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Message from the Editor-in-Chief

Dear Colleagues,

TOJET welcomes you. This journal was initiated in October 2002 to share knowledge with researchers, innovators, practitioners and administrators of education. We are delighted that more than 650000 researchers, practitioners, administrators, educators, teachers, parents, and students from around the world had visited since October, 2001. It means that TOJET has diffused successfully new developments on educational technology around the world. We hope that the volume 19 issue 4 will also successfully accomplish our global educational technology goal.

I am always honored to be editor in chief of the TOJET. Many persons gave their valuable contributions for this issue. I would like to thank to the guest editor and editorial board of this issue.

TOJET thanks the editorial board of this issue.

Prof. Dr. Aytekin İŞMAN
Editor in Chief

Editorial Board

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A Scale Development Study for Determining Caricature Reading Skills of Students

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ABSTRACT
An achievement test was prepared to determine students' caricature reading skills. In the first draft of the achievement test, 32 test items and four choices were prepared for each question. The item analysis of the data obtained from the pre-application was made and the internal consistency coefficient (KR-20) was calculated as 0.67 for the reliability of the scale. The mean of item discrimination of the achievement test is 0.34 and the mean of item difficulty is 0.38. After the pre-application, it was decided (concluded) that the achievement test was feasible (applicable), and general application was initiated. General application was performed on 160 sixth-grade students. As a result of the item analysis, it was seen that item difficulty levels of achievement test were between 0.32 and 0.67.The mean of difficulty index of the test was determined to be 0.50. The test items, was found to be between 0.20 and 0.72. Items 2 and 6 with a value less than 0.30 were removed from the scale due to their low discrimination strength index. The reliability coefficient was calculated as 0.85. A valid and reliable 30-item assessment tool was created to determine students' caricature reading skills. Caricature reading scale has been considered as a valid and reliable assessment instrument to be used to detect the caricature reading students' skills.
Keywords: Achievement Test, Caricature, Caricature Reading, Scale

INTRODUCTION

The constantly developing and changing world has greatly influenced the materials used in educational environments. The impact of a material on the target group in an educational environment may change every single day. For this reason, individuals who are in the position of tutors exploit different materials considering the tendencies of the target audience and the characteristics of the educational environment. One of these types of materials is visual materials, whose value increases even more with the emergence of the effect of the enrichment of learning environments with multiple stimuli on learning. In Turkish language education too visual materials are used in order to enrich the learning environment and to increase the interest and participation of the students in the course. Caricatures are also among these visual materials that can be benefited from in Turkish language education.

Caricature reproduced from the word "caricare", which means overstatement and loading (Topuz, 1986);It is rich, versatile and remarkable as a visual material. Due to this feature, there are many definitions that emphasize different qualities of the caricature art in the literature: taking the humorous and remarkable aspects of the event or situation as the fundamental (Avşar, 2007), combining thought and humor and illustrating them by drawing (Akkaya, 2011); depicting people or objects in exaggeration (Kılınç, 2006), presentation of any event that concerns people and society as a subject in the form of a thought-provoking and humorous picture (TDK, 1998), the use of breaking lines such as humor, exaggeration and contrast in conveying emotions and thoughts.

When the literature is reviewed, it is seen that there is a variety of caricature definition based on the types of caricatures, as well as several caricature classifications: Kamiloğlu (2014) after dividing caricature into three as political, humorous-funny and explanatory, he states that caricature that deal with current issues and events are political caricatures. He explains that caricatures with a dominant humor aspect explain individual or social events with an allegory. He emphasizes that advertising and teaching material-oriented products are included in the field of explanatory caricatures.

Kazanevsky (2005) classifies caricatures by topic as; drawing reflecting philosophical problems of human being, criticizing the social structure of the community, and caricatures that include humor. Kabapınar's (2003) scientific classification of events cause-and-effect relationship that describes the visual elements at the macro level the question as to single or multi-stage questions, or thinking a character with balloons, consisting of a single frame or several frames, caricatures, and more than one idea discussed is in the form of concept caricatures. Depending on the elements it carries, Avşar (2007) divides the caricature into three parts as: artistic,

intellectual, and humorous. He states that it is not possible to create comic-strips without the art, ideas, and humor which he defines as the basic components of caricature.

Kar (2004) compiled the types of caricatures in his study and listed them as follows:

- Political caricatures
- Advertising-oriented caricatures
- Portrait caricatures
- Surreal caricatures
- Humor caricatures
- Surreal (absurd) caricatures
- Surreal (romantic) caricatures
- Typifying caricatures
- Caricatures with and without words
- Black humor caricatures
- Line-comedy
- Comic-strips
- Collage caricatures

LITERATURE REVIEW

THE PLACE OF CARICATURE IN EDUCATION

Numerous teaching materials are used to ensure permanent learning and to create an effective learning environment. One of these materials -even one of the most influential (Uslu, 2007)- is caricature due to its educational function. When we look at the studies related to caricature, they are used in teaching Social Studies (Tuncel, 2017), History (Avşar, 2007), Geography (Ayyıldız, 2010), Mathematics (Karaduman & Ceviz, 2018) yet the number of the studies on the use of caricature as an educational tool in Turkish language education is insufficient. When we classify the studies administered in Turkish language education, it is seen that research on the use of caricature in teaching the rules and concepts of Turkish language education has been quantitatively insufficient.There are studies that focus on demonstrating how caricature-strips (or caricatures as is stated in this study) develop vocabulary (Mürsel, 2009; Varışoğlu, Şeref, Gedik, & Yılmaz, 2014), their effect on academic success (Eker & Karadeniz, 2014), the impact of caricature-supported education on teaching literary arts (Coşar, 2005), their contribution to writing skills (Üstün, 2007), in teaching abstract subjects (Delp & Jones, 1996;Göçer & Akgül, 2018), and from basic language skills to the effect of listening and speaking skills (Şeref, Gedik, & Yılmaz, 2014).

Caricature is one of the materials frequently used in educational activities. The fact that caricature has a transdisciplinary feature is the factor in choosing caricatures as a teaching material in many different fields.
The humorous feature of the caricature is very important in terms of motivating students during educational activities. With humor, students can learn while having fun. Another feature of caricatures is that it eliminates the lack of self-confidence (Haugaard, 1973); Caricature facilitates communication and offers individuals the opportunity to express themselves better. In addition, caricature develops individuals' problem solving skills and encourages them to think critically.

In the studies carried out in the field, (Kleeman, 2006; Vogler, 2004) the contributions of caricatures to educational environments are described as follows:

- It has a facilitating feature to remember because it contains materials for different intelligence types. This feature of the caricature directly affects the permanence of learning.
- Students can improve their oral and written communication skills by adding meaning to the caricature.
- The critical approach at the center of the caricature makes it easier for individuals to approach social events with a critical point of view and to become conscious about critical thinking.
- With caricatures, individuals can also gain aesthetic pleasure while exploring their interests.
- By embodying soft information, caricatures both ensure the continuity of learning and shorten the time spent on learning.
- Caricature emerges as a major element in improving courtship skills and controlling cognitive understanding..
- Caricatures directly affects students' thinking skills and creativity.
- As an educational material, caricature offers the opportunity to bring popular culture outcomes and current events to the classroom.
- Caricatures can be used to understand the subject, as well as to prepare for the lesson or determine whether students are ready and draw attention to the subject.

Considering the specified characteristics of the caricature, it is one of the original materials that are very effective in terms of understanding and organizing information and relating different pieces of information to each other.

ASSESSMENT OF APPRAISAL

An assessment for appraisal is a type of assessment that is used to determine whether at the end of a program individuals are able to achieve the goals set initially. As a result of this evaluation, the instructor determines the success level of the student and the program. Achievement tests, final tests, proficiency and expertise tests are among the tests that are used to determine the success levels of the students in assessments. Achievement tests used in assessments are performed to find the difference between an instructional program's input and output skills or behaviors. Achievement tests are among the most commonly used and valued assessment techniques known by most teachers in the education and training process. Through the achievement tests, teachers can determine the students' achievement level, the level of learning of the subjects, and the competence of the autonomous cognitive field skills.

METHOD

This research was conducted with the aim of developing a measurement tool to determine individuals' caricature reading skills.. According to Ercan & Kan (2004), measurement is whether the object has a specified property, if so, the degree of it is observed and the results are expressed in numbers and symbols. It is extremely important that the asset concerned is measurable in order to evaluate the asset under consideration in a scientific way. The accuracy and appropriateness of the evaluations and decisions to be made on individuals, events or objects subject to the measurement depends on the measurement results on which the decisions are based and the appropriateness of the criteria. For this reason, standardization of the scale and measurement instrument is very important, so item analysis or similar applications needs to be done.

In this study, the validity and reliability procedures of the scale, which was designed as an achievement test in order to evaluate students' caricature reading skills, were performed.

STUDY GROUP

The study group consists of sixth grade students from a secondary school in Afyonkarahisar. The pre-application was carried out with 59 students, 27 girls and 32 boys. The working group of the general practice consists of 160 students, 77 girls and 83 boys.

Table 1. Distribution of Students in the Working Group (by Gender)

Study Group	Gender	N	N(total)
Preliminary Application	**Girl**	27	59
	Boy	32	
General application	**Girl**	77	160
	Boy	83	

SCALE DEVELOPMENT PROCESS

In order to determine the levels of the students, a caricature reading scale was prepared by the researcher online as a data collection tool. During the preparation process, the following measurement tool development stages were followed:

- Determining the purpose of the test
- Determining the curriculum standards to be measured and creating the specification table
- Determining the number and type of items
- Determining the duration of the test
- Writing test items
- Getting expert opinion
- Piloting the test
- Item analysis and selection
- Finalizing the test

While preparing the test items, all activities related to visual reading skills in the 2018-2019 academic year Turkish language course textbooks of all grades were examined. Thus, it was aimed to ensure that the question styles included in the test items are compatible with the activity styles that the students are accustomed to in the

curriculum. The theoretical background of the measurement tool to be developed has been created based on a literature review.

PREPARING THE SPECIFICATION TABLE

During the creation of the test items on the scale, the curriculum standards on caricature perception mentioned in the "caricature literacy module," prepared by the researcher himself, were taken into consideration. Özgüven (2012) states that content validity should be taken into consideration in the development of tests, such as achievement tests, and completion tests, aiming to reveal the difference between the skill level at the entrance and the skill level at the exit. Attention was paid to the balanced distribution of the test items for the content validity of the caricature reading skill achievement test developed within the scope of the research to the standards in the curriculum specified in the "caricature literacy module." Careful attention has been paid to make sure that each of the test items actually measures the behavior it was designed to measure. Accordingly, the specification table was prepared. Through the specification table, it is possible to ensure that strong items with high power to represent the universe are included in the test.
The specification table is presented below:

Table 2.Caricature Reading Skills Achievement Test Specification Table

Learning Area	Goal	Related Standards in the Curriculum	Question No
Caricature Perception	**Recognizing and analyzing the structural features of caricatures**	Explains the art elements and design principles in visual materials.	1
		Explain the laws governing perception used in the perception of visual materials.	2
		Explains the perception areas used in the perception of visual materials.	3
		Explain the effect of perception fields used in visual material perception on visual material perception.	4
		Explains the breaking lines forming the caricature.	5
		Explains the types of caricatures according to their application.	6
		Distinguishes the types of caricatures according to their application.	7
		Explains the types of caricatures according to the expression style.	8
		Distinguishes the types of caricatures according to the expression style.	9
	Questioning the contents of the caricature	Explains the effect of context on the content of the caricature.	10
		Questions the caricature formed by individuals or groups with different socio-cultural characteristics in the context.	11
		Realizes the effect of different perspectives (by the artist) on the visual material's message.	12
		Analyzes the effect of prejudice on caricatures of similar theme.	13
		Compares the message of the caricature with her own life.	14
		Realizes that effect of caricature varies according to the variables.	15
		Questions the consistency of a caricature appropriate to their level.	16
		Explains the effect of popular culture on contemporary caricatures	17
		Inquires messages in advertising-oriented caricatures.	18
	Questioning the origin of the caricature	Explains the manipulation that emerges from the source of the caricature.	19
		Discusses the reliabilityof the source on which the content in the caricature is based.	20
		Questions the interventions carried out by the source for propaganda and persuasion.	21
		Complies with ethical principles when accessing and using caricatures.	22

Caricature perception, comprehension, interpretation, evaluation	Explains the effect of using visual material on understanding the text.	23
	Determines the subject of caricature.	24
	Reveals the main idea / main emotion of caricature.	25
	Relates the caricatures that produce similar messages.	26
	Arranges the caricatures which have the characteristics of a comic strip in the order of occurrence.	27
	Explains the implicit meanings in caricatures.	28
	Analyzes the relationship between text and caricature.	29
	Perceives and interprets emotions, thoughts, information and events presented in caricatures.	30
	Analyzes the caricature according to the period and conditions in which it was produced.	31
	Determines the target audience that the caricature addresses.	32

In addition to the researcher, a visual communication design expert and a visual arts teacher worked together on the preparation of the test items and the preparation of appropriate images for the items. Some of the caricatures, which are considered suitable for the test items by scanning various sources and thus selected, were edited by the researcher with the web 2.0 tool named "Toondo". Some of the caricatures were drawn and made suitable for the research by a student, who had similar characteristics with the target audience in accordance with the pedagogical approach. It was decided to submit the test online taking into account the reasons such as easy achievement of the participants to the test, the caricatures used in the test are not adversely affected by factors such as printing, the ease of storing the answers, the control of the test if needed, and the ease of making the necessary analyses. Prepared items were processed into Google Form and students' responses to the test were also stored in Google Form database. Participants reaching the caricature reading test on the “Google Form” via the web, see the welcome screen with information about the test when they visit the site for the first time.

In preparing the screen view of the test, special attention was given to the caricatures, texts, visual design principles and elements on the screen, where the participant could easily see them and to be of a certain quality. During the answering of the test, choices were given under the test items regarding its use and students were asked to mark the correct answer. Again in the answering of the test, the screen was designed to advance with student approval, in terms of recognizing individuality to the participants. At any time during the test, the participant returned to the item if he / she wanted and changed its previously marked choice. When all the test items were answered, the participant was greeted by a closing screen and a message “your responses have been recorded” is displayed on the screen. A student, who completes the test can no longer see the items and answers related to the test. Responses and response statistics of participants can be viewed from the admin panel of “Google Form”. Each participant's response to each test item is separately stored.

In the first draft of the achievement test designed by the researcher, 32 test items were produced according to the indicator table prepared for a total of 32 standards in the curriculum on the field of caricature reading, and four choices in accordance with the level were arranged for each question. The prepared draft form was presented to the experts’ opinion in terms of content validity. During this process, the opinion of the field experts, who have a first-degree relationship with caricature literacy, was taken into consideration. At this point, three faculty members from Uşak University, Institute of Social Sciences Turkish Education Department, one faculty member from the Department of Visual Communication Design at Dumlupınar University, Faculty of Fine Arts, one Visual Arts teacher and two Turkish language teachers were consulted. The experts in the field of Turkish language teaching examined the test items both in terms of language and in terms of compliance with the standards in the curriculum. In addition, the Visual Communication Design Department expert examined the suitability of the test items for the standards in the curriculum, and the visuals used, in terms of design, and presented their opinions. Expert opinions on the test items are about; whether the test items are appropriate (if not the experts wanted corrections), the comprehensibility of the test items and their appropriateness for the participants.

The similarity / difference between the opinions of experts was compared for each question regarding the suitability of the test items in accordance with the opinions of the experts, and the content and structure validity of the scale was ensured. As a result of the expert opinion, a pre-application form with 32 questions was developed.

Prior to the application on the target sample, in order to make an observation-based questioning of the validity and reliability of the test, to check the clarity of the instructions (technical terms, etc.) and the clarity of the test items, to evaluate the answering duration and the application style in general, a preliminary application was made on a group of 59 sixth-grade students representing end-groups with similar characteristics (academic success, economic condition etc.) to the target group of the study.

The preliminary application has facilitated the researcher's work by providing considerable labor and economic benefits. In that preliminary application, test items, instructions and choices that were not understood by the participants, and the caricature drawings used were evaluated and response time of the participants was noted. The Caricature Reading Skill Achievement Test lasted an average of 35-40 minutes. During the test process, necessary observations were made, the students' understanding of the questions was monitored, and no negative situation was encountered. The item analysis of the data obtained as a result of the pre-application was made and KR-20 internal consistency coefficient was calculated for the reliability of the scale. After determining that the achievement test was feasible at the end of the preliminary application, general application has been started in order to obtain the most accurate structure of the concept, feature and skill that was intended to be measured and to obtain the necessary data in a healthy way.

In the general practice carried out in the second term of the 2018-2019 academic year, the necessity of applying to a group with similar characteristics, which is one of the aims of scale development, was taken into consideration and the achievement test prepared to calculate the reliability coefficient of the Caricature Reading Skill Achievement Test was studied in a public school in Afyonkarahisar. It was applied to a group of students who saw. The voluntary basis and heterogeneous distribution were taken into account in the formation of the working group. Easily accessible sample selection technique was used. As the variance applied to the Scale decreased, the scale's capacity to represent the structure decreased, Pituch and Stevens' (2006) formula of 5-20 people per variable (item) was taken into account in the trial application of the scale and the scale was applied to 160 participants. Scale development analyses were started with the number of N = 160 samples.

DATA ANALYSIS

Preliminary and general application data were analyzed using Microsoft Excel 2010. The scores obtained from the test were calculated from top to bottom and scores of 27% of the upper group and 27% of the subgroup were determined. For each question, the number of correct answers was determined for forty-three each students in the upper and lower groups. Since the measurement tool was applied once to the sample group, single-application methods were used. Item analysis was performed to check whether a high reliability and validity scale was obtained or not, for the standards in the curriculums to be measured. Since the measurement tool was applied once to the sample group, single-application methods were used. Item analysis was performed to check whether a high reliability and validity scale was obtained or not, for the standards in the curriculums to be measured. When item difficulty (p) is evaluated, the closeness of p value to 1 indicates the ease of that test and the closeness to 0 indicates difficulty. Tests with a p value between 0.30 and 0.70 are considered to be of medium difficulty, whereas tests with a p value less than 0.30 are considered difficult and tests with a p value greater than 0.70 are considered easy (Güler, 2019). Another analysis conducted in item analysis is the strength of item discrimination (r). Item discrimination is the level of the test items' ability to distinguish between those who know and those who do not. The test item has a value between -1 and 1 for distinguishing purposes. Test items with an R value of 0.40 or greater are very good in terms of discrimination, items between 0.30 and 0.39 are good, items between 0.20 and 0.29 need to be corrected, items with 0.19 and below are accepted weak because of their incompetency in discrimination (Baykul, 2010).Finally, reliability coefficient was calculated in item analysis. Kuder-Richardson 20 (KR-20) formula was used to calculate the reliability coefficient.

FINDINGS

Item analysis helps the researcher by revealing the usefulness of the test items prepared by the researcher according to the determined criteria. With item analysis, the researcher realizes the errors in the scale he has prepared and can make the corrections if required. Item analyses (item difficulty and item discrimination strength), and the reliability coefficient for the preliminary application are given in Table 3:

Table 3.Quantitative Data on Preliminary Application

Caricature Reading Skill Achievement Test	Numerical Values
Number of questions	32
Number of people applied	59
Mean of item discrimination (rJx)	0,34
Mean of item difficulty (pj)	0,38
Kuder Richardson-20 Reliability Coefficient	0,67

Item analysis of the data obtained from the preliminary application was performed and the internal consistency coefficient KR-20 was calculated for the reliability of the scale. When Table 3 is examined, the mean of item discrimination of the achievement test at the end of the pre-application is calculated as 0.34 and the average of item difficulty is 0.38 and the reliability coefficient (KR-20) is 0.67.

At the end of the preliminary application, the achievement test was found to be feasible. As a result of the general application, which was made after the pre-application, item analysis (item difficulty and item discrimination) of the data obtained was performed and then KR-20 internal consistency coefficient was calculated for the reliability of the scale. The data obtained are shown in Table 4:

Table 4. Item Analysis Related to General Application

Item Name	Item Difficulty (pjx)	Item Discrimination (rjx)
1. Item	0,37	0,47
2. Item	0,35	0,28
3. Item	0,45	0,53
4. Item	0,64	0,49
5. Item	0,48	0,35
6. Item	0,45	0,21
7. Item	0,64	0,44
8. Item	0,52	0,49
9. Item	0,53	0,47
10. Item	0,42	0,51
11. Item	0,62	0,44
12. Item	0,55	0,44
13. Item	0,58	0,51
14. Item	0,55	0,53
15. Item	0,33	0,56
16. Item	0,43	0,58
17. Item	0,51	0,70
18. Item	0,67	0,47
19. Item	0,55	0,49
20. Item	0,56	0,70
21. Item	0,40	0,51
22. Item	0,58	0,60
23. Item	0,48	0,72
24. Item	0,56	0,51
25. Item	0,55	0,67
26. Item	0,47	0,65
27. Item	0,51	0,60
28. Item	0,63	0,42
29. Item	0,48	0,53
30. Item	0,48	0,53
31. Item	0,42	0,47
32. Item	0,50	0,44

As a result of item analysis, it was seen that item difficulty levels of caricature reading skill achievement test ranged between 0.32 and 0.67. The average difficulty of the test was determined as 0.50. According to these results, it can be said that caricature reading skill achievement test is of medium difficulty. Another analysis conducted in item analysis is the power of item discrimination (r). The test item has a value between -1 and 1 for distinguishing purposes. Test items with an R value of 0.40 or greater are very good in terms of discrimination, items between 0.30 and 0.39 are good, items between 0.20 and 0.29 need to be corrected, items with 0.19 and below are accepted weak because of their incompetency in discrimination (Baykul, 2010). After the item analysis for the caricature reading skill achievement test, the discriminative strength index of the test items was found to be between 0.20 and 0.72. Since the item discrimination average is 0.51, it can be said that the scale is sufficient in terms of discrimination. Due to the low discrimination strengths of items 2 and 6 with a value less than 0.30, it was decided to remove these two items from the scale. Finally, reliability coefficient was calculated in item analysis. Kuder-Richardson 20 (KR-20) formula was used to calculate the reliability coefficient. According to

this formula, the reliability coefficient of the caricature reading skill achievement test was calculated as 0.85. Item analysis showing the numerical values of the general application is summarized in Table 5:

Table 5. Numerical Data Related to General Application

Caricature Reading Skill Achievement Test	Numerical Values
Number of questions	32
Number of people applied	160
Mean of substance discrimination (rJx)	0,51
Mean of item difficulty (pj)	0,50
Kuder Richardson-20 Reliability Coefficient	0,85

When Table 5 is examined, the average item difficulty index is 0.50, which indicates that the test consists of questions at the intermediate difficulty level. The fact that the item discrimination is 0.51 on average indicates that the test actually has a high validity at the point of distinguishing students. As a result of the general application of the achievement test, it was found to be of moderate difficulty and to have high discrimination strength. The internal consistency coefficient (KR-20) was calculated as 0.85. The fact that this value is above 0.70 indicates that it is positive in terms of reliability in addition to its validity (Büyüköztürk, 2018). Regarding these results, it can be stated that the items included in the caricature reading skill achievement test are compatible with the whole test and in terms of difficulty and discrimination level, the test is of a moderate difficulty and discriminative.

CONCLUSION

In the 32-item achievement test developed to measure students' caricature reading skills, a specification table was prepared for the balanced distribution of test items to the standards in the curriculum in the “caricature literacy module” in order to ensure content validity.. Following the specification table, 32 test items were formed according to the specification table designed for a total of 32 standards in the curriculum on the caricature reading field, and four choices were prepared for each question. The draft form prepared was submitted to the expert opinion for content validity. Content and structure validity of the scale was ensured with expert opinion. As a result of the expert opinion, a pre-application form with 32 questions was developed. Prior to the application on the target sample, in order to make an observation-based questioning of the validity and reliability of the test, to check the clarity of the instructions (technical terms, etc.) and the clarity of the test items, to evaluate the answering duration and the application style in general, a preliminary application was made on a group of 59 sixth-grade students. The average of item discrimination index as a result of the pre-application test was calculated as 0.34, the average of item difficulty index was 0.38 and the reliability coefficient (KR-20) was 0.67. At the end of the preliminary application, it was decided that the achievement test was feasible, and the general application was started in order to obtain the most realistic structure of the concept, feature and skill that is aimed to be measured. Item analysis was performed in order to check whether a high reliability and validity scale was obtained for the standards in the curriculum to be measured for general application. As a result of item analysis, it was seen that item difficulty levels of caricature reading skill achievement test ranged between 0.32 and 0.67. The average difficulty index of the test was 0.50. After the item analysis for the caricature reading skill achievement test, the discriminative strength index of the test items was found to be between 0.20 and 0.72. The mean of item discrimination is 0.51. Due to the low discrimination strengths of items 2 and 6 with a value less than 0.30, it was decided to remove these two items from the scale. Finally, the reliability coefficient was calculated by Kuder-Richardson 20 (KR-20) formula. According to this formula, the reliability coefficient of the caricature reading skill achievement test was calculated as 0.85. After the necessary corrections based on the results of item analysis, the 30-item test consisting of 1 item to remember, 13 to understand, 9 to analyze and 6 to evaluation and 1 to create; has taken its final shape (See appendix A). After all these validity and reliability procedures, it can be stated that the caricature reading scale is a valid and reliable measurement tool that can be used to determine the students' caricature reading skills.

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Appendix A

6th Grade Caricature Reading Skill Achievement Test

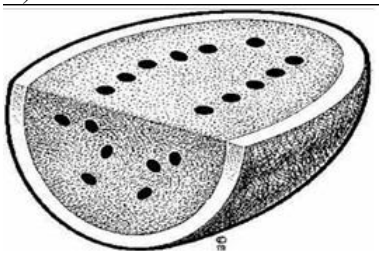
Dear Students,

This Study was designed to determine your cartoon reading skills. Please read all items carefully and reply. This is not an exam or assessment tool for your Turkish course. Your answers to these items will be used for scientific purposes only. Thank you for your contribution to the research.

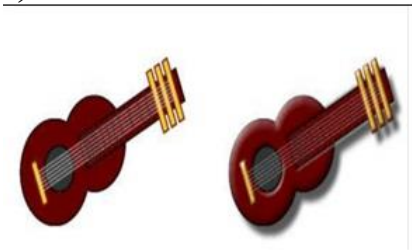
Dr. Kadir KAPLAN

1- Visual design elements and principles are the principles necessary for a design to be more comprehensible, clear and clearly perceived by the individual. Which of the following pairings is incorrect in terms of visual design element principles?

A) POİNT



B) SHAPE



C) TYPOGRAPHY

Türkiye Cumhuriyeti
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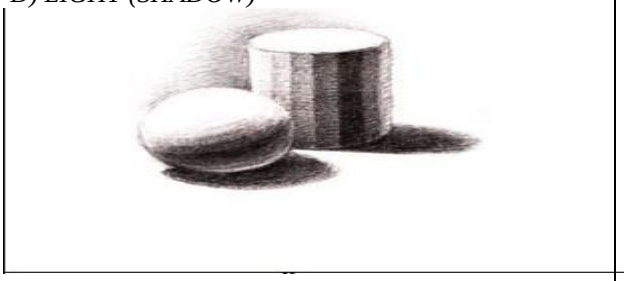
D) LIGHT (SHADOW)

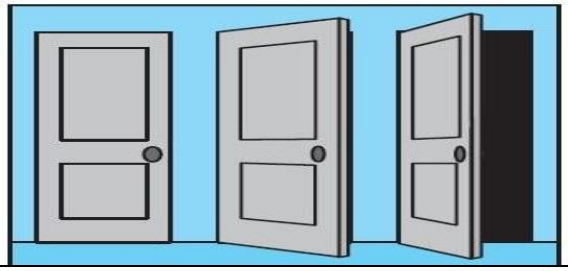


2- Which of the perception field matches played a role in the perception of the visual material given below is wrong?

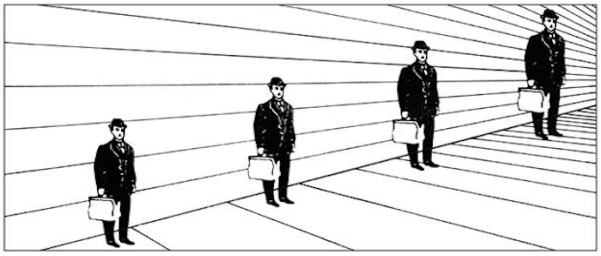
A) Magnitude Invariance

B) Color Invariance

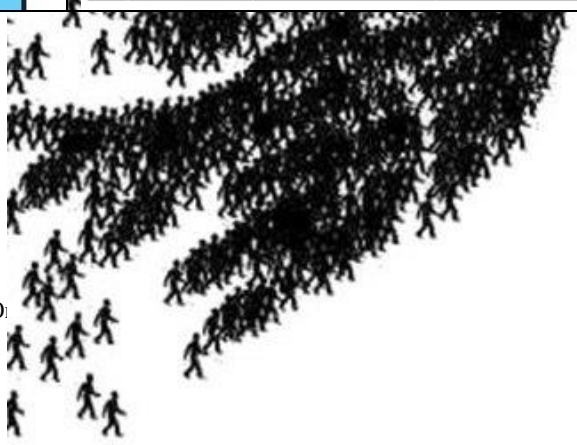
C) Shape Invariance



D) Brightness Invariance

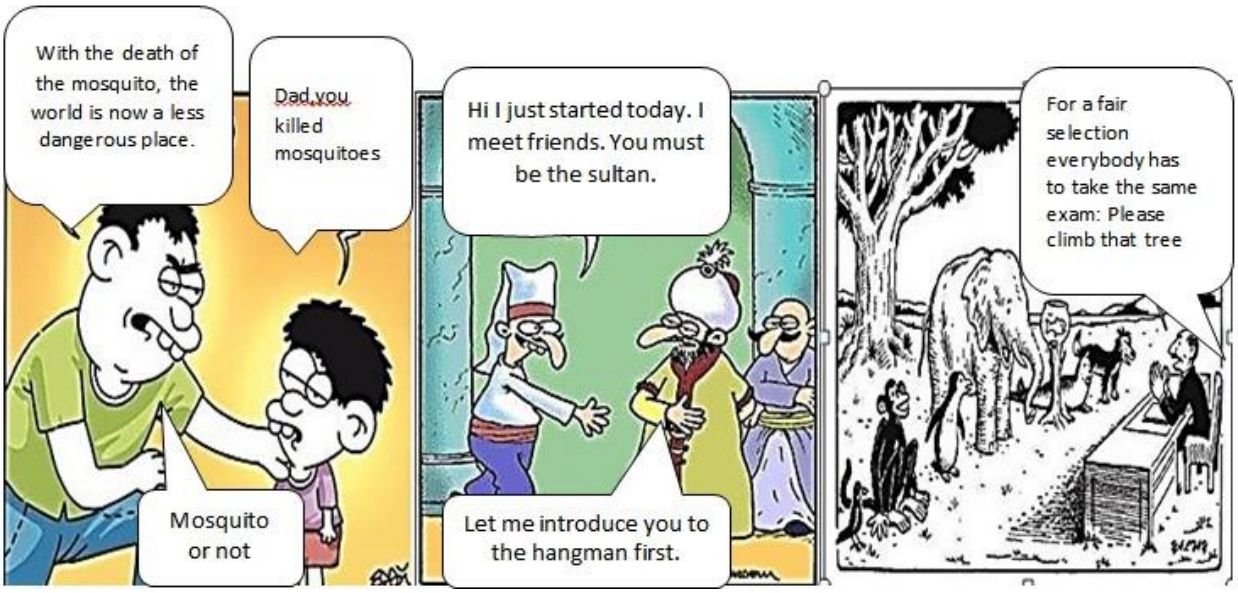


3- Hundreds of people who look at the same caricature at the same time may not see the same thing, even though they look at the same



caricature. Some people looking at the material on the side see people gathered at some point, while others see pigeons with olive branches in their mouths. What area of perception does this explain that plays a role in the perception of visual material?

A) Detection Stability
B) Invariance in Perception
C) Color Invariance
D) Selective perception

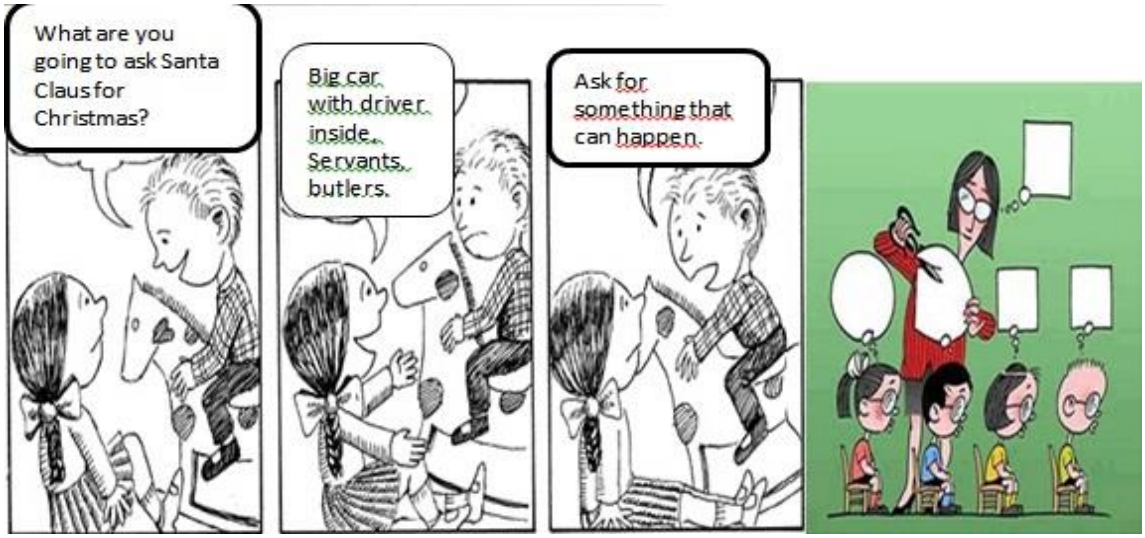


4- From the above caricatures, identify the lines of break in the caricature.

A) Surprise-Humor-Criticism
B) Education-Political-Social
C) Color-Black-White / Mixed
D) Humor-Opposit-Exaggeration

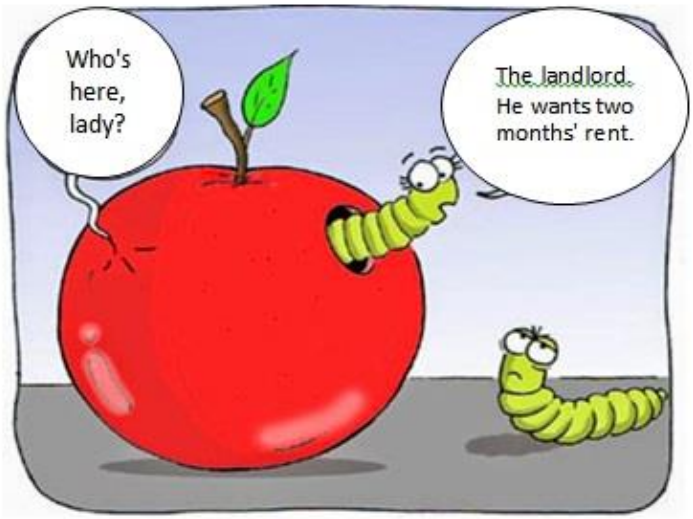
5- What kind of caricature is given on the side according to its application?

A) Series
B) Vignette
C) Single Frame
D) Tape



6- Which of the following is one of the caricatures used according to the expression style?

A) Black / White-Color B) Written-Unwritten C) Single-Band D) Humor-Exaggeration

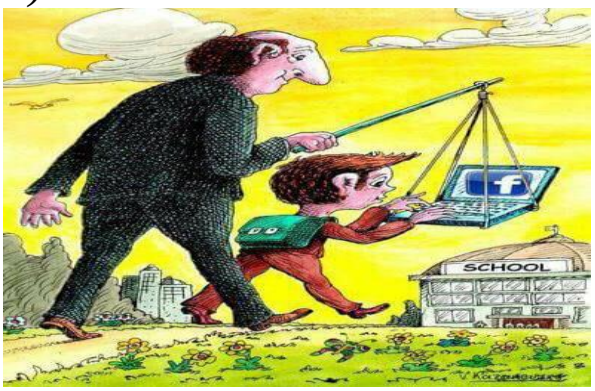


7- Find the type of caricature given according to its application and expression.

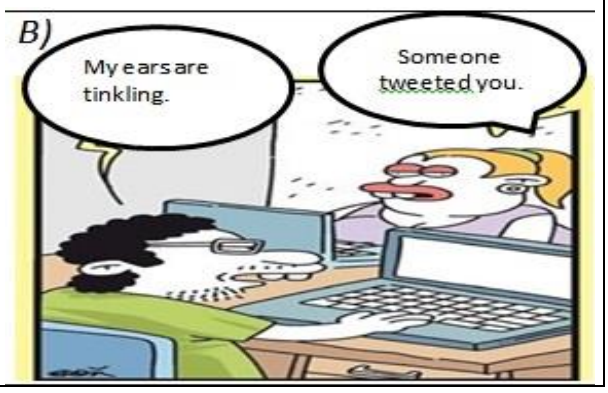
A) Single Frame-Written
B) Single Frame-Unwritten
C) Unwritten-Single Frame
D) Written-Single Frame

8- Which of the following caricatures that reveal the impact of technology on people is not suitable for Eren born in 2011?

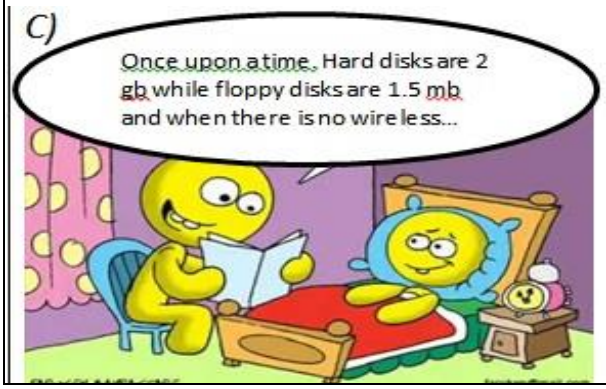
A)



B)

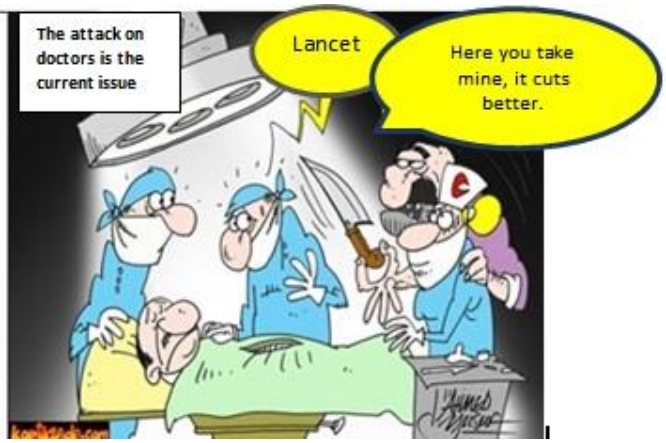


C)



D)

9- What is the reason for the content difference in the two caricatures, the subject of violence against healthcare workers?



