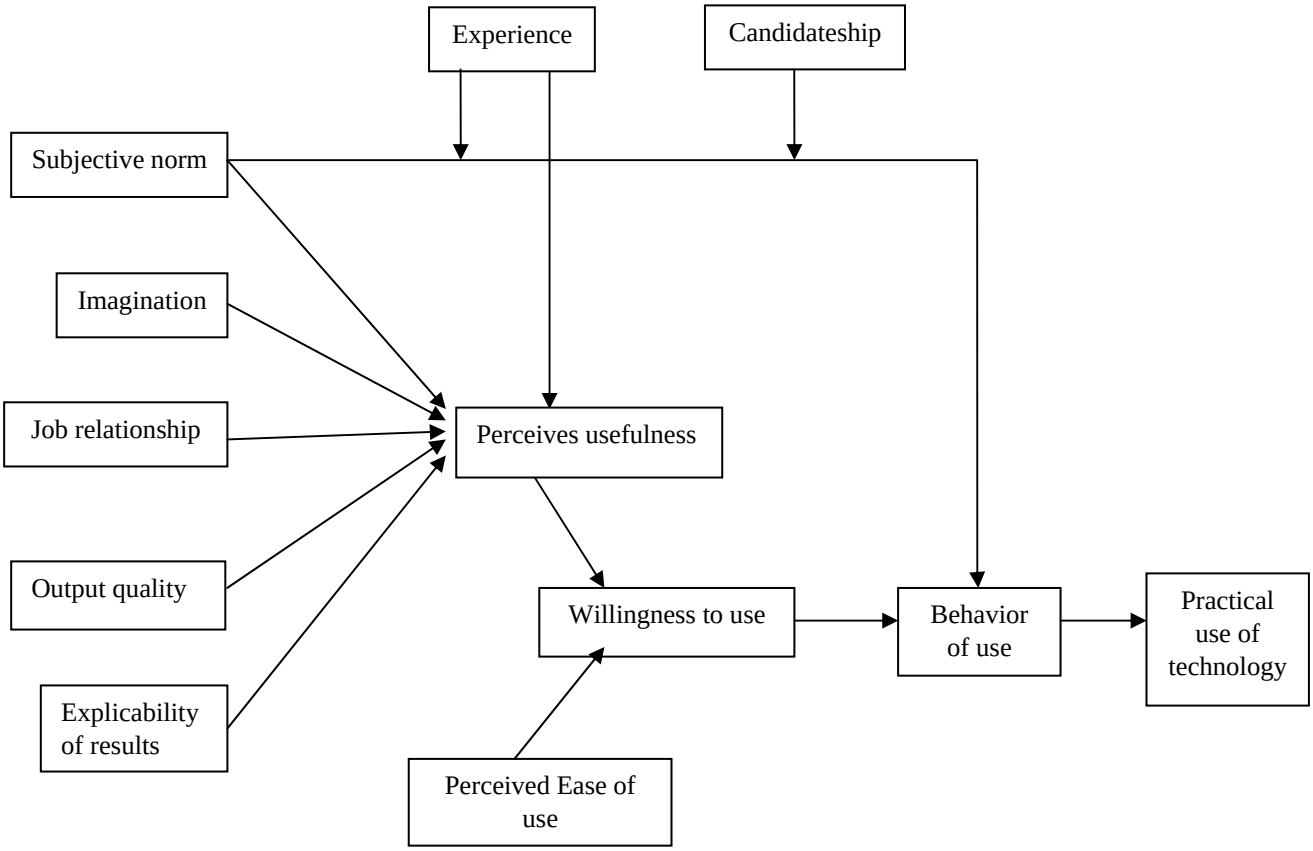

Figure 2: Expanded Technology Acceptance Model TAM2 (Venkatesh and Davis, 2000: 325)

The TAM2 model examines the voluntary and compulsory use of technology, and suggests that over time, when people gain more experience about the system, their perceptions of the usefulness and attitude of using that system will change. Many researchers have shown a significant relationship between individual differences and technology acceptance in their studies (Davis, 1989; Gerhart et al., 2010; Kripanont, 2007).

Some theorists have investigated external variables and concluded that these factors are the final determinants for the use of technology (Dejamasbi et al., 2010; Elbanna, 2010; Legris et al., 2003). Since then, the variables of the original model of TAM have been considered as mediating variables, which are in turn influenced by external factors. In this model, external factors can include any type of factor, organizational factors, social factors, features of computer systems such as hardware and software, teaching methods, training course and other people's assistance in using computer systems which will affect the subjective perceptions of individuals about the usefulness and ease of using information technology (Lazakidou, 2008; Ahmed & kabir, 2018). Therefore, in order to use any new technology in the organization, it is necessary to provide the ground for the acceptance of this technology. Therefore, teaching employees as one of the external and important factors can affect their subjective perceptions about the usefulness and ease of using technology. The importance of training in the empowerment of human resources is such that no transformational organization no longer sees itself needless of being trained. In fact, education is a useful investment and a key factor in knowledge development, improvement of skills and creation or change of employees' attitude (Ju &Albertson, 2018).
So, this research seeks to find out if there is a technology acceptance in using social networks by teachers and educational employees in Ahwaz?

RESEARCH BACKGROUND

In a research entitled "Study of the Relation of Transformational Leadership with the Acceptance of Information Technology by Bam Education Management Staff", Tabakhzadeh and Derakhshan Davari (2017) examined the relationship between transforming leadership and IT adoption. The method of present research is descriptive and correlational and in terms of the purpose it is applied. The statistical population of the research consists of all the employees of education management in Bam (300 people). According to the Cochran formula, 169 people of them were randomly surveyed using simple random sampling. A questionnaire was used to collect data. Pearson regression and correlation tests were used to test the hypotheses. The results showed that there is a positive and

significant relationship between transforming leadership and the acceptance of information technology by the employees.

In the study of the technology acceptance level by the faculty members of the Anadolu University College of Languages, conducted by 44 people, Coral Gumzoglou and Akay (2017) concluded that the teachers' attitude towards the use of technology based on the model (UTAUT) is moderate.

In the study of the perceptions of English-language and foreign language pre-service teachers in using Web-based technology 2, Bing et al. (2018) found that using these technologies in the modeling of structural equations on the data of 295 people are highly capable of predicting the use of technology. The findings were made to help these pre-service teachers, and thus could provide different facets of facilitating the conditions for the effective use of technology from their viewpoint.

In a similar research on the technology acceptance in Technology-Rich Learning Environments by pre-service teachers in UAE, Scott et al. (2018) found that the TAM model supported the cultural and social structure of the United Arab Emirates; meanwhile the pre-service teachers have regarded the most important factor as a predictor of their future behaviors as the perceived profitability of using technology.

Naghi (2018), in his research, evaluated the use of online videos and learning satisfaction based on the TAM model, in which the structure of TAM as the core of learning performance, learner-learner interaction, and learner-teacher interaction was addressed. Data were collected from 89 students through a questionnaire. Structural equation modeling was used to evaluate the research model. The results showed that the usefulness, attitude and self-efficacy of the Internet have a direct impact on the use of the video. Satisfaction with learning was directly influenced by learner-learner interaction, ease of comprehensibility and learning performance. In addition, the results showed that the use of video has a significant impact on learning performance and learning satisfaction.

RESEARCH METHOD

Accordingly, the present research is applied in terms of purpose, and in terms of collecting data and method of studying and analyzing, it is a (non-experimental) descriptive-causal research; the researcher's attempt is to answer a real question in a research process. Since the questionnaire was used to collect data, it is considered as a survey. The number of questions for the variables considered in the research is as follows:

1. Perceptual usefulness, ease of use, willingness to use, behavior of use and practical use of technology 5 questions for each one;
2. Candidateship, experience, subjective norm, imagination, job relationship, output quality, ability to prove the results 4 questions for each one.

Total: 53 questions

The sample size was adopted for about 361 person from 6000 teachers and 162 administrative employees from administrative population that was 280 person.

Table 1: distribution of frequency according to gender

Gender	Teachers		Administrative employees		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Woman	200	55/4	94	58	294	56/2
Man	161	44/6	68	42	229	43/8
Total	361	100	162	100	523	100

According to the findings of Table 1, 55.4% of the teachers were female and the rest were male and among the administrative employees 58% were female and 42% were male.

Table 2: distribution of frequency according to age

Age	Teachers		Administrative employees		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Under 30 years	42	11/6	28	17/3	70	13/4
30-40 years	162	44/9	65	40/1	227	43/4
40-50 years	133	36/8	48	29/6	181	34/6
More than	24	6/6	21	13	45	8/6

50 years						
Total	361	100	162	100	523	100

According to the findings of Table 2, 11.6% of teachers are under 30 years old, 44.9% are 30-40 years old, 36.8% are 40-50 years old and 6.6% are more than 50 years old. Also, 17.3% of the administrative employees are under 30 years old, 40.1% are 30-40 years old, 29.6% are 40-50 years old and 13% are more than 50 years old.

Table 3: distribution of frequency according to education

education	teachers		Administrative employees		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
BA	180	49/9	62	38/3	242	46/3
MSc	162	44/9	95	58/6	257	49/1
Ph.D	19	5/3	5	3/1	24	4/6
Total	361	100	162	100	523	100

According to the results of Table 3, 49.9% of teachers are of BSc education, 44.9% of them are MSc and 5.3% of Ph.D degree. Also, among administrative employees, 38.3% had BSc degree, 58.6% had MSc degree and 3.1% had doctorate.

Table 4: distribution of frequency according to occupational history

history	teachers		Administrative employees		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Under 5 years	32	8/9	22	13/6	54	10/3
5-10 years	85	23/5	42	25/9	127	24/3
10-15 years	108	29/9	48	29/6	156	29/8
15-20 years	99	27/4	37	22/8	136	26
More than 20 years	37	10/2	13	8	50	9/6
Total	361	100	162	100	523	100

According to the results of Table 4, most of the teachers have a history of 10 and 15 years, and among the employees, most of respondents are of 10-15 years of history.

Table 5: descriptive indices of research components

Variable	Mean (from 5 scores)	Standard deviation	Minimum value	Maximum value
Subjective norm	2/74	0/84	1/25	1/25
Imagination	2/83	0/89	1	1
Job relationship	3/07	0/96	1	1
Output quality	2/98	0/98	1	1
Explicability of results	2/73	1/006	1	1
Experience	2/79	1/14	1	1
Candidateship	3/37	0/89	1	1
perceived usefulness	2/78	1/01	1	1
Ease of perceived use	3/005	0/97	1	1
Willingness to use	2/73	1/04	1	1
Behavior of use	2/95	0/89	1	1
Practical use of technology	3/01	0/95	1	1

Regarding the results of Table 5, the mean of the components of the research is moderate and lower than moderate; the component of candidateship has the highest mean and the tendency to use the lowest. In general, the status of the components is undesirable.