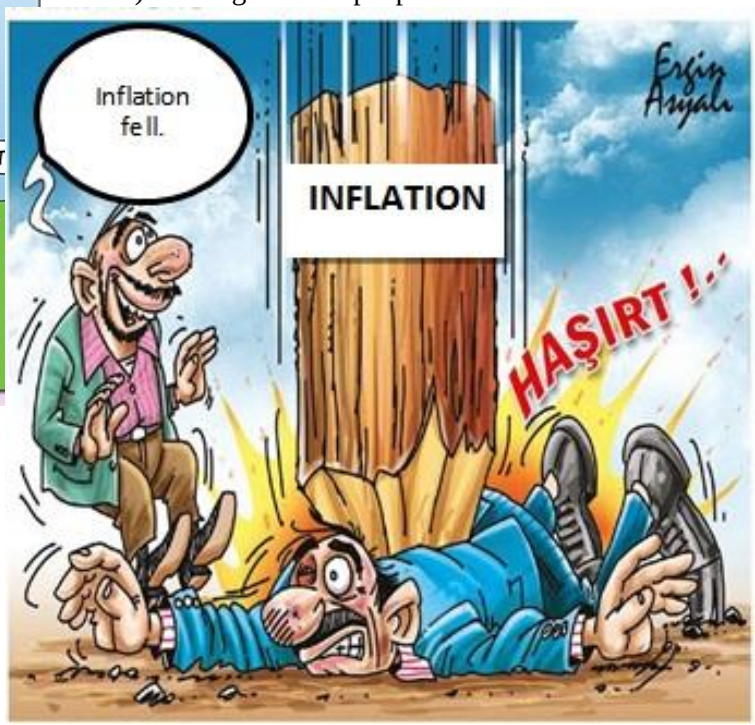
A) Being the product of individuals or groups with different socio-cultural characteristics.
B) The difference in caricature technique.
C) Preparation of different dates.
D) Caricature variety flexibility.

10-Aylan is a 3-year-old refugee. From Turkey to the Greek Islands lost their lives while trying to pass. The painful event in Bodrum has affected the whole world. Two caricatures were published after the event. The first caricature in Turkey, the second caricature was published in France. In the caricature published in France; If Aylan Bebek had grown, he would have been a pervert who harassed us. What is the reason why the two caricatures interpret the same event differently?

A) Event to be experienced in Turkey
B) Turkish people being emotional
C) Difference in the origin of the caricaturist
D) Differences in the geographical characteristics of the two countries

11- French caricaturist, before going to Turkey and the Turkish barbarians despite the absence of any Turkish friends (coarse, primitive) has revealed that the right draw caricatures. French caricaturist draws the caricatures two years after coming to Turkey rough reality of the Turkish people will see that being a nation to handle and upset. What could be the reason for the French caricaturist?

A) French caricaturist training
B) Dominance in Turkey's political history
C) Prejudiced approach to the situation
D) Loving his own people



12- Fırat sees the following caricaturecaricature on the economy page of the newspaper. First he is happy to see inflation falling; but then recalls that his father had regularly reduced his allowance for 4 weeks. He did not believe that the inflation in the caricature fell. What is the reason that the Euphrates made this decision?

A) Comparing the accuracy of the message in the cartoon with his daily life
B) Increase in unemployment rate
C) Error in caricature technique
D) Method of application

13- To prepare for a magazine publishing a caricature themed freedom to continue life in Turkey is required. Which of the following drawings do you not include in the caricature you will send to the magazine, which is a readership of Turkish citizens and individuals aged 30-40?

A)

B)

C)

D)

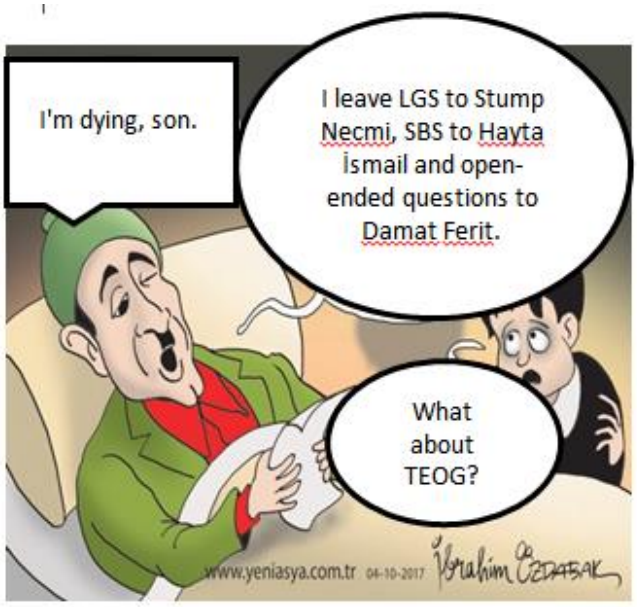
14- One day Muhsin meets his friend on the road and the dialogue presented between them is experienced. Muhsin On top of that, when questioned the accuracy of the information given by the friends get the results of the research conducted by the Turkey Statistical Institute. He sees the truth is not what his friend says. What is the most comprehensive judgment that can be drawn from this situation where Muhsin lived?

A) Eat with friendly, drink inside but don't shop.
B) The truth is unique. One has to trust his friend.
C) Technology can have negative effects on people.

D) The information claimed to be adopted by the majority must be verified.

15- What is the reason why the Hulk is used in advertising-based caricatures?

A) The natural relationship between the Hulk and the band-aid
B) Hulk's frequent injuries in his daily life
C) Show Hulk band-aid for sale (reference)
D) Hulk's being a giant



16- It is seen that caricaturists periodically concentrate on certain subjects and publish caricatures on similar subjects. For example, since the date of the exam is approaching recently, "LGS" has appeared in almost all newspapers and magazines. How can this be explained?

A) Contains a difficult process
B) To be known and followed by everyone
C) LGS affects parents
D) Changing the exam

17- A computer company outperformed other companies in desktop computer sales in the first quarter of 2019. The difference between the second company and the number of sales is only 3. The company announced this information in the caricature on the side. Which of the following is not one of the directions that the company makes by hiding that information and not providing information in the caricature?

A) Sales information for the first quarter of 2019
B) Sales information is for desktop computers
C) Numerical difference in sales information with the second company
D) Year of establishment

18- Which of the following is important in the perception of the caricature given the dialogue between the people in the caricature?

A) Contact
B) Air pollution
C) Technology

D) Verifying Information

19- What is the effect of the caricature on the side?

A) Persuasion
B) Information
C) Offering Options
D) Increasing Interest in Print Media

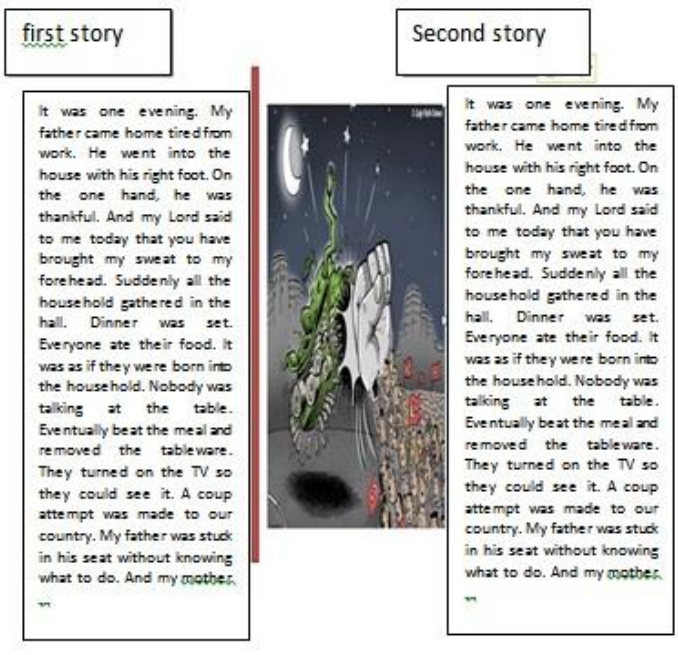
20-

Muhammed Can, a student of Hamidiye Secondary School, deals with caricatures and draws very successful caricatures. One day, he shows a caricature to his friend. His friend loves the caricature and takes a picture of it. A few weeks later, Muhammad Can, who wandered through social media, sees that his caricature is shared by his friend on his own page. He is very happy at first, but when he looks carefully, he is very upset when he sees that his signature is clipped in the lower right corner of the caricature. What is the cause of Muhammad's upset?

A) Sharing Caricature on Social Media
B) Sharing without permission
C) No Value to Art
D) Copyright Truncation

21- Ömer Halis loves to read books. Ömer Halis reads two stories before going to bed last night. The subject of two stories he read is "Love of the Fatherland". The author is also a partner; However, Ömer Halis understood the second story better than the other one and answered his questions more easily. What could be the reason for this?

A) Different Author
B) Caricature Support
C) Understanding the Language
D) Low Number of Foreign Words



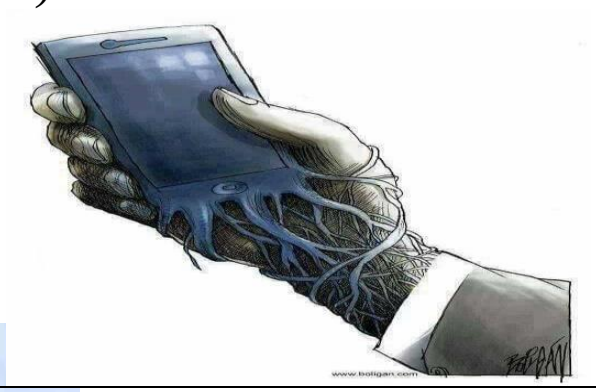
22- Oktay suffers from time to time in identifying the subjects of caricatures. Help Oktay by finding out which of the following unwritten caricatures is different.

A)

B)

C)

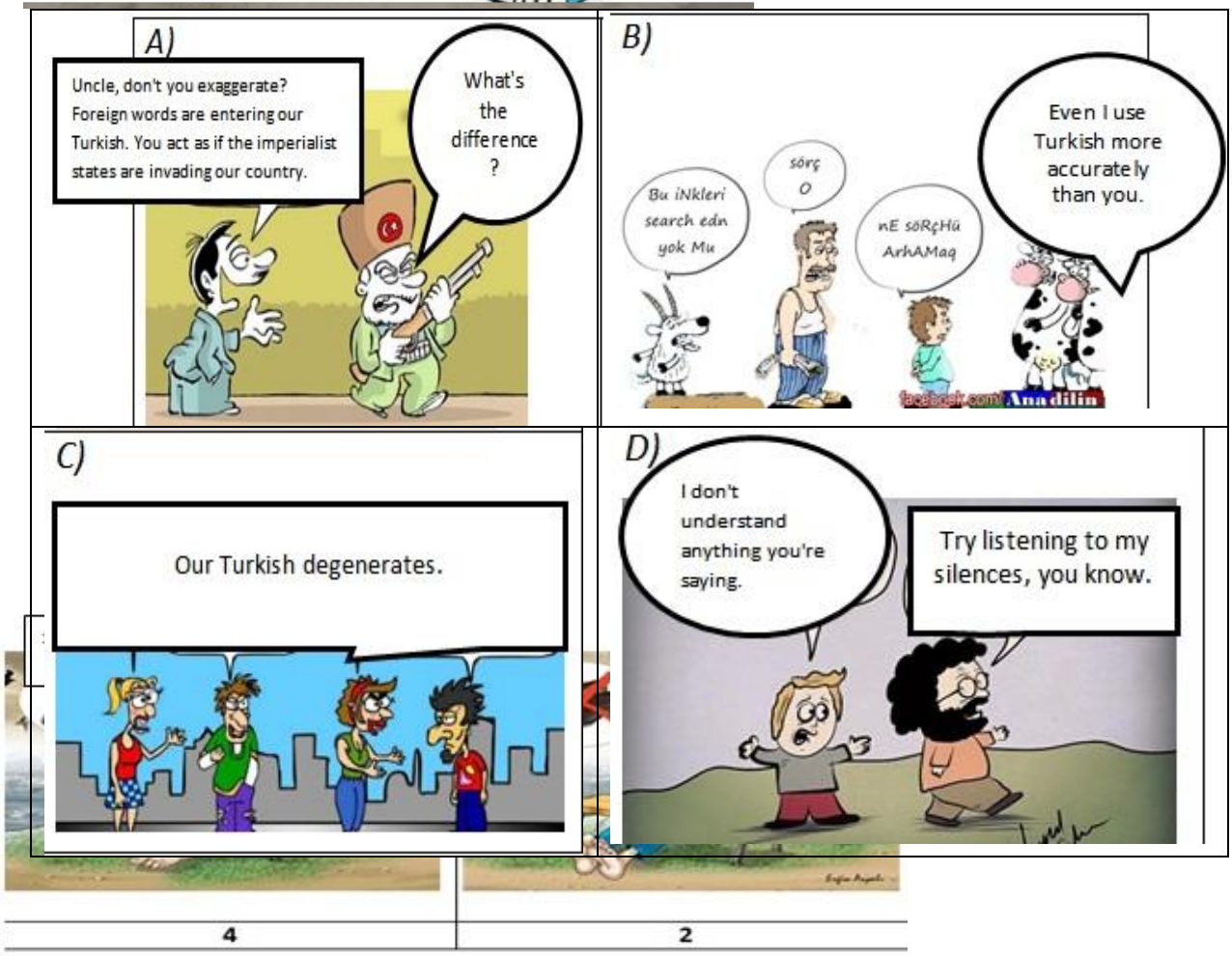
D)

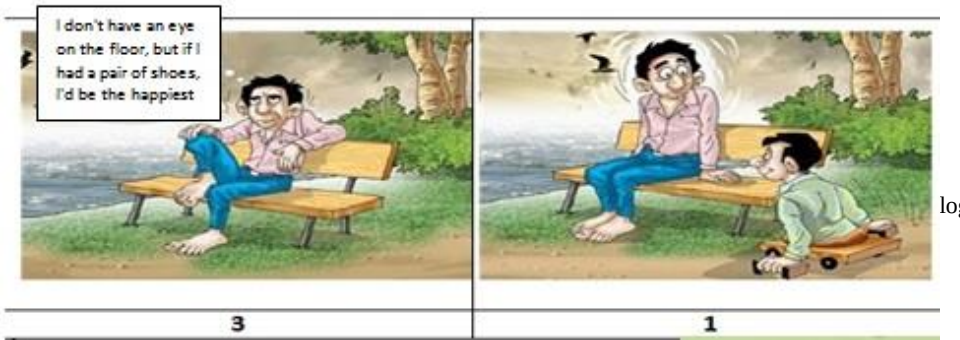


23- The aim of the caricaturist is; is to open a discussion of the things that go wrong by looking critically at life. Find the main idea of the caricature below.

A) You must submit to the law of nature.
B) We should protect animals.
C) Never give up, struggle is hope.
D) You shouldn't trust everybody.

24- Yunus Emre teacher shows the caricature on the side as an example to save Turkish from the influence of foreign languages and asks his students to make caricatures with similar messages. Which of the following caricatures is not one of the caricatures Yunus Emre wants?





25- Tuğrul confuses the order of his brother Çağrı's caricature for him. Help Tuğrul by

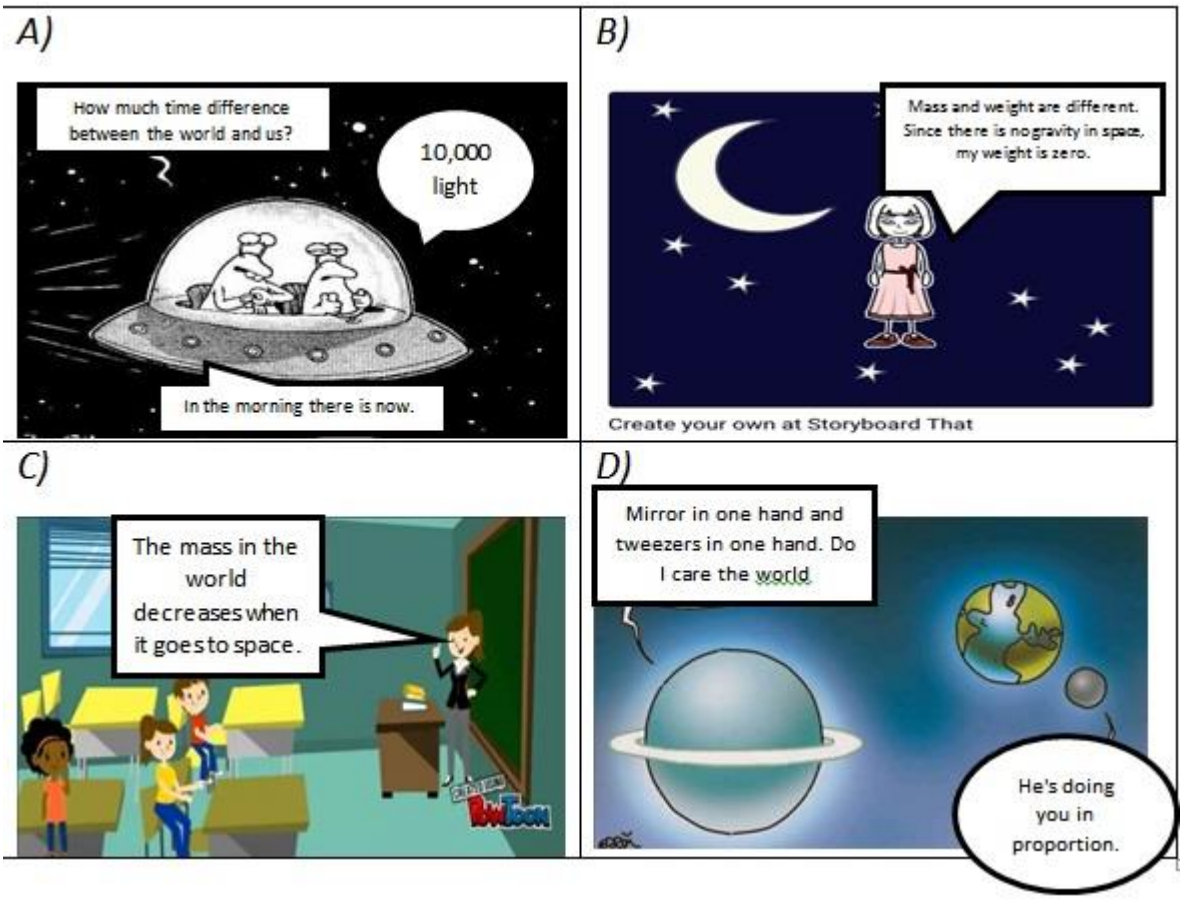
arranging the caricatures that are given in mixed form in order of formation.

A) 3-4-1-2
B) 1-3-4-2
C) 3-4-2-1
D) 1-3-2-4

26- Meaning in which a second meaning is obtained outside the given meaning is called implicit meaning. What are the two meanings to be drawn from the given caricature?

A) Pigs are cowards-wolves are brave.
B) The wolf is Muslim - the pigs survived because Muslims did not eat pork.
C) The wolf gave salute-The pigs did not receive the salute.
D) The wolf has greeted - he can speak among the animals.

27- The mystery of space has been the reason people have admired the night sky since the dawn of time. These fascinating formations in distant lands will continue to excite both astronomers and us with their secrets for many more years. Who knows, maybe one day we'll go to one of them and settle down.
Which of the following caricatures is not relevant to this text?



28- Based on the main idea of the given caricature, which of the following cannot be reached?

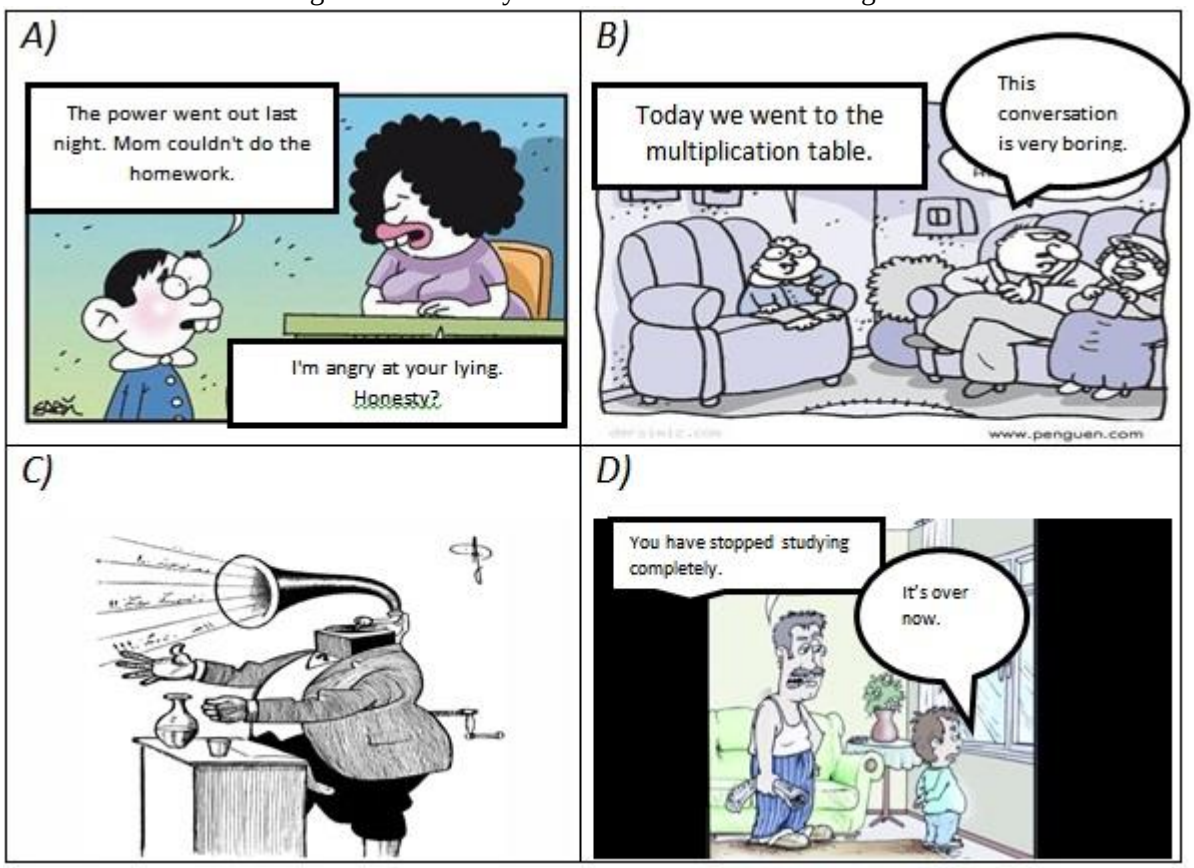
A) Human is also involved in the harm done to nature.
B) Excessive and uncontrolled concretization destroys trees.
C) If we raise people's awareness, we can protect nature.
D) Nature is disappearing by human hand.

29- Alparslan was born in 1990. Last year, he went to caricature school and studied caricature. One day he finds a magazine while he is reading books from his father. In one of the magazines he finds a caricature of the Ottoman Empire;

however, they have problems in interpreting and evaluating the caricature. What is the reason of this?

A) Since the evaluation was not made considering the years of the caricature
B) Since the assessment is not objective
C) Because different people are involved in the evaluation process
D) Because evaluation skills are not improved

30- Which of the following caricatures may not be suitable for students aged 9-10?



Applying Mall to an EFL Listening and Speaking Course: An Action Research Approach

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ABSTRACT
The study adopted an action research approach to investigate mobile-assisted language learning (MALL) teaching and learning processes in an English-as-a-foreign-language (EFL) listening and speaking course at a Chinese university. The study participants were 61 students majoring in business English. For this study, an English-learning application, Keke, was integrated with MALL exercises. Data were collected using questionnaires, reflective journals, interviews, and pre- and post-study proficiency tests. The results of two action research cycles revealed that students' attitudes toward MALL listening and speaking practices became more positive after certain changes were made to the intervention in Cycle 2; these changes included various types of mobile-assisted exercises, enhancements for teacher monitoring, and the incorporation of an online learning management application. Students made significant progress in English listening, but not in speaking. This study, therefore, has pedagogical implications for the use of MALL in facilitating EFL listening and speaking education.

KEYWORDS: MALL, EFL listening and speaking, Action research

INTRODUCTION
Training in English listening and speaking is essential for facilitating EFL learning because these two skills are interrelated and work together to foster effective oral communication (Liu & Chu, 2010; Sadiku, 2015). However, EFL learning contexts may lack opportunities for verbal and aural practice due to factors such as a lack of English contexts and good spoken English examples, as well as heavy reliance on traditional teaching methods (Hwang, Shih, Ma, Shadiev, & Chen, 2016). So far, listening and speaking skills still pose great challenges for EFL learners (Andújar-Vaca & Cruz-Martínez, 2017). To tackle these problems, mobile-assisted language learning (MALL) can be utilized in listening and speaking courses. In a review article, Kukulska-Hulme and Viberg (2018) suggest that MALL can provide many affordances, such as flexibility of use, personalization, active involvement, timely feedback, and self-evaluation. MALL can also positively affect motivation, learner attitudes, engagement, and mutual encouragement. Nevertheless, although a great number of investigations have delved into the application of MALL in English-listening and -speaking education (Burston, 2013), little is known about the crucial processes that underlie its pedagogical design (Kukulska-Hulme & Viberg, 2018). Therefore, with the intent of revealing the teaching and learning processes underlying MALL, the present study adopted an action research approach to investigate EFL learners' perceptions of mobile-assisted pedagogy in a listening and speaking course and the progress they made with regard to English-listening and -speaking skills.

LITERATRUE REVIEW
MALL
MALL refers to the formal or informal way of learning a second/foreign language by using mobile devices (McCarty, Stao, & Obari, 2017). In recent years, MALL has received extensive research in the field of foreign-language teaching and learning because it offers a number of advantages, such as ownership, mobility, and technology convergence (Kukulska-Hulme, 2009). First, with remarkable progress made in mobile technology, mobile devices, in many countries, have become prerequisite tools for language learners who have their own smartphones or other mobile devices. Mobile device owners thus could have easy access to various types of mobile resources and applications. Second, MALL has freed learners from the time and space constraints with regard to the learning process; now, based on their needs, they can learn almost anytime and anywhere. Third, mobile technology has changed the manner in which learning language is carried out in multimedia environment. Additionally, mobile devices have come to transform the way in which learners interact with peers, send and receive feedback, and engage in collaborative learning (Hwang et al., 2016; Xu & Peng, 2017).

In recent years, the application of MALL in EFL learning contexts has yielded fruitful research findings and positive effects, including those related to vocabulary (Ko, 2019; Zhang, Song, & Burston, 2011), reading (Hendriwanto & Kurniati, 2019; Lin, 2014), writing (Andujar, 2016; Chen, Carger, & Smith, 2017), and listening and speaking (Ahn & Lee, 2016; de la Fuente, 2014; Xu, Dong, & Jiang, 2017). However, there are difficulties that EFL teachers and learners face with respect to the teaching and learning processes of MALL, because new mobile technology has offered alternative approaches to the language learning process itself (McCarty et al., 2017). It is therefore particularly important to investigate what changes or improvements can be made in terms of the way language learning takes place in MALL contexts.

MALL-based English-listening and -speaking teaching and learning processes

Listening and speaking are essential language skills that underlie EFL learning, and they form the core components of a learner's communicative ability (Cohen, 2012). However, in EFL learning contexts characterized by limited exposure to English, learners, who usually have few opportunities to listen to authentic English or speak English in daily life, are often offered decontextualized learning resources and tasks. Therefore, they mainly depend on traditional teaching methods, which in some cases their learning motivation may decrease (Hwang et al., 2016; McCarty et al., 2017).

To overcome such drawbacks, some researchers have recommended the use of MALL and its incorporation in the teaching of listening and speaking because its characteristics such as ownership of mobile devices and mobility, could cater to learners' particular needs (Kukulska-Hulme & Shield, 2008). Some studies have attempted to apply MALL to listening and speaking learning activities by using different types of mobile technology, including mobile phones (Gromik, 2012; Moghaddas & Bashirnezhad, 2016), social communication applications (Andújar-Vaca & Cruz-Martínez, 2017; Hsieh, Huang, & Wu, 2017) , and digital games (Hwang et al., 2016; Liu & Chu, 2010).

For instance, Hsieh et al. (2017) utilized a Technology Acceptance Model questionnaire to examine EFL learners' acceptance of a social communication application, LINE, in an English oral-training course. They found that mobile-assisted flipped instruction positively affected students' oral skills and that students' attitudes toward this type of LINE usage determined their following intention to accept such applications. Liu and Chu (2010) reported on a study that incorporated ubiquitous games named *HELLO* in an English-listening and -speaking curriculum. Their results show that the incorporation of MALL-based learning activities in English learning could improve EFL learners' listening and speaking abilities and that the study's gaming-based group was more motivated to learn than the non-gaming-based group.

Taking into account the rapid advances in language-learning applications, some researchers have proposed that such applications should be utilized as effective tools in facilitating EFL learning (Ahn & Lee, 2016), and some attempts have been made to incorporate such applications in the teaching of listening and speaking skills. For instance, Read and Bárcena Madera (2016) used the mobile-assisted listening application ANT (Audio News Trainer) to improve Spanish EFL learners' listening comprehension in a distance-learning context. Their findings show that this tool was effective for facilitating learners' metacognitive development during the MALL process.

Ibáñez Moreno and Vermeulen (2015) tested the validity of the MALL application named VISP (VIdeos for Speaking). The application adhered to pedagogic and linguistic standards, and it aimed to promote learners' oral proficiency. The authors of the study found that, because of cultural and linguistic differences, Spanish students showed greater motivation in engaging with the application for learning purposes than did Belgian students, although the Belgian students ultimately performed better. Researchers have suggested that MALL applications should be localized, taking learners' cultural and linguistic factors into account.

Although there have been many endeavors to investigate the role of MALL in teaching EFL listening and speaking skills, few studies have attempted to investigate the teaching and learning processes underlying MALL. As a consequence, little is known about what processes and steps are crucial for mobile learning design (Kukulska-Hulme & Viberg, 2018), where many changes are needed due to the implementation of new mobile technology. In addition, while most of the previous studies have adopted experiments, quasi-experiments, or case studies as their research methods, few studies have taken an action research approach to delve into the teaching and learning processes per se. As recommended by Yasmeen (2008), action research should be implemented by educators as an important approach to improve the teaching and learning outcomes. Such qualitative dimensions may provide a fuller picture of pedagogy in mobile-assisted language learning as elsewhere (McCarty et al., 2017).

Taking into account the literature and its research gaps, this study used an action research approach to (1) probe EFL university students' attitudes toward using MALL applications in a listening and speaking course and its effectiveness in enhancing students' listening and speaking abilities and (2) provide pedagogical implications for further improving teaching procedure and teaching efficiency in MALL contexts.

In this study, two research questions were addressed:
(1) What are EFL learners' perceptions of MALL-assisted listening and speaking learning processes?
(2) What improvements have EFL learners made with regard to listening and speaking abilities in the context of MALL?

METHODOLOGY

The present study, which drew on multiple data sources, including questionnaires, reflective journals, interviews, and proficiency tests, adopted an action research approach. According to Burns (2015, cited in Cornwell, 1999, p. 5), action research is a self-reflective and systematic approach to enquiry, with the aim of identifying problems encountered by the participants and conducting further investigation to bring about critical changes in practice. It typically consists of four dynamic phases that are repeated throughout the investigation: planning, action, observation, and reflection (Kemmis & McTaggart, 1988). The current study included two research cycles, and the findings of the first one influenced the second.

Participants

A total of 61 sophomore-year participants (9 male and 52 female) who majored in business English at a Chinese university were recruited. The participants had been learning English for an average of 12.5 years, and 85% had never been to an English-speaking country. According to the pre-study questionnaire, on average, in self-rating for English-listening and -speaking proficiency, they scored 2.46 and 2.41, respectively, on a scale of 5. Additionally, their pre-study listening and speaking proficiency test (i.e. a Cambridge IELTS mock test) scores were averaged at 5.5.

With regard to English-learning-application use experience, 87% were familiar with such applications and used them sometimes or quite often in their spare time, 88.5% used them for listening practice, and 31.1% used them for speaking practice. However, only 50.8% considered these applications useful in improving their English-language learning. With regard to their past learning experiences, 82% had never been required to complete listening and/or speaking assignments via English-learning applications, but 67.2% were willing or quite willing to complete listening and/or speaking assignments via applications.

The intervention

In traditional teaching methods, students' homework usually consists of handwritten dictation exercises and paper-and-pencil listening tests. This study's general intervention involved the application of English-learning applications in listening and speaking exercises outside class hours. After careful selection, the Keke English-learning application was chosen for the following reasons: (1) it is one of the most popular English-learning applications in China, with more than two million users; (2) it offers a variety of English-listening materials and well-designed speaking tasks, which cater to students' particular needs and proficiency levels; (3) based on the pre-study questionnaire, around half of the students reported that they had already used Keke and found it useful for improving their English abilities; (4) previous research has proved that Keke can enhance Chinese EFL learners' English language learning experience (e.g. Zhao, Zhu, & Tian, 2019).

Each week, study participants were asked to complete at least three sets of listening and speaking exercises from a practice column designed by Keke. They were given the opportunity to select the learning materials catering to their needs. While the listening exercises included word ordering and dictation practice, speaking exercises included shadowing and recording based on listening materials (see Figure 1). Upon task completion, the students automatically received their scores. Their performances were also recorded by Keke teachers' application used only by the instructors, allowing teachers to observe students' performances. The student exercises aimed to improve listening and speaking abilities through MALL methods. They thus supplemented the learning and teaching carried out through classroom teaching and textbook exercises.

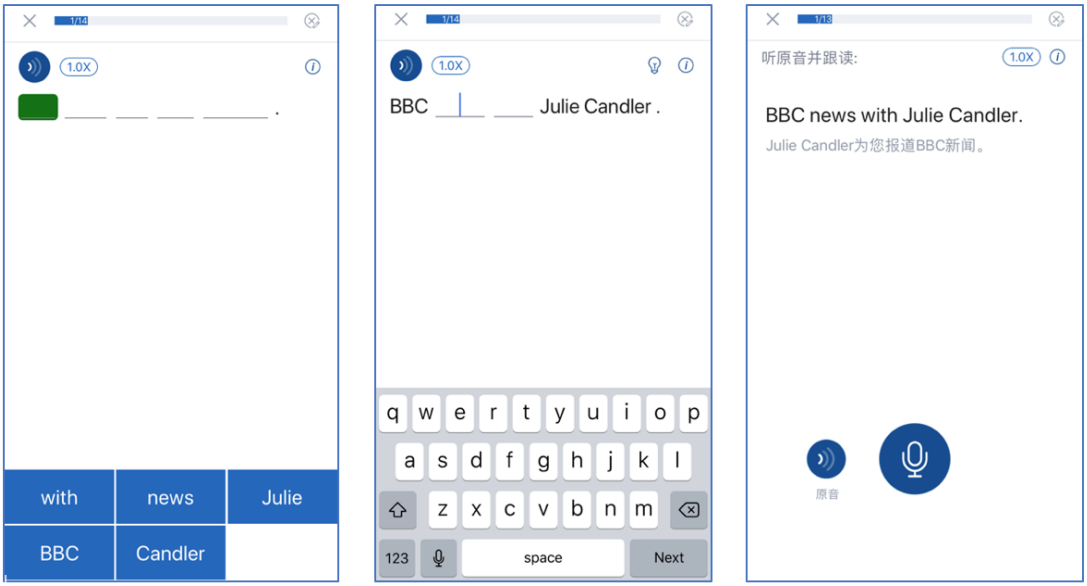

Figure 1. Word ordering, dictation, and speaking exercises on Keke

To facilitate class management, an online learning management application, MosoTeach, was used for posting notices, uploading learning materials, and conducting learning activities outside the classroom.

Instruments

This study adopted a mixed-method approach that included both quantitative and qualitative data. The following instruments were utilized to investigate how students responded to the MALL listening and speaking practice; the instruments also assessed the effectiveness of such practice for improving students' listening and speaking abilities.

(1) *Questionnaires*: Three questionnaires, designed with reference to Hwang et al. (2016) and modified for our research purposes, were distributed to students during Weeks 1, 6, and 16. These included five-point Likert scale types and open-ended questions, which primarily targeted students' attitudes toward MALL listening and speaking learning activities and their perceptions of the usefulness of MALL practices. English-language questionnaires were used; the questions were presented in plain English, which the students found easy to understand. For the open-ended questions, students were allowed to respond in either English or Chinese to ensure that they could express themselves clearly.

(2) *Reflective journals*: During Week 16, each student kept a reflective journal in which they introspected on their MALL experience throughout the semester. Some of the listed prompt questions were as follows: "What improvements have you made after completing the mobile-assisted exercises (for instance, in terms of English listening abilities, speaking abilities, and learning abilities)?" and "What suggestions would you make for improving the mobile-assisted exercises (for instance, regarding Keke, types of homework, and feedback provision)?" The participants wrote their reflective journals in Chinese, which were later translated into English by two research assistants for research purposes.

(3) *Semi-structured interviews*: Ten students were randomly selected during week 16 to participate in a series of semi-structured interviews. The prompt questions were mainly follow-up questions based on the previous questionnaire items: for instances, 'Why do you like or dislike completing your listening and speaking homework via Keke?', 'In what ways do you think that learning practice carried out via apps could enhance your English listening and speaking abilities?', and 'What is your attitude toward the use of MosoTeach in this course?'. The interviews were undertaken in Chinese and then transcribed and translated into English by two research assistants for research purposes.

(4) *Listening and speaking proficiency tests*: During Week 1 (the pre-study period) and Week 16 (the post-study period), listening and speaking proficiency tests were administered to the students in the language laboratory of the university. These tests were adapted from the Cambridge IELTS mock listening and speaking tests. All student-spoken outputs were recorded using lab computers and then scored by two experienced university English teachers. Their scoring was based on IELTS marking criteria, i.e., fluency and coherence, lexical resources, grammatical range and accuracy, and

pronunciation.