DATA ANALYSIS

In order to compare the mean of the components of the technology acceptance model between the two groups of teachers and administrative employees, the t test was used for two independent samples, the results of which have been given in Table 6:

Table 6: Comparison of research components in two groups of teachers and administrative employees

Variable	Teachers		Administrative employees		t-test statistic
	Mean	Deviation	Mean	Deviation	
Subjective norm	2/74	0/84	3/13	0/86	4/901**
Imagination	2/83	0/89	2/94	0/96	1/24
Job relationship	3/07	0/96	3/28	0/94	2/309*
Output quality	2/98	0/98	3/18	0/98	2/178*
Explicability of results	2/73	1/006	2/95	1/03	2/319*
Experience	2/79	1/14	2/86	1/12	0/654
Candidateship	3/37	0/89	3/54	0/78	2/078*
perceived usefulness	2/78	1/01	2/81	0/98	0/313
Ease of perceived use	3/005	0/97	3/20	0/96	2/114*
Willingness to use	2/73	1/04	2/95	1/01	2/315*
Behavior of use	2/95	0/89	3/11	0/87	1/95
Practical use of technology	3/01	0/95	3/14	1/03	1/403

** Significance at level of 0.001

* Significance at level of 0.05

According to the findings of the research, Table 6 shows that there is a significant difference between the mean components of subjective norm, job relationship, output quality, explicability of the results, candidateship, ease of perceived use, and willingness to use in two groups of teachers and administrative employees. On the other hand, according to the average calculated in the two groups, it can be concluded that the average components among administrative employees is higher than teachers.

Also, in order to compare the mean of the components of the technology acceptance model in the two groups of women and men, T-test was used for two independent samples, the results of which have been given in Table 6:

Table 7: Results of t-test for Comparison of research components in both male and female groups

Component	Group	Standard deviation±mean **(Mean±SD)**	T statistic
Subjective norm	Woman	3/12±0/91	8/347**
	Man	2/52±0/66	
Imagination	Woman	3/05±1/006	5/335**
	Man	2/63±0/72	
Job relationship	Woman	3/30±0/94	4/450**
	Man	2/93±0/95	
Output quality	Woman	3/45±0/96	12/07**
	Man	2/52±0/74	
Explicability of results	Woman	3/26±1/04	13/70**
	Man	2/20±0/58	
Experience	Woman	3/04±1/18	5/26**
	Man	2/52±1/01	
Candidateship	Woman	3/62±0/82	6/317**
	Man	3/16±0/84	
Perceived usefulness	Woman	2/94±1/04	4/013**
	Man	2/59±0/93	
Ease of perceived use	Woman	3/42±0/92	10/63**
	Man	2/59±0/83	

Willingness to use	Woman	3/20±0/96	11/28**
	Man	2/28±0/88	
Behavior of use	Woman	3/29±0/87	8/99**
	Man	2/63±0/76	
Practical use of technology	Woman	3/29±0/99	6/387**
	Man	2/75±0/88	

** Significance at level of 0.001
* Significance at level of 0.05

According to the results of Table 7, there is a significant difference between the mean of the components of research in both male and female groups. In general, the mean of the female group is higher than that of men, which indicates that technology acceptance is desirable among women.

In order to compare the mean of the components of research in different age groups, F one-way analysis of variance was used:

Table 8: Results of the test for the comparison of the mean of research components among age groups

Component	Under 30 years	30-40 years	40-50 years	More than 50 years	F test statistic
Subjective norm	3/11	2/86	2/79	2/75	2/509
Imagination	3/08	2/95	2/74	2/58	4/696*
Job relationship	3/08	3/25	3/06	2/96	2/055
Output quality	3/08	3/09	2/99	2/90	0/709
Explicability of results	2/90	2/93	2/72	2/34	4/921*
Experience	2/94	2/89	2/70	2/68	1/348
Candidateship	3/58	3/47	3/38	3/06	3/955*
perceived usefulness	3/03	2/85	2/68	2/58	2/998*
Ease of perceived use	3/20	3/11	2/98	2/95	1/259
Willingness to use	2/90	2/86	2/69	2/77	1/237
Behavior of use	3/11	2/95	3/04	2/94	0/820
Practical use of technology	3/17	3/08	3	2/96	0/708

** Significance at level of 0.001
* Significance at level of 0.05

Regarding the findings of Table 8, it can be seen that, with increasing the age of the respondents, the willingness of respondents to accept technology has relatively decreased. Also, there is a significant difference between the mean components of the imagination, explicability of the results, candidateship and the perceived usefulness of the different groups.

RESEARCH MODELS FIT

a. Group of employees

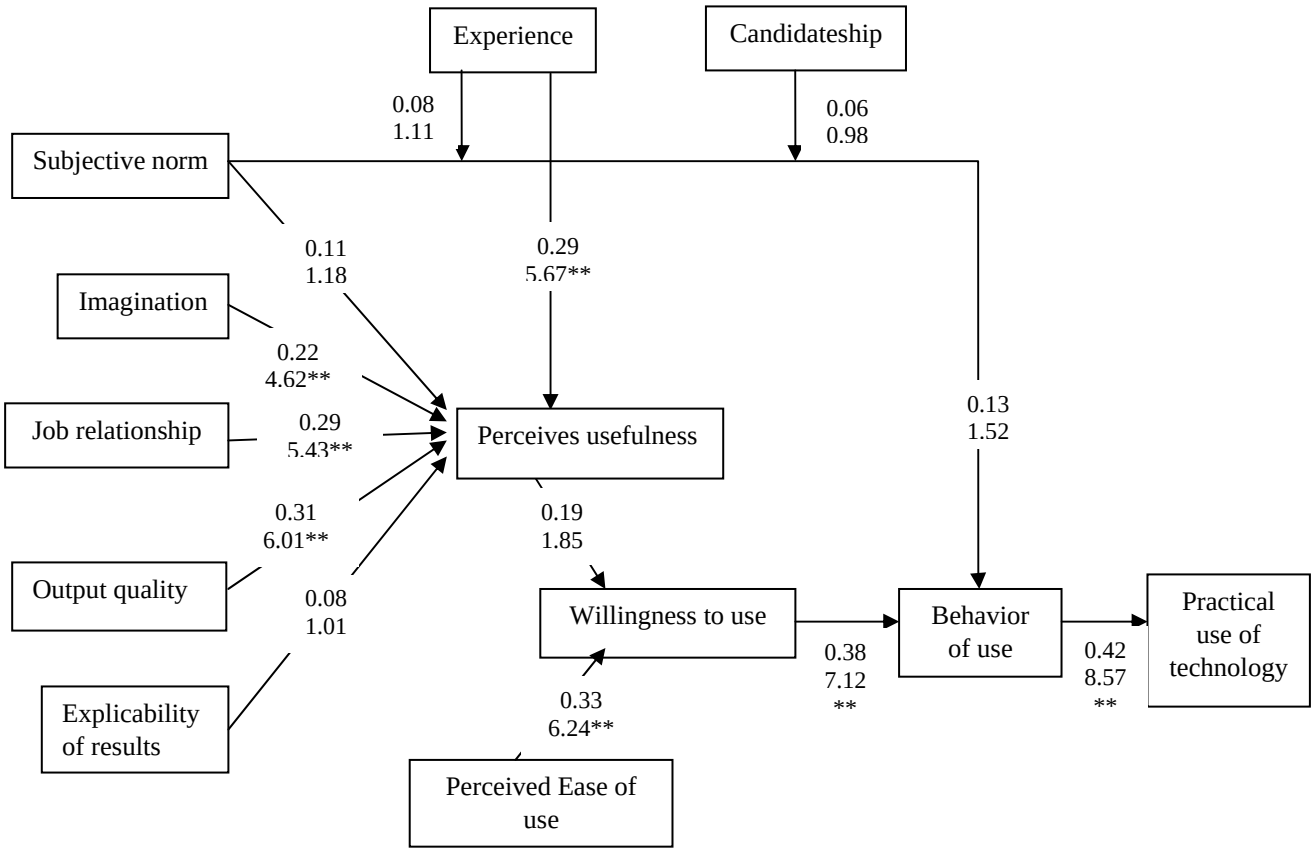

Figure 3: Research model fit in group of employees

b. Group of teachers

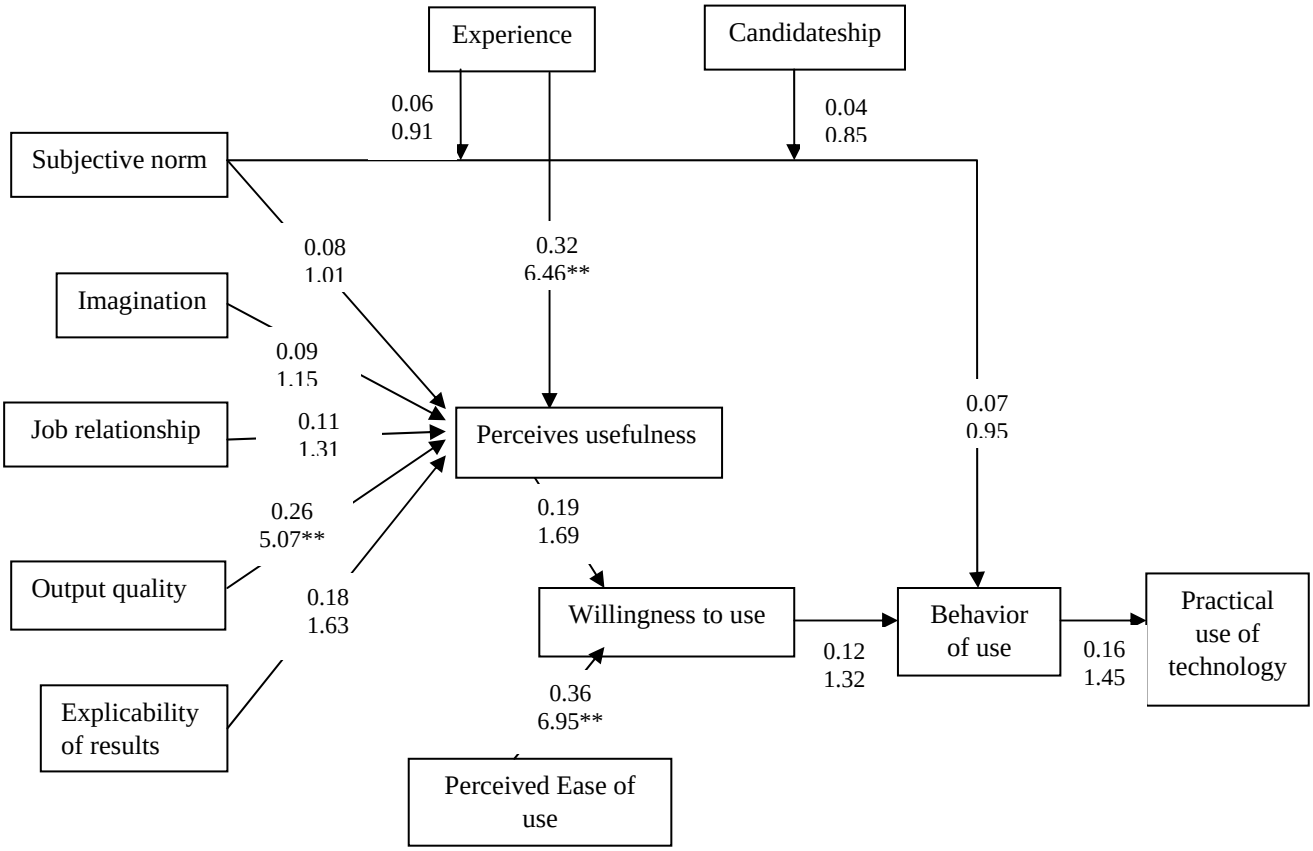

Figure 4: Research model fit in group of teachers

GOODNESS OF FIT TESTS

Table 9: research model fit indices

Index statistical title	Model (of employees)	Model (of teachers)	Accepted range	Test result
χ^2 / df	1/362	1/805	χ^2 / df < 3	confirmed
P-value	0/000	./000	P < 0/05	confirmed
RMSEA	0/037	./048	RMSEA < 0/09	confirmed
RMR	0/042	0/054	RMR < 0/09	confirmed
GFI	0/91	./91	GFI > 0/9	confirmed
AGFI	0/91	./90	AGFI > 0/9	confirmed
CFI	0/94	./92	CFI > 0/9	confirmed
RFI	0/92	./93	RFI > 0/9	confirmed
NFI	0/94	./90	NFI > 0/9	confirmed
NNFI	0/93	./91	NNFI > 0/9	confirmed

As shown in Table (9), according to the fitness indices in both models, the ratio of Chi-square to degree of freedom B, the Goodness-of-Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Incremental Fitness Index (CFI) and The root of the mean square approximation error (RMSEA) are acceptable, indicating that the model has a decent fitness without need to correction. Also, all relations between variables in the model are significant at the level P <0.05.

TESTING RESEARCH HYPOTHESES

Table 10: Studying research hypotheses

	Model of employees		Model of teachers	
Direct path	Impact coefficient (β)	Significance number (t-value)	Impact coefficient (β)	Significance number (t-value)
Subjective norm → perceived usefulness	0/11	1/18	0/08	1/01
Imagination → Perceived usefulness	0/22	4/63**	0/09	1/15
Job relationship → Perceived usefulness	0/29	5/43**	0/11	1/31
Output quality → Perceived usefulness	0/31	6/01**	0/26	5/07**
Explicability of results → Perceived usefulness	0/08	1/01	0/18	1/63
Experience → Perceived usefulness	0/29	5/76**	0/32	6/46**
Perceived usefulness → Willingness to use	0/19	1/85	0/19	1/69
Ease of perceived use → Willingness to use	0/33	6/24**	0/36	6/95**
Subjective norm → Willingness to use	0/13	1/52	0/07	0/95
Willingness to use → behavior of use	0/38	7/12**	0/12	1/32
Behavior of use → practical use of technology	0/42	8/57**	0/16	1/45
Subjective norm * experience → Willingness to use	0/08	1/11	0/06	0/91
Subjective norm * candidateship → Willingness to use	0/06	0/98	0/04	0/85

** Significance at level of 0.001
* Significance at level of 0.05

According to the results of Table 10 and Figures 1 and 2, it can be seen that among teachers, the effect of output quality and experience on perceived usefulness and the effect of ease of perceived use on the willingness to use is significant (the significant number calculated is more than 1.96). other hypotheses have been rejected.

Also, among administrative employees, the significance number related to the effect of the variables of imagination, job relationship, output quality and experience on perceived usefulness and the effect of ease of perceived use on the tendency to use and the effect of the tendency to use on the behavior of the use and behavior of use on the scientific use of technology is greater than 1.96, which indicates the significance of the effect of each of the above variables.

CONCLUSION

Based on the data obtained from the research, it can be stated that the administrative employees of Ahwaz have, generally speaking, accepted the use of social networks as their task and consider the use of social networks

useful and easy. These results are in line with the results of Tabakhzadeh's research (2017). In contrast, based on their and society's subjective norms, what they think of social networks and that they cannot determine the results of using social networks based on their tasks, the teachers are not so inclined to accept social networks; in practice they do not find useful these networks for their work, although they consider them easy to use. This result is in agreement with the results of Koral Gümüsoglu & Akay (2017), but is inconsistent with the results of Bing et al. (2018), Scott et al. (2018) and Naghi (2018).

On the other hand, women both as teachers and as employees have more acceptance in the use of social networks. This suggests that women generally have more time and spend more time on using such networks.
Another notable result that can be obtained from the data is that the lower the age was, greater was the acceptance of technology. This shows that there is a significant relationship between technology and generations; each generation has its tendency to use the technologies of its own age because that generation is more dominant over that particular technology of that age.

REFERENCES

Ahmed, Mazharuddin Syed, & Kabir, Akramul. (2018). The Acceptance of Smartphone as a Mobile Learning Tool: Students of Business Studies in Bangladesh. *Malaysian Online Journal of Educational Technology*, *6*(2), 38-47.

Al-Obaidi,Z, (1993) International Technology Transfer Mode Selection, Helsinki schools of economics, Series B-135, HSE Press, Helsinki.

Anni, Catharina Tri, Sunawan, & Haryono. (2018). School Counselors' Intention to Use Technology: The Technology Acceptance Model. *The Turkish Online Journal of Educational Technology*, *17* (2), 120-124.

Asghari ,M . and Pakhshanikia , M .(2013) .Technology Transfer in Oil Industry , Si , gnificance and Challenges Original Recearch Article Procedia – Social and Behavioral Sciences 75 ,pp 264-271.

Ashraf al- Oqhalai, Ahmad Reza (2002), Management in cyberspace. Etemad newspaper.

Khalil. Tarek. M. (2014). *Management of Technology.* McGraw-Hill Education (India) Pvt Limited.

Chitazazan, Alireza (2006), Knowledge Management and Human Capital, Tadbir, No. 177.

Davis, F. D. (1989). "Perceived Usefulness, Perceive Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, 13, pp 319- 339.

Djamasbi, S., Strong, D., Dishaw, M., (2010). Affect and acceptance: Examining the effects of positive mood on the technology acceptance model", *Decision Support Systems*, 48(2): 383–394.

Elbanna, A. (2010). From intention to use to actual rejection: the journey of aneprocurement system". *Journal of Enterprise Information Management*, 23(1): 81-99.

Forsyth, P.B., Adams, C.M., & Hoy, W.K. (2011). *Collective Trust: Why Schools can't improve without it:* Teachers College Press.

Fry, H., Ketteridge, S., & Marshall, S. (2014). *A Handbook for Teaching and Learning in Higher Education: Enhancing academic practice*: Taylor & Francis.

Gerhardt Schierz, P., Schilke, O., Wirtz, B. (2010). Understanding consumer acceptance of mobile payment services: An empirical analysis. *Electronic Commerce Research and Applications*, 9 (3): 209–216.

Hjenaabadi, H. (2017). *On the relationship between loneliness and social support and cell phone addiction among students*; School Psychology; 5 (4). P7-30.

Ivanović, M., & Jain, L.C. (2013). *E-Learning Paradigms and Applications: Agent-based Approach:* Springer Berlin Heidelberg.

Ju, Boryung, & Albertson, Dan. (2018). *Exploring factors influencing acceptance and use of video digital libraries.* Published Quarterly By The University of Boras, Sweden, 23(2), 1-35.

Koral Gümüsoglu, Eylem; Akay, Emel. (2017). Measuring Technology Acceptance Level of Teachers by Using Unified Theory of Acceptance and Use of Technology, *Online Submission*, International Journal of Language Education and Teaching. v5; n4. P378-394.

Kripanont, N. (2007). *Examining a Technology Acceptance Model of Internet Usage by Academics within Thai Business Schools*. This thesis is presented in fulfillment of the requirements of the degree of Doctor of Philosophy, Victoria University, Australia.

Lazakidou, A.A. (2008). *Handbook of Research on Distributed Medical Informatics and E-Health*: IGI Global.

Legris, P., Ingham, J. & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Managemen*t, 40 (3): 191-204.

Mei, Bing; Brown, Gavin T. L.; Teo, Timothy.(2018).Toward an Understanding of Preservice English as a Foreign Language Teachers' Acceptance of Computer-Assisted Language Learning 2.0 in the People's Republic of China, *Journal of Educational Computing Research*, v56; n1. P74-104.

Mohemed, Mirghan; Stankosky, Michael; Murray, Arthur. (2006). Knowledge management and information technology: can they work in perfect harmony? Journal of knowledge management. Vol.10. no.3. Retrieved from www.emerald.ir. Date: 2008/11/05.

Nagy, Judit T. (2018).Evaluation of Online Video Usage and Learning Satisfaction: An Extension of the Technology Acceptance Model. *International Review of Research in Open and Distributed Learning*, v19; n1. p160-185.

Nazmun, N. (2000). IT-enabled effective and efficient international technology transfer for SMEs. In *Evolution and Challenges in System Development* (pp. 85-98). Springer, Boston, MA.

Taylor,S., Todd, P.A. (1995). "Understanding Information Technology Usage: A Test of Competing Model", *Information Systems Research*, Vol.6, No. 2, pp. 144- 176.

Parkman, Scott; Litz, David; Gromik, Nicolas. (2018). Examining Pre-Service Teachers' Acceptance of Technology-Rich Learning Environments: A UAE Case Study. *Education and Information Technologies*, v23; n3. P1253-1275.

Rogers, E.M. (2010). *Diffusion of Innovations, 4th Edition*: Free Press.

Sadeghi, Karim, Saribagloo, Javad Amani, Aghdam, Samad Hanifepour, & Mahmoudi, Hojjat. (2018). the impact of Iranian teachers cultural values on computer technology acceptance. *The Turkish Online Journal of Educational Technology*, *13*(4), 124-136.