(5) *Assignment performance*: All student-completed assignments were collected on the Keke application. This allowed researchers to observe their participation and completion quality.

DADA ANALYSIS AND RESULTS

Table 1 summarizes two action research cycles. It also delineates specific steps with regard to the Plan-Act-Observe-Reflect cycle (adapted from Kemmis & McTaggart, 1988).

Table 1. Summarizing two action research cycles

	Phases	Instruments
Cycle 1 (Weeks 1–6)	Plan	✧ Findings of Questionnaire 1 ✧ Pre-study tests: Listening and speaking
	Act	✧ Listening: Word ordering and dictation on Keke ✧ Speaking: Shadowing and recording on Keke
	Observe and Reflect	✧ Questionnaire 2 (Week 6) ✧ Assignment performance
Cycle 2 (Weeks 7–15)	Revised Plan	✧ Findings of Questionnaire 2
	Act	✧ Listening • Word ordering and dictation on Keke, or • video-based exercises: multiple choice and dictation on Keke, or • handwritten dictation submitted to MosoTeach ✧ Speaking • Shadowing and recording on Keke, or • video-based recording on Keke, or • task-based speaking practice on MosoTeach.
	Observe and Reflect	✧ Questionnaire 3 (Week 16) ✧ Reflective journals (Week 16) ✧ Interviews (Week 16) ✧ Assignment performance ✧ Post-study tests: Listening and speaking

Cycle 1: Weeks 1–6

Plan and Act

In Week 1, the researchers distributed the first questionnaire to students to explore their background information, familiarity with MALL, and learning needs. The Questionnaire 1 results show that most of the students were willing to use English-learning applications to practice listening and speaking. Therefore, the students were required to complete a set homework assignment every week, as stated in the intervention section (namely, at least three sets of listening and speaking exercises on Keke). Students' homework data were then automatically submitted to the Keke teachers' application. Using this, teachers acted as observers and recorded students' performances.

Observe and Reflect

To allow the researchers to observe and reflect on students' performances, Questionnaire 2 was distributed to students during Week 6. The aim of this questionnaire was to collect the participants' responses to interventions in Cycle 1.

(1) Listening

The results of Questionnaire 2 show that 82% of the students were willing or quite willing to complete their listening homework on Keke, while only 68.8% considered it (quite) useful in improving their listening abilities. Responses to

the open-ended questions on students' suggestions regarding the use of Keke were as follows.

Some students mentioned that it was somewhat ineffective in helping them complete their listening exercises for the following reasons: (1) there were a wide variety of exercises in the Keke practice column recommended by the teacher, and they did not know how to choose the most appropriate listening materials to suit their listening proficiency; (2) they regarded typing as being less effective than taking handwritten notes, especially with regard to dictation exercises; (3) they felt that certain exercises took too much time to complete; and (4) many of the listening materials were not up to date. Additionally, many students expressed their preference for more varied types of listening exercise.

(2) Speaking
The results also show that 73.8% of the students were willing or quite willing to complete speaking homework on Keke. However, only 63.9% found it (quite) useful in improving their speaking ability. Some students complained about the technical problems they faced during the speaking exercise, including difficulties in uploading their recordings and inaccurate scoring. Since the exercise mostly involved repeating and shadowing activities, as opposed to creating new contents using their own language, they did not perceive much improvement in speaking.

Cycle 2: Weeks 7–15
Plan and act
In line with observations and reflections from Cycle 1, some modifications were made to the teaching procedure. Several students had complained about the operation of Keke and the limited types of homework assignment it offered; therefore, the researchers decided to offer more options to the students, especially with regard to how they could practice listening and speaking via language-learning applications. In relation to listening practice, in addition to the Keke-based word-ordering and dictation exercises, the option of completing video-based listening exercises via Keke—that is, multiple-choice and dictation exercises—was offered to students, who also had the option of completing handwritten dictation exercises and then submitting them to MosoTeach. Figure 2 illustrates new types of Keke and MosoTeach-based listening exercises offered to students.

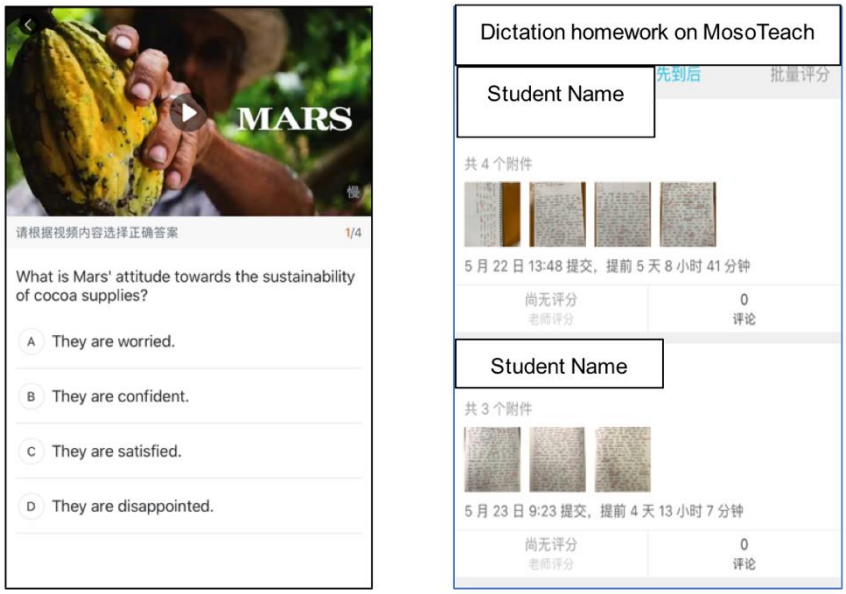

Figure 2. New types of listening exercises added to Keke and MosoTeach

With regard to speaking practice, in addition to shadowing and recording exercises, students were provided with the option to dub videos by speaking English via Keke. They were also provided with the option of recording speeches on given topics and uploading their recordings to MosoTeach. They were then asked to provide peer assessments for two students' recordings. Figure 3 illustrates these speaking exercises

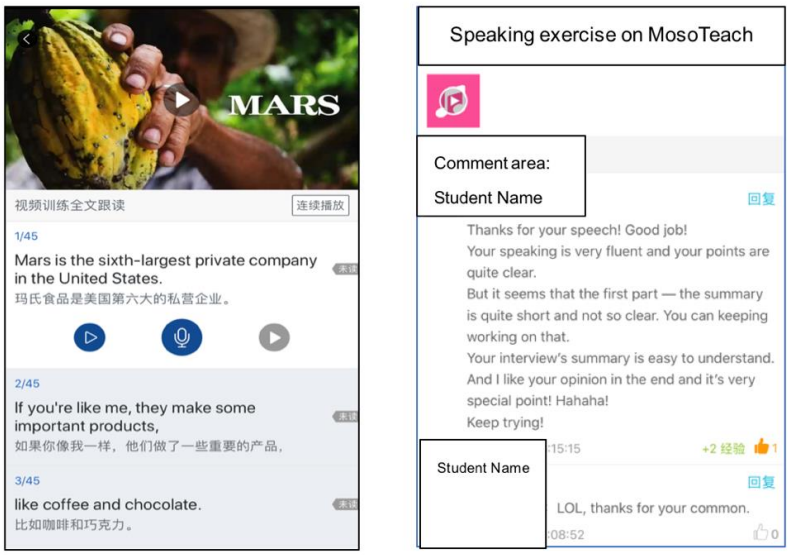

Figure 3. New types of speaking exercises added to Keke and MosoTeach

MosoTeach provided students with the option of submitting Word files, pictures, recordings, and videos. MosoTeach also provided scores and feedback for peer assignments. Therefore, it was feasible to carry out task-based speaking homework via the MosoTeach platform. Task-based speaking practices were utilized because task-based language teaching (TBLT) offers students sufficient opportunities to complete meaningful tasks by using the target language; furthermore, research has shown that TBLT is an effective pedagogical method for second-language learning (Douglas & Kim, 2015; Liu & Chu, 2010).

In Cycle 2, 27 students chose to record speeches every other week while following the teacher's instructions. The speech topics were (1) methods companies can use to retain staff members, (2) reflections on the film *Inside Out,* (3) whether it is advisable to hire nannies to control children's screen exposure, and (4) comments on the prospect of artificially intelligent television-news anchors.

Observe and Reflect

Compared with Cycle 1, students in Cycle 2 were more willing to participate in the listening and speaking activities outside classroom hours, and they evaluated these activities as being more useful in improving their listening and speaking abilities during Cycle 2. Tables 2 and 3 show these changes in the students' attitudes toward MALL-based assignments.

Table 2. Questionnaire results during Week 16

Scale of willingness	5	4	3	2	1	Mean	SD
to complete listening homework	45.9%	39.3%	9.8%	4.9%	0%	4.26	0.830
to complete speaking homework	37.7%	42.6%	16.4%	3.3%	0%	4.14	0.823
Scale of usefulness							
for improving listening ability	39.3%	32.8%	27.9%	3%	0%	4.11	0.813
for improving speaking ability	27.9%	44.3%	23%	4.9%	0%	3.95	0.842

(1) Listening

The results of these questionnaires show that 85.2% of the students were willing or quite willing to complete the listening homework (82% in week 6), and 72.1% considered it to be useful in improving their listening abilities (68.8% in week 6).

The percentages of week 16 questionnaire results were slightly higher than those of Week 6. Table 3 shows that students were more willing to complete the listening homework, and their perceptions regarding the usefulness of MALL exercises also improved.

Table 3. Comparing questionnaire results, Week 6 and Week 16: Listening

Questionnaire	Willingness to complete listening homework		Usefulness of the listening homework	
	Mean	SD	Mean	SD
Week 6	4.14	0.819	3.83	0.834
Week 16	4.26	0.830	4.11	0.823

Analysis of students' reflective journals and interviews showed that several students mentioned their improvements with regard to listening skills and abilities. Some example quotations (translated from Chinese) are as follows:

- *This semester, my English listening ability improved because I finished the listening assignments carefully under the teacher's supervision each week.* (Student 20; reflective journals; English listening ability)
- *My ability to grasp keywords from the English listening materials has improved after practicing the Keke listening training exercises for one semester.* (Student 49; reflective journals; English listening skills)
- *I was able to select various English listening materials from the Keke application, and this increased my interest in listening practice. In the beginning, I had to make many attempts to complete the word order and dictation exercises, but now I can finish these tasks within a much shorter time period.* (Student 27; interview; learning interest and listening ability)

Additionally, students' IELTS mock listening test scores increased from 5.5 (SD=0.976) to 6.5 (SD=0.988). The results of the paired *t*-test show that there were significant differences between the pre-study and post-study test results (t=9.942, *p<.001). This shows that students' listening abilities improved greatly after one semester of continual MALL practice.

(2) Speaking

The Week 16 questionnaire results show that 72.1% of the students were willing or quite willing to complete speaking homework (73.8% in Week 6) and that 72.2% thought that it was useful for improving their speaking abilities (63.9% in Week 6). Table 4 shows that the students were relatively more willing to complete speaking homework in Cycle 2 in comparison to the results in Cycle 1, and that their perceptions regarding the usefulness of mobile-assisted speaking exercises increased as well.

Table 4. Comparing questionnaire results, Week 6 and Week 16: Speaking

Questionnaire	Willingness to complete speaking homework		Usefulness of the speaking homework	
	Mean	SD	Mean	SD
Week 6	3.94	0.966	3.71	0.990
Week 16	4.14	0.813	3.95	0.842

Analysis of the reflective journals and interviews showed that more than half of the students mentioned improvements in their speaking abilities, especially with regard to aspects such as fluency, organization, content quality, and logic. Furthermore, their confidence was enhanced. Some example quotations (translated from Chinese) are as follows.

- *At the beginning of the semester, I found it very difficult to say something about the topics, but after carrying out oral practice through homework for one semester, I felt less nervous and was able to express myself better.* (Student 8; reflective journals; English speaking ability)
- *I enjoyed oral practice inside and outside the class because it taught me to make English speeches in an efficient way and also improved my thinking ability.* (Student 20; reflective journals; speaking and thinking abilities)
- *This semester, I made the most improvements in terms of my speaking ability and also my speaking confidence. I tried my best to record every speech without consulting any notes. My speech fluency was enhanced, but the richness of my speech content should be further improved.* (Student 4; interview; confidence and fluency)

Some students reported perceived improvement in speaking, however, their average scores on speaking tests only slighted increased from 5.54 (SD=0.574) to 5.67 (SD=0.589), and there was no significant difference between the pre-study and post-study test scores (t=1.552, p=0.126).

Along with mentioning improvements in their English listening and speaking abilities, 15 students mentioned in their reflective journals that they had benefited from self-regulated learning. During the MALL-based learning practice process, students had to select listening materials based on their language proficiency, learning needs, and interests, and they had to manage their own learning pace. In this way, their ability to self-regulate their learning was enhanced. The following quotations have been extracted from students' reflective journals and interviews, and translated into English from Chinese.

- *The most important thing was that I fostered the habit of listening and speaking in my spare time. In the beginning, I had to be pushed to complete the exercises, but now I have become used to doing them by myself even without the teacher's supervision. Keke has become a part of my life. I'll continue to carry out these exercises during my vacations.* (Student 6; interview)
- *I have realized the importance of self-regulated learning. Whether it is Keke English or handwritten dictation, we could only complete the tasks effectively with persistence and self-reliance. Sometimes I was a little lazy, but I convinced myself to overcome it by using long-term goals.* (Student 9; reflective journals)
- *I have developed better learning habits after practicing listening and speaking on Keke for a semester. I not only finished the assignments assigned by the teacher but also listened to various types of material based on my own needs. My listening ability has indeed improved.* (Student 51; reflective journals)

DISCUSSIONS AND CONCLUSION

By analyzing two action research cycles, this study explored the methods needed to improve MALL listening and speaking teaching practices. The results show that, once a few modifications were made to the original intervention (i.e., three sets of listening and speaking exercises on Keke), students developed a more positive attitude toward MALL assignments, and their perception of the usefulness of the tasks increased. Students also expressed greater satisfaction with the course (average score: 4.47 out of 5) at the end of the semester, compared with their perception of the course at the beginning (average score: 3.68).

In addition, the pre- and post-study proficiency tests revealed that students' listening ability improved significantly, whereas their speaking ability did not show significant improvement. The two major reasons for students' slow development in speaking skills may be: (1) only half of them participated in speech-recording exercises, with the rest of them completing 'Listen and Repeat' exercises; and (2) due to the heavy workloads, students were asked to complete speech recordings every two weeks, and thus, the amount of oral practice was not sufficient to significantly improve their speaking ability. For EFL learners, speaking is one of the most challenging skills (Ahn & Lee, 2016), and therefore, MALL tasks may require longer periods of time for any positive changes to occur.

The study's findings indicate that the integration of English-learning applications could enhance EFL learners' learning experience. Their improvement is primarily manifested in positive attitudes and increased willingness to participate in MALL activities. These findings are in line with those of Ahn and Lee (2016), in which positive effects were detected in learner attitudes, motivation, and engagement within MALL contexts after the implementation of an English-learning application.

In addition, the use of language-learning applications may play a facilitative role in improving EFL learners' listening and speaking abilities. Although the students in the study did not make any significant progress in speaking ability, their attitudes toward the usefulness of MALL tasks became more positive to a certain extent. Ibáñez Moreno and Vermeulen (2015) noted that the use of such applications positively affected EFL teaching because they offer flexibility, which enables learners to personalize their learning process.

However, simply using such applications is not sufficient for effectively cementing learning. Additional aspects, such as teachers' supervision and guidance, diversified learning activities for catering to learners' needs, and the incorporation of online learning management tools are necessary. Although several students reported their improvement in terms of self-regulated learning, obvious individual differences were observed between different types of learners. For students who lack a sense of self-regulation and self-discipline, instructor supervision is particularly important to monitor and control their tendency to become unmotivated. Teachers' guidance—in terms of listening-material selection and speaking-task monitoring—was also necessary for students who needed learning scaffolding. Stockwell (2014) cautioned that learners may not know how to use mobile technologies effectively to further their

learning aims; therefore, such learners require guidance from instructors (Kukulska-Hulme & Viberg, 2018).

Many of the study participants also preferred the freedom to choose listening and speaking tasks via Keke because certain tasks did not satisfy their learning needs. For instance, during Cycle 1, several students complained about the inefficiency of the dictation exercises on Keke, and some of them encountered technical problems during their voice-recording activities. These experiences may have led the students to develop negative attitudes toward the MALL assignments. After the researchers reflected on the practices of Cycle 1, changes were made to the types of learning activity. These changes, which were well received by the students, included video-based listening exercises, handwritten dictation exercises, task-based speaking exercises, and peer assessments on MosoTeach.

Kukulska-Hulme and Viberg (2018) maintained that, because of the differences between learners' characteristics and skills, as well as the specific contexts involved in MALL, a variety of instructional approaches should be used. Previous research studies (e.g., Ilic, 2015; Ogunduyile, 2013) have used diverse technologies and media to facilitate collaboration, thus providing learners with more choices. Ahn and Lee (2016) also encouraged more diversity in the use of mobile technologies in order to make learning activities more interactive. Therefore, it is necessary to provide students with a variety of assignment selections and diversified tasks. In the present study, the MALL speaking exercises were greatly diversified by incorporating the online MosoTeach learning management tool in the course.

This study filled some research gaps by utilizing an action research approach to explore English-listening and-speaking teaching and learning processes out of the classroom. It accomplished this with the assistance of mobile-based learning applications. Two cycles of this type of teaching practice had some positive effects. Nonetheless, this study has some limitations. First, the participants were limited in number and homogeneous in background, so the results may not be generalizable to other populations. Second, the study intervention lasted for only one semester; this is a relatively short period for training students in speaking skills. Third, only half of the students participated in the task-based speaking exercises, and there was still a lack of interaction and collaborative learning throughout the teaching process.

Future research should recruit participants with more diverse backgrounds who have different levels of language proficiency. Furthermore, such research should conduct longitudinal studies over a longer period. As suggested by Andújar-Vaca and Cruz-Martínez (2017), researchers should also provide an environment where learners are able to freely negotiate meaning, reflect on and assess their own performance by means of authentic interaction and feedback, so as to afford more opportunities for second language proficiency development.

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Assessment and Evaluation in Mega Universities

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ABSTRACT
The study examines assessment and evaluation procedures in mega universities. Within the scope of the study, the literature focusing on mega universities offering open and distance education and their assessment and evaluation systems were examined first. Later, the results of the questionnaire administered in the study-specific mega universities to support the findings obtained from the literature were presented. The results of the study showed that assessment tools used by mega universities to determine the achievement levels of learners considerably vary and the most frequently applied assessment tool was found to be multiple-choice tests. Finally, the study also revealed that the number of the learners and raters was the main determinant factor affecting the choice of assessment tools used in these institutions.

KEY WORDS: Mega University, assessment and evaluation, assessment tools

INTRODUCTION

Assessment and evaluation procedures of an educational institution determine the effectiveness of its educational programs, learning environments and the methods applied to achieve its predetermined goals. Moreover, they provide valuable feedback for learners' performances and progress. It is clear that "open and distance education" differs from traditional educational environments since it provides education benefiting from the integration of various communication technologies between and/or among learners and instructors into the learning and teaching processes when they are in different physical environments. Such differences are also naturally reflected in assessment practices (Puspitasari 2010:60).

The fact that learners and instructors are in different physical environments in open and distance education requires the integration of assessment practices based on self-study and self-learning principles into course contents. Such activities, which are prepared according to self-directed learning principles, are evaluated within the framework of monitoring/training-oriented assessment practices. The study by Gagné, Deschênes, Bourdages, Bilodeau and Dallaire (2002:25) reveals that distance and open education learners give importance to such activities since they enable them to evaluate themselves in terms of course content because these activities have the potential to bring advantages regarding self-assessment and guide learners while preparing for their exams.

Another method applied while assessing learners is the assessment aiming summative evaluation, which includes final /exit exams administered at the end of learning activities (Aisha, 2007: 41-42; Jones, 2002:1). Unlike face-to-face learning environments, it is not possible to assess learners based on their participation in lessons, oral exams and the quality of the questions they ask in a classroom environment in open and distance education. Therefore, written assignments and tests have a determining role in assessing their achievement (Puspitasari, 2010:60; Lindler, 1998:25). Mc Isaac and Gunawardena (1996:403) also argue that there is a limited number of options in assessing the performances of learners in open and distance education systems.

This study aims to identify which assessment tools are used in mega universities offering open and distance education in the world, how frequently they are used and the factors affecting why particular tools are preferred to others.

MEGA UNIVERSITIES: ASSESSMENT AND EVALUATION SYSTEMS

Daniel (1998:29) defines mega-university as "a distance education institution offering educational services for over 100.000 active learners enrolled in courses at different levels of higher education". Distance education is the primary activity of these universities. It is clear that definition of a mega university involves three main

criteria: namely “distance education”, “higher education” and “size” (Daniel, 1998:29). The basic information about the universities meeting these criteria such as the numbers of learners and academic staff as well as the country they are located in is presented in the table below. This information was obtained from various resources as well as the questionnaire used in this study.

Table 1. Mega Universities

Institution	Established in	Country	The number of active learners	The Number of Academic Staff	
				Full Time	Part-Time
Indira Gandhi National Open University (IGNOU)	1985	India	3.500.000	420	36.000
Open University of China (OUC)	1999	China	3.590.000	-	
nadolu Universitesi	1982	Turkey	1.361.000	1.800	
Allama Iqbal Open University (AIOU)	1974	Pakistan	1.121.038	1.899	
Payame Noor University (PNU)	1988	Iran	1.101.182		
Universitas Terbuka (UT)	1984	Indonesia	607.712	766	15.484
Bangladesh Open University (BOU)	1992	Bangladesh	600.000		
Open University (OUUK)	1969	England	253.075	1.200	8.000
Korea National Open University (KNOU)	1982	South Korea	210.978	308	3.356
Universidad Nacional de Educacion a Distancia (UNED)	1972	Spain	205.000	1.450	6.900
Sukhothai Thammathirat Open University (STOU)	1978	Thailand	172.984	379	-

Indira Gandhi National Open University (IGNOU): It was established in 1987 and offered educational services in its first year to 4528 students in 2 programs. Indira Gandhi National Open University is also known as “The People’s University” and considered the primary institution contributing considerably to Indian higher education through open and distance education. IGNOU currently provides services for more than 4 million students in 490 programs at certificate, undergraduate, graduate and postgraduate levels in 37 countries, 67 regional centers, 3.000 learner support centers, 67 centers abroad, and with 420 headquarter staff and 36.000 academic supervisors.

IGNOU has a significant role in the country’s education system as a national distance education quality assurance institution because it successfully produces high quality distance education materials used by a great majority of learners and instructors. It is also a national resource center for open and distance education in the country as an internationally recognized institution (Panda and Mishra, 2007:328; Panda, 2005:206).

IGNOU uses credit system, and learners are assessed through continuous assessment practices and final exams. Continuous assessment practices include assignments graded by supervisors and computers as well as course-specific project reports in some courses. Learners are required to hand in their assignments to the regional centers they registered in or upload them to the university’s website until the end of March, April, August and October. Learners are required to submit maximum 3 assignments in 2-credit courses. The weight of these assignments in overall assessment grade ranges between 25 % and 30 %. The assignments graded by academic supervisors are sent back to learners with detailed feedback. In some programs, certain assessment tools are used such as assignments, projects and seminars for monitoring-oriented assessment purposes, whose percentages in overall assessment range between 25 % and 30 % and even increases up to 50 % in some cases. Another practice adopted to determine achievement levels of learners is end-of-course exams administered twice in a year; namely in June and December. The weight of these exams in overall assessment grade ranges between 70% and 75 % (Manjulika and Reddy, 2000:225).

IGNOU administers computer-based final exams (On-Demand Exam) in 17 regional centers, 25 different programs and 135 courses once a week on demand. It is technically possible for IGNOU headquarter staff to monitor these exams through close-circuit camera systems. Learners can apply Regional Center Director for final exams and pay for the exam fee by credit card or cash in the bank office located near the center.

Open University of China (OUC): Previously known as Chinese Central Radio and Television University, the institution was renamed in 2009 as "Open University of China" (Belawati and Baggaley, 2010:7). The university offers two or three-year courses in 26 undergraduate and 69 associate degree programs for learners ranging from farmers to military personnel and the credits of the courses are determined on annual basis. Being a member of Asia Open Universities, Open University of China collaborates with 128 universities in the country as well as in other 38 countries. Academic year consists of two semesters, each of which lasts 18 weeks and each one credit corresponds to an 18-hour-course. When students complete all the required credits, they carry out a field study and graduate with a total of 144 credits. In order to graduate from Regional Radio Television Universities, it is necessary to take 60% of the total credits specified by the institution. Regional Radio and Television Universities administer mid-term exams, however, final exams are organized and administered by the Center in 2000 exam centers. The learners graduating from two or three-year programs are favored by Chinese government for employment purposes. In the pilot program called "Open Entrance Learners, the credits learners obtained after 8 year period become valid. When they take a sufficient amount of credits, they carry out a practicum in the related field and later graduate depending on their overall achievement. These graduates are also evaluated by the Chinese government for employment. Since each learner has an individualized learning field in OUC, it is possible to apply personalized / individualized assessment as well (Chaudhary and Dey, 2013:211).

Anadolu University (AU): The history of Anadolu University dates back to the establishment of Eskişehir Economics and Commercial Sciences Academy in 1958. Entitled the official authority to provide distance education system in the country by Higher Education Law enacted in 1981, Anadolu University offers open and distance education services in Open Education Faculty and Economics and Business Administration Faculties, which design their educational practices according to the principles of Open Education System. Central Open Education System uses semester credit system and provides open and distance education services in 107 programs; which includes 54 programs at certificate level, 36 at associate degree level and 17 programs at undergraduate level.

The system was restructured in 2012-2013 academic year under the framework of Bologna Process and now offers educational services to approximately 1.3 million students in 81 provinces in the country and in 113 liaison offices, including the offices in Lefkoşa in Turkish Republic of Northern Cyprus, Cologne in Germany, and the head office located in Eskişehir.

The main assessment tool used in assessing the achievement of learners is multiple-choice exams, which are held as one mid-term and one final exam as well as three course exam. The exams for e-certificate programs are administered online. In addition to multiple-choice exams, other assessment tools such as assignments, oral exams, and classical written exams are used in some programs. The university quickly integrates the new developments in information and communication technologies into its practices and adopts the new opportunities provided by new technologies as much as possible. Accordingly, e-portfolio has been effectively used in some programs as an assessment tool since 2008 (Özgür and Kaya, 2011:297).

As of 2011-2012 academic year, the university adopted criterion-referenced assessment system although it had used absolute assessment system since its establishment. Exams are graded out of 100 and only multiple-choice tests are administered in mid-terms and final exams. The weight of these tests in overall assessment grade are 30% and 70% respectively. In the courses where assignments are used as an assessment tool, final grade is calculated by taking 30 % of the mid-term score, 20% of the assignment and 50 % of final exam score. In Distance English Language Teaching Program, 40 % of the mid-term scores obtained from the courses taught in English and 60% of the final exam score are used to calculate the final grade. In applied courses, final grade is calculated by taking 50 % of the grades given by mentors and supervisors separately. In laboratory practices, those who obtain higher than 60 points are given S (satisfactory) grade and lower than 60 U (unsatisfactory) grade. The weight of the score obtained from applied courses in overall grade is 20%. In internship applications, learners are evaluated as "successful" or "unsuccessful" in the courses depending on their performances.

In Anadolu University Central Open Education and Distance Education Programs, "final grade" lower bound system is applied for each course, which is 30 except for laboratory course applications and the courses given in

English in Distance English Language Teaching B.A Program. The learners with lower grades than this lower bound gets FF. Different tables are used depending on the number of students (higher or lower than 30) taking the course and for the courses offered in English in Distance English Language Teaching B.A Program. However, since the number of learners is higher than 30 in most of the courses, the table valid for this situation (the number of students being higher than 30) is used.

Final grades for courses except laboratory course applications and the courses given in English in Distance English Language Teaching B.A Program are calculated as follows when the number of learners taking the course is higher than 30:

a. The scores of learners with a final grade over 30 are converted to normalized z values by using a "z" table prepared for normal distribution. While calculating normalized z values, the achievement percentage of the group in which learner's score is listed is calculated. Z value corresponding to this percentage are calculated by using z table.
b. The normal distribution obtained is divided into 10 parts since there are 10 passing scores according to z values.
c. The letter grade equivalent for each part is assigned according to normalized z values.

Table 2. Anadolu University Open Education System: Normalized "z values" and "Letter Grade Equivalences - When the Number of Learners Taking a Course is 30 or above

z lower bound	z upper bound	Letter Grade	Coefficient
+2,0000	+∞	AA	4,00
+1,5000	+1,9999	AB	3,70
+1,0000	+1,4999	BA	3,30
+0,5000	+0,9999	BB	3,00
+0,0000	+0,4999	BC	2,70
-0,5000	–0,0001	CB	2,30
-0,9999	–0,5001	CC	2,00
-1,5000	–1,0000	CD	1,70
-2,0000	–1,5001	DC	1,30
-∞	–2,0001	DD	1,00

Allama Iqbal Open University (AIOU): Established in 1974 and having 3.577.883 active learners in 2011-2012 academic year, Allama Iqbal University provides open and distance education services in 36 regional centers, 108 liaison bureaus, 1.628 study centers, 1.223 exam centers and 62.882 part-time supervisors (AIOU IN BRIEF, 2012:12). The achievement of learners are determined through assignments and three-hour final exams. It uses credit system and learners take 2 full-credit courses and submit 4 assignments for each full-credit course. These assignments are graded by part-time working supervisors and sent back to learners with detailed feedback. The scores they obtain from these assignments are officially confirmed by supervisors in the last week of each semester. In order to pass a course, learners have to obtain a higher score than the predetermined passing grade when 70% of the score taken from the final exam and 30% of the scores obtained from assignments are calculated. If learners gets a score less than 40, they cannot take the final exam, and if the score obtained from the final exam is lower than 40, learners fail this course (The interview with AIOU test unit head 10.04.2013). Testing Unit administers 2 final exams at the end of the semesters in March or April and August or September. Exams are administered in 300 exams centers across the country and 9 centers located in the Middle East (Haque and Batool, 2000:188). The assessment system used in the university can be summarized as shown in the diagram below.

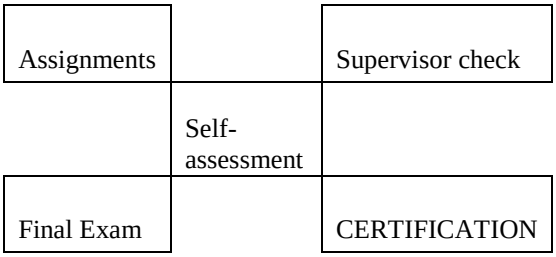

Figure 1. AIOU Learner Assessment System

The scores obtained from assignments and final exams are converted to letter grade according to the table below.

Table 3. AIOU Letter Grade System

Letter Grade	Score-range
A+	80-100
A	70-79
B	55-69
C	40-54
D	Lower than 40

Payame Noor University (PNU): Established in 1988 aiming to "provide higher education through distance learning for everybody, everywhere and every time", Payame Noor University offers educational services to nearly 1.000.000 learners with 3.500 academic staff in 32 regional (provincial) centers, 500 study centers and campuses. The university uses credit system and learners graduate from undergraduate programs by completing 71-72 credits and from graduate programs 132-144 credits. Learners take their exams at the end of each semester in regional centers. The tests used in the exams are prepared by the academic staff of the university and other universities located in other cities of the country. The score learners obtain from these exams and from midterms are calculated as the exit score for each learner. Learners have to get at least 10 out of 20 in each course in order to pass. The assignments, which are also midterm scores, have 25% weight in overall passing score.

Universitas Terbuka (UT): Established in 1984 to provide distance higher education to Indonesian citizens and foreigners, Terbuka University uses semester credit system and offers higher education services to nearly 607.000 learners in certificate, diploma, undergraduate and graduate programs in 4 faculties. The exam system of the university consists of three components; assignments, final exams and comprehensive written exams. While assignments and final exams generally include objective tests (short answer, multiple-choice, true-false, matching etc.), written exams consists of open-ended questions requiring long answers. Assignments are graded in regional offices, objective final tests are computer graded and the exams requiring long answers are graded manually by "Exam Center" of the university. The weight of assignments in overall assessment grade is 20 % and final exam 80%. A "comprehensive exam" involving questions about all the basic courses in the program are rated as: 4 "very good", 3 "good", 2 "medium", "not good" and 0 "poor".

Bangladesh Open University (BOU): Founded in 1992, the university is the only educational institution offering distance education in the country. The university provides educational service for nearly 380.000 in 6 faculties, 12 regional centers, 80 coordination centers, 1106 study centers, and 23 formal and 19 mass education programs. Credit system is used and the components of the exam system are assignments and final exams. Assignments are graded according to 6-scale rubric (A+, A, B,C, D and E). The prerequisite to take the final exams is to get a score higher than a predetermined grade when the mean of the scores obtained from assignments. The weight of continuous assessment practices (assignments) in overall grade is 30% and final exams 70% (Parhar, 2000:252).

Open University (OUUK): Established in 1996 and inspiring most of open universities as a model, British Open University offers services for more than 250.000 learners with 1200 full-time instructors, 3500 support and technical staff and 7000 supervisors. The university uses continuous assessment practices in the form of written assignments throughout the academic year in most of its undergraduate and graduate programs, and exits exams are administered at the end of the year for each course. In some graduate courses, learners are required to carry out project studies. Continuous assessment practices involves two types of assignments; those graded by computers and those graded by instructors. In general, learners submit 7 assignments assessing their

metacognitive competencies for each course (Gibbs, 2010:164). The number of assignments graded by supervisors vary according to the courses and often include questions requiring short or long answers. As for the assignments graded by computers, learners are provided detailed feedback about their performances. The results are normally announced within a week. The exams administered at the end of semesters are invigilated and generally last 3 hours (Rumble and Harry 1982:181). The weight of continuous assessment practices and final exams for each course is determined by "Exam and Assessment Committee". Learners are evaluated for each unit in continuous assessment practices. The assessment system adopted by the university can be shown as follows:

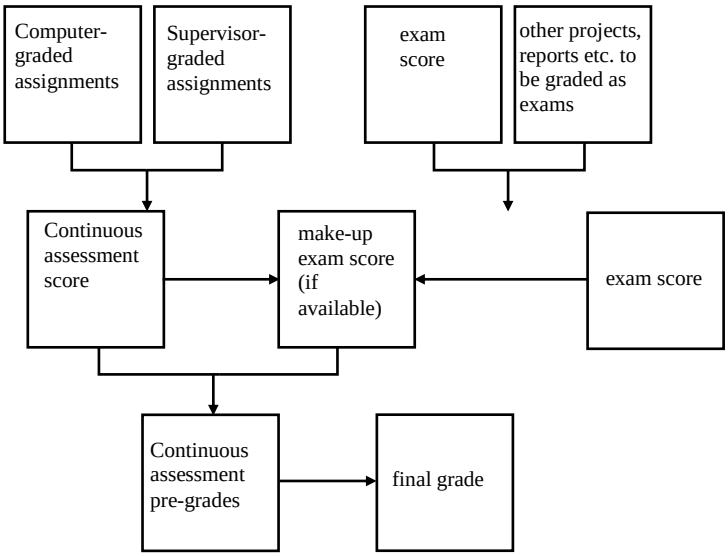

Figure 2. OUUK Learner Assessment System

The scores of learners, whose academic achievement is determined through assignments and a final exam, are converted to letter grade according to the table below.

Table 4. OUUK Letter Grade System

Letter grade	Score ranges	Performance standard
A	85-100	Passes 1
B	70-84	Passes 2
C	55-69	Passes 3
D	40-54	Passes 4
E	30-39	Poor
F	15-29	Poor
G	0-14	Very poor

Korean National Open University (KNOU): Founded in 1972, KNOU is the first distance education university of Korea. It offers educational services for 173.758 learners in 17 departments in 1 faculty and 22 departments in 4 schools with 308 full-time and 3356 part-time instructors. The university uses various technologies such as satellite TV, video conferencing and the Internet. As for assessment purposes, the components of the midterms administered in the university include group work, presentation of assignments etc. The final exams involve questions requiring long answers.

Assessment and Evaluation System at Korean National Open University is displayed in Figure 3.

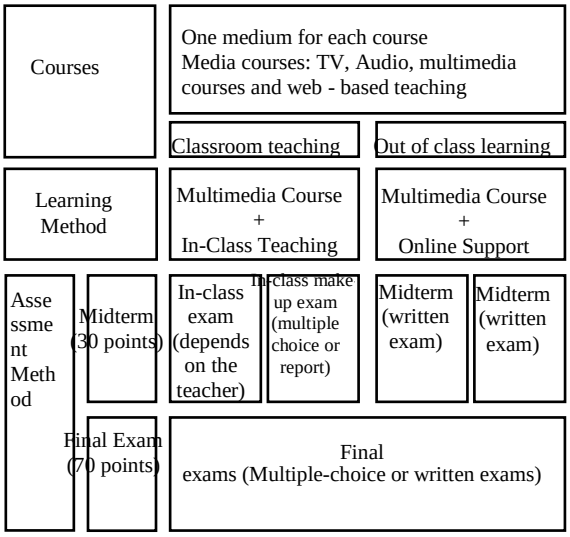

Figure 3. KNOU Learner Assessment System

Universidad Nacional de Educacion a Distancia (UNED): Established in 1972, the university provides distance education services for more than 205.000 learners in 9 faculties, 2 technical schools with more than 1400 academic staff. The tests enabling the authorities to monitor learners' individual developments are the important components of its assessment and evaluation system. Called "Distance Evaluation Tests", these tests can be designed as objective tests as well as written exams requiring long answers, interactive activities, case studies and discussions, which are determined by the academic staff of the university. "Distance Evaluation Tests" are also used as a component to determine academic achievement of learners in addition to invigilated exam. For instance, the reports prepared by supervisors about learners depending on the scores they get from these tests are used to finalize learners' overall academic achievement grade. Academic staff may ask learners to submit extra assignment or take an exam to pass a course in some cases.

Sukhothai Thammathirat Open University (STOU): The university, which was established in 1978, offers educational services for 172.984 learners in 94 programs at certificate, associate, undergraduate and graduate levels. Learners take final exams that are administered on a weekend (two days) at the end of each semester. These exams are administered across the country in regional study centers, and learners have to take the exam on the day and in the exam hall specified for them beforehand by the test center. Exam documents are brought to the centers by the university staff themselves, and the academic staff of the local schools and universities invigilate in these exams. The learners at graduate level are assessed by assessment tools such as assignments, end-of-course exams, dissertation and presentations about vocational experiences. As for undergraduate level learners, written exams has a weight of 80 % in theoretical courses, and course-specific assessment techniques are used in applied courses. According to calculations made after the exams, if learners at undergraduate level gets 76 and above out of 100, they obtain "honor" degree, they get "satisfactory/successful" degree between 60-75 and those getting lower than 60 obtain "unsatisfactory/unsuccessful" degree. Only the learners obtaining "honor" and "satisfactory" degree pass the course (Prudtikal, 2000:78). The following rating system is used for graduate level students.

Table 5 STOU Letter Grade System

Letter Grade	Point per credit	Remarks
A	4.0	Perfect
B+	3.5	Very Good
B	3	Good
C+	2.5	Over the average
C	2	Mediocre
D	1	Poor
F	0	Fails

METHOD

The research uses mixed research method, in which both qualitative and quantitative data are collected. In this method, there are two types of data analysis: statistical and thematic (Plano Clark and Cresswell, 2010:297). In the studies using mixed research method, both qualitative and quantitative data are collected to compensate the weakness of one data set with the strength of the other (Johnson and Christensen, 2008: 48; Plano Clark and Creswell, 2010: 299).

DATA COLLECTION

Both qualitative and quantitative data were collected for the purposes of the study. The quantitative data was collected through Assessment Tools / Techniques used to Assess Student Learning Outcomes in Mega Universities Questionnaire. For the data collection purposes, 11 mega universities in the world offering distance education were sent the link of this online questionnaire as well as an official letter stating this request. While determining the mega universities to be included in the study, the information available in related resources (Jung, 2005: 81; Moore ve Kearsley, 2012: 34) were used. The questionnaire was finalized after it was presented to three experts working as directors of distance education institutions for feedback during an international conference focusing on distance education.

The Mega universities which were sent online survey link and an official letter are presented in Table 6

Table 6 The Mega universities which were sent the link of the online survey

Institution	Country	The contact person
Indira Gandhi National Open University (IGNOU)	India	Rector-president
Open University of China (OUC)	China	Rector-president
Allama Iqbal Open University (AIOU)	Pakistan	Rector-president
Payame Noor University (PNU)	Iran	Rector-president
Universitas Terbuka (UT)	Indonesia	Rector-president
Bangladesh Open University (BOU)	Bangladesh	Director of Student Affairs Unit
Open University (OUUK)	England	Vice-rector
University of South Africa (UNISA)	South Africa	Rector-president
Korea National Open University (KNOU)	South Korea	Rector-president
Universidad Nacional de Educacion a Distancia (UNED)	Spanish	Vice-rector
Sukhothai Thammathirat Open University (STOU)	Thailand	Rector-president

The survey was replied by the contact people of the following six universities: Allama Iqbal Open University (AIOU), Universitas Terbuka (UT), Open University (OU), Korea National Open University (KNOU), Universidad Nacional de Educacion a Distancia (UNED) and Sukhothai Thammathirat Open University (STOU).

The qualitative data of the study were obtained from Allama Iqbal Open University, which was visited by the authors to obtain more detailed data about the assessment and evaluation procedures of the university as specified by the research problem. The interview conducted with the Head of Exam Services revealed valuable information about the assessment tools used in the programs. Field notes were taken during the field visit and some documents were collected such as leaflets, program catalogues, exam regulations, assignment samples and assignment confirmation and evaluation forms. The detailed observations were made while visiting Punjab Regional Center of the university. Two exam halls were visited during a real exam administration.

DATA ANALYSIS

The study uses check list and frequency tables to analyze quantitative data collected through Assessment Tools and Techniques used in Assessing Learners in Mega Universities Questionnaire

The qualitative data of the study were obtained from Allama Iqbal Open University, which was visited to obtain more detailed data about assessment and evaluation procedures. The field notes taken during the field visit, leaflets obtained, program catalogues, exam regulations, assignment samples and assignment confirmation and evaluation forms were analyzed as documents qualitatively.

FINDINGS

The findings about the mega universities that replied the questionnaire are classified under the following titles: Institutional Information, Assessment Tools and Techniques used in Mega Universities, the Factors Affecting the Choice of Assessment Tools and Techniques in Mega Universities

INSTITUTIONAL INFORMATION

Table 7 Institutional Information about Mega Universities

INSTITUTION	MODE OF EDUCATION		THE NUMBER OF INSTRUCTORS		THE NUMBER OF PROGRAMS					Total
	Distance	Both face to face and distance	Full time	Part time	Certificate	Associate	Undergraduate	Graduate	Post Graduate	
Open University (OUUK)	X		-	8.000	50	66	66	49	1	232
Korean National Open University (KNOU)		X	147	1.472	0	0	22	17	0	39
Universitas Terbuka (UT)	X		766	15.484	6	3	19	4	0	32
Sukhothai Thammathirat Open University (STOU)		X	379	-	22	0	36	26	10	94
National University for Distance Education (UNED)	X		1.450	6.900	0	21	27	45	39	132
Anadolu Üniversitesi (AU)		X	2.200	-	42	46	12	4	0	104
Allama Iqbal Open University (AIOU)		X	-	62.882	7	7	32	56	16	118
Total					127	143	214	201	66	

The data displayed in Table 7 show that 3 of the participant universities offer only distance education and 4 both distance and face-to-face education.

In these universities, the number of part-time instructors is higher than full-time ones. AIOU strikingly stands out with the number of its part-time employed instructors. Also called “supervisors”, these instructors are

responsible for grading the assignments, giving feedback about them and being the moderators of workshop practices carried out at the end of the terms which enable learner-learner and learner-instructor interaction. The number of part-time instructors employed nationwide in AIOU during 2012-2013 academic year is 62.882 (AIOU IN BRIEF, 2012).

The column displaying the data regarding the number of the programs in Table 7 shows that the university with the highest number of programs is OUUK with 232 programs. This university is followed by UNED with 132 programs, AIOU with 118, AU 104, STOU 94, KNOU 39 and UT 32. OUUK and AIOU both give diplomas and degrees ranging from certificate level to PhD level. According to Table 7, KNO, UT and AU do not have distance PhD programs, and KNOU and UNED do not offer certificate programs, and KNOU and STOU do not have associate degree programs.
The information about assessment in mega universities are presented in Table 8.

Table 8 The Information About Assessment in Mega Universities

INSTITUTION	GENERAL ASSESSMENT (%)		ONLINE ASSESSMENT			ASSESSMENT METHOD	
	Continuous	End of Course	High	Middle	Low	Norm-referenced	Criterion referenced
Open University (OUUK)	50	50			X	X	X
Korean National Open University (KNOU)	30	70			X	X	X
Universitas Terbuka (UT)	50	50		X		X	
Sukhothai Thammathirat Open University (STOU)	10	90			X	X	
National University for Distance Education (UNED)	20	80	X			X	X
Anadolu Üniversitesi (AU)	10	90			X		X
Allama Iqbal Open University (AIOU)	30	70				X	

When the data in Table 8 are examined, it is seen that continuous and end-of-course assessment have equal weights in OUUK and UT, and end-of-course assessment has higher weight in other universities, especially in AU and STOU with 90 %.

In 4 of mega universities (OUUK, KNOU, STOU and AU), online assessment is reported to be applied at a "low" level, in UT "medium" and in UNED "high" level.

While three universities (UT, STOU and AIOU) reported that they use only norm-referenced system, other 3 universities (OUUK, KNOU and UNED) use both norm-referenced and criterion referenced assessment. AU uses only criterion referenced assessment system.

ASSESSMENT TOOLS AND TECHNIQUES USED IN MEGA UNIVERSITIES

The contact people of study-specific institutions were asked to specify the assessment tools listed in the questionnaire and rate the degree of their use ranging from 1 to 10. The replies of the contact people are presented in Table 9. The empty columns in the table imply that they are not used by these institutions, "1" means the lowest degree of use and "10" the most frequent use.

Table 9 The Degree of Use of Assessment Tools and Techniques in Mega Universities to Assess Students

		Mega Universities									
	Assesment Tools/Methods	AIOU	AU	KNOU	STOU	OUUK	UNED	UT	Min	Max	Nr.of Institution
1	Multiple Choice Tests		10	7	10	1	7	9	1	10	6
2	Oral Examination (Face-to-Face)	3	1	1		1	1	1	1	3	6
3	Open-Ended Questions	9		6	2	10		2	2	10	5
4	Final Exam/Exit Exam	4			3	5	4	10	3	10	5
5	Assignments	3	2		10	10		10	2	10	5

6	Internship	3	2	2	1	1		1	1	3	5
7	True-False Tests				1	1	1		1	2	4
8	Short Answer and Completion Questions	3			2	10		1	1	10	4
9	Research Paper/Thesis	4			2	10		2	2	10	4
10	Online Discussion	1			6	1		10	1	10	4
11	Perfomance Assessment	1			3	1		1	1	3	4
12	Rubrics	1			2	10		2	1	10	4
13	Drama	2			2	1		2	1	2	4
14	Project	2			3	5		1	1	5	4
15	Case Study	1			2	2		5	1	5	4
16	Matching	1			1	1			1	1	3
17	Interview (Face-to-Face)				1	1		1	1	1	3
18	Discussion Questions				6	9		10	6	10	3
19	Online Examination		1		2			7	1	7	3
20	Portfolio	1			1	1			1	1	3
21	Group Work Assessment				5	1		1	1	5	3
22	Self-Assessment				10	10		9	9	10	3
23	E-Portfolio		2			1			1	2	2
24	Surveys				2	1			1	2	2
25	Pre-Testing/Post-Testing	1			10				1	10	2
26	Nationally Recognized Assessment Tools				1	1			1	1	2
27	Focus Group Interviews	1			1				1	1	2
28	Consept Maps				1	1			1	1	2
29	Diagnotic Tree				1	1			1	1	2
30	Online Interview				1	1			1	1	2
31	Online Oral Exam				1	1			1	1	2
32	Product Development							1	1	1	1
33	Reflective Letter					10			10	10	1
34	Structured Grid					1			1	1	1
35	Peer Assessment				1				1	1	1

According to Table 9, the following data were obtained from the institutions: 6 out of 7 institutions that replied the questionnaire reported that they use multiple-choice and oral exams; 5 institutions open-ended questions, final/exit exams, assignments and internship; 4 institutions true-false tests, short answer and sentence completion questions, research article / dissertation, online discussions, performance assessment, rubrics, drama, project and case studies; 3 institutions matching questions, interviews, discussion questions, online exams, portfolios, group work assessment and self-assessment; 2 institutions e-portfolios, surveys, pre-tests/post-tests, nationally recognized standard assessment tools, focus group interviews, concept maps, diagnostic trees, online interviews and online oral exams; 1 institution product development, reflective letters, structured grids and peer assessment. Although oral exam is used in 6 out of 7 institutions, its frequency of use is quite low. Only tool which was not included in the table because it was not specified by any institutions is “drama”.

When the table is examined in terms of the variety of assessment tools, it is seen that two institutions (OUUK and STOU) use the highest number of tools specified in the list. The contact people of these institutions reported that they use 30 out of the tools in the list. These two institutions are followed by UT with 20 assessment tools and AIOU with 17. While AU uses 6 assessment tools, the institutions using the least number of tools are KNOU and UNED.
When the degree of use is considered, 12 out of 35 assessment tools and techniques listed in the questionnaire (multiple-choice test, open-ended questions, final/exit exam, assignment, short answer and sentence completion questions, research article/dissertation, online discussion, rubrics, discussion question, self-assessment, pretest – posttest and reflective letter) are more frequently used in some institutions. Assignment and self-assessment are rated as 10 point in two institutions (OUUK and STOU)

Extra information about AIOU was obtained during the field visit and from STOU through correspondences. Accordingly, the assessment tools used in STOU depends on undergraduate and graduate programs. To illustrate with, while multiple-choice tests, open-ended questions and self-assessment are generally used in undergraduate

programs, oral exams, final/exit exam, research article/dissertation and project are preferred for graduate programs.

In AIOU, assignments are given for midterms and open-ended questions requiring long answers for final exams. Leaners are required to answer 5 out of 8 open-ended questions in final exams.

Although the assessment tools and techniques vary according to the programs, assignments play a great role in raising awareness about the curriculum by encouraging learners to use study materials, engaging them into continuous assessment procedures and providing them with valuable feedback given by instructors.

Learners are required to submit 4 assignments for a full-credit (6 credits) course and 2 assignments for a half-credit (3 credits), and these assignments have a weight of 30% of the final grade. If learners get a score lower than 40, they cannot take final exams. Similarly, learners fail the course if they get a lower score than 40 in the final exam.

Assignments include open-ended questions just like in final exams to assess learners with different cognitive levels. Learners are asked to answer the questions in 1200 words the least. The information about assignments such as the content and deadline etc are published on university's official website. Learners have two options to submit their assignments; to upload them to the official websites of the institution or to hand them in to the staff working in regional centers.

AIOU uses other assessment tools and techniques in addition to assignments. Among these alternatives at undergraduate level are open-ended questions, short answer and sentence completion questions and at graduate level final/exit exam, oral exam, online discussion via video conferencing; product development and internship in Business Administration Program; and portfolio in vocational courses. In addition, certain tools and techniques are used in Master's degree and PhD programs, which are based on research, such as pre-test / post-test, focus group interview, research article / dissertation, case study and project.

Table 10 displays the percentages of assessment tools and techniques in overall assessment and their frequency of use in AIOU Computer Sciences Undergraduate Program. Continuous assessment involves assignments, mid-term, presentation or lab study, and final exam can be administered both in written and oral format.

Table 10. The Learner Assessment System in AIOU Computer Sciences Undergraduate Program

ASSESSMENT TYPE AND TOOL		COURSE PRESENTATION							
		Face-to-face		Distance		Online		Project	
		Nr.	%	Nr.	%	Nr.	%	Nr.	%
Continuous assessment	Assignment	2	10	2	30	2	10	-	-
	Mid-terms or Lab studies	1	20	-	-	1	20	-	-
	Presentation	-	-	-	-	-	-	4	30
Final Exam	Written Exam	1	70	1	70	1	70	-	-
	Oral Exam	-	-	-	-	-	-	1	70
Total Percentage		100		100		100		100	

One of the tools used in assessing learners is presentation. In some programs, learners are required to make presentations. To illustrate, learners enrolled in Business Administration program are required to submit two assignments, make one online presentation and take the final exam. The score taken from the presentation consists of 10 % of the final grade, total weight of assignments and presentations 30 % and the final exam 70 %. It is also required to obtain at least 50 points out of 100 from assignments and presentation and 70 % attendance is obligatory.

The question asking about three most frequently used assessment tools in the institutions was also included in the questionnaire sent to mega universities. The replies given to this item are presented in Table 11 below.

Table 11. The Most Frequently used 3 Assessment Tools in Mega Universities

The Most Frequently used 3 Assessment Tools	The Number of Institutions
Multiple Choice Tests	4
Assignments	3
Final / Exit Exam	3
Projects	2
True-False Tests	1
Internship	1
Report	1
Open-ended questions	1
Case Study	1
Presentation (Workshop)	1

Table 11 clearly shows that multiple choice test is the most commonly used assessment tool, which is followed by assignments and final/exit exams, true-false tests, internship, report, open-ended question, case study and presentation (workshop). Here, workshop refers to compulsory presentations to be made by learners for their peers and instructors at regional centers of AIOU at the end of terms under the supervision of moderators. The interviews conducted with the contact people in institutions revealed that workshop practice increases the interaction of learners with the system and help them develop commitment to the institution.

THE FACTORS AFFECTING THE CHOICE OF ASSESSMENT TOOLS AND TECHNIQUES IN MEGA UNIVERSITIES

The contact people in mega universities were asked about the factors affecting their choice of assessment tools and techniques. The replies given for this question are presented in Table 12 below.

Table 12. The Factors Affecting the Choice of Assessment Tools and Techniques in Mega Universities

The Factors Affecting the Choice of Assessment Tools and Techniques	The Number of Institutions
The number of learners	5
The number of teachers/raters	4
Time	4
Technological Infrastructure	4
Cost	4
Pedagogical Issues	4
Organizational Structure	2

When Table 12 is examined, it is seen that 5 out of 7 contact people reported that the most important factor affecting the choice of assessment tools and techniques is the number of learners. In addition, 4 contact people replied “the number of instructors/raters, time, technological infrastructure, cost and pedagogical issues as the other determining factors. Finally, two universities stated that organizational structure affects the choice of assessment tools.

The finding suggesting that the number of learners as a determining role while choosing assessment tools are well supported with the data presented in the table above. High number of learners in universities requires the use of multiple choice tests for assessment purposes. However, it is interesting that AIOU, which has the highest number of learners among the participant universities, do not administer any multiple choice test. This university prefers assignments and open-ended questions in the exams and the replies are graded by raters / supervisors. Although a rubric is used in assessment, some learners complain about the subjectivity of this type of grading. This information was obtained from the dissertations written at the university and the interviews conducted. The interviews conducted with the contact people in AIOU revealed that they are planning to integrate objective tests into the system as well.

CONCLUSION

Assessment tools used to evaluate students in mega universities vary to a great extent. The widest range of variety is in OUUK and STOU. These two universities use 30 out of 37 assessment tools included in the survey. These two institutions are followed by UT with 20 assessment tools and AIOU with 17 tools. The mega universities using the least number of assessment tools are AU with 6 tools and KNOU and UNED with 4 tools.

The most frequently used assessment tools and techniques in mega universities are multiple choice tests, assignments and final/exit exams. In addition, the most important factor affecting the choice of these tools is "the number of learners". The institutions where multiple-choice tests are preferred the most often are AU, STOU and UT and the least used institution is OUUK. Assignments and self-assessment are used the most often in STOU and OUUK. It is interesting that although AIOU is among the mega universities with the highest number of learners, multiple-choice tests are not used in this institution. AIOU administers a final / exit exam which consists of assignments and open-ended questions. Learners are asked to express their opinions and point of views in a detailed way by answering 5 open-ended questions out of 8. Graded as mid-terms, assignments guide learners to the content of course materials so that they are informed about the curriculum even at the beginning of the semesters. The assignments submitted to supervisors until the predetermined deadlines are graded, and detailed feedback is provided regarding the content of the assignments. This practice is believed to promote learners' commitment to the system as well as to the institution. Another similar and useful practice in this sense is the compulsory presentations made by learners in collaboration with their peers in regional centers and graded by their supervisors.

The number of part-time employed teaching staff in mega universities is quite high, which enables the institutions to integrate certain assessment tools such as assignment, project or portfolio etc. into the system. This staff contributes to the system by grading the assignments and giving feedback to learners when necessary.

Another important finding of the study is that continuous assessment, which aims to assess learners during learning process in certain intervals, is weighted as equally as end-of-course assessment tools in the assessment process in mega universities. In other words, process-oriented assessment is preferred in these universities. By doing this, learners are given more feedback to give them opportunity for permanent learning and institutional commitment.

Another finding of the study is the low number of cases when online assessment practices are applied in mega universities. This result clearly indicates that online technologies are not used in assessment systems yet. The reason lying behind this situation might be the disadvantages of online environments in terms of data security.

As for the assessment methods adopted, some mega universities are found to be using only absolute assessment while others prefer both norm-referenced and criterion-referenced evaluation. Unlike other universities, Anadolu University uses only criterion-referenced evaluation method.

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Broken of Bravery to the Invention of Rifle: A View on Project Technology Context of Creativity and Mastership

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ABSTRACT
The aim of the study is to bring a critical perspective to the use of projection and copy technologies, which have become widespread and degenerate by developing technology, in the art of painting. The data were evaluated by methods such as literature review, sample analysis, observation and experience. Projection technologies and the history of the camera obscura were examined. The effects of technologies on the art of painting have been questioned: reflection technologies such as photography, video, projection; printing technologies as blueprints and digital printing. The technical process on the basis of reproduction by projection consists of tracing the image and its repetition. Thanks to the printing technologies, this is not even necessary. This method which undermines the creative process, weakening hand-brain-eye coordination, perception development, imagination and composition design; can bring impersonality and uniformity. Wide range of uses and causes of projection technologies, concept confusion and discourses, the dimension that threatens creativity and mastery , encouraging use to support creativity; the subject has been interpreted on the basis of art ethics and aesthetics. One of our most important problems as a country is that we cannot be productive and creative enough to compete with the world market. The origins of the gradual decrease in the importance given to art and creative thinking and the loss of inventive ability can be found in the wrongness of education and cultural policies. We need research and studies that try to bring creativity and inventiveness to the fore, not imitation, and prioritize creativity in art and education through art.
Keywords: Painting Art, Camera Obscura, Projection Technologies, Copy, Creativity, Art Education

"Rifle was invented, manhood broke" Köroğlu

INTRODUCTION

If we look at the sky after the rain, we observe the rainbow formed by the light reflected from the water. With the same logic, Newton discovered the laws of color, which passed the light through prism. The first projectors are made up of these simple laws of nature, it consisted of light, its transmission, glass prisms, spheres, mirrors, water, etc.. The development of optics -astronomy and the projection technologies are parallel. Reflection technologies have been used in various ways and purposes throughout the history. Projection technologies, like any technological development, can be diverted from its purpose.

Nowadays, handcraft have been replaced by ready-made productions; pure art has been replaced by more articulated, genetically modified, art-like products. As a result of the fact that the technological tools are getting more between the artwork and the artist, ready-made presentations have increased, which makes difficult the separation of aesthetic object and artwork. In the article, the threat of copy, projection and printing technologies at the center of these problems and their use exceeding the purpose, were questioned.

Art is the act closest to person's own essence. As the artist moves away from the purpose of existence and spontaneity, she moves away from the arts. How should be shaped Art Education on the basis of originality, creativity and craftsmanship?

THE STUDY

The data were evaluated by methods such as literature review, sample analysis, observation and experience. Projection technologies and the history of the camera obscura were examined. The effects of technologies on the art of painting have been questioned: reflection technologies such as photography, video, projection; printing technologies as blueprints and digital printing.

FINDINGS

Projection Technology History

Shapes reflected in shamans' drums with the help of light and shadow; perhaps it was the first projection

drawings. It is possible to see old traces of reflection techniques from shadow theater to sun temples such as Abu Simbel temple where the light is specially dropped from a cone or hole on certain days. The concept of contemporary painting is based on the canons of the philosophers and artists of Ancient Greece and Rome, and the Renaissance, which is its revival. Gombrich (1951: p.56; 1998: p.57) says that we are all the pupils of the Greeks, and the Greeks are the pupils of the Egyptians.

> "According to Pliny, this art was carried into Egypt by the Lydian Gyges, who, standing near a fire, and observing his own shadow, instantly sketched himself on the wall with a piece of charcoal"(Vasari, 1855, p.12; Vasari, 2013, p. 27).

Al-Kindi who was probably born late in the eight century in the city of Al- Kufa was the first major philosopher of the Islamic world to study optics. It is to bring criticism to the Greek philosophers' theories about vision, the propagation of light from the object and the eye (Lindberg, 1981, pp. 18-33). Ibn al Haytham (Alhazen) was born in Basra in 965 (Hogendijk, 1985, p. 53). " We have no evidence so far, or knowledge, of image projection via a Pinole in a camera obscura prior to Ibn Al Haytham."(Russell, 2019, p.663).

> "The two words are "retina" and "lens" – in Arabic, al-shabakiyya, and al-'adasa. Their absence signals that, for the author of the book, the organ of sight, al-baṣar, rendered in the Latin thirteenth-century translation as visus and oculus, is not to be understood as a pin-hole camera (as, e.g., in Leonardo) or a lens camera (as, e.g., in Kepler)… However, whether intentionally or otherwise, in I/6, Alhazen does lay down the principle of the pin-hole camera.. ." (Sabra, 2007, p.53).

> "If a white body with a pitch black section is seen from afar, that section maybe judged to consist of darkness so it will be concluded that right where that section maybe judged to consist of darkness behind[the surface of] that body seems to show." (Alhazen & Smith 2001 , p.609).

> "In November 2001, David Hockney's Secret Knowledge. Rediscovering the Lost Techniques of the Old Masters was published with great fanfare. It made the claim that many artists from the Renaissance on used a now antique technology, the camera obscura, to make their paintings… If Hockney is correct, then many revered artists could now be thought to have 'cheated' by copying an image produced by a device, a sort of drawing-by-the-lines approach taken as 'inauthentic' by the art crowd who implicitly favored hand and brush." (Ihde, 2008, p. 383).

It was not a crime to seek help to capture the curiosity, secular realism, analogy anxiety and objective realism that led great artists to these discoveries. At that time pictures photo function and one-on-one analogy was very important.

> "Leonardo da Vinci (1452-1519) mentions the camera obscura in his Codex Atlanticus and Manuscript D giving detailed accounts of the camera obscura effect, diagrams, observations, and explanations of its principle. He, like many scholars before and after him, tried to solve one of the outstanding optical puzzles – how the eye works. But it was not him but Kepler who made the most significant step for our understanding of vision since Alhazen. Being in the position to compare the eye to the optical camera obscura rather than to the pinhole camera, he developed a convincing understanding of the role of the eye's lens and retina. If the back layers of the eye were to be peeled back, there could be seen the inverted image normally cast on the retina. This experiment was actually carried out with an ox eye by the Jesuit scholar Kaspar Schott in 1657…René Descartes (1596-1650) compared the eye to the camera as well, stating that the retina was the same as the screen of the camera obscura…The scioptric ball or "ox-eye lens" was developed in 1636 by..Daniel Schwenter. The movable lens-ball in the aperture of the scioptric ball allowed the artist either to draw or to paint panoramic views…Reinerus Gemma-Frisius (1508-1555), observed an eclipse of the sun with a camera obscura at Louvain on January 24, 1544... Galileo was one of the first to make serious studies of sunspots (1610)... John Flamsteed (1646-1710), reports this use of a camera obscura during the solar eclipse of July 2, 1684… Christopher Scheiner (1575-1650) used his "Pantograph" or "Helioscope", a portable camera 22 metres in length, equipped with a telescope to view sunspots. With this instrument, .., he was able to project the surface of the sun onto a piece of paper." (Wenczel, 2007, p. 24-29).

The hey-day of the optical camera obcura was between 1600 and 1800(Lefevre, 2007,9). Human beings have been interested in visual games and perspective for about five hundred years (Keleşoğlu & Uygungöz, 2014, p.8). Two names stand out in the invention of photography: In 1827,Joseph Nicéphore Niépce was the first to

stabilize the camera's image; In 1839, Louis-Jacques-Mandé Daguerre improved the exposure and stabilization processes within the camera obscura with chemical processes (Davenport, 2000: p.6-8). All recording and printing processes owe the invention of photography. Thanks to reproduction, Benjamin (2005, p.13,15,21) says of loss of the authenticity and the aura; he claims that it has been freed from the ritualist structure of art. If we expand the meaning of magic and ritual here, actually the art has lost its inspiration. Girgin (2018, p.35) approaches the subject more functionally: "After the first world war, the paintings created with different meanings in the Pop Art and New Realistic approach tried to integrate the popular culture on the one hand and the elite on the other".

Figure 1 The Experimental Historical Camera Obscura Max Planck Institute Berlin

Projection systems are much more advanced than yesterday. Although it is difficult to transfer colors and details in the past, nowadays two-dimensional, three-dimensional color images can be projected and printed on the canvas. Freezing and transferring motion images is no longer a problem. Painting can be done on the canvas or on the wall with robo-technology.

> "Peter Weibel took the critical approach in his essay Transformation of Techno- Esthetics (1991). All key concepts used to define art over the past two hundred years by philosophers such as Kant, Hegel and Heidegger, according to Weibel, fall flat as a result of what he calls techno-art… It not only undermines our faith in the image as a representation of reality, it declares the image to be irrelevant… Techno-Art emancipatory because it is aimed at overthrowing the power concealed in the classic concept of art. Techno-art according to Weibel is an anti-force, an anti -art." Mulder and Post (2000: p.117-118)

Here, there is some shifting of meaning and confusion. Technology has been shown to be anti-power, in fact, technology is in the hands of hegemony. Moreover, by saying that power determines what is true and spiritual, he transfers the concepts of creativity and inspiration and human nature to robo- technology and defines it as freedom. Our belief in reality was not undermined by robo technology, but was already undermined by physical advances and modern painting. Besides, in the manifesto of v2 (1987) exemplified by Mulder and Post (ibid), the statement "Art should be both destructive and constructive" was already the essence of modern art. What we are against here is not the use of technology for art. It is the dimension that replaces human nature, ignores creativity and inspiration.

Development of Copy and Projection Technologies

Although copy has been seen as an educational tool throughout history, copying and its types have increased today. We can summarize the causes of copying and proclivity to copy materials as follows:

1. Academic understanding that objective realism is dominant
2. Objective realistic power of photography

3. Habit from student period
4. Shortening of time
5. Increased interests
6. The development of technology
7. Speed
8. The complexity of the environment
9. Dense population
10. Unemployment
11. Increased interest in art
12. Misperceptions and judgments about art
13. Art market
14. Ease of convenience and easy way to get results
15. Fatigue
16. Herd mentality
17. Not knowing the value of originality
18. Not knowing the value of labor
19. Unqualified increased demand
20. Some jury and art consultants do not have enough knowledge, cannot reach technological speed, do not have universal perspective.
21. Using projection technology as an auxiliary tool in the creative process: The artist's own, hand, computer etc. Transferring the drafts and drawings of the prepared visuals to the canvas and other surfaces with projection or other copy material.

The phenomenon of copying can be examined in seven dimensions according to its purpose:

● **Copy for Restoration Purpose**: Perhaps it is the most justified reason of using projection and copying techniques. It is the renewal of the work in accordance with the original without damaging by providing exact copying and simulation.

● **Copy for Traditional Arts**: Altough Copy methods are thought to be compulsory for Traditional Arts, can not be made progress without transformation and development. However, computer programs offer numerous advantages in operations such as symmetry, asymmetry and rapport.

● **Master Copies:** Trying to learn the painting in academic understanding by experiencing the techniques of color, brush, and composition of the famous painters, usually in the classical period and after, for learning purposes from the masters. There is a reproduction of the pictures here. There are also relatively few copies of comments. These are sometimes humorous and in the style of nazire. Sometimes famous artists also make reference copies to important paintings.

● **Imitating the teacher**: In the master apprentice relationship or academic environment, it is usually the imitation of the student's teacher. There are four reasons for this: The first is to model and repeat to learn the technique. The second is admiration, the third is: taking refuge in the safe harbor of the accepted and relatively successful style, thus trying to impose himself, and the fourth is trying to compliment the teacher: this is an imitation for profit made without believing. The imitation status also likes sometimes by teacher because the imitations keep alive the origin. This situation, which is somewhat acceptable until it learns, threatens the uniqueness of the student over time.

● **Copy for profit:** While reproduction (replica-copy) is generally done for learning purposes, reproduction of old paintings for sales purposes has increased. We owe this to projection technologies. Just like the prints can be intervened with the brush technique or it can be painted over the projected image. It seems that a legal regulation has not been made yet. Ethical, cultural, social etc. the results are more frightening. The pictures are not claimed to be original here. Reproduction can also be made to order, and there are galleries in the market that deal with this business. These can be a tool for fraud.

● **Copying his own work**: Sometimes it is the artist's presenting his old works with little change or the same as a result of the problem of creating, sometimes not being able to risk. The reason for this may be misrepresentation, inability to see the old acceptance and fear of failure. In general, it is expected that a series will not decline after reaching a certain maturity and evolve into a new dimension. In series that have not been fully realized and have not reached maturity, there may be returns.

● **Theft imitation:** this type of imitation can also be diversified within itself:

1. Deliberately imitating an artist is different from being affected and benefiting, plagiarism is partly or almost a copy, but not a reproduction. It is intellectual and technical copying.
2. The second imitation for theft and fraud: to try to copy and sell for profit, the picture including his signature of an artist who died or lived. The difference from the idea and technical copy is the claim that the painting is original.
3. Another type of theft imitation is self-appropriation. Here, the person copies a piece of work that has not seen

by anybody in another country, in a remote land, but this time he makes his own signature as if he was the creator of the work. It is emerging in a short time today.

Throughout history, copy types have evolved from simple to complex. However, depending on the environment, older copying techniques can also be used.

Copy Types of Technically

1. A natural or artificial light source, tracing paper, parchment, sketch paper, etc. Copying with the help of, copying with stamp technique, copying with carbon paper, drilling method and buffering with coal dust.
2. Copying based on its original or reflection, reproduction from mirror, direct or square etc.(Figure 2)
3. Doing the same by looking so on Imitation by catching understanding of technique and ideas.
4. Reproduction with print types photo, offset, digital, and blueprints.
5. Copying from the digital image with a graphic tablet again. (Figure 6)
6. Sticking adhesive stickers with digital printing and other copy types on the painting surface.
7. Transfer prints
8. Marufle (marouflé Fr. Mounted. You can use a picture that has been copied on the painting canvas cloth on another surface many times, usually when the previous surface is old, the picture is decoupled and taken to another place.
9. Decupe process is to separate or paste only the desired area from within an image. Sometimes it can also be used with photoshop operations.
10. Templates prepared with original print types can be in citations prepared from their own creative works as well as quotations belonging to someone else. You can copy many times and repeat the same figure in different contexts. Reuse of sections taken from original prints, creating prints with a surface such as glass, paper and collages, canvas, spray, sponge from negative parts of cut templates or like coloring with a brush.
11. With the help of computer, photo, two-dimensional drawings etc. projection or transfer by printing technology
12. Transferring and painting 3D ready or designed images, transferring and painting two-dimensional images by transforming them into three dimensions with the help of a computer
13. 3D modeling with the help of computer technologies, transferring to a canvas or a surface such as a photoblock
14. Copying and printing via three-dimensional printers (products such as figurine relief)
15. Re-creation of the work on the surface of canvas, etc. by programming with robotics and printers.

Figure 2 Copying by square

Figure 3 A simple mirroring device that can be used with mobile phone and table

Figure 4 Lightbox

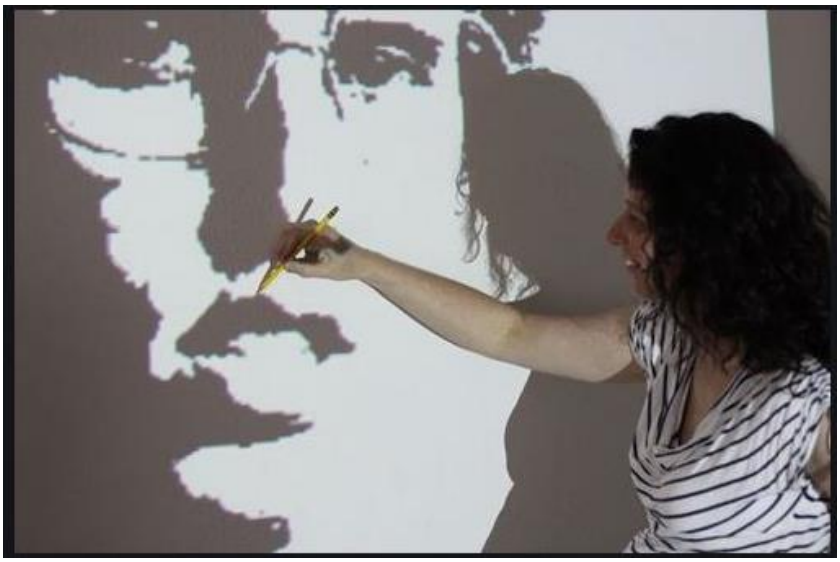

Figure 5 Drawing on the wall with projection

Figure 6 Ceyhun Kocakanat Drawing phase with graphic tablet

Figure 7 Drawscope

Figure 8 Projection

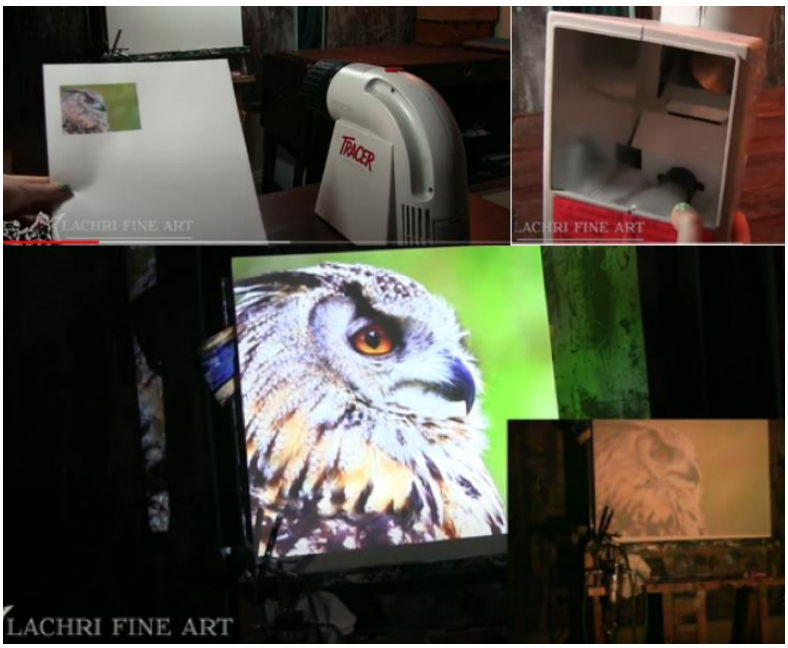

Figure 9 Artograph with mirrored light system inside. The image to be transferred to the canvas is placed under the device

Figure 10 Painting machine capable of automatic three-dimensional printing on the wall

A few ways to use projection, computer and copy materials in painting

1. Using the material in a creative way: transforming photos, taking sections, editing composition, making changes on it, creating fiction with methods such as decupe, marufle, photo-montage, painting on it (Figure 12)
2. Three-dimensional modeling from live and moving images with a scanning device. Modeling of living and non-living things that actually exist or do not exist. (Figure 11)
3. Realization of a scene with creative stage design, fictions and costumes and photographing under studio conditions, transferring and recording the visual record to the canvas.
4. Enlarging oneself own sketches or using the same scale mirroring as a painting aid
5. Reflecting the photo into painting with brush techniques
6. In the programs such as photoshop, acrylic, oil painting, relief etc. by transforming it into a type of technique
7. Painting over a picture in programs such as Photoshop on that is similar to other than canvas technique (watercolor etc.).
8. Painting in oil painting technique and other techniques of the photograph taken by oneself.
9. Reproduction of someone else's picture purpose of transformation or reflection in the same technique by copying
10. Copying someone else's picture by using copied by sectioning or transforming, reflecting or looking

11. Transferring someone else's photographs with projection, photoshop or classical copying methods with various techniques and converting them into pictures
12. Monitoring the reflected image with a device that functions as a projector, which has become the size of a small handheld camera and glasses with new technology. This optic tool, called the drawscope, allows to see the image on the canvas while looking at the object placed next to the canvas (Figure: 7).
13. Direct copying on the wall with the help of recently manufactured robots (Figure:10).
14. Converting a photograph taken by someone else and using it with classical and modern copying and projection methods by taking various sections.
15. Using projection and photography technologies for humor, with an emphasis on their own background and technique. Here, especially computer programs like photoshop are put in the viewer's eye and present a transparent summary of the history of the canvas painting to the audience.(Figure 12)
16. Interpretation copies and other humorous copies in the form of Nazire
17. Reproduction pictures with computer technology and robotic technology without any human touch. Artificial intelligence products.
18. Painting the same image reflected on the existing work for restoration purposes and renewing it according to the original work.
19.