Stock, Gregory N, (2000). A Typology of Project Level Technology Transfer Processes, *Journal Of Operations Management* 18, 719-737.

Venkatesh, W., and Davis, F.D.(2000). "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies", *Management Science*, Vol. 46, No. 2, pp. 186- 294.

The Effectiveness of Using Corpus-Based Activities on the Learning of Some Phrasal-Prepositional Verbs

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ABSTRACT
This empirical study investigates the effectiveness of using corpus-based activities on 70 Turkish upper-intermediate level teacher candidates' learning of 40 phrasal-prepositional verbs, verb + particle + preposition combinations. The purpose of the study is to determine whether six-hour instruction via corpus-based activities is effective with (a) helping the students recognize and understand the form of the verbs, (b) helping the students understand the metaphorical meanings of these structures, and (c) helping the students construct the correct forms of the verbs in order to use them while paraphrasing sentences. Three tests were administered to the students, and the results revealed that the students were able to recognize and understand the form of those verbs and construct the correct forms of them in order to use them while paraphrasing sentences after six-hour teaching via corpus-based activities. However, it was found that six-hour instruction via corpus-based activities was not effective with helping the students understand the metaphorical meanings of those structures.

KEYWORDS: Corpus-based activities, phrasal-prepositional verbs, corpora, language teaching

INTRODUCTION

It is highly acknowledged that second language teachers face great challenge while teaching phrasal-prepositional verbs, verb + particle + preposition combinations, to language learners (Dagut & Laufer, 1985). Although there are many materials (e.g., textbooks, course books, specialized learner dictionaries of multi-word verbs) to help students learn these verbs, it is suggested that these materials present the structures in a way that students have to learn them by memorizing, thereby implying that there is no system to learn them easily and effectively (Ganji, 2011). More precisely, it is hypothesized that students fail to recognize and understand the form of these structures, because there are so many of them and the combination of verb, adverb, and particle seem so random (Ganji, 2011). In terms of meaning, it is hypothesized that even if language teachers help students learn the structure of phrasal-prepositional verbs effectively by using different methodologies and materials, helping them to go beyond the literal meaning constitutes a real challenge for language teachers (Side, 1990). Lastly, in terms of use, it is hypothesized that students struggle with deciding when and how to use one form of a verb instead of another and when the particles of the structures should be separated from its verb (i.e., principle of dominance) (Erteschik-Shir & Lappin, 1979).

This empirical research aims to examine whether using different materials (i.e., corpus-based activities) is effective with teaching 70 Turkish upper-intermediate proficiency level teacher candidates 40 high level phrasal-prepositional verbs in terms of three dimensions (i.e., form, meaning, and use) of phrasal verb knowledge after six hour instruction. The research also aims to reveal any learning difference among the students' knowledge of these three dimensions of phrasal-prepositional verbs.

The current research is a quantitative one that includes the analysis of the tests on the students' recognition of the form of the phrasal-prepositional verbs, understanding of the metaphorical meanings of the verbs, and their ability to construct the correct forms of the verbs in order to use them in sentence writing. It should be noted that the use dimension in the current study is presented in a different sense, which is defined as the construction of the correct forms of the verbs in sentence writing. Therefore, the current research hypothesizes that by using corpus-based activities, a) the students will be able to recognize and understand the form of the phrasal-prepositional verbs, b) the students will be able to understand the metaphorical meanings of these structures, and lastly c) the students will be able to construct the correct forms of these structures in order to use them while paraphrasing sentences. Data obtained from the tests were compared through One-way ANOVA and the means were presented to reveal any significant difference. In the conclusion part, suggestions were given for language teachers who are having difficulty in the teaching of verb + particle + preposition combinations to students.

LITERATURE REVIEW

The use of corpora in language classes has been widely acknowledged as a valuable resource by many researchers (e.g., Biber & Reppen, 2002; Chambers, 2007; Hill, 2000; Hunston, 2002). Over the years, several

studies have emerged in the field to investigate the effectiveness of the use of corpora in language teaching (e.g., Ashkan & Seyyedrezaei, 2016; Barabadi & Khajavi, 2017; Chan & Liou, 2005; Chao, 2010; Chujo, Utiyama & Miura, 2006; Gaskel & Cobb, 2004; Koosha & Jafarpour, 2006; Paker & Ergül-Özcan, 2017; Sun & Wang, 2003; Tekin & Soruç, 2016; Uçar & Yükselir, 2015; Vannestal & Lindquist, 2007; Yılmaz & Soruç, 2015). The majority of these studies have attempted to determine the effectiveness of the use of corpora on learners' learning of vocabulary in English (e.g., Ashkan & Seyyedrezaei, 2016; Barabadi & Khajavi, 2017; Chan & Liou, 2005; Chao, 2010; Koosha & Jafarpour, 2006; Paker & Ergül-Özcan, 2017; Sun & Wang, 2003; Tekin & Soruç, 2016; Uçar & Yükselir, 2015; Yılmaz & Soruç, 2015).

Paker and Ergül-Özcan (2017), for example, investigated the effectiveness of corpus-based vocabulary teaching activities on 28 intermediate level students' English vocabulary learning. The participants in the experimental group were taught through corpus-based vocabulary teaching activities, whereas the participants in the control group were taught vocabulary activities through the tasks in their text book and dictionary. The researchers found that using corpus-based vocabulary tasks were more effective than the tasks in the textbook. Similarly, Ashkan and Seyyedrezaei (2016) examined the effect of corpus-based teaching on EFL learners' vocabulary learning. The results of the study indicated a significant difference between the experimental and control group in favor of corpus-based vocabulary teaching.

Sun and Wang (2003) investigated the effectiveness of inductive and deductive teaching on 81 senior high school students' learning collocations by using a concordancer. The study concluded that using the concordancer was beneficial for the learners, as it helped them develop their own effective learning strategies for language learning. Chan and Liou (2005) also investigated the effectiveness of using a web-based Chinese-English bilingual concordancer on the learners' learning of English verb-noun collocations. The researchers found that the learners improved their collocations significantly after the treatment.

Koosha and Jafarpour (2006) investigated the role of the DDL (Data-Driven Learning) in the teaching of the collocations of English prepositions to adult learners. The researchers divided the learners into two groups. While one group received the data-driven instruction, the other group received conventional instruction. The researchers found that the learners receiving data-driven instruction outperformed those who received conventional instruction in the learning of the collocations of prepositions.

Uçar and Yükselir (2015) also examined whether corpus-based activities had an effect on the teaching of some adjective-noun collocations to language learners in an EFL context. The researchers found that the students receiving instruction through corpus-based activities outperformed those who received instruction in the traditional method on the collocation recognition test.

In the light of these effects, it can be claimed that an investigation of the effectiveness of using corpora on the learners' learning of English phrasal-prepositional verbs has not been given special attention in research literature. Rather, the majority of the studies have mostly centered upon the learners' learning of English collocations, and one central finding coming from the studies is that using corpora is quite effective with teaching collocations to language learners. Therefore, the current study seeks to investigate whether the use of corpora is also effective with teaching language learners English phrasal-prepositional verbs.

METHODOLOGY

This section firstly introduces the research questions and participants of the current study. Additionally, instruments and materials used in the study are presented in turn. Lastly, data collection and data analysis procedures are summarized briefly.

Research questions

The current study seeks to answer three research questions as proposed below:

1. Is six-hour instruction via corpus-based activities effective with teaching the students the form of the phrasal-prepositional verbs?
2. Is six-hour instruction via corpus-based activities effective with teaching the students the metaphorical meanings of the phrasal-prepositional verbs?
3. Is six-hour instruction via corpus-based activities effective with teaching the students how to construct the correct forms of the phrasal-prepositional verbs in order to use them while paraphrasing sentences?

Setting and participants
The study was conducted at a state university, in the Department of English Language Teaching (ELT), in the Faculty of Education. Two intact classes, which included 70 Turkish students of English language education in total, took part in the study. The students' proficiency level was upper-intermediate. They were in their first year and were taking the Contextual Grammar I course. Each intact class consisted of 35 students. The students were in the age range of 18 to 21. Forty-eight of the students were female and 22 of them were male.

Instruments and materials
Three tests (i.e., form recognition test, multiple-choice meaning test, and sentence-rewrite use test) were used in the current study, and the materials were a corpus and corpus-based activities.

Tests
The tests prepared for the study were form recognition test, multiple-choice meaning test, and sentence-rewrite use test. To ensure that the study included the parallel versions of the tests, a question pool of the test items were made. Approximately 150 questions in total were written for the question pool, and the questions were prepared from the sentences which were taken from the Corpus of Contemporary American English (COCA). To ensure that the questions were all at the same level of difficulty, some experienced teachers were consulted. After receiving feedback from the teachers about the questions and making the necessary changes, the tests were constructed. The form recognition test included 20 extracts which were taken from the corpus and each of which included only one phrasal-prepositional verb. The students were required to identify the phrasal-prepositional verb in each extract. The multiple-choice meaning test consisted of 20 sentences which were also taken from the corpus. The students were required to choose the best phrasal-prepositional verb, a, b, c, d, or e to complete the sentences. Lastly, the sentence-rewrite use test consisted of 20 sentences which were also taken from the corpus. The students were required to write a new sentence with the same meaning, using the correct form of a phrasal-prepositional verb from the list. Therefore, each test consisted of 20 questions, so the pre-test consisted of 60 questions in total and the post-test consisted of 60 questions in total. The tests can be seen in Appendix A.

The tests were scored by three people, including the researcher. For two tests (i.e., form recognition test and multiple-choice meaning test), the scoring was based on a 0-1 point scale. More precisely, the students received 0 point when they provided an incorrect response, or when they did not provide a response at all, and they received 1 point when they provided a complete correct response. For the sentence-rewrite use test, the scoring was based on some partial points. That is, if the errors in the paraphrased sentences did not make a substantial change in the meaning of the sentences and the students managed to construct the correct forms of the verbs to use them while re-writing appropriate sentences, the sentences were given some partial points (i.e., 0, .5, and 1). To ensure that the reliability of the scoring was sufficient, 10% of the test papers were randomly selected and scored by a different person, and it was found that the interrater reliability was 91%.

The corpus and corpus-based activities
In this empirical study, the corpus of contemporary American English (COCA) (Davies, n.d.) was used as a resource while preparing both the tests questions and the activities (i.e., corpus-based activities). For practice activities, appropriate concordance lines which were taken from the corpus for the targeted phrasal-prepositional verbs were prepared with an im to help the students see the usage of the phrasal-prepositional verbs in their real contexts so that they can understand the form of the verbs, discover the meaning of them, and use the correct form of them while re-writing sentences. Therefore, firstly, the concordance lines, which include the usage of the targeted phrasal-prepositional verbs, were prepared, and they were taken to the classes and used for presentation, discovery, and practice purposes. A screen shot of some of the concordance lines can be seen in Appendix B.

After getting the concordance lines for the phrasal-prepositional verbs from the corpus, the corpus-based activities were prepared. The activities consisted of four sets of papers each of which included 20 concordance lines in which 10 phrasal-prepositional verbs were seen in their real usages and five tasks that included form, meaning, and use activities of the phrasal-prepositional verbs. A sample of the activites prepared for the phrasal-prepositional verbs can be seen in Appendix C.

Data collection procedure
The focus of the current study was 40 high level phrasal-prepositional verbs which were selected from Longman Dictionary of Phrasal Verbs and instructed via corpus-based activities for six hours. In Table 1, the target 40 phrasal-prepositional verbs of the study are presented.

After selecting the phrasal-prepositional verbs from the dictionary and preparing the tests and the corpus-based activities, the study was initiated with the pre-testing session in the two intact classes. The students were firstly

tested on their recognition of the form of the phrasal-prepositional verbs, then on their understanding of the metaphorical meanings of the verbs, and lastly on their ability to construct the correct forms of the verbs in order to use them in sentence writing. Approximately 15 minutes for each test was given; hence, both the pre-testing and the post-testing sessions lasted 45 minutes.

Table 1: The target phrasal-prepositional verbs

To walk out on	To start in on	To eat away at	To chip away at	To knock up against
To get round to	To fly off with	To creep up on	To get back at	To cut ahead of
To bring up against	To burst in on	To clean up on	To cry out against	To hold on to
To face up to	To go back on	To talk back to	To dine out on	To clamp down on
To stand in for	To brush up against	To look down on	To check up on	To feel up to
To do away with	To hammer away at	To wake up to	To come in on	To boil down to
To shy away from	To hang around with	To go through with	To fall back on	To put in for
To drop out of	To look out for	To fit in with	To add up to	To bubble over with

Approximately one week later than the pre-testing session, the instruction was started, which lasted two days and six hours for each class. During the six hour treatment, the students were given four sets of corpus-based activities each of which consisted of 20 concordance lines that included 10 high level phrasal-prepositional verbs and five tasks that included form, meaning, and use activities of the phrasal-prepositional verbs. For form recognition activity in Tasks A and B (see the tasks in Appendix C), the students were required to discover the form of the verbs on their own. As such, an implicit teaching was used for the analysis of the verbs in the concordance lines. However, since the participants in the current study did not know what a corpus is and what a concordance line is like, one example analysis was presented to them so that they could understand the specific features of the verbs (i.e., verb + adverb particle + preposition + noun phrase). In Task C (see the task in Appendix C), the students were required to discover the meanings of the verbs by analyzing the concordance lines on their own. As such, an implicit teaching was used again while practicing the meaning of the verbs in Task C. However, an explicit teaching was used while practicing the meaning and the usage of the verbs with 10 meaning-based multiple-choice questions in Task D (see the task in Appendix C) as well as 10 usage-based sentence-rewrite questions in Task E (see the task in Appendix C). Therefore, it can be claimed that the study adopted a combination of explicit and implicit instruction.

Approximately 14 days later than the instruction and 21 days later than the pre-testing session, the students were again tested on their recognition of the form of the phrasal-prepositional verbs, then on their understanding of the meanings of the verbs, and lastly on their ability to construct the correct forms of the verbs in order to use them in sentence writing.

Data analysis

In order to investigate the effectiveness of the corpus-based activities on the students' performance on the tests, the quantitative analysis of the test scores of the students was used to compare the students' initial performance with their final performance on the tests. The pre-test scores of the two intact classes were firstly compared to see whether the groups were homogenous in terms of their knowledge of the target phrasal-prepositional verbs, and then the pre-test scores and the post-test scores of the students were compared in order to see whether the students in both classes demonstrated learning for three dimensions (i.e., form, meaning, and use) of phrasal verb knowledge. Lastly, a learning gain score for each individual student was calculated by subtracting the pre-test scores from the post-test scores.

RESULTS

Out of 70 students, three students did not participate in any of the two testing sessions in total. Additionally, nine students' test papers were eliminated from the study, because three of them only participated in the pre-testing session, two of them only participated in the post-testing session, and four of them were not present at the time of the instruction. Therefore, while conducting the data analysis for the study, only the results of 58 students were taken into consideration.

Comparison of the pre-tests scores

The data were initially analyzed to see whether the pre-test scores of the two intact classes were equivalent in terms of three dimensions (i.e., form, meaning, and use) of phrasal verb knowledge. That is to say, the data were initially analyzed to determine whether the two classes were homogenous in terms of their knowledge of the phrasal-prepositional verbs before the instruction started.

Table 2: Pre-test means, two classes

	Class 1 (N=32)		Class 2 (N=26)		Independent Sample T-Test Results
	Mean	Std. Dev.	Mean	Std. Dev.	
Form (max. score 20)	13.81	6.85	15.53	4.78	P(two-tailed)=.282
Meaning (max. score 20)	6.62	3.24	5.46	2.30	P(two-tailed)=.129
Use (max. score 20)	1.12	1.49	1.69	1.31	P(two-tailed)=.136

The means presented in Table 2 appear to show that there were some differences between the classes in terms of their pre-test scores for form, meaning, and use. The mean scores of the classes for the pre-tests were compared using Independent Sample T-Test, and the test showed that there were no significant differences between the classes in terms of their pre-test scores for any dimension (p (two-tailed) >.05). From these results, it can be claimed that the two classes were equivalent in terms of their knowledge of the target structures at the beginning of the teaching.

Comparison of the pre-tests and post-tests scores

The pre-test scores and the post-test scores of the students were compared in order to see whether the students in both classes demonstrated learning for the dimensions. In Table 3, the means and standard deviations of the pre-test scores and the post-test scores of the students are presented.

Table 3: Pre-tests and post-tests means

	Pre-test				Post-test				One-way ANOVA results
	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	
Form (max. score 20)	0	20	14.58	6.02	4	20	17.43	3.16	P(two-tailed)=.021
Meaning(max. score 20)	1	13	6.10	2.89	1	15	9.79	3.05	P(two-tailed)=.267
Use (max. score 20)	0	7	1.37	1.43	0	16	6.94	4.34	P(two-tailed)=.041

The means presented in Table 3 appear to show that the students demonstrated learning for all dimensions. The means of the pre-test scores and the post-test scores were compared using One-way ANOVA test, and the test showed that there were significant differences between the students' pre-test scores and post-test scores for two dimensions (i.e., form and use). However, for meaning dimension, there was no significant difference between the students' pre-test scores and post-test scores. Therefore, it can be claimed that using corpus-based activities is not effective with teaching English phrasal-prepositional verbs in terms of meaning.

Comparison of gain scores

In order to see how much was learned from the pre-assessment to post-assessment, a learning gain score for each individual student was calculated by subtracting the pre-test scores from the post-test scores. Firstly, the number of the students was calculated in order to determine the number of the students who gained and did not gain. In Table 4, the number of the students who gained and did not gain from the pre-assessment to post-assessment can be seen.

Table 4: Student numbers, gains vs. no gains

	Gains	No gains
Form	34	24
Meaning	45	13
Use	52	6

The numbers presented in Table 4 appear to show that the number of the students who gained was higher for meaning and use dimensions, and the number of the students who did not gain was higher only for form dimension. It can be claimed that even if the number of the students was higher for meaning dimension, the students could not demonstrate significance learning by using corpus-based activities.

DISCUSSION AND CONCLUSION

This empirical study investigated whether using different materials (i.e., corpus-based activities) is effective with teaching Turkish upper-intermediate proficiency level teacher candidates some high level phrasal-prepositional verbs in terms of three dimensions (i.e., form, meaning, and use) of phrasal verb knowledge after six hour instruction. The purpose of the study was to determine whether six-hour instruction via corpus-based activities is effective with teaching the students the form of the verbs, teaching them the metaphorical meanings of those structures, and teaching the students how to construct the correct forms of the verbs in order to use them while paraphrasing sentences. There tests were administered to the students.

The findings indicate that six hour instruction via corpus-based activities is effective with teaching the learners these structures in terms of two dimensions (i.e., form and use). More precisely, the students in the current study were able to recognize and understand the form of the phrasal-prepositional verbs by using corpus-based activities (i.e., Hypothesis 1), and they were also able to construct the correct forms of the verbs in order to use them while paraphrasing sentences (i.e., Hypothesis 3). However, the students in the current study were not able to understand the metaphorical meanings of these structures by using corpus-based activities (i.e., Hypothesis 2). Therefore, using corpus-based activities was found not to be effective with teaching the metaphorical meanings of the verbs to the students in the current study.

Celce-Murcia (2001) suggests that in the process of learning such structures, meaning dimension is a real challenge for students. Side (1990) also claims that students fail to understand the metaphorical meaning of these structures even if language teachers try their best to help them. Hence, this study also provides further evidence that learning the metaphorical meanings of these structures is really challenging for students. This might be due to the high-frequency unknown words in the concordance lines that the students might have had difficulty in understanding in the current study, thereby having a strong influence on the misunderstanding of the phrasal-prepositional verbs. In addition, this might also be linked to the fact that six hour instruction via these sources was not enough to help the students understand the metaphorical meanings of the structures. Yet, the findings indicate that the students in the current study were able to use the corpus-based activities effectively in terms of understanding how phrasal-prepositional verbs in English are formed and constructing the correct forms of the verbs in order to use them in sentence writing.

These findings confirm the findings of the previous studies that have attempted to investigate the effectiveness of the use of corpora on language learners' vocabulary learning (e.g., Ashkan & Seyyedrezaei, 2016; Barabadi & Khajavi, 2017; Paker & Ergül-Özcan, 2017), more specifically collocation learning (e.g., Chan & Liou, 2005; Chao, 2010; Koosha & Jafarpour, 2006; Sun & Wang, 2003; Uçar & Yükselir, 2015). These studies found that the use of corpora is quite effective with teaching English vocabulary, collocations in particular, to learners. Similarly, the current study also showed that the students demonstrated significant learning in terms of recognizing and understand ing the form of the phrasal-prepositional verbs and constructing the correct forms of the verbs in order to use them while paraphrasing sentences by the help of the corpus-based activities.