Figure 11 Three-dimensional modeling

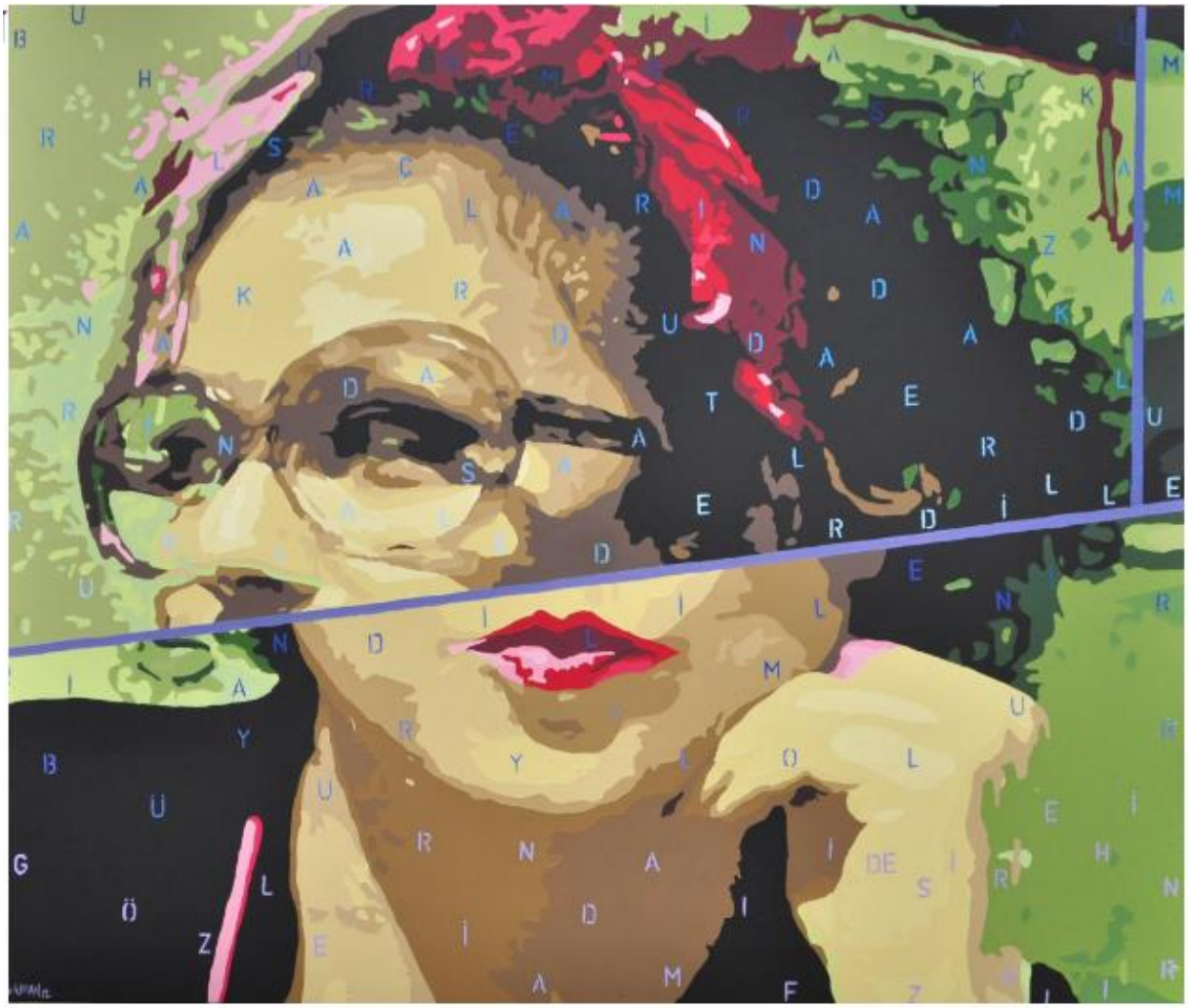

Figure 12 Deniz GÖKDUMAN, Bu Hürrem Başka, 2012, Acrylic on MDF, 154x182,5 , Bora Collectio

Effects and Dilemmas of Copy and Projection Technologies

As we mentioned, the invention of the camera in the modern sense, dates back to the second quarter of the 19th century. Photography has been also instrumental in the formation of ideas that support Modernism movements. What was the truth? Was art the reflection of reality and just imitation? What would be the changing, transforming reality? Form change and destruction of classical tradition was defined as modern. But modernism was also gaining momentum towards another dimension. Technology to be easily accessible, entering daily life.

Pop Art focused on sections of daily life, appliances that left their mark on the era, innovations, consumer materials, advertisements that left the most traces, product posters, bring visuality to life that inventions such as photography and TV that started to enter everyone's home. Therefore cannot be denied the effect of Pop Art in the transition to Photorealism and Hyperrealism movements.

> ""When it comes to the 1960s, it is seen that the Hyperrealism movement was quite effective especially in New York and Los Angeles. The starting point of hyperrealism is photography. As it is known, photography has been used as a tool in the art of painting before, but photorealist artists, unlike the artists before them, do not see photography only as a tool, they almost look at the world through photography. Some of the artists working in this style worked from photographs, some of them tried to capture the photoreality by distributing the detail sharpness equally to the whole picture using the slides projected on the canvas."(Gökduman,2020,s.12).

There are artists and good examples working in the field of Hyperrealism and Photorealism in the 2000s as well. Ron Mueck is just one of them. (Figure 13)

Figure 13 Ron Mueck A girl 2006. Polyester resin, fibreglass, silicone, synthetic hair, synthetic polymer paint

Artists who tend to these styles today may have other philosophical concerns as well, this is somewhat related to the perception that surprise and shock developed with post-modernism is an aesthetic aspect. The truth is that we are now evolving towards an aesthetic level that will not admire a work, without a solid infrastructure and intellectual ground behind it just because it has acquired a surreal resemblance to the object.

As can be seen, all art has been formed and gained meaning in accordance with the requirements of the age in accordance with social and scientific developments, and today, the easy access of everybody to countless copying devices has brought the art and the art-like an undetectable dimension. These auxiliary tools and techniques have exceeded their intended purpose and have almost become intent. Misuse of technology has brought along many handicaps.

Copying and projection technology creates a range of problems, from technical errors such as incorrect scaling and size change in reproductions to ethical issues that lead to loss of creativity and theft. While it is easier to understand all kinds of copies in today's technology, the phenomenon of copies is still at a level to make the institutions struggle and to mix the art market.

As Temel (2009) has shown, artificial neural networks can also be used to detect art forgery. On the contrary, it may try to replace the artist: as a matter of fact, a painting produced using artificial intelligence and algorithm was first put on sale in 2018. The "Portrait of Edmond Belamy", developed by the Paris-based art collective "Obvious", is the work of a computer algorithm that includes about 15000 portraits produced between the 14th and 20th centuries. It is one of a group portraits of the fictional Belamy family (Figure 14).

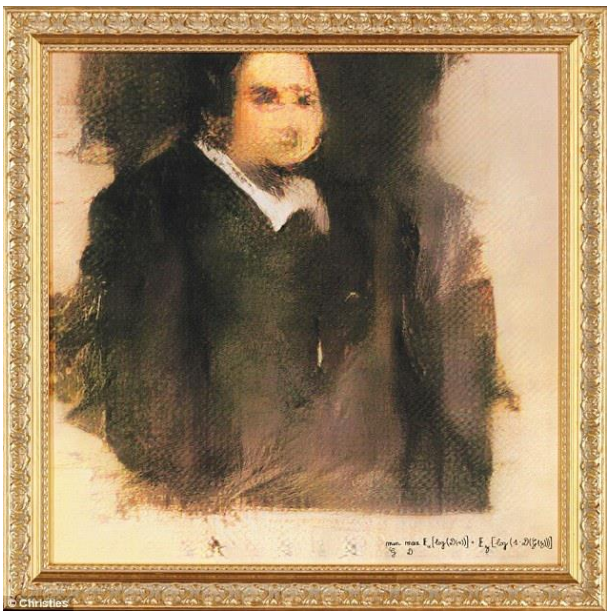

Figure 14 The first painting to be sold with the signature of artificial intelligence is "Edmond Belamy's Portrait"

Those who rely on copy styles often start with anxiety of objective realism and want it to be the same If the mimesis proposes to imitation of the ideas world; with the copies that are the imitation of these works, the imitation of the imitation of the imitation is made vulgar. However, understanding of idealized classical beauty carries soul. Based on the synthesis of living bodies, the Greeks sought an expression of psychophysical beauty, ideal beauty, between body and soul, in which formal beauty and spiritual well-being formed harmony. (Eco, 2006, p. 45).

In the sense of objective realism combined with idealized beauty, emotions are transferred to the work of art through interpretation. However, photographs rarely reflect personality traits and emotions, except for artistic very good photographs. The photo has a dull expression In painting, a character, for example, is reflected in the portrait, while the sum and essence of the character's personality; typical gestures and facial expressions, poses in mind from that character; the whole of expressions that are reflections of personality; summary and a sharp reflection passes to the canvas. This effect becomes more believable and permanent if the pictures are known or if their feelings can be felt and reflected. With the feeling of Einfühlung (empathy), it gains an immortal authenticity. However, the image in an ordinary photograph is not similar to the original as in the picture. It does not pass that feeling as much as a work of art. Let's not fall into the following error here: not every photograph is a work of art, nor is every picture a work of art. The real work of art can pass the emotion to the viewer. Of course, photography can be used, but real painters want to work from the model to the extent possible.

The artist has a memory of a creative process on the canvas. Today, even the originality of the painting is understood through this process: For example, in the phenomenon called pentiment, where the artist transformed his painting, he gave up, erased, spoiled or rearranged the composition: the whole story in the old works, the personal history of the canvas can be brought to light with x-rays and special examinations. Under the perfection of the new projection technique, its soullessness will also be understood through studies.

The technical process, which takes shape on the basis of copy and reproduction by projection, consists of tracing the image and its repetition. This projection painting technique seems to be more suitable for the Restoration Divisions.

Contemporary Art Education, Observations and Applications

One of the events we witnessed in our teaching process is that the students who meet the projection device constantly try to transfer images to their canvases and ask for auxiliary materials for this. In this way, some students want to participate in talent shows. Such talent shows are held around the world, and in some cases, the painter reverses the picture at the last minute and shocks the audience. These images are dropped onto the canvas in advance with the projection device and are quickly completed by the talented painter with the chemical or markings that the distant audience cannot see. It is not always possible to find a live model, to capture the moving image, or to give the desired pose. For this reason, more importance should be given to photography lesson in elective workshops, photography should be handled with all its subtleties. Students should be encouraged to use their photographs in their own painting projects. Of course, there are images that cannot be reached by everyone. Almost everyone benefits from public channels of visual culture. Copyright should be taught to students thoroughly, and ethical discussions should be made about citation, plagiarism and exploitation. While exhibiting their reproductions publicly, they should indicate their painter and copy, and should not accidentally write their names on such paintings. Computer graphics are becoming increasingly important in elective art workshops. Three-dimensional models and modeling programs can be developed here and different poses can be produced and diversified on figures. Again, transfers can be added to the traditional painting and traditional surfaces from here.

Implicit and explicit affirmation of objective realism is equivalent to that of learning the work in proportion to the accuracy of secular reflection, but a false perception occurs among young people. Continuous approval of the photographic reality both in the grading stage in the education process, in the selection process in the competitions, through the media, through the hidden and open norms, and the fact that it was acceptable, inclined the student to the method of painting with projection, which leads the student in an easy and short way and gives good results in a visible way. With the gradual shortening of the Main Art Workshop course at the Faculty of Education, technological aids can be tolerated, especially in reproductions, so that painting can be started immediately. Maybe some art students and prospective artists tend to reflect objective realism. They are going to do this more or less without any tools, whereas this issue, and those who have no tendency and love, or those who are not suitable for this, have followed this trend. A popular discourse among students is: "imitation brings tactics". This is learned, habitual imitation. Each brush stroke has a different sense of meaning and is momentary. Neither time,place, conditions nor people can be the same. Likewise, the tactic that everyone will

develop must be appropriate to their own structure. Learning tactics with copying may be a bit more possible when you face an original production. It is much more possible if you see the lower layers with today's technology. Even so, it is the discourses and actions that hinder the student from finding himself.

Citation sampling in art education developed by Kodaman and Yılmaz (2014) can be considered as a search for a meaningful method in this context. During the teaching of objective realism, the technical process can be comprehended by repetition, with qualified quotations, without falling into the habit of copying. As Yilmaz (2015) stated:

> "Individuals who are not directed to think differently, are encouraged to be like others, and therefore cannot take different approaches, always want to be like others, in an effort to emulate others, during their school life; especially the education understanding that they have at an early age, which consists of imitation, copy and template works, has a great impact (p.111-112)."

The projector is not a device produced for reproduction. (Christenson, 2016) as shown by using the projection device in classrooms and workshops: Demonstration and discussion of teacher's works of art in the classroom, observing students' work and development, creating games for teaching concepts, document titles and requirements, sharing daily events, visual There are many ways, such as sharing things that support discussions. We use them as needed.

We take excellent portfolios in the graduate exam evaluation juries. The common feature of these files is that they have excellent drawings and painting. Another common point is that the files are almost the same. When these candidates take the design exam, it is understood that they have low proficiency from their files. They have begun to lose the ability to form a solid pattern, let alone looking at the image, even with mere hand-brain-eye coordination. Our wrong education system may have contributed to this. This is due to photographic work with copy methods. It is predicted that there will be a need for more spontaneity, naturalness, creativity, more authenticity, more stylistic differences.

CONCLUSIONS

The invention of the camera in the modern sense dates back to the second quarter of the 19th century. Although the camera pioneered modernism movements in the point that the refraction of reality and art is nothing but imitation, with the introduction of the camera into daily life and being the chief assistant of the artist, with the Pop Art effect after 1960, movements such as photorealism and hyperrealism, where projection technologies were dominant, came to the fore. While these trends were meaningful in their time and being a pioneer, they deviated from their purpose over time. Today there are countless copying and printing devices based on photography and projection. These auxiliary devices can reproduce different fictions of visual images instead of imagination and put the artist in a vicious circle. It can lead to uniformity and vulgarization. The one reflected from the naked eye or imaginary is immediately distinguished from the viewfinder. Although it can help with learning light-shadow and perspective, it can lead to rely on readiness preparation for areas that require creativity. On the basis of repair, one-to-one resemblance, reproduction, projection copying is more meaningful and beneficial for Restoration sections.

Projection copying is more useful and meaningful for the restoration departments. Altough Copy methods are thought to be compulsory for Traditional Arts, cannot be made progress without transformation and development. However, computer programs offer numerous advantages in operations such as symmetry, asymmetry and rapport.

Just like the spread and misuse of printing and projection technologies threaten mastery and creativity. Although reproduction in the context of copy works at the educational stage, it may have consequences in the long run that will lead to violations of rights and unfair earnings. By repeating an image, at the lowest level, without hand-brain-eye coordination, without problem solving and without developing new ideas, in the context of artistic creativity in the student; it will not contribute in the context of mastery. It is clear that projection technologies, especially those used to benefit from the works of others, will harm one's artistic development and the art world. Students should be encouraged to use the visuals theyself produce and develop as much as possible. In this context, photography lesson and computerized design lesson become more important for the main art branch in elective art lessons. They should be encouraged to create different compositions such as traditional drawing, painting, modeling methods leading to three-dimensionality, sketches, drafts and transformations from the photos and videos they use. Digital assistance is only meaningful in the context of developing creativity. Creativity is a process and it can yield positive habit regardless of the stage it is used in education. Studies carried out with copying, computer and projection technology and authentic (original) studies should be

evaluated in a separate track. Techno art and pure art, that is, only art products that come out with artist handcraft and imagination, maybe should be evaluated in separate lanes.

As a country, one of our most important problems is our external dependency and our inability to be productive and creative enough to compete with the world market. The roots of the gradual decrease in the importance given to art and creative thinking and the loss of creativity can be found in educational habits, wrong education and cultural policies. Trying to emphasize creativity and inventiveness, not imitation; We need research and studies that prioritize creativity in arts and education through art. As long as continues the logic of imitating, desire to adopt of something which someone else has labored to produce, we are dependent on outside in every field. What we expect from artist candidates is not to repeat a famous artist in history, but to reflect their own personality. We are curious about their feelings, thoughts and distilleries. We want them to find their own artistic language. Therefore, we support creativity, not copy.

LIST OF FIGURES

Figure 1 The Experimental Historical Camera Obscura
The *Experimental Historical Camera Obscura* is a research tool for historians of art and science who investigate the17th-century camera obscura. It was designed and constructed for the Max Planck Institute for the History of Science in Berlin, by Carsten Wirthand Henrik Haak. İn Lefèvre W. (2007). "The Optical Camera Obscura I A Short Exposition" *Inside The Camera Obscura – Optics and Art under the Spell of the Projected Image* (Edit: Wolfgang Lefèvre) p.10 Picture 4: Berlin: Max Planck Institute for the History of Science.

Figure 2 Copying by square
Sandrine Pelissier 2017 Is using a lightbox cheating? The controversy about using a projector or a lightbox for your paintings in Drawing, Painting Technique, Thoughts
https://paintingdemos.com/is-that-cheating-the-controversy-about-using-a-projector-for-your-paintings/

Picture 3 A simple mirroring device that can be used with mobile phone and tablet
https://tr-m.banggood.com/Drawing-Painting-Sketch-Optical-Mirror-Reflection-Projection-Tracing-Plate-Board-p-1597147.html

Figure 4 Lightbox
Sandrine Pelissier 2017 Is using a lightbox cheating? The controversy about using a projector or a lightbox for your paintings in Drawing, Painting Technique, Thoughts
https://paintingdemos.com/is-that-cheating-the-controversy-about-using-a-projector-for-your-paintings/

Figure 5 Drawing on the wall by projection
Napoleon Dynamite, May 26, 2010 https://www.designmom.com/napoleon-dynamite/

Figure 6 Ceyhun Kocakanat Drawing phase with graphic tablet
"Hiperrealist çizim nasıl yapılır?" https://www.youtube.com/watch?v=nxFV-cxNm30

Figure 7 Copying by Drawscope
https://www.drawscope.com/

Figure 8 Projector
"How to choose the best Projector for art Tracing Masterpieces"
https://www.youtube.com/watch?v=Z8sb96GdGI0

Figure 9 Artograph with mirrored light system inside. The image to be transferred to the canvas is placed under the device https://lachri.com/art-projectors/

Figure 10 Painting machine capable of automatic three-dimensional printing on the wall
https://www.youtube.com/watch?v=5bCVX6UJb8s

Figure 11 Üç boyutlu modelleme
https://cadsay.com/3d-modelleme

Figure 12 Deniz GÖKDUMAN, Bu Hürrem Başka, 2012, Acrylic on MDF, 154x182,5 , Bora Collection
http://www.borakoleksiyonu.com/eser.aspx?isim=DEN%C4%B0Z%20G%C3%96KDUMAN&kimlik=46

Figure 13 Ron Mueck A girl 2006. Polyester resin, fibreglass, silicone, synthetic hair, synthetic polymer paint second edition, artist's proof. Scottish National Gallery of Modern Art, Edinburgh, purchased with assistance from The Art Fund 2007. © Ron Mueck courtesy Anthony d'Offay, London. Photo: Antonia Reeve https://christchurchartgallery.org.nz/bulletin/162/the-edge-of-life

Figure 14 The first painting to be sold with the signature of artificial intelligence is "Edmond Belamy's Portrait"
Sami Quadri Painting created by an AI 'artist' goes up for auction for the first time and is expected to fetch up to $10,000For The Daily Mail Published: 08:31 BST, 23 August 2018 | Updated: 12:04 BST, 23 August 2018
https://www.dailymail.co.uk/sciencetech/article-6089693/10-000-painting-created-AI-artist-goes-auction-time.html

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Comparison of Collaborative and Individual Learning in Online Learning

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ABSTRACT
In the online learning environment, it is seen that problems arise in the absence of interaction. In order to prevent these problems, this study, which was carried out by taking into consideration the principles that are formed using the community of inquiry framework, took place during the 2014-2015 Spring Semester using 30 students from a vocational college located in the Turkish Mediterranean Region who enrolled in the "Graphic Animation" course. The study was used a pretest-posttest control group design. The control group constituted of students working with online problem based individual methods while the experimental group constituted of students working with online problem based collaborative learning methods. The groups were compared in terms of academic success, motivation and satisfaction. It was determined that the motivation was higher in the experimental group, while there was no difference in the achievement and satisfaction in the experimental group and the control group.

Keywords: cooperative/collaborative learning; distance education and telelearning; interactive learning environments; teaching/learning strategies

INTRODUCTION

There are different definitions of online learning, which is the realization of the learning-teaching process in a software environment (Govindasamy, 2002). While Carliner (1999) identifies online learning as the educational material presented by the computer, Ally (2004) defines it as the acquisition of learning experiences and the construction of personal meanings by using the internet in accessing learning materials, ensuring the interaction of learners with content, teachers and other learners in order to obtain information and support the learning process. Jolliffe, Ritter, and Stevens (2012) on the other hand, reported online learning was a process where students were asked questions online, received answers to the same questions, and were evaluated online. As can be seen, the previous definitions emphasize the use of material on the internet, and the next definitions are the outcome of interaction. Interaction, which is expressed as mutual communication (Garrison, 1993) is among the skills needed in the 21st century (Cheryl, 2003). In this environment, individual learning is important but not ideal (Anderson & Garrison, 1998). Individual work in an online setting should not be considered loneliness. The student should interact both with the instructor and with those preparing the lesson throughout the process (Keegan, 1986) and active involvement must be achieved (Hung & Chou, 2015). Meyer (2014) stresses the importance of interacting with other students, the instructor, and the content to ensure the quality of learning. It is known that student-student and student-instructor interaction is valuable (Navarro & Shoemaker, 2000) and increases education quality (Phipps, 2015) in an online learning environment.

In many existing studies on online learning environments, it has been established that interaction is one of the most important factors in determining student satisfaction (Kuo, Walker, Belland, & Schroder, 2013; Summers, Waigandt, & Whittaker, 2005; Navarro & Shoemaker, 2000;Gould & Padavano, 2006) and that it has the influence to increase performance and success (Paulus, 2003; Saba, 2000;Navarro & Shoemaker, 2000). Many studies have established the importance of interaction in the online learning environment (Kauffman, 2015; Bowers & Kumar, 2015; Kuo, Walker, Schroder, & Belland, 2014;Song, Singleton, Hill, & Koh, 2004; Drange, Sutherland, & Irons, 2015). However, critics emphasize that interaction is not at desired levels in these environments, which introduces a big problem (Ozkose, Ari, & Cakir, 2013; Baris & Cankaya, 2016; Zhu, 2012; Muirhead, 2000). It has been observed that learning models with limited interaction have been used in online learning environments as a result of one-way communication (Anderson & Garrison, 1998). As a result of

examination of various studies conducted by Cho and Berge (2002), it has been determined that lack of interaction is expressed as a problem. For this reason, it has been determined that the students do not feel themselves as belonging to the community (Vrasidas & Mclsaac, 1999). Lack of interaction, which is important for success in online learning, is considered to be as a major weakness in online education, and should be increased (Paulus, 2003). Display quotations of over 40 words, or as needed.It is known that in an online learning environment, interactive and student-focused methods (Brooks & Brooks, 1999) including practices based on objective and constructive theories (Deryakulu, 2000) lead to success (Simonson, Smaldino, Albright, & Zvacek, 2002). Vrasidas and Mclsaac (1999) expressed that teaching objectives could be achieved by interaction strategies. According to the methods used in interaction strategies, students need to take an active role in the process (Tinto, 1997). During the active role stage, a learning method based on cooperation was used, among other methods, to increase the learning experience and effectiveness of students (Curtis & Lawson, 2001). One of the models that incorporates learning methods based on cooperation is the online learning model. In his online learning model, Anderson (2008) states that learning in an online environment develops in two primary ways. The first of these is learning based on cooperation, the second is independent learning. Cooperation based learning speaks of group learning and focuses on the need and desire of students for support from a teacher. As a result of this interactions are kept within a community of inquiry based on either synchronized or unsynchronized collaborative activities, computer mediated communication devices (CMC) which include, phones, emails, voicemails, and online chatting are implemented.

Group work is emphasized throughout the online learning process (Ergul, 2006). As a result of this, the group learning method, being the first method in the online learning model defined by Anderson (2008), has been used in the study. In order to establish student to student and student to instructor interactions, Collaborative learning methods, community of inquiry (COI), and computer mediated communication devices (CMC) have been utilized. In addition, collaborative work has been performed based on problem solving methods. Collaborative problem solving which has been defined by Nelson (2009), is realized through the implementation of nine steps. These steps are listed as preparations, forming and norming groups, determining problem situations, distributing the tasks, finalizing the solution, synthesis and reflection, formative and summative evaluation, and ending the process. In the Problem based collaborative learning process, firstly students are given an ill-structured problem. During the process of solving the ill-structured problem, students are expected to use their own knowledge and to take personal responsibility in their group work (Bridges, 1992). Through this process, students come together to achieve a common goal and solve problems through cooperation as well as by incorporating their own experiences into the problem solving process (Yeh & She, 2010). Thus students form a social agreement with each other (Savery & Duffy, 1995). Within the ill-structured problems, authentic scenarios are created and solutions to the problems or other alternatives are not clear (Jonassen, 1997). The review of various studies which used this method revealed that it provides improvements in student learning, success, and collaborative abilities (An, 2006; Akarasriworn, 2011).

Another component in the community learning phase of the online learning model is the Community of Inquiry – (COI). The COI, which is expressed as a model used in the process of meaningful learning in the online learning environment, consists of three main elements; social, cognitive, and instructional (Garrison, Anderson, & Archer, 2000). It has been determined from previous studies that attention should be paid to certain issues when creating an online community of inquiry. These issues, including the number of students who will participate in the study and the actions of the students and the instructor in the working process, are aimed at making communication more effective.

The importance of interaction in an online learning environment can be seen in existing studies. It has been established that the dropout rate in the online environment is higher compared to the traditional environment (Foust, 2008; Carr, 2000). Increasing interaction in the online environment may be a solution to this situation. For this purpose, the collaborative learning model, community of inquiry, and computer mediated communication components were utilized in order to seek answers to the following questions.

(1)When comparing students in an online learning environment where problem based collaborative learning method is implemented and those in an online learning environment where problem based individual learning method is implemented;
(a) Is there a significant difference in academic successes?
(b)Is there a significant difference in satisfaction?
(c)Is there a significant difference in motivation?

METHOD

During the study, a pretest-posttest, randomly ordered matched control group method was used. In this method, similar participants are randomly assigned to the control group or experimental group. During this study, implemented in the scope of the "Graphic Animation" course, students taking the course were randomly assigned to either the control group or experimental group by considering their department, gender, learning style, grade average, pretest results and motivation before the experiment.

Working Group

The study took place in the "Graphic Animation" course during the 2014-2015 Spring Semester. In order to determine the participants, the instructors announced to their students that a Graphic Animation course would take place and collected 130 application forms. After the course's content and topics were finalized, the participant number was lowered to 30. Out of these 30 participants, 15 were assigned to the experimental group which worked collaboratively in an online learning environment, and the remaining 15 were assigned to the control group which worked individually in an online learning environment. While creating the collaborative learning groups, certain criteria was considered and the groups were made to be heterogeneous. Table 1 and Table 2 show the characteristics of the participants. As seen in Table 1, students were paired according to their department, gender, grade average, and learning styles. In addition, the pretest and posttest results and motivation rates were used in pairing the groups.

During analysis of the pretest and motivation rates, it was established that the data showed normal distribution. Therefore, an "independent sample T-test" was used in order to determine if there was a significant difference between the two groups. The analyses, pretest and posttests, and motivation rates indicated that there was no significant difference between the two groups.

Table 1: Demographic characteristics of participants

Variables		Experimental Group (n)	Control Group(n)
Department	Office Management	2	3
	Call Centre	5	5
	Foreign Trade	2	1
	Accounting	6	6
Gender	Female	10	9
	Male	5	6
General Grade Average	1.00-2.00 (Low)	3	3
	2.01-3.00 (Medium)	8	9
	3.01-4.00 (High)	4	3
Learning Style	Independent	2	3
	Evasive	4	3
	Cooperative	2	2
	Dependent	3	3
	Competitive	3	2
	Participative	1	2

Table 2: Profiles of participants working in collaborative groups

Group Name	Gender	Departments	GPA	Learning Styles
Group 1.	2Female/ 1Male	Accounting/Office/Call Centre	Low/Mid/High	Dependent/Participative/Collaborative
Group 2.	2Female/ 1Male	Accounting/Call Centre/ Foreign Trade	Low/Mid/High	Competitive/Independent/ Evasive
Group 3.	2Female/ 1Male	Call Centre/ Accounting/ Accounting	Low/Mid/High	Independent/Evasive /Collaborative
Group 4.	2Female/ 1Male	Call Centre/Office/ Accounting	High/Mid/Mid	Competitive/Evasive /Dependent
Group 5.	2Female/ 1Male	Call Centre/ Accounting/ Foreign Trade	Mid/Mid/Mid	Dependent/Competitive /Evasive

As indicated by Johnson and Johnson (1999), while creating the groups it is important that they are heterogeneous. The experimental group consisting of 15 people was divided into 5 groups made up of 3 people, and as shown in Table 2, it was ensured that each group was as heterogeneous as possible within each group.

Data Collection Tools

The study aimed to identify student successes by process and product evaluation. During this process, an indicator table for learning objectives created by the researcher was taken into consideration. The indicator table was finalized with expert opinions.

The evaluation of the process was based on the activities on the indicator table. The product evaluation was based on the projects prepared for ill-structured problem situation and the achievement scores on the achievement test prepared by the researcher and the instructor teaching the class. However, in spite of all the measures and incentives implemented in the process, it was observed that data was lost due to the fact that very few of the students submitted projects and the achievement was therefore measured only by the test. During the process of creating the achievement test, questions were generated by the researcher and the instructor teaching the class. Other than the researcher and the course instructor, two experts were consulted to ensure the content validity of the test. After implementing experts' opinions, a factor analysis was conducted to ensure that the items on the test were valid and reliable. In order to perform the item analysis, the first achievement test, which was composed of 82 questions, was conducted on 90 students who had taken the Graphic Animation course.

As a result of the analyses; The KR - 20 Reliability Coefficient was calculated as 0.91. The average difficulty of the test was calculated to be 0.53. The difficulty ratings of the items in the test range from 0.24 to 0.85. According to this; There are 12 easy questions with item difficulty coefficients between 0.70 and 1.00, 36 moderately difficult questions between 0.40 and 0.69 and 16 difficult questions between 0.00 and 0.39. The discriminant coefficients range from 0.20 to 0.59. According to this; There are 16 low discriminative questions with item discrimination coefficients ranging from 0.20 to 0.29, 17 moderately discriminative questions between 0.30 and 0.39, and 31 very discriminative questions between 0.40 and above.

In order to determine the motivation level of students, the motivation section of the Motivated Strategies for Learning Questionnaire developed by Pintrich, Smith, Garcia, and McKeachie (1991), which had been adapted to Turkish by Buyukozturk, Akgun, Kahveci, and Demirel (2004) and named as the "Motivation and Learning Strategies Scale was used. The use of this scale on 852 students from two different universities by (Buyukozturk et al., 2004) determined that this scale which had been adapted to Turkish from the original Questionnaire was comprised of six separate factors. The Cronbach's Alpha values for the motivational scale ranged from 0.86 to 0.59. It was determined that the Cronbach Alpha values were 0.86 to 0.59 in the scale of recalculation of the reliability value, and between 0.94 and 0.54 in the pilot application and between 0.83 and 0.54 in the application.

The "Satisfaction Scale Related to the E-Learning Process", developed by Gulbahar (2012) was used in order to determine satisfaction in the e-learning process. According to the reliability analysis results of 2963 students, the Cronbach's alpha reliability coefficient was determined as .97. According to the exercise that took place with 81 students before the study, Cronbach's alpha value was found to be .97, 81 for pilot and .91 for practice.

Implementation process

The study took place during the 2014-2015 Spring Semester at a vocational school in a public university located in the Mediterranean Region. In the course, the students in the experimental group worked collaboratively in different roles such as designer, developer, and coordinator, while the students in the control group worked individually. Figure 1 shows how the implementation process was carried out. The study was divided into three stages. During the first stage, online lessons, the experimental and control group were given weekly, hour-long lessons through LMS. The second stage, online work, took place after the online lessons.

During this step the students working collaboratively divided into 5 groups consisting of 3 people. Each group was observed by the instructor and researcher throughout the online working process. The third stage, participation in the discussion group, took place asynchronously. The purpose of this step was to carry out the exercises that could not be conducted synchronously. Another goal was for formal and informal communication to be provided through LMS During the pilot application, communication in this step was limited to email. This caused students to develop negative feelings regarding the use of forums. For this reason, it was left as an optional stage during the actual exercise.

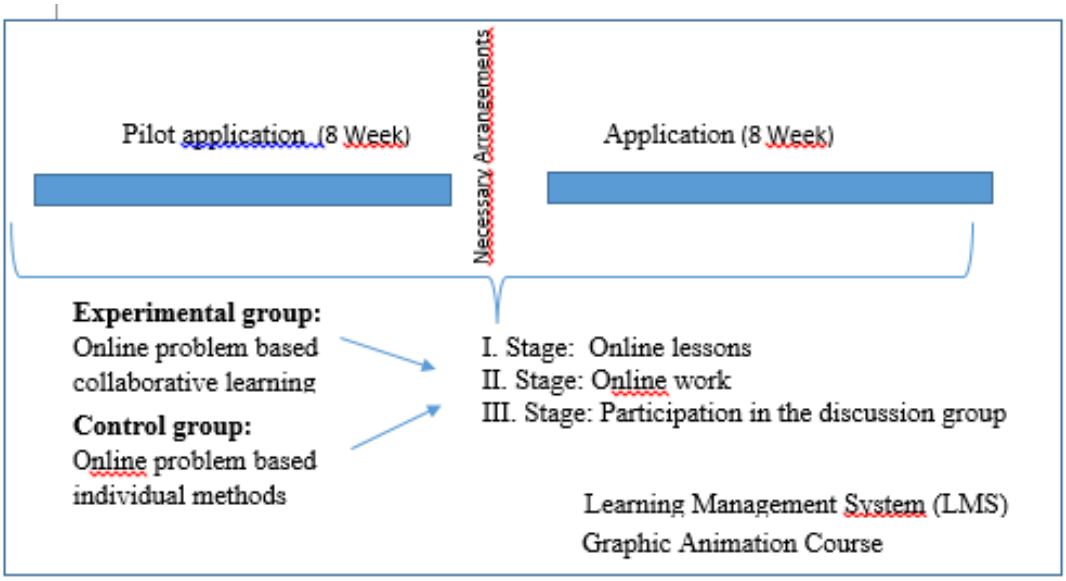

Figure 1: Implementation Process

FINDINGS

As indicated before, achievement test results were used order to specify if the difference in academic success between the collaborative learning method and individual learning method in an online learning environment was significant or not. As both the pretest performed before the study and the posttest performed after the study indicated normal distribution, the difference between the groups was examined by an "independent sample T-test."

Table 3: Pretest and posttest results of students who participated in the exercise

Pretest Points						
Group	N	$\bar{X}$	S	sd	t	P
Experimental Group	15	20.93	15.47	28.00	.483	.506
Control Group	15	16.33	13.89			
Posttest Points						
Group	N	$\bar{X}$	S	sd	t	p
Experimental Group	15	55.07	16.39	28.00	.525	.413
Control Group	15	44.20	13.75			

In Table 3, it is seen that there is no difference in test points between the experimental group and the control group, both before the exercise [t(28.00) =.483, p>.05] and after the exercise [t(28.00) =.525, p>.05]. This shows that the method used does not alter achievement scores.

In the study, an "independent sample T-test" was implemented on the data that showed normal distribution in order to specify if the difference in motivation between the collaborative learning method and individual learning method in an online learning environment was significant or not.

In Table 4, it is seen that there is no difference in motivation rates between the experimental group and the control group before the study [t (28) =1.376 p>.05]. The motivation test results after the study, however, show a significant difference in motivation rates between the experimental group and the control group [t (28) =2.329 p>.05]. The motivation of participants in the collaborative learning (experimental) group ($\bar{X}$=154,80), was determined to be higher than those in the control group working individually($\bar{X}$= 140,87). This is thought to be related to the fact that the collaborative learning method increases student's motivation.

Table 4: T-test results of the motivation factor before and after the study

Before						
Group	N	$\bar{X}$	S	sd	t	p
Experimental Group	15	152.53	22.38	28.00	1.376	.180
Control Group	15	163.67	21.92			

After						
Group	N	$\bar{X}$	S	sd	t	p
Experimental Group	15	154.80	17.47	28.00	2.329	.027
Control Group	15	140.87	15.21			

In the study, an "independent sample T-test" was implemented on the data that showed normal distribution in order to specify if the difference in satisfaction between the collaborative learning method and individual learning method in an online learning environment was significant or not.

Table 5: T-test results of the satisfaction factor according to groups

Group	N	$\bar{X}$	S	sd	t	p
Experimental Group	15	121.73	18.58	28.00	.449	.657
Control Group	15	124.20	10.33			

According to the analysis results in Table 5, it was established that that there was no significant difference in satisfaction between the experimental group and the control group, and that satisfaction was high in both groups [t(28)=.449 p>.05].