The findings of the current study also confirm what the DDL approach proposes. The researchers adopting the approach argue that exposing learners to contexts, which present the specific features of language, facilitate creativity and self-discovery learning among learners (Batstone, 1995). As the activities used in the current study, which consisted of the concordance lines and form-meaning-use tasks, required the students to analyse the structures in the lines, understand the metaphorical meanings of them, and construct the correct forms of them to use them while re-writing sentences on their own, it can be claimed that they facilitated the learners' self-discovery learning by showing them the target structures in some real, authentic contexts. In addition, the DDL approach was found to be quite effective with teaching the collocations of prepositions to the learners in the study of Koosha and Jafarpour (2006). Since the findings of the current study also indicate that the learners were able to use corpus-based activities effectively in order to learn the target structures, it provides further evidence that language learners can benefit from the data-driven learning.

Celce-Murcia (2001) suggests that in informal spoken discourse, native speakers of English use such structures quite often. Similarly, Quirk et al. (1985) also claim that such structures are "prevalent in everyday language" (p.1150). However, it is very challenging for language learners to learn such structures. It is claimed that

language learners avoid using them while speaking or writing in English (e.g., Cornell, 1985; Dagut & Laufer, 1985; Ganji, 2011; Liao & Fukuya, 2004; Yasuda, 2010).

Although many materials (e.g., textbooks, course books, specialized learner dictionaries of multi-word verbs) are introduced to language teachers to help their students learn these verbs, teachers are having a great difficulty in the teaching of these structures to their students. One consensus is that these materials present the structures in a way that students have to learn them by memorizing, thereby implying that there is no system to learn them easily and effectively (e.g., Ganji, 2011). However, the current study provides evidence that language teachers can make use of corpora in their classes to help their students learn these structures, even high level ones.

It should be noted at this point that the target 40 phrasal-prepositional verbs were determined by the researcher's intuition instead of administering a diagnostic test to the students in the current study. Therefore, some of the verbs might not indeed be high level phrasal-prepositional verbs for some of the students. Also, the current study failed to control the high-frequency unknown words in the concordance lines that might have had potential influence on the misunderstanding of the phrasal-prepositional verbs. Yet, the study not only provides evidence for language teachers questioning whether to use corpora to teach such structures to their learners, but it also provides some alternative and effective ways of teaching the verbs in language classrooms. For each target structure defined in the present study, corpus-based activities were prepared by the researcher by taking some concordance lines from the corpus (i.e., COCA) and preparing form-meaning-use tasks, in which the sentences were also taken from the corpus, to help the students understand the form and metaphorical meanings of the verbs and construct the correct forms of the verbs in order to use them while paraphrasing sentences. Thus, if language teachers who want to make use of corpus-based sources to teach such structures to their students are informed about these designs and principles, they can create their own corpus-based activities to teach such structures to language learners. In addition, Biber and Reppen (2002) suggest that materials developers can also use the information based on corpora in order to increase the meaningful input provided for language learners. Therefore, the present study provides further evidence for language teachers and curriculum designers who might want to consider incorporating such materials and activities into language teaching.

The present study only investigated the effectiveness of using corpus-based sources on the learners' performance on the tests. Thus, some empirical studies should definitely be conducted in order to investigate the effectiveness of learning of such structures through corpus-based sources on students' ability to use them effectively in other skills (e.g., speaking) of English. That is, the long-term effects of using corpus-based sources on students' use of such structures in speaking should be examined. In addition, as this study was conducted with upper intermediate level students, future research should concentrate on the effectiveness of using corpus-based sources on the teaching of such structures to learners at lower level of English proficiency and from different backgrounds in order to see whether there will be the same results.

REFERENCES

Ashkan, L., & Seyyedrezaei, S. H. (2016). The effect of corpus-based language teaching on Iranian EFL learners' vocabulary learning and retention. *International Journal of English Linguistics*, *6*(4), 190-196.

Barabadi, E., & Khajavi, Y. (2017). The effect of data-driven approach to teaching vocabulary on Iranian students' learning of English vocabulary. *Cogent Education*, *4*(1), 1-13.

Batstone, R. (1995). Product and process: Grammar in the second language classroom. In M. Bygate, A. Tonkyn, & E. William (Eds.), *Grammar and the language teacher* (pp. 224-236). London: Prentice Hall.

Biber, D., & Reppen, R. (2002). What does frequency have to do with grammar teaching? *Studies in Second Language Acquisition*, *24*, 199-208.

Celce-Murcia, M. (2001). *Teaching English as a second or foreign language (3rd Edition).* Boston: Heinle & Heinle.

Chambers, A. (2007). Integrating corpora in language learning and teaching. *ReCALL*, *19*(3), 249-251.

Chan, T., & Liou, H. (2005). Effects of web-based concordancing instruction on EFL students' learning of verb – noun collocations. *Computer Assisted Language Learning*, *18*(3), 231-250.

Chao, P. (2010). *A study of collocation learning of junior high students in Taiwan via concordance.* Paper presented at the 2010 international conference on English teaching, Kaohsiung, Taiwan. Retrieved 11.06.2018, from http://www2.kuas.edu.tw/edu/afl/20100430Final/Word/2010comp_EPCA.pdf.

Chui, K., Utiyama, M., & Miura, S. (2006). Using a Japanese-English parallel corpus for teaching English vocabulary to beginning-level students. *English Corpus Studies*, *13*, 153-172.

Cornel, A. (1985). Realistic goals in teaching and learning phrasal verbs. *International Review of Applied Linguistics in Language Teaching*, *23*, 269-280.

Dagut. M., & Laufer, B. (1985). Avoidance of phrasal verbs: A case for contrastive analysis. *Studies in Second Language Acquisition*, *7*, 73-79.

Erteschik-Shir, N., & Lappin, S. (1979). Dominance and the functional explanation of island phenomena. *Theoretical Linguistics*, *6*(1), 41-85.
Ganji, M. (2011). The best way to teach phrasal verbs: Translation, sentential contextualization or metaphorical conceptualization?. *Theory and Practice in Language Studies*, *1*(11), 1497-1506.
Gaskell, D., & Cobb, T. (2004). Can learners use concordance feedback for writing errors? *System, 32*(3), 301-319.
Hill, J. (2000). Revising priorities: From grammatical failure to collocational success. In M. Lewis (Ed.), *Teaching collocation: Further development in the lexical approach* (pp. 47-69). Oxford: Oxford University Press.
Hunston, S. (2002). *Corpora in applied linguistics*. Cambridge: Cambridge University Press.
Koosha, M., & Jafarpour, A. (2006). Data-driven learning and teaching collocation of prepositions: The case of Iranian EFL adult learners. *Asian EFL Journal Quarterly*, *8*(4), 192–209.
Liao, Y., & Fukuya, Y. J. (2004). Avoidance of phrasal verbs: The case of Chinese learners of English. *Language Learning*, *54*(2), 193-226.
Paker, T., & Ergül-Özcan, Y. (2017). The effectiveness of using corpus-based materials in vocabulary teaching. *International Journal of Language Academy*, *5*(1), 62-81.
Quirk, R., Greenbaum, S., Leech, G., & Svartvik, J. (1985). *A comprehensive grammar of the English language*. New York: Longman.
Side, R. (1990). Phrasal verbs: Sorting them out. *ELT*, *44*(2), 144-159.
Sun, Y-C., &Wang, L-Y. (2003). Concordancers in the EFL classroom: Cognitive approaches and collocation difficulty. *CALL*, *16*(1), 83–94.
Tekin, B., & Soruç, A. (2016). Using corpus-assisted learning activities to assist vocabulary development in English. *TOJET: The Turkish Online Journal of Educational Technology*, *Special Issue*, 1270–1283.
Uçar, S., & Yükselir, C. (2015). The effect of corpus-based activities on verb-noun collocations in EFL classes. *TOJET: The Turkish Online Journal of Educational Technology*, *14*(2), 195–205.
Vannestal, M. E., & Lindquist, H. (2007). Learning English grammar with a corpus: Experimenting with concordancing in a university grammar course. *ReCALL*, *19*(3), 329-350.
Yasuda, S. (2010). Learning phrasal verbs through conceptual metaphors: A case of Japanese EFL learners. *TESOL Quarterly*, *44*(2), 250-273.
Yılmaz, E., & Soruç, A. (2015). The use of concordance for teaching vocabulary: A data-driven learning approach. *Procedia-Social and Behavioral Sciences*, *191*, 2626–2630.

The Qualities Criteria of Constructive Play and the Teacher's Role

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ABSTRACT
The purposes of this study were to identify the qualities criteria of constructive play and the teacher's role to enhance the qualities of constructive play. The participants for this study were ninety-seven 5-year-old children (53 boys and 44 girls) attending one kindergarten located in S city, K province in South Korea. Ten research assistants were in the course of the master's degree and senior majoring in early childhood education. They were trained to observe and record the qualities criteria of constructive play in block play. Ninety-seven (97) children were divided into 20 groups, each group was consisted of 5 or 6 children. They participated in 10 block play sessions twice a week. The duration of each play session was 40 minutes. During the first 10 of 40 minutes, introduction activities were conducted by research assistants and constructive play session lasted for 30 minutes. Unit Blocks were used in this study.

The results were as follows; The qualities criteria of constructive play were time (duration), diversity (number of constructions), organization, elaboration, imagination, concentration, and variety (number of blocks, shapes of blocks). The teacher's roles to improve the qualities of constructive play are teachers should encourage and support children to participate in constructive play, and provide a plenty of time, multiple open-ended materials, diverse stories, fairy tales, many play experiences, and safe environment. Teacher's guidance, preparations, support, and encouragement will promote children's high qualities of constructive play. These high qualities of constructive play maybe contribute to quality learning and development of the young children.

INTRODUCTION
Constructive play involves manipulation of materials to create things: sand, art materials (paint, large chalks, clay, paper), water, woodwork activities, sticks and stones, and a variety of different sized and different type of blocks (Wardle, 2000). Constructive play is organized, goal-oriented play in which children use play materials to create or build something (Johnson, Christie, & Wardle, 2005). Constructive play involves open-ended exploration and gradually more functional in nature, then evolving to make-believe transformations. Four-and 5-year-olds often switch back and forth between constructive and dramatic play, and it can be difficult to distinguish between the two forms of play (Kostelnik, Soderman, & Whiren, 2007; Drew, Christie, Johnson, Meckley, & Nell, 2008).

All play is a delight to the young children engaged in it. In fact, symbolic and constructive play are the hallmarks of the early childhood period (Kostelnik, Soderman, & Whiren, 2007). Rubin, Fein, and Vandenberg (1983) reported that about 50% of all play activity is constructive play at this age. Constructive play involves exploration and discovery, tactile stimulation, problem-solving, social interaction, engagement and concentration, and attention to process and outcomes. Children represent their ideas, knowledge and interests in multimodal ways such as layouts, buildings, plans, and sculptures (Wood, 2013). Constructive play seems to play a very crucial role, both high incidence in the preschool and especially in the free play setting. But most studies have been focused on the symbolic play rather than constructive play (Park & Han, 2017).