DISCUSSIONS AND CONCLUSION

At the end of the study, it was established that the achievements of the students working collaboratively were not different compared to those of the students working individually. Therefore, it is thought that methods and activities based on collaboration are at least as effective as other methods. Although this method puts an additional load on students and teachers, it does not impair academic achievement. The research finding is supported by previous studies in which there was no apparent difference between the collaborative learning method and other learning methods. (Dennis, 2003; Depriter, 2013; Gokhale, 1995; Kamin, Glicken, Hall, Quarantillo, & Merenstein, 2001; Mazzoni, Gaffuri, & Gasperi, 2010; Nam, 2016; Nickel, 2010; Sendag & Odabasi, 2009). However, in certain studies (Lin, Yang, She, & Huang, 2015; Boling, 1996; Atici & Gurol, 2002; Uribe, Klein, & Sullivan, 2003; Gursul & Keser, 2009; Tarmizi & Bayat, 2012) it was seen that there was a difference between the groups and success was generally higher in those working collaboratively.

Before the study, the experimental group and control group were placed in order to be equal in terms of motivation. At the end of the study, it was established that the experimental group's motivation was higher. The higher motivation of the students working collaboratively can be credited to the fact that they worked together. This finding is supported by previous studies (Tsai, 2010; Sulaiman, 2013) which found that student's manner of work varied under different methods.

During the study it was established that the experimental group and control group's satisfaction did not differ and was high in both cases. It is thought that the design principles of the study in which problem solving method was used in both groups implemented throughout the process prevented a difference in satisfaction between the groups. In Capdeferro and Romero, (2012)'s studies on disappointments related to collaborative learning experiences, it was found that despite dissatisfaction with many situations, the majority of students were pleased overall with the study.

At the end of the study these suggestions were offered; The study was conducted with two different groups that worked in a learning environment designed based on principles of community of inquiry framework. Since the student satisfaction was high in both groups, instructional designers should pay attention to these principles while designing a learning environment based on problem based learning method. It was determined that the collaborative learning activities that took place in the experimental group increased student's motivation. Therefore, instructors may be encouraged to use collaborative learning activities in the online learning environment. Before the study began, it was expected that students should have been graded on the projects they submitted throughout the term in order to determine academic achievement. However, when the course was completed, it was seen that the number of projects submitted were not as high as expected. Students should be given tasks that aroused their attention more effectively. As is the case with every social study, there were restrictions. It was found that not all of the planned collaborative learning activities were implemented. This situation may have been caused by the fact that the study was carried out as part of an extracurricular course. For this reason, the study could be repeated within the scope of a regular program class.

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Effect of Database Technology on Some Cognitive Variables in Learning of Physics at Undergraduate Level

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ABSTRACT

Education for sustainable development is an emerging concept that encompasses a new vision in physics education that empowers the learner to assume responsibility for creating a sustainable future. Physics education is still struggling to adapt to the personalized approach in learning. Personalized learning thrives in this technology-rich environment, but it is not enough to revolutionize the learning experience. Physics is a challenging subject to learn at higher education level due to its heavy emphasis on problem-solving. Technologies in learning physics create a learner-centered learning environment that is individualized and interactive. The authors attempted to develop the software using database technology for assisting learners to keep their learning materials for learning physics step by step. Database tools are primarily used for storing, modifying, extracting and searching for information within the database. The tool used for this research was the Database software (CVLP) which was made available on the cloud platform. This tool was designed by using the relational database model. The researcher has used the experimental method in studying its effectiveness in learning physics. The samples selected for this study comprised of the students studying an undergraduate course in four colleges at Tamilnadu, India. In this study, t-Test was the statistical technique applied to draw conclusion. The higher difference in mean scores between the experimental group and control group indicates that the database software was effectively utilized by the learners. The results revealed that the database software developed by the researcher helped the learners in learning physics concepts and solving physics problems.

Keywords: Database Software, Database Technology, Physics Education

INTRODUCTION

Physics is the challenging subject to form an essential and unavoidable base for many professional subjects. Learners are facing many challenges in physics education at the undergraduate level. The major challenges faced by the students are that they should remember, understand and use so many constant values, standard laws, basic principles, important facts and phenomena frequently. A good physics education should be a blend of learning physics and also acquiring a skill to conduct experiments to solve problems. Physics has two areas such as theoretical physics and experimental physics. Theoretical physics deals with an explanation for the pattern in nature that is supported by scientific evidence and verified multiple times by various groups of physicists. Experimental physics deals with the systematic and sequential procedure which is based on empirical evidence. Students of Physics at undergraduate level find difficult to connect the concept they studied in the classroom with the laboratory experiments. Students also find difficulty in solving physics problems related to the concept they studied in the classroom (Natasha, 2017). With their problem-solving ability and understanding the principles of physics, they can fulfil the requirements of society. Meeting these goals will be a difficult task. It is necessary to gather so many related issues for understanding any concept. But with the advent of computer technology, it will be easy. In this line of thought, the authors attempted to use database technology to support the learner.

The one-to-one initiative will allow the learner to have far more access to relevant information. Technology-Enabled learning is the application of some form of digital technology to teaching also learning in an educational context (Kirkwood and Price, 2016). Database technology is one of the core areas of computer technology. Many researchers have conducted their research through developing tools using Data mining and Data warehousing. Data mining in an e-learning system favorably adopt students who need sufficient knowledge as well as analyzing students who have faced difficulties in acquiring new knowledge (Ananthi and Nazreen, 2018). After reviewing related literature, authors found the research gap that the personalized repository will be developed to assist learners to organize their learning materials in a personalized manner. Authors analyzed

many kinds of database tools and attempted to develop a simple software package by using the relational database model. It will provide the learner to search the content from various kinds of resources, store it in the memory space and retrieve it for learning. The researchers have developed a software package using database technology which will enable the learner to store, manipulate, update and retrieve the study materials according to their learning ability. Students can search and manage the content so that they can accelerate their level of learning from the knowledge level to understand level and then to skill level. Knowledge, understand, application and skill are the cognitive variables. The investigators adopted the Two Group Experimental Design in which the experimental group was exposed with the software and the control group was treated with the conventional method. Learning outcomes were analyzed through cognitive variables such as Remember, Understand and Application. The influence of demographic variables such as gender, locality, medium of instruction and type of institution were also analyzed.

OBJECTIVES

- To develop and validate a database package for assisting undergraduate students in their learning.
- To compare the achievement of learners through the conventional method of learning and learning with the support of the database package.
- To find out the achievement of learners through the conventional method of learning and learning with the support of the database package for cognitive variables viz., Remember, Understand and Application.
- To know the influence of demographic variables viz., gender, the locale of the learners, type of institution, and type of institution and medium of instruction at higher secondary school level on their achievement.

HYPOTHESES

- Undergraduate students who have learnt the concepts of physics through Database technology and conventional learning methods differ significantly in their post-test achievement scores.
- There is no significant difference in the achievement of learners through the conventional method of learning and learning with the support of the database package for cognitive variables viz., Remember, Understand and Application.
- There is no significant difference in the achievement of male learners and female learners in their achievement in learning physics.
- There is no significant difference between the students from urban background and students from a rural background in their achievement in learning physics.

REVIEW OF RELATED LITERATURE

Review of literature on a research problem makes the researcher familiar with the concise of previous research, the writing of experts in the area of research, what is already known, and what is still unknown and untested and thus provides a background for the development of the study undertaken.

Bhupathi (2015) discussed in detail about the ailments in physics education in India. Some of the physics students in the students in UG colleges do have a target to go for higher studies and research. There is no mechanism to check the quality of resource materials used by the students for their studies. Dewi and Nur (2018) analyzed the problem-solving skill in physics. The success of college students is the main aim of education on tertiary education level. Students who do not reach success learn allegedly caused by many factors. Among them, the lack of supporting material is an important one. Based on these two researchers the authors realized the problems of learners who are opting Physics as their main subject. Govindarajan (2019) in an article on development and analysis of infotainment programme on learning of physical science at secondary school level pointed out that the main concern of the teachers in the secondary level is on making the student understand the concepts of physical science easily. The authors at this point realized that modern technologies will provide support to the learner. The authors attempted to use one of the emerging field called database technology.

Hongying, Lingling & Liyou (2018) have studied the application of database technology in the information society and its existing problem and analyzed the development of a knowledge database. Knowledge database can be defined as a collection of knowledge, experience, rules and facts. Rai and Pramod (2017) analyzed the security threats to the databases. The developers of the database management system must understand the security aspects. The attackers will try to perform privilege abuse, privilege elevation, inference, SQL injection, Buffer overflow, weak audit, covert channel and weak authentication. HongYing, LingLing & Liyou (2018) analyzed the technology in the development of a knowledge database. The researcher got ideas to use database technology. The researcher reviewed the works of Mohammed and Yassir (2018), Adham (2017), Vodomin and Androrec (2015) & Mimoza (2016) and deeply understands the big data environment, database for educational

applications and use of SQL for the development of database software. Further, the researcher reviewed the next generation of databases analyzed by Guy (2015), Anupama (2018), Hemamalini and Suresh (2018). Naren (2018) discussed the suitable algorithm for the development of software for data mining. The concept of data mining is useful for the selection of study material from the websites and to store it in the data warehouses. The researcher attempted to use these two techniques in software development. Anupama (2018) have prepared an efficient clustering algorithm in Educational data mining. The Handbook of research on knowledge management for contemporary Business Environment prepared by the author suggested a suitable algorithm for knowledge management. With the help of all these and many more reviews, the authors attempted to construct new software using database technology.

METHODS

The investigator developed the database software and named it as CVLP. This tool was made available on the cloud platform. Students in the experimental group were registered and used the tool for learning physics. It is still available in the following IP address: **http://139.59.57.143/cvlp.** Another tool used for this research was achievement tests for pre and post-tests developed by the investigator and the 'Personal Data Blank' to collect data from the sample students. In this study, t-Test was used to analyze the differential hypotheses. The treatment variables were the learning strategies namely '**using the database software package' and 'the Conventional method of learning'.** The independent variables are Gender and Locale. The dependent variable was "Achievement of the students". The following experimental design was adopted for the study.

E_R	P_r	L_1	Po
C_R	P_r	L_2	Po

In the experimental design, E_R and C_R denote the samples chosen for the Experimental group and Control group respectively. P_r denotes the pre-test measure of the scholastic performance in learning physics. Po denotes the post-test measure of the scholastic performance of in learning physics. L_1 denotes learning through the software developed using the database technology and L_2 denotes learning through the conventional method.

The size of the experimental group was 46. The students of the experimental group preferred the learning of physics through software developed by using database technology. The experimental group was subjected to the achievement test (Pre-test) constructed by the investigator on the selected units of one of the course 'Electricity, magnetism and Electromagnetism' of undergraduate physics programme. Then the experimental group was exposed through individualized training to the handling of the software. During the training of operating the software, proper care was taken to clear the doubts and the problem likely to be faced by the students. They were provided with operating manual and permitted to take own time to complete the lesson. The students were again assessed with the help of the achievement test. The items in the post-test are similar to that of the pre-test, but the order of items was different. The medium of learning was English.

The size of the control group was 38. The students of the control group preferred the conventional mode of learning physics. The students of the control group were subjected to the achievement test (Pre – Test) constructed by the investigator on the selected units of one of the course Electricity, magnetism and Electromagnetism of undergraduate physics programme. The control group was then exposed to conventional study methods using reference books, notes prepared by the teachers and classroom observation. After the completion of the learning sessions, the investigator administered the post-test. The items in the post-test are similar to that of the pre-test, but the order of the items was different. The medium of learning was English.

The students at the undergraduate level opting for physics as a major subject in the four colleges affiliated to the Bharathidasan University, Tamilnadu, India formed the universe of the study. 84 students were selected from the Second year B. Sc., Physics programme as the sample for this research. Purposive sampling method was used for sample selection. There were 46 students in the experimental group and 38 students in the control group.

DEVELOPMENT OF DATABASE SOFTWARE

The software package prepared for this study will provide a personalized environment on which learner can store the learning material according to his need and manipulate the information within the database quickly at any time. In order to study the effectiveness of database technology in learning physics, the pre-test and post-test experimental design were used. The sample was divided into different groups viz. Experimental group and Control group. The control group was allowed to learn through a conventional method whereas the experimental group was exposed with the database technology. At the end of the study, the difference between the mean scores of the control group and the experimental group in their learning outcome was analyzed.

SOFTWARE DETAILS (OPEN SOURCE):

1. **Relational database: MySQL version 5.5.60 / MariaDB**
2. **Web Server: Apache 2.4.6**
3. **Web Development language: PHP Version 5.6.38**
4. **Front –end frame work: Bootstrap 4, HTML5/CSS3/JavaScript/Ajax/Slim REST API**

The first page called Home Page, the title and the login credentials are given. User can type their valid user name and password to enter into the software. Captcha code is provided in order to tell computers and human apart. In the second-page user details are given on the top of the page. By clicking the 'syllabus' tab, the syllabus prescribed by the University for the Selected Course will be displayed. The Learner should type the unit number, unit name and name of the topic. At this stage, if the learner wishes to access the web site then students should open and search the content.

The selected content can be copied from the website partly or wholly and can be pasted in the 'notes' tab. Students can store the URL of the web page in the 'Source' tab. The learner can directly type the content from the book or their own notes. The learner is instructed to type the source for future reference. By clicking the 'save' tab the content will be stored in the database. There is a provision for taking printout of the material. This can be done by clicking ' Print my Learning material' The 'Clear' tab will make all the parts of the working space blank to enable the learner to store the next subsequent content. The learner can edit and remove the previously stored content in the workspace. The admin database of the software keeps track of the user details, memory space and metadata about the database. Admin database has the overall control. Registration for the utilization of software can be done by the admin database only. Thus there are three databases in this system namely, Database for a user account, Database for admin and User database.

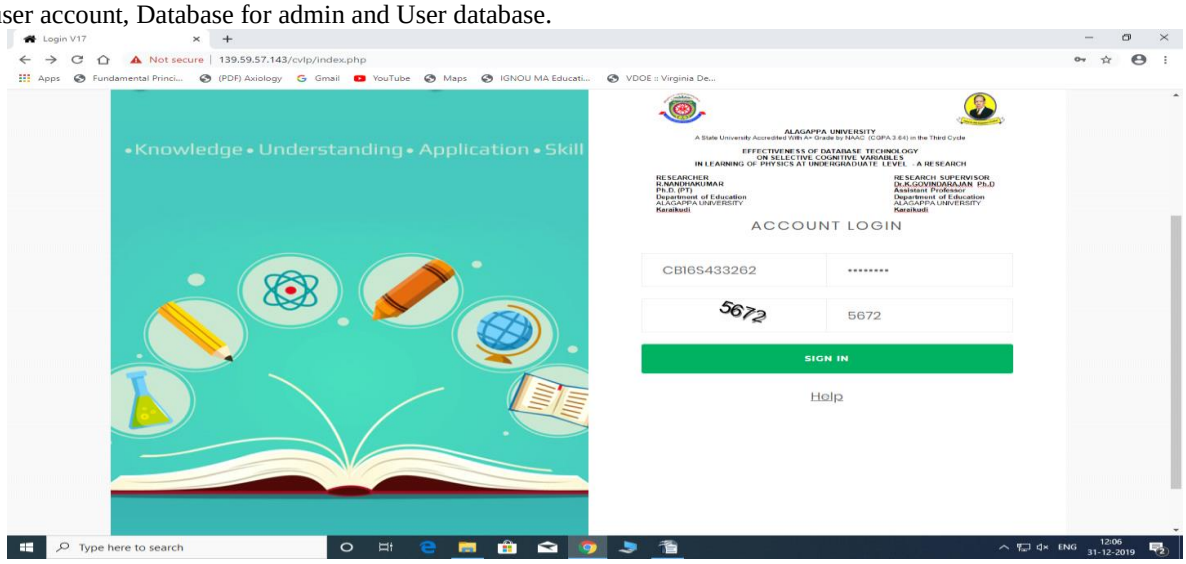

Fig.1. Home Page

In the first page called Home Page (Fig.1), the title and the login credentials are given. User can type their valid user name and password to enter into the software. Captcha code is provided in order to tell computers and human apart. In the second-page user details are given on the top of the page. By clicking the 'syllabus' tab, the syllabus prescribed by the University for the Selected Course will be displayed. In Fig.2. The repository is shown. The Learner should type the unit number, unit name and name of the topic. At this stage, if the learner wishes to access the web site then students should open and search the content. The selected content can be copied from the website partly or wholly and can be pasted in the 'notes' tab. Students can store the URL of the web page in the 'Source' tab. The learner can directly type the content from the book or their own notes.

The learner is instructed to type the source for future reference. By clicking the 'save' tab the content will be stored in the database. There is a provision for taking printout of the material. This can be done by clicking ' Print my Learning material' The 'Clear' tab will make all the parts of the working space blank to enable the learner to store the next subsequent content. The learner can edit and remove the previously stored content in the workspace shown in the Fig.3.

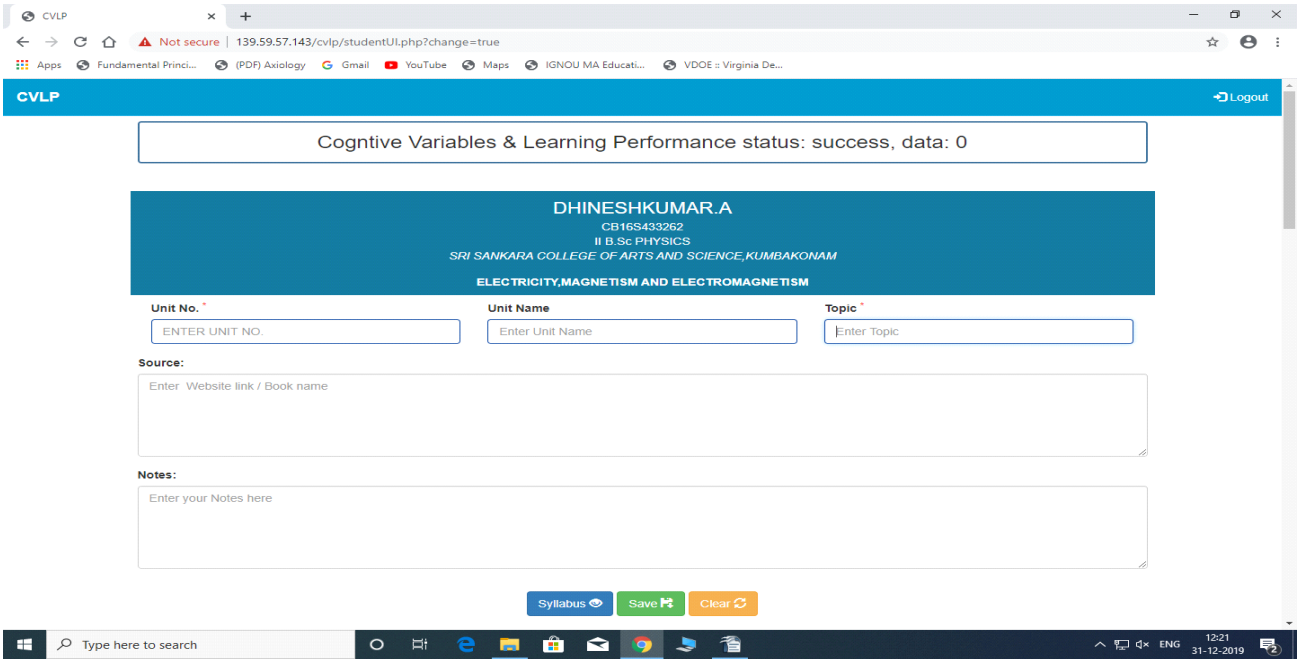

Fig.2. Repository

The admin database of the software keeps track of the user details, memory space and metadata about the database. Admin database has the overall control. Registration for the utilization of software can be done by the admin database only.

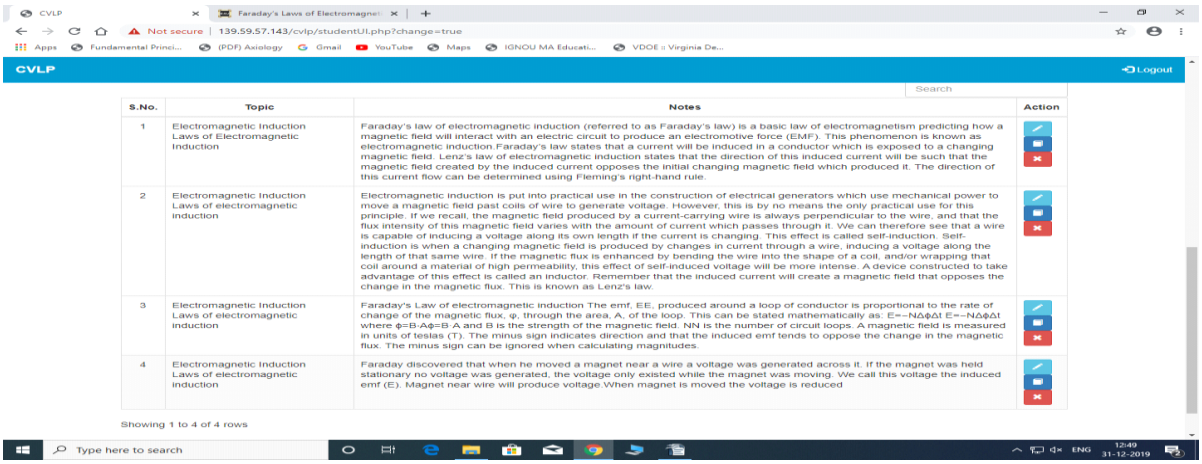

Fig.3. Workspace

Thus there are three databases in this system namely, Database for a user account, Database for admin and User database.

ANALYSIS AND INTERPRETATION

Hypothesis 1: Undergraduate students who have learnt the concepts of physics through Database technology and conventional learning methods differ significantly in their post-test achievement scores.

TABLE 1: Comparison of Post Test scores

Group	Size (N)	Mean (ẍ)	SD	t - value	Remark
Experimental	46	25.98	5.3	7.73	Significant at 0.05 level
Control	38	18.50	2.98		

From Table 1. it is observed that The students in the experimental group performed better than the control group. **The hypothesis is accepted at 0.05 level of significance**

Hypothesis 2: There is no significant difference in the achievement of learners through the conventional method of learning and learning with the support of the database package for cognitive variables viz., Remember, Understand and Application.

TABLE 2: Comparison of mean gain Scores with respect to cognitive variables.

Cognitive variable	Group	Size (N)	Mean gain score	SD	Remark
Remember	Experimental Control	46 38	8.30 2.32	3.80 1.54	Significant at 0.05 level
Understand	Experimental Control	46 38	1.85 0.87	1.98 1.07	Significant at 0.05 level
Apply	Experimental Control	46 38	1.20 0.47	1.54 0.69	Significant at 0.05 level

From Table. 2. it is inferred that the mean gain scores of the experimental group and control group differed significantly at 0.05 level of significance in all the three variables viz. remember, understand, apply. The higher mean scores of the experimental group indicated that their performance based on remember, understand and application of the concept, through database technology were better than the students who used the conventional method for learning.

The hypothesis is rejected at 0.05 level of significance.

Hypothesis 3: There is no significant difference in the achievement of male learners and female learners in their achievement in learning physics.

TABLE 3: Gender-wise Comparison of mean gain scores

Cognitive variable	Group	Size (N)	Mean gain score	SD	Remark
Remember	Female Male	35 11	8.20 8.64	4.15 3.74	Not Significant at 0.05 level
Understand	Female Male	35 11	1.86 1.82	1.89 2.31	Not Significant at 0.05 level
Apply	Female Male	35 11	1.20 1.18	1.60 1.40	Not Significant at 0.05 level

From Table 3, it is inferred that the mean gain scores of female and male students did not differ significantly at all the levels of knowledge viz. remember, understand and apply. The mean scores obtained by the female students and male students were equal. It is concluded that both male and female students performed equally when they used database technology for their learning.

The hypothesis is accepted at 0.05 level of significance

Hypothesis 4: There is no significant difference between the students from urban background and students from a rural background in their achievement in learning physics.

TABLE 4: Area-wise comparison of mean gain scores

Cognitive variable	Group	Size (N)	Mean gain score	SD	Remark
Remember	Rural Urban	40 6	8.40 7.67	4.03 1.75	Not Significant at 0.05 level
Understand	Rural Urban	40 6	1.82 2.00	2.01 1.89	Not Significant at 0.05 level
Apply	Rural Urban	40 6	1.23 1.00	1.47 2.09	Not Significant at 0.05 leve

From Table 4, it is inferred that the mean gain scores of the rural background students and urban background students who have used the database technology did not differ significantly at 0.05 level of significance in all the levels viz. remember, understand and apply. Hence it is concluded that both the rural background students and urban background students performed equally well.

The hypothesis is accepted at 0.05 level of significance.

FINDINGS

The researchers compared the post-test achievement scores of experimental group and control group with the assumption that undergraduate students who have learnt the concepts of physics through Database technology and Conventional learning methods differ significantly in their post-test achievement scores. From Table – 1, it is observed that the achievement level of the undergraduate students who have used the database software package is better than the achievement of the students who have used conventional learning methods. Database technology is found to be more effective on learner's achievement than the conventional method of learning physics at the undergraduate level. The achievements of learners were analyzed with the selected cognitive variables such as remember, understand, application and skill with the assumption that there is no significant difference in the achievement of learners through the conventional method of learning and learning with the support of the database package for cognitive variables viz., Remember, Understand and Application. There is a significant difference between the experimental group and control group. In learning physics at the undergraduate level, the database software using database technology is more effective in the realization of instructional objectives viz. remember, understand and apply than the conventional method of learning. The researchers analyzed the performance of students with a rural background and students with an urban background in the realization of instructional objectives viz. 'remember' 'understand' and 'apply'. As far as the gain in achievement is concerned, the effectiveness of the database technology is same for the students with a rural background and students with an urban background in learning physics at the undergraduate level, The researchers analyzed the performance of male and female students in the realization of instructional objectives viz. 'remember' 'understand' and 'apply'. with the use of database technology, the male students and female students performed equally in the realization of instructional objectives viz. 'remember' 'understand' and 'apply'. Similarly, the difference between the mean gain scores of rural and urban students is marginal. Thus there is no significant difference between the students from the rural background and students from the urban background.

DISCUSSION

Physics is a challenging subject to learn at higher education level due to its heavy emphasis on problem-solving. Physics is one of the important disciplines in all the universities and a few good students are still attracted to this knowledge-rich and challenging subject which continues to form an essential and unavoidable base for many professional subjects. The learners at the undergraduate level are facing problems in both the theoretical and practical aspects of this discipline. There is a need for a personalized approach to enhance learning. Keeping these things in mind the authors developed the database software and studied its effectiveness. The researchers have used the experimental method in studying its effectiveness in learning physics. Pre Test and Post-test was conducted for the two groups' namely experimental group and control group separately. The results of the post-test revealed that the students in the experimental group who have used database software performed well. The difference in mean gain score is high in the case of the experimental group. In another study, the performance of the experimental group and control group were analyzed on selected cognitive variables namely remember, understand and skill. The students in the experimental group were performed well in all the three variables. The difference in the mean gain score is very high in the case of Remember. This means the software can be effectively used to enrich the basic knowledge of physics concepts. The gender-wise comparison of mean gain scores revealed that both the male and female students are doing well and there is no significant difference between the male and female students. Similarly, the difference between the mean gain scores of rural and urban students is marginal. Thus there is no significant difference between the students from the rural background and students from the urban background.

CONCLUSION

The investigator has developed the database software package with the use of database technology. In order to examine its effectiveness in learning of physics at the undergraduate level, this has been implemented in the colleges affiliated to the Bharathidasan University, Tiruchirapalli, Tamilnadu, India. The database software developed by the investigator is simple to access and user- friendly. Students in the experimental group performed better than the control group. For self-learning, database software is an effective tool. The Learner can use the software to select the desired content based on their potentiality and stored it in the database. Whenever and wherever required the content can be retrieved easily. This helps to increase the achievement level of the students who are learning physics at the undergraduate level. This learning package accelerated the power of acquisition of knowledge than the conventional method. In terms of understanding and application of knowledge, the effect of database software developed by using the database technology does not differ much from the conventional method of learning. When the students are using the database software continuously, they will perform well in the understanding and application levels. There is no significant difference between male and female students in using database software. Similarly, there is no significant difference between the students from rural background and students from an urban background. As experienced by the researcher, the use of database software package helped the learners to enrich their knowledge. Thus the database technology

influences the achievement level of the students to a great extent on selected cognitive variables. In future, this type of database software can be enhanced with data mining and data warehousing.

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Student Opinions on the Use of Geogebra Software in Mathematics Teaching

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ABSTRACT
Mathematics as a discipline requires abstract operations under many sub-learning areas is considered hard by students to learn. In this respect, it has become indispensable to make mathematics teaching processes fun and to structure teaching procedures by using different teaching methods, techniques or materials. In this context, the purpose of the study is to determine the teachers' views of 7th grade students about the use of geogebra on lines and angles. The case study approach and focus group interview method were used in the study. In this context, 14 students studying in the city of Ankara were taught within the framework of the activities on lines and angles and carried practice out. At the end of these practices, a focus group meeting was held with the students, and the data provided from these interviews were expressed with sample sentences. In this regard, 3 activities were developed by the researcher for each of the two different acquisitions under the sub-learning area relating to the teaching of lines and angles. According to the results of the research, it was concluded that geogebra makes mathematics learning processes fun and enjoyable, helps students in concretizing abstract concepts often found in mathematics, and that students with low computer literacy have hardship in applying geogebra activities.
Keywords: Geogebra, Mathematics Teaching, Dynamic Geometry Software Programs

INTRODUCTION

As mathematics is a discipline that requires abstract operations under many sub-learning areas, it is considered had by students to learn. In this respect, it has become indispensable to make mathematics teaching processes fun and to structure teaching procedures by using different teaching methods, techniques or materials. As a result of this, reform movements in mathematics processes made dynamic mathematics software programs an inseparable part of this process.

The use of dynamic software in mathematics teaching processes has great importance in terms of obtaining students with trial and error opportunities, allowing the student to make assumptions, test and generalize from the results provided by seeing the student as a mathematician who discovers. Considering the sub-learning areas of mathematics, the geometry learning area is regarded as the most prominent area where the student can perform these trial and error activities. Geometry is a difficult learning area to learn in terms of its abstract conceptual structure and the expectation of high-level thinking skills from the student. According to Toluk (2003), it is possible for a student to acquire high-level learning skills in an area only if the student is interested in activities in the teaching process. It is clear that dynamic geometry software will be effective in obtaining this interest in geometry teaching processes.

Dynamic geometry software programs developed for geometry sub-learning area are used in geometry teaching because of their features such as creating geometric shapes, changing the angles and edges of these shapes, dragging the shapes, tracking the quantities measured during the movement of the geometric structure depending on this change, allowing the measurement of variables such as length, area, angle. One of these software is Geogebra software, that is developed as open source and carries geometry, algebra and analysis to a single interface. The superior aspects of geogebra over other dynamic geometry software are that it is designed for meaningful mathematics learning and it provides the opportunity to follow the movements of independent objects. In addition, the fact that the user interface and help menu of the geogebra provides service in Turkish and allows unlimited freedom in its use with educational tools are among the superior aspects of Geogebra compared to other software. Geogebra is a computer algebra system as well as being a software that can operate with points, coordinates, equations and functions, draw shapes and make measurements.

Geogebra was initially prepared as a program for the use of analysis, algebra and arithmetic operations by student groups at different levels, and later entered educational processes as a versatile tool by combining computer algebra systems and dynamic geometry software (Antohe, 2009; Hohenwarten and Jones, 2007). Geogebra is a dynamic software that is easy to use in teaching environments due to its ability to create interactive learning material as a web page, to provide language support and to be a free of cost open-code software.

There are plenty of studies on the use of geogebra in education processes. As a result of these studies, it was observed that the use of Geogebra in educational processes positively increased student achievement and self-sufficiency, designed the guidance of teaching processes and made learning easy (Erdogan & Seker; 2017). In the study conducted by Selcik and Bilgici (2013), it was concluded that using Geogebra in teaching the subject of polygon increased the motivation of students and facilitated learning basic geometric concepts. In the study by Icel (2011) examining the effectiveness of Geogebra teaching with activities on the subject of triangles and the Pythagorean theorem, it was found that Geogebra had a positive effect on students' learning and achievement as a result of the tests and the comparisons between the groups, and the recall test results showed that it is also effective in increasing the permanence of information. Research has also revealed that Geogebra teaching makes teaching processes fun, enables students to participate in the class effectively and that the learning environment creates a positive learning competition between groups with in-group and out-group interaction (Bagcivan, 2005; Topuz & Birgin; 2020).

In the light of all these findings, the purpose of this study is to determine teachers' views of 7th grade students about the use of Geogebra on lines and angles. The motives for choosing the subject of lines and angles in the study are that the subject is suitable for teaching with dynamic geometry software, the information about the use of dynamic geometry software in the explanations of the curriculum, and the teaching options related to lines and angles are widely included in the Geogebra program. The gains of the 7th grade on lines and angles are listed as determining the bisector by dividing an angle into two equilateral angles, examining the properties by determining the corresponding, inverse, internal inverse, external angles formed by a purse with two parallel lines, determining the angles that are equal or wholes and solving related problems. Under the title of this topic, the states of three lines in the same plane with respect to each other and deciding whether two lines are parallel or not are explained to students.

METHODOLOGY

The case study approach and focus group interview method were used in the study. In this context, 14 students studying in the city of Ankara were taught and implemented practice within the framework of activities on lines and angles. At the end of these practices, a focus group meeting was held with the students, and the data gathered from these interviews were expressed with sample sentences. In this context, 3 activities were developed by the researcher for each of the two different acquisitions under the sub-learning area regarding the teaching of lines and angles. For the practical studies, two hours of Geogebra activities were carried out by 14 students for 5 days within the framework of lines and angles unit activities in mathematics lessons. At the end of this practice, the opinions of the students about the Geogebra applications were taken. The main reason for choosing the focus group interview method in the study is to determine the opinions of the students on the use of Geogebra within the framework of predetermined instructions according to the logic and personal characteristics of the interviewee.

FINDINGS

Following the implementation of the geogebra activities, the data gathered from the focus group meeting with the students are detailed below.

1- Students' Opinions Concerning Advantages or Benefits of Using Geogebra:

In this context, the students were asked about the advantages or benefits of the use of Geogebra in teaching them the topic of angles and angles, sample answers from the student opinions are given in Chart 1 by numbering them as K1, K2, K3 etc. and compiling them under subheadings.

Chart 1. Student Opinions Regarding the Benefits of Using Geogebra

Subheading	Student Opinion
Making teaching fun and enjoyable	**K2:** I easily drew the lines that intersect each other. I measured the angles of these without needing anything else. I do not like using compasses and rulers. This topic always seemed very depressing to me. This time I enjoyed. **K4:** Math is a very difficult subject. I wasn't enjoying. Rather I love playing games on the computer or social media. I learned the subject of lines for the first time. **K9:** Learning subjects using computer is fun,

	especially if it is geometry. **K10:** We worked together with my friend. We cut one angle into two identical parts on the computer. I used compasses before, I did not like it at all. This is nicer.
Benefitting the process of making assumptions, generalisations and discovery	**K3:** If this angle used to be this much, the other would be this much. Or if these angles were in the same direction, I could not comment that they would be equal. But I made such comments in this application. **K7:** I predicted that the dimensions of the leading angles would be equal. **K9:** The teacher said break the parallel of the lines. When the parallel was gone, the angles did not match either. I will no longer forget in my life.
Being facilitating	**K3:** I do not like using compasses or something like protractor. This program made my work easier. I wish we learned other subjects like this.. **K5:** I can not measure angles by using protractor. This program has an angle measurement feature. **K12:** You can learn all subjects in a short time. Saving on time. Otherwise, it would take years for me to do these works with a compass and ruler.

When the Chart 1 is examined, it is seen that Geogebra makes the process of learning mathematics fun and amusing. Reis and Ozdemir (2010) stated that computer-aided teaching methods in which visual elements are used in teaching parabola are interesting to students. Zengin et al. (2013) also stated these methods using visual elements in their studies on prospective mathematics teachers are found interesting by students.

When the Chart 1 is examined, students state that Geogebra assists them to concretize abstract concepts often found in mathematics. Some students stated that they acquired generalization skill with this application. According to Baki (2002), computer-equipped environments obtain students with skills such as solving complex problems, developing various solutions, making generalizations based on assumptions, or they can provide suitable learning environments to develop these skills. Kabaca and Aktumen (2010) explain that the most significant feature of Geogebra that distinguishes it from other software is to use multiple representations to see mathematical relations. From these viewpoints, it can be said that Geogebra offers students learning environments that develop students' exploration and generalization skills by offering trial and error opportunities. When the chart is examined, it can be said that students agree that Geogebra is useful in learning mathematical concepts or making measurements. When the MEB (Ministry of National Education) curricula are examined, it is seen that geometry acquisitions are included in all grade levels as a sub-learning area, starting from the first grade with the vertex and raised numbers of geometric shapes, the concepts of bisector, directional, inverse, internal inverse and external inverted angle in the 7th grade Geometry and Measurement learning area and handled in a very broad perspective. When the 7th grade gains are examined, it is seen that there are many gain explanations for the use of compasses, rulers and protractors. In this context, using Geogebra to teach geometry learning area gains will remove the application burden with tools such as compasses and rulers. According to Ciftci and Tatar (2014), it is possible to construct dynamic geometric structures on paper by using Geogebra software that has features such as compass-ruler-measurement. Since the Geogebra program also has the principle of resilience to motion, when certain properties of a shape change (such as parallelism of lines in terms of lines and angles), it can give clues to the student about if other properties are preserved. The findings obtained from the results of this research coincide with the findings of the research conducted by Kabaca (2010). In this study, too, it is stated that different learning environments are offered to students and teachers in constructing geometric structures or shapes with geogebra. Can (2010) also states that dynamic software is a software that enables repeatable experiments in course teaching processes and provides rich environments to students.

Sample answers when asked students about the disadvantages of using Geogebra are given in Chart 2.

Chart 2 - Students' Opinions on the Disadvantages of Using Geogebra:

Subheading	Student Opinion
Computer Literacy	**K7:** I am not good at computers. So it took time for me to find the icons the teacher said there. Ia I am tired. **K11:** I can not use the computer well. Therefore, it was not much fun. **K14:** Those who play games on the computer learned better. I found it very hard to draw lines and measure angles. I wish we had the training for this as well.
Collaboration	**K4:** The teacher formed groups of two. I dislike working with someone else. I myself am very good at the computer. **K13:** We fell into the duo group with a friend of mine whom I really do not like. That's why I did not enjoy it.