Furthermore, many of today's parents, in response to the widespread stress on cognitive development in children, are demanding that their children be exposed to a program that is more than just play. Parents may choose a program for its so-called academic focus. In response, programs often include the terms school, early learning, academy, or some such phrase in their names (Rogers & Sawyers, 1992). But children learn many things through play. Especially through constructive play, children can learn to read, write, speak, and listen. Constructive play can teach them about math, science, and social studies. Constructive play often involves cooperative, collaborative learning, which helps children grow emotionally and socially. Constructive play also enhances their physical growth and development (MacDonald, 2001). In addition, through constructive play, problem solving ability was improved (Park, 2007). To facilitate and encourage constructive play, it needs to investigate the qualities criteria of constructive play and the teacher's role to enhance the qualities of constructive play.

RESEARCH QUESTIONS

The main research questions posed in this study are as follows:

1. What are the qualities criteria of constructive play?
2. What are the teacher's role to enhance the qualities of constructive play?

METHODS

Participants

The participants for this study were ninety-seven 5-year-old children (53 boys and 44 girls) attending one kindergarten located in S city, K province in South Korea.

Procedure

Preliminary observation. Before starting main observation, preliminary observations were conducted. Through preliminary observations, some problems were founded and these problems were made up for main observation. To reduce the sound of wooden blocks, a carpet was put in the block area. To videotape children's play behavior well, two video camcorders were established opposite sides with trivet. To establish rapport between children and researcher and research assistants, we read fairy tales to the children.

Training of research assistants. Ten research assistants were trained to observe and record the qualities of constructive play in block play. Among them, seven research assistants were in the course of master's degree and three were senior (undergraduates) majoring in early childhood education. Prior to the observation, they were trained four times in total, for 3 hours per one training session, about the definition of the qualities criteria of constructive play, the method of using video camcorder, and observer's attitude etc.

One group consisted of 5 or 6 kids, and are playing with 1 set of Unit Blocks for 30 minutes. Five research assistants observed 5 children's block play and they coded the score using the qualities criteria of constructive play. And every play session was videotaped.

As soon as each observation time was over, observers checked the scores to ensure the inter-rater reliability. Inter-rater reliability of coding scores was established as follows: (a) the research assistants coded appearing the qualities criteria of constructive play with observation forms and photographed the scene, (b) when the play session was over, they compared the coding scores with each other, and (c) if there were any differences between their scores, they discussed until they agreed on the coding scores of them.

Observation. The place of block play was set up in an extra room separated from their classroom in the kindergarten. Ninety-seven (97) children were divided into 25 groups, 5 or 6 children were grouped in one group, and they participated in block play sessions twice a week. As a result, they participated in ten-times in total. They were grouped in same classmates and 2 girls 3 boys were one group or 3 girls 2 boys or 3 girls and 3 boys were one group.

One play session lasted for 40 minutes. During the first 10 of 40 minutes, introduction activities were conducted by research assistants and constructive play session lasted for 30 minutes. They read story books to the children or they told with the children experiences about zoo, transportations, for example, airplane, ship, bus, train, etc., and Christmas. The books were predetermined to stimulate children's block construction as *The Three Little Pigs*, *Kindergarten*, *Zoo*, *The Wizard of Oz, Thomas and friends*, *Manhee's House*, Cosmos, *Block City, Transportations, and White Christmas.* The research assistants asked the children to make structures using blocks, and let them play, as they wanted. For example, when they read of *The Three Little Pigs,* children constructed three kinds of pigs houses with blocks. After they completed their block constructions, they played with construction(s) and play props or they used props as block construction. The research assistants did not interact with children when the children played with blocks. After the play session, research assistants asked them to name and describe their constructions. And the block structures were photographed to identify their structure's elaboration.

Materials for block play. Among constructive play, block play is appropriate for meeting the developmental needs of young children, providing opportunities for social, physical, and cognitive development (Han & Park, 2010). In the block center, there are no right answers. Activities are open-ended and children are free to change direction. Blocks promote children's awareness of symbols and their purposes (Wellhousen & Giles, 2005). Among blocks, Unit Blocks were used in this study. Other kinds of blocks are also available, but Unit Blocks consisted of various shapes and sizes in mathematical design and it is valuable equipment we can offer to children. In addition, it is helpful and useful to evaluate the qualities of constructive play. Unit Blocks were invented by Caroline Pratt. Unit Blocks have the basic dimensions 3.5x7x7cm, others are either multiple or divisions of the unit. Unit Blocks are consisted of unit, half-unit, double unit, quadruple unit, large arch, half

circle, 1/4 circle, pillars, half pillars, small cylinders, large cylinders, ramps, circular curves, elliptical curves, large triangle, small triangle, floor board, right-angle switches, X-switches, and Y-switches. Unit Blocks are built in mathematical proportion and they are different shapes and sizes. They are made from solid hardwood (MacDonald, 2001).

In addition, props (accessories) were supplemented. The props were wooden made. These were provided in all ten play sessions. For example, a miniature size of humans, animals, cars, trees, and traffic signs. The props had different shapes, colors, and sizes. Miniature of humans were adults, children, man, and woman. Miniature of animals were snake, elephant, crocodile, and rhinoceros. The props promoted and facilitated Unity Block play. Table 1 shows the kinds and number of Unit blocks that used in this study. These blocks were provided for one group in every play session.

Table 1. The kinds and numbers of Unit Blocks that used in this study

The Kinds of Unit Block	Number
half-unit	25
unit	50
double unit	32
quadruple unit	15
half-pillars	7
pillars	11
small cylinders	14
large cylinders	10
1/4 circle	2
half circle	4
half arch	7
large arch	4
circular curves	2
elliptical curves	2
small triangle	17
large triangle	10
floor board	9
ramps	8
right-angle switches	6
Y-switches	1
X-switches	1
props (miniature of humans, animals, cars, trees)	25
props (traffic signs)	5
The number and kind of blocks	**23**
Total	**267**

RESULTS

1. The qualities criteria of constructive play

The sub-qualities criteria of constructive play in this study were time (duration), diversity (number of constructions), organization, elaboration, imagination, concentration, and variety (number of blocks, shapes of blocks). These sub-qualities of constructive play were evaluated at each play sessions. Table 2 shows the qualities criteria of constructive play.

Table 2. The qualities criteria of constructive play

Sub-qualities	Contents / Explanation	Examples and Scores
Duration of play time	- The time that children participated in constructive play (The time limit of one play episode was 30 minutes in this study.)	Some children play constructive play 30 minutes, others play 10 minutes or 20 minutes in one play session. The children who play constructive play 30 minutes get a high score.
Diversity	- The number of constructions in one play episode	For example, after reading *The Three Little Pigs*, children construct the first pig's house, the second pig's house, and the third pig's house. In this case 'diversity' is 3. If a child constructs only the third pig's house, the 'diversity' is 1.
Organization (Relationship)	- The organization of between theme and constructions - The relationship of between theme and constructions	For example, after reading *The Three Little Pigs*, if a child constructs the first pig's house, the second pig's house, and the third pig's house, the 'organization' is high score. But if a child constructs something that is no relationship with *The Three Little Pigs*, the 'organization' is low score.
Elaboration	- The degree of elaboration of construction - To evaluate elaboration researcher looked at carefully the constructions and took photos of constructions.	For example, after talking about *Transportations*, if a child constructs airplane not only inside but also constructs outside very concretely, the elaboration is high score. If a child constructs only outside of airplane roughly, the 'elaboration' is low score.
Imagination	- The degree of imagination of construction - Most children construct based on the theme of each play session predetermined books or storytelling, or some children construct using their imagination based on the theme.	For example, after reading *White Christmas*, if children construct White Christmas castle, Santa's house, and playground for Rudolf deer and his friends, the 'imagination' is high score. After reading *Hensel and Gretel*, if children construct the prison for the witch and the policeman to protect Hensel and Gretel, the 'imagination' is high score.
Concentration	- The degree of concentration on constructive play - The action or power or focusing on children's attention on constructive play	For example, when children construct their construction, if they are very concentrate on construct their construction, the 'concentration' is high score.
Variety	1) The used number of blocks in constructions 2) The number of kinds of block shapes in constructions	1) The sum of used number of blocks in one play episode. For example, children construct the first pig's house, the second pig's house, and the third pig's house, the first 'variety' means the sum of used number of blocks in three pig's house. 2) For example, children construct the first pig's house, the second pig's house, and the third pig's house, the second 'variety' means the sum of used number of different kinds of block shapes in three pig's house.

2. The teacher's role to enhance the qualities of constructive play

For optimal learning to occur through constructive play, children need support, time, and open-ended materials that stimulate the brain to think imaginatively (Drew, Christie, Johnson, Meckley, & Nell, 2008). The teacher's roles to enhance the qualities of constructive play are as follows;

(1) Time

Research has demonstrated the importance of the length of an activity period to mature, complex forms of play. Longer play periods were associated with more constructive and dramatic play. The researchers concluded that longer time periods maybe necessary for children 'to become involved in mature, complex forms of play' (Tegano, Lookabaugh, May, & Burdette, 1991; Park & Han, 2018). The most essential condition to support constructive play is the child's sense of schedule. Play does not survive when children rushed; constructive play must be nurtured by time (Forman, 2006). Teachers should give plenty of time for constructive play.

(2) Diversity

Teachers should emphasize the process rather than the product. This will aid in developing children's creativity, but even more importantly will ensure that children feel competent and good about their own work and therefore will be self-motivated to continue to learn. Constructive play should be studied by process. Also, teachers and parents should avoid the use of adult models of art or building projects for children to copy. Rather, let children use materials in ways that are most meaningful to them (Rogers & Sawyers, 1992).

Young children bring to an exploration of building their own ideas, interests, and beliefs based in experience and culture, and tempered by their developmental level. Some children may have had more opportunity to play and build with blocks and other and other materials both indoors and out. Others may have had less opportunity. Some of girls avoid the block area and need specific encouragement to build. Having a time in the block area just for girls or connecting building with the dramatic play area are other possible strategies. (Chalufour & Worth, 2004). Thus teachers should arrange near by the block play area and dramatic play area. Because these make constructive play become more diverse and connected to symbolic play.