When the Chart 2 is examined, it is observed that students who do not have computer literacy skills have difficulty using the geogebra software program. It is also observed that students who have the skills of accessing information and understanding information, analyzing, producing and sharing through devices such as smart phones, tablets, laptops and desktop computers participate more effectively in geometry learning processes with geogebra. In this sense, it seems vital to create course content for individuals to know the ways to access information on the internet, to realize the stages of purchasing products and services from the internet, and to acquire skills in being aware of the risks in the virtal environment. It is thought that the introduction of the software and informing about the toolbars before using these software programs in the teaching processes will prevent negative experiences in this process.

When the Chart 2 is examined, it is seen that a group of students does not like collaborative working environments and they have difficulties in Geogebra learning processes, which are performed by forming groups. However, studies indicate that students like their work and develop a positive attitude towards mathematics in mathematics education processes where collaborative learning methods are applied (Bilgin and Gelici, 2011). In this context, it is thought that students will enjoy the collaborative learning environment by enhancing the applications.

The opinions of the students on the applicability of the Geogebra program in other sub-learning areas of mathematics are given in Chart 3.

Subheading	Student Opinion
The compatibility of the software's toolbars to the sub-learning zone	**K5:** I wish this program had been used especially in the teaching of triangles and quadrilaterals. Not only could I measure angles but also I could grasp the properties of triangles better. **K6:** There are icons on the toolbars such as measuring, drawing various shapes. It would be very good to use the geogebra program in teaching other topics of geometry.
The Difficulty of Topics of Mathematics	**K8:** I find it difficult to learn especially probability topics in mathematics. How nice it would be if we could use this program on these topics. **K11:** I have difficulty with subjects related to algebraic expressions. While working with this program I saw that there was an algebra window. I do not know what this window does, but it can be useful in teaching this topic.

When the sample responses in Chart 3 are examined, it is observed that students want to use Geogebra in teaching mathematical topics that are difficult to understand in general, such as probability and algebra. In addition, due to the suitability of the structure of the Geogebra software, it is seen that there are students' opinions concerning the use of this software in teaching other topics of geometry. Research findings indicate that using Geogebra software in mathematics teaching processes augments the academic success of students (Kaya & Ocal, 2018; Genc & Oksuz, 2016)

CONCLUSION

When examining the findings provided as a result of the research, it is observed that the use of Geogebra lets students to make mathematical generalisations and makes mathematics teaching processes fun and entertaining, but students who are not sufficient in computer literacy or who dislike collaborative work environments have difficulty in doing Geogebra applications.

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The Determination of Teachers' Motivation Based on Herzberg's Motivation Theory

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ABSTRACT
Motivation initiates, maintains and directs spiritual and physical activity of individuals. It is important to determine the motivation of teachers who play important role in education and technology usage. The purpose of this study is to use the motivational scale to measure the motivation of teachers working in Zonguldak city of Turkey. The the cross-sectional survey design is used in the study. The motivation scale adopted from the components of the Herzberg's motivation theory was used in the study for data collection. 463 teachers working in Zonguldak city of Turkey completed the scale and became the sample of the study. The findings of the study showed that the motivation of teachers in Zonguldak city of Turkey is high. It is also found that the motivation level of female teachers is higher than that of male teachers. Moreover the motivation of teachers does not change based on the school type, the type of school that teachers graduated from and the school level teachers work for. In future studies, the motivation of teachers working in other cities of Turkey should be investigated. The data of the study was obtained from the responses of the participants to the scales. In future studies, motivation of teachers should be examined using the qualitative data obtained through interviews and observations.

Keywords: Motivation, teachers, motivation theory, Herzberg

INTRODUCTION

The motivation concept comes from the word "movere" which means mobilization and it is defined as the most important power source that determines the direction, violence and determination of behavior ("TDK", 2020). The word motivation is also defined as the process that initiates, maintains and directs spiritual and physical activity in the most general sense, which drives the organism into action in order to reach a certain object or situation (Budak, 2003).

In the light of this information, it is understood that there is no consensus on the definition of motivation. But when these definitions are compiled, the motivation is that the beings in nature do not move to a moving state when they are in a stagnant state without any reason; it can be defined as having external forces (Öğülmüş, 1991). Motivation which can be defined as the process of creating the desired behavior in the individual, behavior; orientation (preference), intensity (effort) and duration (persistence) can affect the three aspects of motivation also gives the individual skills and abilities as well as how to use these skills and capabilities to manage the direction (Locke and Latham, 2004).

According to Şerif & Şerif (1996) there are two types of motives, primary and secondary. The primary motive is biological origin, is universal, can be observed in all living things (hunger, thirst, breathing, etc.). The secondary motive is psychological and socialbased, (Success motivation, passions, desire to reach a certain social position, etc.). The motive comes from the effect of a certain situation and is temporary (The student only works to pass the exam). Continuous motive occurs with the effect of a permanent condition and continues for a long time (The student wants to learn). Internal motivation is the result of internal needs and wishes (The student solves the problem in his/her spare time because s/he likes mathematics). External motive occurs as a result of external influences such as award, penalty, printing etc. Effects play an important role in the development (The student tries to pass the class as a reward for taking the bike).

Intrinsic and extrinsic motivation

Motivational sources that direct human behavior are devided into two as external and internal. If the cause of the behavior is caused by the outside of the individual, it is called extrinsic motivation. Awards, penalties and social support are the most prominent examples. In intrinsic motivation, the causality of behavior is internal. Intrinsic motivation comes from the individual's needs. Interest, talent and curiosity are among the most important of these resources. Attitudes and values of the individual's personality traits also affect intrinsic motivation. The

main difference between intrinsic and extrinsic motivation is related to the focus of the causality of behavior. The control in intrinsic motivation is in the external self and in the external motivation.

Motivation Theories

Motivation theories; behavioral, cognitive, humanistic and social-cognitive learning theories. Behavioral approaches emphasized the importance of extrinsic motivation resources. Cognitive and humanistic theories emerged in response to behaviorism and gave importance to sources of internal motivation. Cognitive motivation is associated with cognitive concepts and humanistic theories have been associated with attitudes. The social learning approach explained motivation with both internal and external motivation sources (Altun and Yazıcı, 2010).

Behavirorist Motivation Theory

Behaviorists have often addressed motivation in terms of factors beyond the control of the individual, and they have concluded how the behavior has increased and what the consequences of behavior affect the likelihood of repetition. Behaviorists explain motivation with reward and stimulus. The reward is used to express the reinforcements given at the end of the behavior (where and how often the reinforcement is used), while the stimulus is used to express situations that prevent or support behavior (Woolfolk, 1998). According to the behaviorists, motivation is an external process and the individual remains under the influence of these external stimuli. These stimuli affect the learning process in different ways, but this does not mean that internal sources are completely rejected. In this conception, self-evaluation, expectations, predictions and intentions are accepted as important internal factors affecting motivation (Moore, 2001).

Cognitive Motivation Theory

Cognitivists emphasized external motivation rather than external motivation and argued that the individual made an assessment using his/her mental processes prior to conducting an act, determined goals for him/her and decided how to act to achieve these goals. According to this approach, behaviors are started and controlled by plan, purpose, schema and loadings. Individuals develop behaviors with the ways of evaluating these effects rather than external effects. Explains this evaluation process as the source of motivation. This source is internal and related to curiosity, desire to learn, concepts. The cognitive approach attaches importance to thought and recognizes that the thought process is more effective than instinct and needs (Bartlett, Burton &, Peim, 2001). This approach advocates an active process for human behavior. Individuals have the ability to explain, manipulate and evaluate their behavior.

Humanistic Motivation Theory

Human motivation theory; refers to the sources of intrinsic motivation, such as cognitive approach. Selection, creativity, autonomy, self-esteem and needs and motivation are explained. In these theories, it is stated that motivation is a decisive factor in how an individual will use his / her development, growth and energy effectively. Maslow, Herzberg and Mc Clelland are the famous human motivation theorists (Eggert, 2000). According to this approach, self-actualization tendency is the main source of motivation. The individual comes to the world with this tendency. Accordingly, individuals were innately motivated. Motivation is considered as the process that leads to the development and growth of the individual and the most effective use of all of his potentials (Yazici, 2009).

Social - Cognitive Motivation Theory

According to Bandura, one of the social cognitive motivation theorists, motivation is about how the behavior will be demonstrated and sustained. Expectations are seen as one of the most important sources of motivation in this approach. It influences the motivation of individual's expectations and beliefs about self-efficacy and ability to achieve these expectations. According to Bandura, motivation of individuals depends on what they believe in and their movements are more than what is true (Yazici, 2009). Individuals are internally, externally and indirectly reinforced. External reinforcement reduces intrinsic motivation.

Relation of Motivation Theory and Resources

The link between motivation theories and motivation source is summarized in Figure 1 by Moore (2001).

	Founder of the Theory	Motivation Source	Basic Concepts
Behavioral	Skinner	External reinforcement	Individual behaves according to environmental stimuli and reinforcements
Cognitive	Weiner	Internal Reinforcement	Individuals behave depending on beliefs and loads.

Humanist	Maslow, Deci, Mc Cleland	Internal reinforcement	Self-esteem, self-control and full functional behavior are important.
Social Cognitive	Bandura	Internal-external reinforcement	The individual is motivated by the values of purpose and expectation.

Source: Moore, K.D. (2001). Clasroom Teaching Skills. Boston: Mc Graw Hill

Figure 1. The Relationship between Motivation Theories, Motivation Source

There are four basic theories about motivation. These theories; behavioral, cognitive, humanistic and social learning theories. While the external motivational sources emphasize behavioral theory, cognitive and humanistic theories, in contrast to behaviorism, have prioritized internal sources of motivation. Social learning approach has given importance to internal and external motivation sources. According to the source of motivation, the central theories of internal motivational sources are called process theories.

Scope (Content) Theories

Scope theories started in the 20th century. Some of the scope theories of today are Abraham Maslow's hierarchy of needs theory, Frederick Herzberg's double factor theory, Mc Clelland's theory of success motivation and Clayton Alderfer's theory of ERG.

Abraham Maslow's Needs Hierarchy

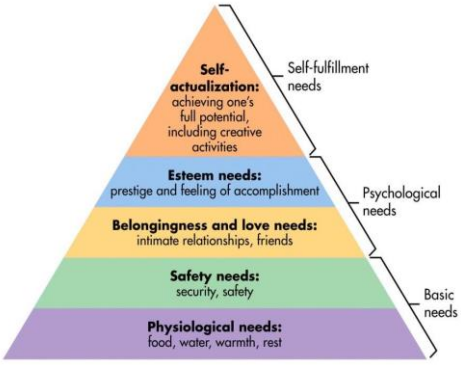

Figure 2. Maslow's Hierarchy Of Needs

One of the most influential in the theories of motivation is Abraham Maslow's hierarchy of needs. Telman (1998): Maslow's theory is based on two basic assumptions (Figure 2). These:

- That human behavior is directed towards meeting specific needs, and that no need can be fully satisfied.
- The needs of the individual are followed by a hierarchical sequence, and the other needs at the upper level without partially addressing the needs of the lower level do not direct the individual to behavior. Accordingly, a satisfied need no longer motivates the individual and a high level of need becomes motivator.

Maslow divides the basic needs that he claims to be in a hierarchical structure into two as low-level needs and high-level needs. It indicates that the needs at the upper level differ qualitatively from the physiological needs such as hunger, thirst, etc (Maslow, 1948). Maslow, one of the pioneers of human psychology, examined human needs in a hierarchical structure. Physiological needs are at the bottom of this hierarchical sequence. Needs such as hunger, thirst, insomnia, are also the primary motivating basic needs. According to Maslow, following the elimination of the physiological needs, there is a need for confidence. Security needs are also continuous, such as physiological needs, and they end up being satisfied. Regular life, danger, etc. Social needs come at a high level after the needs of the needs are also removed. Being satisfied with their needs such as being loving, being loved, comes to a higher level needs. At this level, there are needs such as self-esteem, selfrespect and trust. After the realization of all these needs, a final need for the individual appears, which is the need for self-realization, which expresses the need of the individual to fully grasp his/her talents and be creative. According to Erkan & Özbay (2008), the characteristics of self-fulfilling individuals; (1) Has life goals, (2) Detects the truth correctly, (3) Natural, (4) Creative, (5) is aware of the, (6) deficiencies and competences, (7) Establishes close and meaningful relationships, (8) Independent, (9) Has problem solving skills, (10) Has a democratic understanding, (11) Accepts yourself and other individuals as they are, (12) Has a philosophical sense of humor.

Frederick Herzberg's Motivation Theory

Frederick Herzberg's motivation conservation theory is the most known motivation theory after Maslow's theory. This theory is also called double-factor theory or motivationhygiene theory (Herzberg, 2003). In fact, Frederick Herzberg developed Maslow's theory by classifying him as lower and higher needs, such as Maslow in Herzberg (Herzberg, 2003).

In the work with 200 engineers and accountants, Herzberg asked people two important questions and asked them to explain the events that made them feel the best and feel the worst when they were working. The first one is satisfying, and the second one is the one that makes them feel uncomfortable. Herzberg divided human needs into two groups. The first one is the fear of pain and the second is psychological development.

Motivation factors are called internal factors. Hygiene factors called external factors due to dissatisfaction caused by discomfort or pain (Nelson & Quick, 1997). Hygiene factors are the factors that meet the physiological, safety and social needs of the work and the dissatisfaction that responds to lower level requirements such as physical working conditions, wages and other payments, administration, status, corporate policies and practices. Institutions determine these factors (Yüksel, 1998). The hygiene factors identified by Herzberg are in Adair (2003) as follows; (1) Job security, (2) Fees, (1) Status, (3) Working conditions, (4) Interpersonal relationships, (5) Control style, (6) Business policy, (7) Personal experience.

These factors are support factors. It does not directly affect the motivation of the person. Excellent hygiene factors cause employees to be dissatisfied and have no complaints (Nelson & Quick, 1997). Hygiene factors allow to eliminate unsatisfaction and improve performance to some extent. But to improve, renew and improve these factors is not very useful in increasing motivation. For high performance, management should focus on motivating factors and constantly renew them (Önen & Tüzün, 2005). The motivation factors identified by Herzberg are as follows; (1), Success, (2) Recognition, (3) Work itself, (4) Recognition, (5) Progress, (6) promotion, (7) Responsibility, (8) Feedback, and (9) Development, upbringing opportunities (Adair, 2003).

These factors are closely related. If all of these factors are present, personal development and self-realization needs are met. High levels of performance are achieved (Önen & Tüzün, 2005). From this point on, the two factors hypothesize that:

- The factors that are present when they are satisfied with the job are different and different from the factors during the discontent.
- Satisfying is not the condition of dissatisfaction, but not satisfied.
- The opposite of feeling dissatisfied with the job is not the satisfaction of being satisfied with the job (Karapınar & Önen, 2008).

The four possible situations that may occur with motivation and hygiene factors are:

- There is high motivation and few complaints in a profession where both motivation and hygiene fators are high.
- If the two factors are low, there is low motivation and many complaints.
- Motivation factors are high in a profession with high hygiene factors but motivation is high.
- Motivation is low but motivation is low in a profession with high hygiene factors, but there are very few complaints about workplace environment.

Comparison of Herzberg and Maslow Theories

In Herzberg, the essence of motivation such as Maslow advocated the existence of needs (Önen & Tüzün, 2005). However, Herzberg stated that the most viable way of satisfying individuals in workplaces is to be successful and carry responsibility, and according to him economic factors do not play a significant role in motivation. Maslow, on the other hand, has included economic factors in the first plan and argued that this could not be accomplished unless it was resolved (Koçak, 2008). When the theories of Herzberg and Maslow's theories are compared, the fundamental point where both of them are combined: people can be motivated by the elimination of needs. Therefore, it is aimed at satisfying the needs in both theories. But when Maslow classified the needers in order of importance, Herzberg divided the needs into two groups as satisfying and deprivators. Maslow's needs at the upper level correspond to the motivators of Herzberg, Maslow argues that a relatively unsatisfied need may be a motivational factor, while Herzberg suggests that only the upper tier needs can be motivational elements. However, in both theories, because it needs lower and higher needs, it allows individual growth and development as in Maslow's theory (Yüksel, 1998).

Mc Clelland's Theory of Needs

According to David Mc Clelland, human beings behave under the influence of three groups of needs: success, belonging, and the need to gain power. It is also called The Acquired Needs Theory. The most important feature that distinguishes this theory from other theories is that the needs are not innate intrinsic tendencies, and that they are behaviors learned through signs taken from the environment. According to Mc Clelland, all movements of people have been learned (Akat, 1984).

Need for Success

Although McClelland speaks of three needs in his theory, the need for success in people's own professions and the search for perfection, passion and emotion is reserved (Eren, 1993), emphasizing the need to achieve more. Because this need has a structure that motivates the individual according to another need (Türkel, 1999). While high motivation brings success, it brings high motivation to success (Genç & Demirdöğen, 2000). Those who have high success motivation have a more determined, practical and realistic intelligence than others. But the nature of the work is very decisive. If the nature of the work is open to the individual's individual effort and creativity, the individual can leave behind others. However, if the nature of the work is not open to personal effort and creativity, individuals exhibit a success far from ordinary creativity (Bingöl, 1990). The characteristics of a successful manager listed as follows (Koçak, 2006): (1) Self-confidence is complete, (2) Not afraid to take personal responsibility, (3) Intelligent goals set, (4) Make a specific plan for success, (5) They need a concrete feedback.

The Need for Relationship

This motive refers to the individual's relationship with other people or groups to establish friendship and to establish friendship. The characteristics of individuals who have a motive for relationship Can, Akgün & Kavuncubaşı (1998):

- They want to enter into a friendship and emotional relationship with others.
- They like to be loved by others.
- They enjoy social activities such as parties and cocktails.
- Participated in a group and wanted to access the sense of identity.
  Individuals with high motivation prefer solidarity to competition.

The need to gain power, leave an impact on people, influence others, change people or events, etc. As such, it involves the desire to make changes in life. The desire of people to influence others causes competition and conflict. Power theory greatly influences one's personality trait and culture (Koçak, 2006). The managers with this need give importance to protection and discipline rather than to the authority system. They also believe in fairness and fair treatment for all (Tevrüz, Artan & Bozkurt, 1999). In conclusion, McClelland's theory does not have a hierarchy of needs. It is the social environment and business environment that determines the needs of the individual. McClelland's three requirements can coexist.

Clayton P. Alderfer's ERG Theory

This theory, developed by C. P. Alderfer, is mostly directed towards working life needs. In ERG theory, three groups are mentioned. The need for theory has been derived from the initials of these three needs. These needs are existence, relatedness and growth related (Yüksel, 1998). Similar to Maslow and Herzberg, it was valuable to categorize the needs in Alderfer and found that there were fundamental differences between low and high requirements. Alderfer reduced Maslow's hierarchy of needs to advanced modern societies and reduced needs from five to three levels (Yüksel, 1998). According to this, the necessity of existence represents the safety and peace of life. Relationships need to be in relationship with people, love, friendship and belonging. The need for development includes the freedom of thought and behavior and the feeling of being competent. Unlike Alderfer Maslow (1948), he did not reveal a certain boundary and a certain hierarchy between the needs groups. The needs of the individual may arise without following a certain sequence. Multiple requirements can be seen at the same time. There may also be transitions between requirements groups. From time to time, Alderfer argued that requirements could change (Baysal and Tekaslan, 1996). Another advantage of this theory is that in basic societies, basic needs are no longer as effective motivators as they used to be, and that they are replaced by self-confidence, responsibility and self-fulfillment.

Studies on Motivation

There are numerious studies conducted to investigate the factors that affect the motivation of teachers. Gökay and Özdemir (2010) conducted a scale development study by collecting data from 110 teachers in order to determine the factors that determine the motivation of visual arts teachers. The results of the study showed that the professional goal and love of the profession, professional prestige, professional development and promotion, professional experience, supervision and supervisory attitudes, executive attitudes, school communication and

cohesion, parent attitudes, student attitudes, rewards, wages, and the quality of the course are determining factors of the motivation. In anather study, Ayaydın and Tok (2015) used the screening model in order to determine the opinions of primary school teachers about the factors affecting motivation. Working in Gaziantep / Turkey, 252 classroom teachers working in 18 primary schools participated in the study. Analysis of the data obtained by the Motivation Scale showed that; The most important factors affecting the motivation of primary school teachers are the professional love of the teachers, the suitability of the class structure for education, the observance of the success of the learners, the safety of the school, the compatibility of books and curricula. Also Gömleksiz and Serhatlıoğlu (2014) conducted a study in order to determine the prospective teachers' opinions on academic motivation levels. The results of the study revealed that the academic motivation levels of male pre-service teachers were higher than female teachers, and that the academic motivation levels of the freshman pre-service teachers were higher than the senior pre-service teachers.

Moreover Seniwoliba (2013) in the study investigated factors that motivate and satisfy teachers and factors that cause teachers to leave the teaching profession. Using a self-administered survey, data were collected from 178 teachers. Findings revealed that salary, working conditions, incentives, medical allowance, security, recognition, achievement, growth, students' indiscipline, school policy and status were found to be the ten most important factors of motivation for teachers that could enhance or cause them to leave from the job. Başaran and Orhun (2013) also conducted a study to investigate the factors that affect the profession motivations of preservice teachers using the survey method with preservice teachers in one education faculty of the state university in Turkey. 291 pre-service teachers participated in the study by completing the questionnaire. Research findings showed that low salary earning of teachers after graduation does not affect the motivation of pre-service teachers.

There are also qualitative studies investigating the teachers' motivation. Ada, Akan, Ayık, Yıldırım and Yalçın (2013) used the phenomenon method in qualitative research studies in order to reveal the internal and external factors that positively and negatively affect the motivation of the teachers. Semi-structured interviews were conducted with teachers in primary schools. The result of the study revealed that teachers need a strong and trusting executive support in motivating their teachers. In addition, the motivations of the teachers have been positively influenced by human relations and feeling of being successful. Also Altınkurt, Yılmaz and Erol (2014) used mixed research model in order to determine the motivation of teacher candidates who participated in pedagogical education program. First of all, data were obtained from 347 teacher candidates via motivation survey. After the descriptive analysis, qualitative data were collected through semi-structured interviews. The results of the study showed that the pre-service teachers participating in the pedagogical formation program have high motivations for the teaching profession.

Besides the studies investigating the factors affecting the motivation of teachers, there are also studies comparing the teacher motivation and studies investigating the relationships among factors affecting the motivation of teachers. Gupta and Gehlawat (2013) in the study compared the job satisfaction and work motivation of secondary school teachers based on demographic variables. The descriptive survey method was used and 400 secondary school teachers working in schools in India participated in the study. Study results demonstrated that work motivation and job satisfaction of the participants are not different based on the gender. The job satisfaction and work motivation of teachers who work in private schools are higher than teachers who are employed in public schools. Similarly experience of teachers changes the job satisfaction of the teachers. Less experienced teachers' job satisfaction appeared to be higher than teacher who have more experience. Also Deniz and Erdener (2016) collected data from 1270 teachers who work at 87 different school levels through the work motivation scale to examine whether teachers' work motivations differ according to some variables. The results of the study showed that teachers' work motivation did not show a significant difference according to gender and seniority. Moreover, Canrinus, Helms-Lorenz, Beijaard, Buitink and Hofman (2012) investigated the relationships among teachers' job satisfaction, occupational commitment, self-efficacy and change in level of motivation. Data were collected from 1214 Dutch teachers working in secondary education. Findings revealed that the relationships between the indicators of teachers' sense of their professional identity were found to be similar for novice, experienced and senior teachers. Mansfield and Beltman (2014), also investigated graduating and early career teachers' professional goals using the open-ended survey questions. Data were collected from 332 graduating teacher education students and 162 early career teachers. Findings revealed that graduating teachers referred to avoidance goals significantly more often than the early career teachers. Finally, Gorozidis and Papaioannou (2014) conducted a study to investigate teachers' intentions to participate in training and teaching of an innovative academic subjects. Data were collected from 218 teachers involving the new subject Research Project in Greek high schools through the questionnaires. Results of the study showed that teacher autonomous motivation is connected with job satisfaction and lower teacher burnout.

There are many instruments that have been constructed to measure the motivation of individuals. Among the ones particularly developed based Herzberg' two factor theory is the motivation scale constructed by Akdemir & Arslan (2013) to measure the motivation of the teachers. The purpose of this study is to use the motivational scale to measure the motivation of teachers in Zonguldak city of Turkey and also to verify the factor structure of a set of observed variables by conducting the confirmatory analysis. Following research questions were developed for the study.

1. Does the factor structure of observed variables comply with the factors structure of the motivational scale used in the study.
2. What is the motivation level of teachers?
3. Does the motivation level of teachers change according to gender, the school type, the type of school teachers graduated from and the school teachers work for?

METHOD

The survey research design being one of the quantitative research design is used in this study to investigate the motivation level of teachers in Zonguldak city of Turkey. There are different types of survey designs. In order to investigate the current motivation level of teachers, the cross-sectional survey design was chosen for the study.

The Data Collection Tool

The motivation scale developed by Akdemir and Arslan (2013) according to the components of the Herzberg's two factor motivation theory was used in the study for data collection. The motivation scale has 26 items which are distributed among four factors namely communication factor, progress factor, institution factor and the personal expectation factor. Respondents of the scale are asked to answer the questions that to what extent do you think the following items related to your working life motivate you? Respondents have five response options namely, none, little, medium, high and completely for the each item in the scale.

Population, Target Population and the Sample of the Study

The population of the study consists of teachers working in Zonguldak city of Turkey. The motivation scale was converted to the online form and sent to the schools to be distributed to all teachers in Zonguldak city. The target population of the study consists of 6550 teachers working in Zonguldak in 2018. 463 teachers completed the scale and become the sample of the study. The sample size of 463 is sufficient for the confidence level of %95.

ANALYSIS

As a result of the validity and reliability analysis, it is concluded that this scale which has 4 factors consisting of 26 items can be used to measure the motivation of teachers. Scale factors were named as Communication Factor, Progress Factor, Institution Factor and Personal Expectation Factor respectively. In the confirmatory factor analysis study, after the first analysis, the inter-item covariance was drawn, for example, because the connection between items 11 and 10 was very high (87.34). Subsequent covariance was drawn between items 17 and 18 (84.51) and finally between items 1 and 2 (69.91). The values obtained are presented at Table 1 and Table 2.

Table 1. Goodness fit index values for the model

	First Analysis	E11 & E10	E17 & E18	E1 & E2
CMIN/df	4.47	4.11	3.81	3.56
GFI	.81	.83	.84	.85
CFI	.91	.92	.93	.94
RMSEA	.09	.08	.08	.07

Table 2. Goodness of Fit Indices

	χ^2	df	χ^2/df	GFI	CFI	RMSEA
Motivasyon	1031.27	290	3.56	.85	.94	.07
Goodness of Fit Indices			≤ 3	$\geq .90$	$\geq .90$	$\leq .08$

Note: χ^2 =Chi-Square; df=Degrees of Freedom; GFI=Goodness Of Fit Index; CFI=Comparative Fit Index; RMSEA=Root Mean Square Error of Approximation.

As a result of these modifications, other indicators other than GFI value indicate that the results of the confirmatory factor analysis of the scale are acceptable (Standardized regression coefficients are significant and shown on the Figure 3).

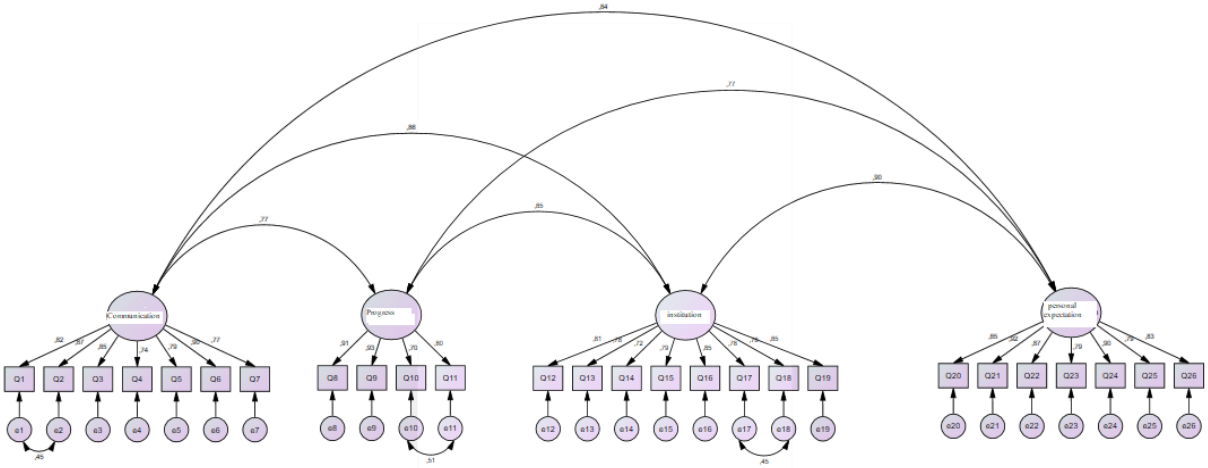

Figure 3. Standardized regression coefficients of the scale

According to the results of the Confirmatory Factor Analysis conducted within the scope of the study, a good fit was found between the data set and the factor structure of the scale (Figure 3). This result indicates that the factor structure of observed variables comply with the factors structure of the motivational scale developed by Akdemir and Arslan (2013). In the analysis of the research questions, ANOVA tests were used for independent samples. All statistical analysis were performed at 0.05 significance level. SPSS (Statistical Package for the Social Sciences) program was used in all analysis.

FINDINGS

The Demographic Characteristics of the Participants

The demographic characteristics of the teachers who participated in the study are given in the Table 3.

Table 3. Demographic Information

Category	n	%	Category	n	%
Gender			School Type by the Governer		
Female	185	40	Public	438	94.6
Male	278	60	Private	25	5.39
Total	463	100	Total	463	100

Degree Earned by Teachers			School Type by Level		
Associate degree +2 years	6	1,3	Pre-school	150	32,4
Education Institute Graduate	18	3,9	Primary school	165	35,6
Bachelor Degree	386	83,3	Middle School	134	28,9
Master's Degree	53	11,5	High school	14	3,0
Total	463	100	Total	463	100

The total of 463 teachers participated in the study by completing the motivation scale. Of the 463 prospective teachers participating in the study, 40% of them were women and 60% of them were men. According to the degree earned by teachers, % 1,3 of them graduated from Associate degree +2 years programs, %3,9 of them graduated from Education Institute program, %83,3 of them holds a Bachelor Degree and % 11,5 of them has a Master's Degree. It is undestood that the majorty of the participants (%83,3) has Bachelor Degree and work at public schools (%94,6).

The Motivation Level of Teachers

The motivation level of teachers by gender is presented at the Table 4. Also the distribution of the sub-factors of the motivation is presented at the Table 4.

Tablo 4. Distribution of the motivation level of teachers by gender

Factors	Gender	N	Min	Max	Mean	Std. Dev.
Communication Factor	Female	278	12,00	35,00	27,2050	5,21222
	Male	185	11,00	35,00	26,4757	6,01454

	Total	463	11,00	35,00	26,9136	5,55191
Progress Factor	Female	278	4,00	20,00	13,7482	4,30111
	Male	185	4,00	20,00	13,2270	4,28373
	Total	463	4,00	20,00	13,5400	4,29714
Institution Factor	Female	278	9,00	40,00	29,5504	7,22381
	Male	185	10,00	40,00	27,8595	7,26829
	Total	463	9,00	40,00	28,8747	7,28111
Personal Expectation Factor	Female	278	7,00	35,00	26,0396	6,67842
	Male	185	8,00	35,00	24,8270	6,91661
	Total	463	7,00	35,00	25,5551	6,79323
Motivation	Female	278	33,00	130,00	96,5432	21,74092
	Male	185	42,00	130,00	92,3892	22,18744
	Total	463	33,00	130,00	94,8834	21,99103

Table 4 shows that the motivation level of teachers is higher than the avearge. The data also indicate that the levels of sub-factors for the motivation are higher than the average for male and female teachers.

The Comparison of the Motivation Levels by Gender

The One-way ANOVA test was used to determine whether teachers' motivation levels differed according to gender.

Tablo 5. The comparison of the motivation levels of teachers by gender

		Sum of Squares	df	Mean Square	F	Sig.
Communication Factor	Between Groups	59,09	1	59,091	1,92	,166
	Within Groups	14181,45	461	30,762		
	Total	14240,54	462			
Progress Factor	Between Groups	30,17	1	30,172	1,63	,201
	Within Groups	8500,83	461	18,440		
	Total	8531,01	462			
Institution Factor	Between Groups	317,59	1	317,593	6,05	,014*
	Within Groups	24175,14	461	52,441		
	Total	24492,73	462			
Personal Expectation Factor	Between Groups	163,31	1	163,316	3,55	,060
	Within Groups	21157,03	461	45,894		
	Total	21320,34	462			
Motivation	Between Groups	1916,74	1	1916,74	3,98	,046*
	Within Groups	221508,96	461	480,49		
	Total	223425,70	462			

The one-way ANOVA results in Table 5 showed that; teachers' motivation levels differ by gender (F (1, 461) = 3.98; p <0.05) (Table 5). The motivation level of female teachers ($\overline{x}$ = 96.5, SD = 21.74) is higher than that of male teachers ($\overline{x}$ = 92.3, SD = 22.1). Similarly one-way ANOVA results showed that; Institute Factor, which is one of the subfactors of motivation, shows a difference by gender (F (1, 461) = 6.05; p <0.05) (Table 5). The motivation level of female teachers ($\overline{x}$ = 29.5, SD = 7.22) is higher than that of male teachers ($\overline{x}$ = 27.85, SD = 7.26). However, there was no significant difference in other subfactors of motivation according to gender.

The Comparison of the Motivation Levels by the School Type

One-way ANOVA test was used to determine whether the motivation levels of the teachers varied according to the type of school.

Tablo 6. The comparison of the motivation levels by the school type

		Sum of Squares	df	Mean Square	F	Sig.
Communication	Between Groups	11,04	1	11,04	,358	,550

Factor	Within Groups	14229,50	461	30,86		
	Total	14240,54	462			
Progress Factor	Between Groups	,518	1	,518	,028	,867
	Within Groups	8530,49	461	18,50		
	Total	8531,01	462			
Institution Factor	Between Groups	4,340	1	4,34	,082	,775
	Within Groups	24488,39	461	53,12		
	Total	24492,73	462			
Personal Expectation Factor	Between Groups	6,214	1	6,21	,134	,714
	Within Groups	21314,13	461	46,23		
	Total	21320,34	462			
Motivation	Between Groups	74,289	1	74,28	,153	,696
	Within Groups	223351,41	461	484,49		
	Total	223425,70	462			

The one-way ANOVA results in Table 6 showed that; There is no significant difference in motivation levels of teachers according to school type (F (1, 461) = 0.153; p> 0.05). Similarly one-way ANOVA results showed that; There was no significant difference in other sub-factors of motivation according to the school type whether it is a public school or private school.

The Comparison of the Motivation Levels by the Type of School Teachers Graduated From

One-way ANOVA test was used to determine whether the motivation levels of the teachers varied according to the type of school they graduated from.

Tablo 7. The comparison of the motivation levels by the type of school teachers graduated from

		Sum of Squares	df	Mean Square	F	Sig.
Communication Factor	Between Groups	39,68	4	9,92	,320	,865
	Within Groups	14200,85	458	31,0		
	Total	14240,54	462			
Progress Factor	Between Groups	46,264	4	11,56	,624	,645
	Within Groups	8484,74	458	18,52		
	Total	8531,01	462			
Institution Factor	Between Groups	33,997	4	8,49	,159	,959
	Within Groups	24458,73	458	53,4		
	Total	24492,73	462			
Personal Expectation Factor	Between Groups	24,202	4	6,05	,130	,971
	Within Groups	21296,14	458	46,49		
	Total	21320,34	462			
Motivation	Between Groups	340,281	4	85,07	,175	,951
	Within Groups	223085,42	458	487,08		
	Total	223425,70	462			

The One-way ANOVA results in Table 7 showed that; there was no significant difference in the motivation levels of teachers according to the type of school they graduated from (F (4, 458) = 0.175; p> 0.05). Similarly one-way ANOVA results showed that; There was no significant difference in other sub-factors of motivation according to the type of school that teachers graduated from.

The Motivation of the Teachers According To the School Level They Work For

The One-way ANOVA test was used to determine whether the motivation levels of the teachers vary according to the type of school level they work for.

Tablo 8. The motivation of the teachers according to the school level they work for

		Sum of Squares	df	Mean Square	F	Sig.
Communication Factor	Between Groups	194,31	3	64,77	2,11	,097
	Within Groups	14046,22	459	30,60		

	Total	14240,54	462			
Progress Factor	Between Groups	72,75	3	24,25	1,31	,269
	Within Groups	8458,25	459	18,42		
	Total	8531,01	462			
Institution Factor	Between Groups	152,14	3	50,71	,956	,413
	Within Groups	24340,59	459	53,03		
	Total	24492,73	462			
Personal Expectation Factor	Between Groups	72,28	3	24,09	,521	,668
	Within Groups	21248,05	459	46,29		
	Total	21320,34	462			
Motivation	Between Groups	1761,63	3	587,21	1,21	,303
	Within Groups	221664,06	459	482,92		
	Total	223425,70	462			

The One-way ANOVA results in Table 8 showed that; there is no significant difference in motivation levels of teachers according to the type of school level they work ($F (3, 459) = 1.21$; $p > 0.05$). Similarly the one-way ANOVA results showed that; There was no significant difference in other sub-factors of motivation according to the type of school level teachers work.

DISCUSSION, CONCLUSION AND SUGGESTIONS

This study is designed to investigate the motivation of teachers using the measure developed according to the components of the Herzberg' two factor theory. The findings of the study showed that the motivation of teachers in Zonguldak city of Turkey is above the average. Similar results are also observed in each sub-factors of the motivation namely the communication factor, the progress factor, the ınstitution factor and the personal expectation factor. Altınkurt, Yılmaz and Erol (2014) supports the findings of this study by demonstrating that even the motivation of pre-servis teachers is high. It is observed that teachers are motivatied even before starting their profession. Another important finding of this study shows that the motivation level of female teachers is higher than that of male teachers. The findings obtained for the effect of the gender on motivation in this study are contradicted to the findings of Deniz and Erdener (2016)'study and the findings of Gupta and Gehlawat (2013)'s study which demonstrated that motivation did not show a significant difference according to gender. On the other hand, for pre-service teachers Gömleksiz and Serhatlıoğlu (2014) found that motivation levels of male pre-service teachers were higher than female teachers. These contradicted findings warn the researchers about drawing any generalizable conclusions about the gender effects of the motivation. Therefore, interpretation for the findings of each study should be made within the boundiries of the sample population for the gender.