(3) Organization (Relationship)

To enhance organization of constructive play, teachers may talk with children about *what* they made their creation and constructions (Rogers & Sawyers, 1988). Teacher's understanding, planning, and preparation are important for high quality of organization (Koo & Lee, 1998). In constructive play, organization means children can recognize and understand the relationship between the theme and their constructions, thus teachers should plan and prepare about constructive play to help and to facilitate children's understanding. For example, fairy tales or storytelling facilitate understanding about the theme and constructions.

Books are most beneficial additions to block play, and one of the easiest to include. Books in the block center offer enjoyment, expose children to new experiences, and generate new ideas for building. As teachers select and read aloud books that relate to building, children develop new ideas and strategies for their play (Wellhousen & Giles, 2005).

(4) Elaboration

Teachers can enhance the elaboration by talking with children about *how* they made their creation and encourage children to create something concretely. Furthermore, after constructing, teachers take photos of children's constructions. These make children motivated to construct more elaborate constructions. According to Park (2007), the longer the children engaged in constructive play, the more problem-solving ability and elaboration improved. In addition, pre-experiences, before constructive play, are helpful to make constructions more elaborate.

(5) Imagination

Imagination can generate alternatives to the 'way things are' and therefore expands the range of possibilities. It is important for the development of abstract, symbolic, 'as if' thinking (Tovey, 2015). Construction requires that the child have an image in mind that he or she then represents by using familiar process. Children's imagination is central to the reasoning process and no activity is undertaken without some image of the result, whether his or her conception is accurate or not (Kostelnik, et al., 2004).

Teachers should talk with children about *what* and *why* they made their creation. Also, it is helpful to keep accessories simple and austere so children can use their imaginations and apply their own meanings (Wellhousen & Kieff, 2001).

Block accessories change the nature of the play. Accessories motivate children by adding new possibilities to

their building. These additions invite different children into the action. Many children will simply be more curious about something new. Accessories can be made from just about any materials, including wood, plastic, or metal. They can be hard or flexible, real or make-believe. They can be people, animals, signs, trees, and objects. These accessories can help imagination and promote symbolic play. Accessories are the 'gate' children go through to enter the real of imagination, while others think more concretely. One never knows what accessory will strike a particular child's imagination. New accessories invite renewed interest (MacDonald, 2001).

In addition, according to Park (2007), before constructive play, reading fairy tales are useful for children's imagination in constructive play. For example, after reading *Hensel and Gretel*, a child constructed police station and put a miniature of men at the police station and put a doll of police officer nearby *Hensel and Gretel*. Research assistant asked why he or she made police station and why he or she put the police officer. A child answered, because he or she wanted to protect Hensel and Gretel from the witch. In *Hensel and Gretel* fairy tales book, there are no police station or police officer. But a child had his or her imagination from fairy tales.

(6) Concentration

Teachers can help children's concentration on constructive play by stimulating children's interests, curiosity, needs, and exploration. Children can concentrate on if they are interested in the activities. Thus teachers need to provide stories, open-ended materials, and supportive environments for constructing. The more concentrate on constructive play, the more problem solving ability improved (Park, 2007).

(7) Variety

Making sure enough blocks is very important. Generally, the number of blocks to have depends on the number of children in the center at one time. If there are too few blocks in the center, there will not be enough to go around, which can cause disagreements among the children. To figure out the best block-to-children ratio, consider the number of children who will be in the center at one time and their age. Many researchers suggest that 200 blocks for three-year-olds, 300 blocks for four-year-olds, and 400 blocks for five-year-olds and older children (MacDonald, 2001). Teachers may consider add more and more complex materials as children become more capable (Rogers & Sawyers, 1992). In addition, teachers should offer many different shapes and sizes of blocks. Variety and availability of appropriate materials will help ensure that children have many opportunities to learn through their play (Wellhousen & Kieff, 2001). Thus teachers should offer enough blocks for children.

DISCUSSIONS

Constructive play is a process, and should be studied as such (Forma, 2006). Thus it needs to be studied about the qualities criteria. Constructive play involves building and making things no one has ever seen before. As young children fiddle with, sort, and arrange materials, ideas and imagination begin to flow: Questions arise naturally: They wonder: What will happen if I put this here? How tall will it go? In this way, constructive play serves to focus the minds of children through their finger and leads them to invent and discover new possibilities, to fulfill their sense of purpose (Drew, Christie, Johnson, Meckley, & Nell, 2008).

Making things is an activity that is key to successful learning for young children. Constructive play inspires creativity, stirs the imagination, and presents opportunities for meaningful problem solving. Constructive play makes learning fun (Oliver & Klugman, 2003). The ability to physically construct new connections between thoughts and objects is the act of innovation and change. Child-focused inquiry learning that involves constructive play with array of three-dimensional materials, fosters positive learning, such as enthusiasm, resilience, creativity, decision making, and persistence in completing tasks (Drew, Christie, Johnson, Meckley, & Nell, 2008). In constructive play teachers allow high degree of freedom for children to choose what they will be representing with blocks, clay, or materials to create something. Constructive play requires children to be imaginative and creative, and involve a hands-on experience of building or making a concrete, three-dimensional model. Through constructive play, children create three-dimensional construction; they can see the elements of their models from different angles and perspectives. Block construction is the transformation of an experience or object into a concrete representation of this experience or object (Han & Park, 2010). Constructive play can provide a window into children's thinking (Forman, 2006). The open-ended nature of blocks and other constructive toys provides young children with multiple opportunities to develop skills and abilities that cross all domains (Wellhousen & Kieff, 2001).

Constructive play is may facilitate problem solving ability. To improve problem solving ability, teachers should allow children to solve their own problem rather than interfering to offer teachers or parents solution. Give them the opportunity to try some unworkable solutions, and let them choose what works best for them. How can we do this? Rather than probing for one specific answer, encourage children to try out, or think of, multiple solutions. Ask questions focusing on "what if?" and "how can we …?" rather than those with a yes, no, or other specific response. So much formal schooling seems to focus on finding the one right answer and how to use

things the one right way. Therefore, teachers should help children take advantage of opportunities to solve problems and think divergently (Rogers & Sawyers, 1992). If a child can construct with concrete objects, the child will learn to construct with words and ideas (Bruner, 1972). They can pretend, invent, and improvise (MacDonald, 2001). Teachers who understand and encourage this process of learning help children develop a very important talent (Drew, Christie, Johnson, Meckley, & Nell, 2008). Constructive play is similar to unstructured play. Unstructured play is just as valuable as structured play. For example, the more time children spend in less structured activities, the better their self-directed executive functioning (Trundle, 2018). Constructive play is open-ended activities allow children to design their own rules and play at their own pace. The objectives of constructive play range widely. Children can learn about physical world, about social world, and particularly about the role of the self in the construction of knowledge (Forman & Hill, 1980).

In summary, to improve the qualities of constructive play, teachers should encourage and support children to participate in constructive play, and provide a plenty of time, multiple open-ended materials, diverse stories, fairy tales, many play experiences and safe environment. It will enhance the qualities of constructive play, time, diversity, organization, elaboration, imagination, concentration, and variety. These high qualities of constructive play maybe contribute to quality learning and development because it provided the ideal conditions in which to learn. It would make more positive effect on learning and development for the children to be engaged in the high qualities of constructive play, rather than to just participate in constructive play. Teacher's interest, preparations, support and encouragement will reinforce children's high qualities of constructive play.

REFERENCES

Bruner, J. (1972). The nature and uses of immaturity. American Psychologist, 27, 687-708.

Chalufour, I., & Worth, K. (2004). *Building structures with young children*. St. Paul: Redleaf Press.

Drew, W. F., Christie, J., Johnson, J. E., Meckley, A. M., & Nell, M. L. (2008). Constructive play; A value-added strategy for meeting early learning standards. *Young Children*, 38-44.

Forman, G. E. (2006). Constructive play. In D. P. Fromberg & D. Bergen (4rd eds.), *Play from birth to twelve* (pp. 103-110). New York, NY: Teachers College Press.

Forman, G. E., & Hill, F. (1980). *Constructive play: Applying Piaget in the preschool*. Monterey: Brooks/Cole Publishing Company.

Han, S. H. & Park, J. H. (2010). Rediscovering the value of block play. *Korean Journal of Child Education and Care, 10*(2), 187-202.

Johnson, J. E., Christie, J., & Wardle, F. (2005). *Play, development, and early education*. New York: Pearson, Allyn & Bacon.

Koo, H. A. & Lee, J. H. (1998). The development of young children's constructive play: an analysis of block play. *Korean Journal of Child Studies, 19*(1).

Kostelnik, M. J., Soderman, A. K., & Whiren, A. P. (2007). *Developmentally appropriate curriculum (3rd eds.)*. New Jersey: Pearson Education, Inc.

MacDonald, S. (2001). Block play. Beltsville: Gryphon House, Inc.

Oliver, S. J., & Klugman, E. (2003). Play and learning day by day. *Child Care Information Exchange, 149*, 62-65.

Park, J. H. (2007). A study on the relationship between the quality of constructive play and young children's problem solving and on variables related to the qua lity of constructive play. Ph. D. Dissertation, University of Sungkyunkwan.

Park, J. H. & Han, S. S. (2017). Exploring the pretending elements in block play. *International Journal of Early Childhood Education, 23*(2), 23-38.

Rogers, C. S., & Sawyers, J. K. (1992). *Play in the lives of children*. Washington. DC: NAEYC.

Rubin, K., Fein, G., & Vandenberg, B. (1983). Play. In P. H. Mussen (Eds.), Vol 4. Handbook of child psychology (pp. 693-774). New York: John Wiley & Sons.

Tegano, D. W., Lookabaugh, S., May, G. E., & Burdette, M. P. (1991). Constructive play and problem solving: The role of structure and time in the classroom. *Early Child Development and Care, 68*, 27-35.

Tovey, H. (2015). Adventurous play outdoors. In J. Moyles (4rd eds.), *The excellence of play* (pp. 213-224). Berkshire: Open University Press.

Trundle, K. C. (2018). Not all play is created equal. *Child Care Exchange, 40*(2), 60-62.

Wardle, F. (2000). Supporting constructive play in the wild. *Child Care Information Exchange, 5*, 26-29.

Wellhousen, K. & Kieff, J. (2001). *A constructivist approach to block play in early childhood*. New York, NY: Delmar.

Wellhousen, K., & Giles, R. M. (2005). Building literacy opportunities into children's block play. *Childhood Education, 82*(2). 74-77.

Whitebread, D., Jameson, H., & Basilio, M. (2015). Play beyond the foundation stage. In J. Moyles (4rd eds.), *The excellence of play* (pp. 84-93). Berkshire: Open University Press.

Wood, E. (2013). Play, learning, and the early childhood curriculum. London: SAGE.