Finding of this study also revealed that motivation of teachers does not change based on the school type. Therefore it can be said that the motivation of the teachers working in public schools is not diffferent from the motivation of the teachers working in private schools. However, in the study conducted in a different context, Gupta and Gehlawat (2013) found that the work motivation of teachers who work in private schools are higher than teachers who are employed in public schools. Thus it can be said that teachers' motivation change for the type of school in each context. Moreover it is found that regardless of the type of school that teachers graduated from, teachers' motivation does not change. In this study four categories have been identifed namely Associate degree +2-year graduate, Education Institute Graduate, Bachelor Degree graduate and Master's Degree graduate. It is understood from the findings that all teachers are motivated and their motivation does not change based on the type of school that teachers graduated from. The final result of the study demonstrated that motivation of the teachers does not change based on the school level teachers work for. In this study four categories have been identifed namely Pre-school, Primary school, Middle School and High school. Therefore it can be said that regardless of the school level, the motivation of the teachers is high and does not show any difference based on the school level.

This study was conducted with the data obtained from 463 teachers working in Zonguldak city of Turkey. In future studies, the motivation of teachers working in other cities should be investigated. The data of the study was obtained by the responses of the participants to the scales. In future studies, motivation of teachers should be examined using qualitative data obtained through interviews and observations.

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Appendix: The Turkish Version of the Motivation Scale

Motivasyon Ölçeği (Öğretmenlere Yönelik)						
Çalışma hayatınız ile ilgili aşağıdaki maddeler size ne derece motive etmektedir? Lütfen belirtiniz.						
Faktörler	Maddeler	Hiç	Az	Orta	Çok	Tamamen
İletişim Faktörü	Meslektaşlar arası etkin iletişim					
	Meslektaşların birbirine önem vermesi					
	Kurumda ekip çalışmasının teşvik edilmesi					
	Veli-öğretmen ilişkileri					
	Öğrenci-öğretmen ilişkileri					
	Meslektaşlar arası olumlu ilişkiler					
	Yapılan işi kabullenme					
İlerleme Faktörü	Kariyer geliştirme olanaklarının bulunması					
	Meslekte ilerleme olanağı					
	Ücret					
	Terfi olanakları					
Kurum Faktörü	İş güvenliği					
	İşin tekdüze olmaması					
	Kurum tarafından sunulan sağlık hizmetleri					
	Kurumda alınana kararlara katılma					
	Yeterli araç-gerecin bulunması					
	İş yükünün aşırı olmaması					
	Çalışma saatlerinin uygunluğu					
	İyi bir oryantosyan sistemi olması					
Kişisel beklenti faktörü	İşin üstlerce takdir edilmesi					
	Yapıcı eleştiriler					
	Kurum tarafından sunulan sosyal aktiviteler					
	Yönetime katılma					
	Üstlerin kendilerine adil davranması					
	Özel sorunlarda ilgi ve yardım					
	İnsiyatif kullanma					

The Effect of Online Learning Attitudes of University Students on their Online Learning Readiness

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ABSTRACT
The aim of this study is to determine the effect of online learning attitudes of university students on their online learning readiness. The study was designed with relational screening model. The research group was formed of 306 university students who are selected with the appropriate sampling method from the non-probabilistic sampling methods from (Law Faculty and the departments of English Language Teaching and Physical and Sports) at different state universities. Data of the research were collected through "Online Learning Attitude Scale" developed by Usta, Uysal and Okur (2016), "Online Learning Readiness Scale" developed by Hung, Chou, Chen and Own (2010) and adapted into Turkish by Yurdugül and Alsancak-Sarıkaya (2013) and "Personal Information Form" developed by the researchers. Data were analyzed by using descriptive statistics, Pearson correlation and regression technique. Looking into the findings of the study, a moderately significant and positive relation was ascertained between the online learning attitudes of students and their online learning readiness ($p<.05$). Besides, online learning attitude has a meaningful effect on online learning readiness ($p<.05$). In addition, it was determined that online learning attitudes and readiness of students did not differ in a statistically significant manner by faculty/department studied ($p>.05$). This study revealed that online learning attitude of learners has a positive effect on their online learning readiness. As a result, to provide the learner with a decent online learning, it is a need to form basis for online learning readiness by creating a positive online learning attitude.

Keywords: University student, Law, English language teaching, Physical education and sports, Online learning attitude, Online learning readiness.

INTRODUCTION
Today's world is experiencing a number of changes depending on the innovations brought by information and communication technology, which is constantly developing and renewing itself. These changes also manifested themselves in the field of education and this allowed the education environment to be designed with new models. One of these models is online learning. Online learning not only provides convenience for the learner digitally, but also allows the learner to follow the changing and improving conditions actively.

Online learning, which has become an interesting and popular type of learning in the educational environment (Pillay, Irving and Tones, 2007) is a learning process in which students realize learning far from the sources by reaching many learning resources at the same time in an environment different from traditional learning-teaching activities and by interacting more than the class environment in most cases (Çalışkan, 2002). Moreover, Horton (2000) defines online learning as a form of education realized over a browser or applications without a need for an additional software and learning resource.

Online learning not only encourages the use of technology for learning and teaching process (Stein, Shephard and Harris, 2011), but also promotes development of pedagogical subjects focused on learning and use of digital resources and communication tools. This type of learning can successfully support learning and facilitates pedagogical decision-making (Gebre, Saroyan and Bracewell, 2014; Osborne, Dunne and Farrand, 2013). According to a pedagogical perspective, it is highly important to determine and encourage the learning leadership of students for a strong online discussion community (Kim, Wang and Ketenci, 2020). Thinking about the facilitation under the leadership of trainer, this type of learning puts students into more frequent interaction and creates discussion environments (Oh, Huang, Mehdiabadi and Ju, 2018) and allows students to think about their ideas critically (Baran and Correria 2009; Brooks and Jeong, 2006; Hew and Cheung, 2008; Wang, 2008). In addition, the use of technology in education has become inevitable for both individual and social reasons with the developments experienced (Usta, 2011). Thus, students should use technology effectively in order to generate new ideas and express their ideas correctly. It is considered very important for students to be motivated for the online environment, which has become the fastest communication/sharing channels, to take action with online channels and to achieve the necessary motivation in this process.

Online learning is multifaceted (Vandenhouten, Gallagher-Lepak, Reilly and Berg, 2014), students should have online readiness (So and Swatman, 2006) and online attitudes (Usta, Uysal and Okur, 2016) in order to realize this multifaceted learning. Online readiness implies physical and mental readiness for the user to obtain learning experience (Borotis and Poulymenakou, 2004). Online learning attitude can be explained as *"the desire and the manner of the individual towards online learning"*.

In order for this multifaceted online learning to be realized, students must have a certain readiness level. Since the readiness of students allows the advancement of online learning (Hukle, 2009). So we can express that a positive online attitude of the learner forms a basis for online learning readiness. For this purpose, readiness of students should be considered before the process if success is desired for online learning practices (So and Swatman, 2006). Thus, readiness is a directly effective structure for success in online learning environments (Artino, 2009; Galy, Downey and Johnson, 2011; Kruger-Rose and Waters, 2013). Even if the standards of all components of the program are prepared in accordance with the development of distance education programs, the success of the education largely depends on the attitudes and approaches of the learner towards these conditions (Usta et al., 2016). Attitude is a concept with "cognitive, effective and behavioral" dimensions (Tavşancıl, 2006). The realization of online attitude can be ensured by the learner reacting to all stimuli of the electronic environment, activating her/his own thoughts, energy and desire, reacting to the effect and turning it into behavior.

An individual's attitude towards performing the behavior is directly proportional to that individual's intention to perform the behavior (Lee, Qu and Kim, 2007; Arı, Yılmaz and Doğan, 2015). Considered in this framework, the attitude of an individual towards learning can be directly related to that individual's learning (Kara, 2010). Depending on the attitude towards the learning environment, the level of adaptation and success may vary (Birişçi, Metin and Demiryürek, 2011).

Students are among the online learning environments. That is to say, positive or negative attitudes towards education in web-based learning environments largely affect the realization of learning (Sanders and Morrison-Shetlar, 2001; Alomyan and Au, 2004). In this regard, the institutions offering web-based teaching services must consider the attitudes of students (Daniels, Tyler and Christie, 2000). As a matter of fact, if student attitude is not taken into account in the educational environment, it may be difficult to wait for learning experiences to occur (Küçükahmet, 2017). Considering these information, it is indispensable to determine the attitudes of students towards the web-based learning (Donmuş-Kaya and Akpunar, 2019).

Because of coronavirus (COVID-19) epidemic, online learning has increased incrementally in recent months (Li and Lalani, 2020) and rapid transitions to online learning were made at all levels of education in order to reduce the traditional classroom environment where face-to-face communication is very intense and social distance is almost non-existent at times. The number of students who cannot attend schools or universities due to the epidemic is increasing rapidly, governments from all over the world have decided to close educational institutions to control this global epidemic (UNESCO, 2020). This study examines the relation between the attitudes towards online learning and readiness in university education, which has increased rapidly in recent months. In today's world where online learning has increased due to technological developments and the epidemic (COVİD-19), this research is thought to be important in that it analyzes the online learning attitude and readiness of students studying in different disciplines of education and Turkish culture and it will guide the future studies. Moreover, this research is thought to provide a contribution and resource to the stakeholders in higher education institutions during the epidemic and post-epidemic education and training process.

METHOD

Research Model

This study was conducted with a "relational screening model" being among the quantitative approaches. According to Karasar, relational screening model is "the research model that aim to determine the existence and / or degree of co-change between two or more variables." (Karasar, 2018, p. 114).

Research Group

The research group was selected from the non-probabilistic sampling methods with the appropriate sampling method. The sample group is composed of 190 female and 116 male students studying in Law Faculties, Departments of English Language Teaching and Physical Education and Sports Teaching in different state universities of Turkey.

Table 1. Descriptive statistics of the research group

Gender	**n**	**%**
Female	190	62.1
Male	116	37.9
Department/Faculty	**n**	**%**
Law	103	33.7
English Language Teaching	98	32.0
Physical Education and Sports Teaching	105	34.3
Universities	**n**	**%**
Sakarya University	101	33.0
Gaziantep University	33	10.8
Uşak University	21	6.9
Trabzon University	26	8.5
Bartın University	20	6.5
Sakarya University of Applied Sciences	105	34.3
Total	**306**	**100.0**

Table 1 shows the descriptive statistics results of the participant students. Accordingly, 62.1% of the participants (n=190) are female and 37.9% of them (n=116) are male students. By faculties, 33.7% of them (n=103) are students of law faculty, 32.0% (n=98) is composed of students in the department of English language teaching and 34.3% (n=105) is the students from the physical education and sports teaching department. Looking at the distribution by universities, 33.0% (n=101) of students from Sakarya University, 10.8% (n=33) of them from Gaziantep University, 6.9% (n=21) from Uşak University, 8.5% (n=26) from Trabzon University, 6.5% (n=20) from Bartın University and 34.3% (n=105) from Sakarya University of Applied Sciences were included in the study.

Data Collection Tools

Data of the research were collected through "Online Learning Attitude Scale" developed by Usta, Uysal and Okur (2016), "Online Learning Readiness Scale" developed by Hung, Chou, Chen and Own (2010) and adapted into Turkish by Yurdugül and Alsancak-Sarıkaya (2013) and "Personal Information Form" developed by the researchers. The detailed information related to measurement tools is given below.

Personal Information Form

Within the scope of the research, "Personal Information Form" developed by the researchers was used in order to determine some demographic information of the students. This form aims to reach such information as gender, university and faculty/department of the students.

Online Learning Attitude Scale

"Online Learning Attitude Scale" used in the research was developed by Usta, Uysal and Okur (2016) on university students. The measurement tool consists of 20 items in 5-point Likert type (1 = Strongly disagree, Strongly agree = 5). Following the statistical analysis, it was determined that the measurement tool had 4 factors: "general acceptance", "individual awareness", "perceived usefulness" and "application effectiveness". According to the results of the factor analysis performed to test the construct validity of the scale, 4 factors including 20 items explain 63.821% of the total variance. Cronbach Alpha internal consistency coefficients of the scale were calculated as .77 for general acceptance, .85 for individual awareness, .79 for usefulness and .68 for application effectiveness and general Cronbach Alpha internal consistency coefficient was found as .90 (Usta, Uysal and Okur, 2016). At the end of the present study, Cronbach Alpha internal consistency coefficients of the scale were calculated as .66 for general acceptance, .89 for individual awareness, .78 for usefulness and .60 for application

effectiveness and general Cronbach Alpha internal consistency coefficient was found as .91. In this study, statistical operations were performed over the total score for the purpose of the research.

Online Learning Readiness Scale

The "Online Learning Readiness Scale" used within the scope of the study was developed by Hung et al. (2010) and adapted into Turkish by Yurdugül and Alsancak-Sırakaya (2013). The measurement tool is in 5-point Likert type (1 = Strongly disagree, Strongly agree = 5) and consists of 20 items. Following the statistical analysis, the measurement tool was found to have 5 factors namely "computer-Internet self-efficacy", "self-directed learning", "learner control", "motivation for learning" and "online communication self-efficacy". Cronbach Alpha internal consistency coefficients of the scale were found as .92 for computer-Internet self-efficacy, .84 for self-directed learning, .85 for learner control and .80 for motivation for learning and 0.91 for online communication self-efficacy and general Cronbach Alpha internal consistency coefficient was calculated as .87 (Yurdugül and Alsancak-Sırakaya, 2013). At the end of the present study, Cronbach Alpha internal consistency coefficients of the scale were found as .88 for computer-Internet self-efficacy, .70 for self-directed learning, .71 for learner control and .83 for motivation for learning and .76 for online communication self-efficacy and general Cronbach Alpha internal consistency coefficient was calculated as .89. In this study, statistical operations were performed over the total score for the purpose of the research.

Data Collection

Before data collection, the required permissions were taken from Sakarya University of Applied Sciences in order to conduct the research. Due to the corona virus (Covid-19) epidemic, research questions were transferred to the online data collection system. The questions transferred to the online system were conveyed to the students between 19.05.2020 and 08.06.2020 through the dean's office, department heads and faculty members, and the data were collected. In addition, a text describing the purpose of the research was written before the questions in order to ensure the voluntary participation of the students in the research and the "I agree to participate in the research voluntarily" button was added to the system.

Data Analysis

The obtained data of the students were checked one by one. Later, data were arranged and conveyed to SPSS program. Before deciding on the statistical operations to be performed on the data, the conformity of the data to the normal distribution was controlled with the normality test. After the statistical operation performed, data were found to distribute within the range -1>,…,<+1. These values obtained are acceptable for normal distribution (Tabachnick and Fidell, 2013). Data were analyzed by using descriptive statistics, Pearson correlation and regression technique.

FINDINGS

Table 2. The results of the relation between online learning attitudes of students and their online learning readiness

		Online Learning Readiness
Online Learning Attitude	r	.65
	p	.00**

Table 2 shows the Pearson correlation analysis results indicating the relation between online learning attitudes of students and their online learning readiness. As a result of the analysis, a positive, moderate and significant relation was ascertained between the online learning attitudes of students and their online learning readiness (r=.65; p<.01).

Table 3. The effect of online learning attitudes of students on their online learning readiness

Model	B	Std. Error	β	t	p
Constant	33,73	2,18	---	15,45	,00
Online Learning Attitude	,49	,03	,64	14,85	,00

R= .65 R^2_{adj}= .42
$F_{(1.304)}$ = 220.56 p= .00

Dependent variable=Online learning readiness Method: Enter

Table 3 reveals the results of simple linear regression analysis performed to determine the effect of online learning attitudes of students on their online learning readiness. The regression model was found to be statistically significant after the analysis. Looking at the t-test results regarding the significance of regression coefficients, online learning attitude (β= .64; t= 14.85; p<.01) was found to be a significant predictor on online learning readiness. It can be stated that 42% of the total variance belonging to online learning readiness is explained with online learning attitude.

Table 4. Comparison of online learning attitudes of students by their faculty/department studied

	Faculty/Department Studied	n	$\overline{X}$	sd	F	p
Online Learning Attitude	Law Faculty	103	64.81	13.31	.70	.50
	English Language Teaching	98	62.37	16.09		
	Physical Education and Sports Teaching	105	64.01	15.01		

Table 4 shows the one-way variance ANOVA analysis results used to compare the online learning attitudes of students by the faculty/department studied. In the light of the analysis, it was determined that online learning attitudes of students did not differ in a statistically significant manner by faculty/department studied (F=.70; p>.05).

Table 5. Comparison of online learning readiness of students by their faculty/department studied

	Faculty/Department Studied	n	$\overline{X}$	sd	F	p
Online Learning Readiness	Law Faculty	103	63.89	10.23	2.75	.07
	English Language Teaching	98	64.63	10.87		
	Physical Education and Sports Teaching	105	67.37	12.50		

Table 5 shows the one-way variance ANOVA analysis results used to compare the online learning readiness of students by the faculty/department studied. The analysis showed that online learning readiness of students did not differ in a statistically significant manner by faculty/department studied (F=.2.75; p>.05).

DISCUSSION, CONCLUSION AND SUGGESTIONS

This study aims to examine the effect of online learning attitude of university students on online learning readiness. In this regard, 306 students studying in Law Faculties, Departments of English Language Teaching and Physical Education and Sports Teaching in different state universities of Turkey participated in the research. Many educators and researchers have emphasized the importance of network technology in terms of helping learners as learning is a social process (Liu & Tsai, 2008). The Internet, one of the most important inventions of the century, provided the opportunity of continuous learning with online learning, which enables learners reach information comfortably and without any place restriction. This situation drew attention to the importance of online attitude and online readiness concepts.

As a result of the research, a moderately significant and positive correlation was found between online learning attitudes of university students and their online learning readiness. In addition, it has been concluded that online attitude predicts online readiness significantly and online attitude has 42% of the total variance in explaining online readiness. The result of this research has proved that if the readiness of students in online education is desired to be high, it is necessary to keep their online attitudes high.

Online learning continues to become popular in disciplines where course content and teaching process is appropriate for teaching time (Arbaugh, 2000; Dahalan, Hassan, & Atan, 2012). Even though the effects of this educational process on students are a matter of debate (Kirtman, 2009; Yoany, 2006), some studies argue that students bring a different approach to this journey in the educational process (Bernard et al, 2004; DiMaria-Ghalili, Ostrow, & Rodney, 2005). Online learning has become a form of learning that has increased its popularity in higher education institutions in recent years and meets the demands with the opening of new online learning programs every day (Tallent-Runnels et al., 2006; Zandberg and Lewis, 2008; Hung et al., 2010). It has become inevitable that students have a positive attitude and behavior towards this increasingly widespread learning style. Considering the learning process, a student's attitude is important for the learning process (Chapman and Van Auken, 2001). Student attitude in the learning process has a strong impact on behavior (Arbaugh, 2000; Arbaugh, 2010; Bernard et al., 2004). Low performances can be in relation to a bad attitude

(Sadik and Reisman, 2004). As a matter of fact, one of the difficulties teachers often encounter during the teaching phase is to form positive student attitudes (Prior, Mazanov, Meacheam, Heaslip, & Hanson, 2016). In addition, attitudes are an important tool for students to encourage themselves (Love, Love and Northcraft, 2010). If the attitude is negative or condescending, the learner's chance to enter any learning process decreases (Prior et al., 2016). Previous research has indicated that there is little difference between face-to-face and distance learning in terms of learning outcomes whereas there is a difference in students' experience of life (Cooper, 2001; Waldman, Perreault, Alexander, & Zhao, 2009). This is the point where the importance of individual differences, which covers attitude and readiness in learning process as well, comes to the stage. That is to say, learners with positive attitude towards online learning are expected to show far more readiness to acquire knowledge, which would most probably lead them have further and more qualified learning outcomes, and thus higher academic success. In the light of this information, the importance of positive attitude in the online learning environment has been clearly revealed as a result of the research. Since the positive attitude and its significant effect on the student's learning readiness show that the results of this research are consistent with the information given above. A clear result of the positive attitude and the significant effect on learning readiness of the student indicates that the findings of this research and the above information are consistent. It is reported in studies in the literature that when learners have a positive attitude towards online learning, they are more satisfied with learning and learning is effective (Piccoli, Ahmad and Ives, 2001; Ku, Tseng, & Akarasriworn, 2013) as well as keeping their motivation and interest alive (Yang & Lin, 2010).

Online learning readiness, which is another aspect of online learning that has become very popular in educational institutions (Hung et al., 2010), is significantly explained by the online learning attitude. The concept of readiness is a variable that is frequently mentioned and measured in distance education, e-learning and online learning research (Horzum and Çakır, 2012; Fogerson, 2005; Smith, 2005; Watkins, Leigh and Triner, 2004; Smith, Murphy and Mahonay, 2003). The researches conducted emphasize the importance of motivation in online learning (Smith et al., 2003; Lim, 2004). The research results have revealed that motivation, being very important in online learning, plays an important role on students' attitudes and learning behaviors (Deci and Ryan, 1985; Fairchild, Horst, Finney and Barron, 2005; Ryan and Deci, 2000). Indeed, the concept of learning occurs through strong interactions and relationships between cognitive and motivational variables (Pintrich and Schunk, 2002; Stefanou and Salisbury-Glennon, 2002). The motivated individual's interest in the subject in performing the behaviors affects her/his attitude and intention in the subject to get the behavior in action, and this intention affects the actual behavior (Arı et al., 2015). Positive attitudes can lead the individual to well-motivated behavior. In this regard, positive attitude towards online learning directly affects the readiness for online learning. In other words, an action-reaction event, or being motivated to act and to show an attitude is to transform into behavior. As a matter of fact, the result of the present research supports this view.

The existence of the studies indicating the positive effect of readiness on learning is observed (Demir-Kaymak and Horzum, 2013; Hukle, 2009; Watkins et al., 2004; So and Swatman, 2006; Artino, 2009; Galy el al., 2011; Kruger-Rose and Waters, 2013). Moreover, many research results analyzing such factors as computer technologies and internet quality which affect online readiness have been reported (Eom, 2014; İlhan and Çetin, 2013; Wu, Tennyson & Hsia, 2010; Shee & Wang, 2008; Sun, Tsai, Finger, Chen & Yeh, 2008). These findings indicate that the convenience provided by technology to the individual can create positive attitudes in this individual towards technology. Ultimately, these positive attitudes also have a direct impact on readiness. Readiness covers the maturity level of the learner, her/his interests, needs, attitudes, motives, pre-learning, abilities and general health conditions. Readiness is also the state of the learner to be ready to learn physically, socially and mentally. In order to create a decent online learning readiness, positive online attitude must exist. The lack of one of these affects the others negatively. In short, online readiness means that the learner is ready and motivated in every way to receive information.

Another finding of the study is that online attitude and online readiness do not differ according to the faculty / department studied. It is thought that the main factor underlying this result is that the students who make up the sample receive education in social sciences such as Law, English, Physical Education and Sports. There are not only the studies supporting this finding in the literature (Adnan and Boz-Yaman, 2017), but also other studies differing from the research results (Yılmaz, Sezer and Yurdugül, 2019). The literature and the results of this research clearly show that the way for a qualified online learning is through establishing a positive online attitude and creating the basis for a successful online learning readiness. This study has revealed that learners' online attitudes have a positive effect on their online readiness. Thus, the results of the literature coincide with the results of our study. In subsequent research, it is recommended to conduct comparative studies on science students and social science students and to conduct similar studies at other levels of education where large sample groups and departments would be included.

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The Prospects of Karaoke as a Teaching Method in Primary Education

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ABSTRACT
The introduction and verification of new teaching methods is of utmost importance nowadays since new generations of students evidently grow up and communicate differently from their predecessors. The aim of this work is to inspect the prospects and possibilities of integrating karaoke into the primary school classroom. The paper explores attitudes toward karaoke as a teaching method in relation to gender, age, and musical skills, aiming to identify ideal target group. General student and teacher attitudes toward karaoke are also examined, as well as teacher attitudes with respect to demographic data such as gender and field of education. Based on the findings of the conducted research, the paper proposes strategies which enable efficient integration of karaoke into the classroom by increasing students' motivation and their satisfaction with education.

INTRODUCTION
In general, music affects people differently. However, the genre also plays a role. While certain genres like jazz, blues or classic music tend to relax, some other genres such as rock, pop or electrical music, act as mood cheerers. The aim of this paper is to inspect the prospects and possibilities of integrating music into the primary school classroom by examining general student and teacher attitudes towards karaoke as a teaching method and by identifying ideal target group with respect to gender, age, and musical skills. The focus of the paper is put on the primary school education and is not related to any particular course. Certain teacher demographic data such as gender and field of education are also taken into consideration. As such, the paper systematically examines the general potential of karaoke as a teaching method in the primary school education.

Karaoke as a concept and type of fun originate from Japan. The word is coined from the word *kara* meaning "empty" and *oke* meaning "orchestra" (Gupta, 2006). The process can be described as playing instrumental music on a computer or a DVD player while one or more people read lyrics and sing along. Although every song with lyrics can be used for karaoke, hit songs are most commonly used.

The original aim of karaoke was to entertain and relax. However, karaoke proved to be an excellent tool for teaching children. Since students enjoy engaging in karaoke during their social activities outside the classroom, there is no reason why it should not be incorporated into the classroom. Children never think of karaoke as of their reading assignment or a homework, but as of dancing and singing. There are thousands of songs in different languages on YouTube, which can be used in the classroom over any networked device. However, songs need to be carefully selected to make them fit for the purpose. Associations such as "The Children's Music Network" publish educational songs, which can be used for language acquisition. One of the best known example songs for using karaoke in foreign language teaching is probably "Let it go" from the movie "Frozen", which talks about hope, goodness, and bravery. Recent studies show that karaoke as a teaching tool has beneficial effects even for grown-up population.

Singing in the classroom has a lingual and cognitive value for language acquisition. Besides acquiring new vocabulary, practicing reading and pronunciation, learning grammar, etc., karaoke can affect social skills in a way that students gradually lose their fear from public performance and gain new friendships by expressing their empathy and encouragement. It helps to develop intercultural and interactive communication skills. Listening becomes more intense and more focused. The related work survey reveals that karaoke is not restricted to language classrooms (Cristofaro, 2011; Erten, 2015; Rasinski, Homan, & Biggs, 2009) but can be applied to Mathematics (Lesser, 2014), Physics (Dickson & Grant, 2003), History (Grossman & Richards, 2016; Grossman

& Simon, 2018), Biology (Grossman & Richards, 2016), Chemistry (Crowther & Davis, 2013), Sociology (Baker, 2012), and Economics (Geerling & Mateer, 2015).

The role that teachers play carries huge responsibility as they have to create a humane environment, or even sing prior to everyone else (Erten, 2015). Teachers should start with simple and slow-rhythm songs and the learning outcomes should be realistic. As an introduction, students can be acquainted with the performer and his or her music genre (Erten, 2015). Students can perform individually, in pairs, or even in groups, which can make karaoke even more fun. For example, one stanza of a poem or one complete poem can be performed by one group and another by some other group. The competitive spirit makes students learn lyrics well and perform better than other groups, and thus acts as a motivation booster. The quality of learning is higher when children sing songs of their favorite performers. Songs can even be chosen by students themselves with the approval from the teacher. The rapidly developing field of media editing software nowadays allows teachers and students to have greater control over the selection of songs for karaoke.

The motivation for the study presented in this paper is the introduction of the course ICT for translators as an elective course for the teaching orientation of the graduate study program in Informatics, with the purpose to get students acquainted with selected tools and services for translators, among which are those for subtitling and making karaoke. The aim of the research is to examine attitudes of primary school students and teachers toward karaoke in the classroom and their relation to gender, age, musical skills, and school subject, and to investigate the presence of karaoke as a teaching method across different subjects in primary schools. The research was conducted in the school year 2018/2019 in four primary schools located in four different towns in Croatia. Based on the research findings, the paper proposes strategies which enable efficient integration of karaoke into the classroom by increasing students' motivation and their satisfaction with education.

RELATED WORK

The learning, which occurs within karaoke, can be seen as free of the constraints of the more institutionalized and restrained setting (Payal, 2010). A live narrative through a karaoke experience, which is presented in Payal (2010) serves as a metaphor for schooling. A 'good' educational experience lies neither in the conditions of the environment nor the individual alone. There are a lot of factors, such as the innate attributes of the student, the student-teacher ratio, the facilities of the classroom, the teaching method, and textbooks. The paper serves as a reminder of the range of learning and teaching that can manifest itself within the educational environment. Prospects and principles for the effective use of karaoke for pedagogical purposes are discussed in Erten (2015).

Karaoke is mostly used in foreign language classes. Although the list of activities related to using music, songs, and lyrics in English Language Teaching (ELT) classes is considerable, a limited attention has been paid to increasingly popular singing activity karaoke (Erten, 2015). The importance of songs as one of the tools to transfer culture is emphasized in Keskin (2011) and exemplified with activities on the case of Turkish as a foreign language.

The survey on the related work shows that karaoke is not restricted to foreign language classes and that it can be quite successfully applied in other subjects as well. A karaoke-related strategy demonstrated in Dickson and Grant (2003) is related to Physics. Students are asked to produce an alternative set of lyrics to a particular song or to any other song provided that the lyrics cover the phenomenon under consideration. In such a way Physics is embedded in the presentation, but also in the preparation of a set of lyrics.

Strategies of teaching which use karaoke as a tool to enhance reading fluency and motivation are presented in Gupta (2006). Although children, when asked specifically, do not necessarily express interest in music, given the opportunity they can display impressive reading skills using karaoke as a unique motivating tool. However, it is important to familiarize children with the lyrics, to make them all sing together, and to give them preview of the lyrics. The authors in Rasinski et al. (2009) also describe different approaches to fluency instruction and single-out karaoke as one of the authentic approaches. Specifically, they describe poetry reading as an exercise for improving reading fluency but admit that singing lyrics to a song is a nearly ideal form of reading for exercising fluency. Same-language-subtitling (SLS) activities in a special education reading class supplemented with cloze worksheets are presented in Mccall (2008). They are similar to karaoke as the subtitled text changes color in exact rhythm to the lyrics (or the dialogue) in such a manner that even a non-literate viewer can visually track the words as they are performed and echo sing-alongs. Students can even engage in creating their own content. The author shows that SLS activities help raising reading levels and support reading growth.

As given in Cristofaro (2011), there is an abundance of reasons for integrating karaoke in language teaching. Some of them are vocabulary acquisition, pronunciation practice, learning of language patterns, and boosting

motivation. For example, a cloze exercise accompanied by a song is the most familiar way of learning foreign vocabulary. Students first fill out short gaps and then gradually fill out bigger gaps. Eventually, the teacher can let students listen verse by verse with no text provided and with small pauses in-between as a replacement for a dictation (Erten, 2015). Moreover, as noted by Keskin (2011), songs are one of the tools to transfer culture. Due to an increasing number of immigrants in Europe, Cristofaro (2011) emphasizes the importance of new didactic and methodological answers.

Although many examples of the use of Mathematics lyrics in the educational environment involve primary school Mathematics, Lesser (2014) sees potential in college level Mathematics.

Using karaoke as a social and academic transition strategy to enhance first-year university experience is presented, and responses of students enrolled in Youth and Society, a first-year foundation course for undergraduate Sociology students, are analyzed in Baker (2012). The teaching evaluation questionnaire filled at the end of the semester extended with karaoke-related questions reveals that over half of the students who completed the questionnaire report that karaoke made their learning environment less threatening, and that karaoke reduced their anxiety and encouraged interaction. Geerling and Mateer (2015) present an activity designed to motivate students, and thus encourage students to take more advanced courses, and increase retention rates in the field of Economics. They let students apply for karaoke and emphasize that the probability of finding a volunteer singer is higher in bigger groups.

A sing-along exercise created and described in Crowther and Davis (2013) is supposed to be applied in college-level Biochemistry courses but can be adapted for less advanced classes. Students' perceptions and reactions to the active learning Karaoke Video project in two undergraduate and graduate classes of Natural History of Georgia and Fish Ecology are evaluated in Grossman and Richards (2016). Students report significantly more positive responses to questions about the project and there are no differences in positive responses between students of different study years. Student perceptions of the inquiry-based, karaoke video exercise in six university classes in The Natural Environment of Athens and Georgia and Vertebrate Biodiversity and Conservation ranging from first year to graduate level are evaluated in a subsequent study (Grossman & Simon, 2018). Students' majors turn out to have no impact on their responses.

It is often advocated that karaoke suits only students with high musical interest or skills. The evaluation of a six-week summer course enrolled by high school students of the last two grades presented in Crowther and Davis (2013) shows that there is no difference regarding enjoyment and helpfulness of the exercise between high musical interest and low musical interest groups or between high STEM interest and low STEM interest groups. Moreover, evidence suggests that a musical intervention may be engaging even for those who are not musically inclined, and, at the same time, that music may not always increase engagement among those who are generally disinterested in STEM. Grossman and Richards (2016) use ANOVA to confirm the hypothesis that students with different musical level do not answer questions with different frequencies. However, in a subsequent study student musical experience proves to have a significant effect on the number of positive responses according to the Kruskal-Wallis test (Grossman & Simon, 2018).

As Lesser (2014) suggests, a good strategy to improve effectiveness is to ask students on their favorite artists at the beginning of the class. The author does not use karaoke in particular but enumerates different ways of integrating lyrics into a lesson. Erten (2015) also emphasizes the importance of using popular songs for creating a positive impact or, as an alternative, employing activities that familiarize students with the song. In order to relieve the stress related to public performance, the lights can be dimmed, students do not have to sing if they feel uncomfortable, or recorded voice can be played along with the soundtrack (Erten, 2015).

A great potential that karaoke has as a teaching method is also reflected by the recently published research by Murad, Wang, Turnbull, and Wang (2018), which presents a multi-language karaoke application called SLIONS: Singing and Listening to Improve Our Natural Speaking. Its key feature is the integration of automatic speech recognition (ASR), which provides students with personalized feedback based on their singing pronunciation. The qualitative feedback from the students suggests that SLIONS makes speaking and signing in a foreign language both fun and motivating. The elements of gamification are incorporated by earning points upon successful completion of each exercise. The introduction of video games or even wider gamification concept into teaching less interesting or harder-to-learn content areas can have a positive impact on intrinsic motivation in the process of learning since students generally like to spend their time playing (Juric, Bakaric, & Matetic, 2018).

The work presented in this paper is most similar to the one in Grossman and Richards (2016) and explores general student and teacher attitudes toward karaoke and their relation to certain demographic factors such as

gender, age, musical skills, and field of education.

EXPERIMENTAL STUDY

Since the aim of the research is to investigate the presence of karaoke as a teaching method and examine attitudes of students and their teachers toward karaoke, particularly with regard to selected demographic data, altogether six research questions were posed and divided into two sets.

The first set of questions (1-4) is related to students. The first three questions concern demographic data and inspect whether ideal target group is gender and age-sensitive, and whether musical skills play a role in forming attitudes toward karaoke as a teaching method. The fourth research question inspects general student attitudes toward karaoke.

Since teachers play a major role in the proper implementation of karaoke as a teaching method, the study also explores whether demographic data such as gender and formal education, which is reflected through the school subject, influence attitudes toward karaoke (questions 5-6).

With respect to the listed research questions, the following null hypotheses are examined:

- There is no association between student gender and willingness to use karaoke (hypothesis 1).
- There is no association between student age and willingness to use karaoke (hypothesis 2).
- There is no difference between student musical ability and response to karaoke because positive responses do not differ significantly among the three levels of musical ability (hypothesis 3).
- There is no difference between positive and negative student responses to karaoke-related questions (hypothesis 4).
- There is no difference between positive teacher responses to karaoke-related questions with respect to gender (hypothesis 5).
- There is no difference between positive teacher responses to karaoke-related questions with respect to school subject (positive responses do not differ significantly among the five subjects) (hypothesis 6).

The research questions are examined by two versions of an anonymous questionnaire administered to four primary schools located in four different towns in the Republic of Croatia. The study was conducted in the school year 2018/2019. The survey was open from the end of May to the end of June 2019 and thus included three weeks prior to summer holidays and one week of summer holidays.

The questionnaire designed for students was filled out by 192 students between ten and fifteen years of age and attending fifth to eight grade of one of the four primary schools in the Republic of Croatia. The questionnaire consists of thirteen questions dealing with the basic demographic data and perceptions of the karaoke. The first four questions relate to general data (gender, age, school grade, favorite subject). In the fifth question students have to self-evaluate their musical level on a five-point scale (advanced: write and perform songs, very good: sing and memorize songs, average: listen to music and can sing a few songs, weak: do not sing or memorize songs, non-existent). The classification of answers into positive and negative responses, as well as the musical level grading system is taken over from Grossman and Richards (2016) to facilitate comparison. In the next section students choose the level of agreement with a set of karaoke related statements on a five-point Likert scale. In the last section they answer couple of questions related to their real-life experience with karaoke in the classroom and optionally state their opinion in an open-ended question.

The teacher questionnaire consists of nine questions and was filled out by 88 teachers of different subjects. The first three questions are related to gender, school subjects and whether they use karaoke within their classes. In case of a negative answer to the karaoke-related question, the respondent is instructed to skip the questions up to question number six, which inspects the level of teacher agreement with a set of karaoke-related statements on a five-point Likert scale.

For ease of interpretation and statistical analyses, we classify answers of “I strongly agree” and “I agree” as positive responses and “I strongly disagree” and I “disagree” as negative responses, except in the two negatively framed questions where the opposite is applied, i.e. negative responses to questions framed in the negative (e.g. “Karaoke in class deconcentrate.”) are considered positive. This is done in line with Grossman and Richards (2016).

The hypotheses on the non-existence of the relationship between age and gender on one hand and willingness to use karaoke on the other hand are examined by means of the chi-square test of independence. The hypothesis that there is no difference between student musical ability and positive response to karaoke is evaluated by

means of the non-parametric Kruskal-Wallis test. The hypothesis that there is no difference between positive and negative student responses to karaoke-related questions is evaluated by means of the parametric t-test. The two hypotheses which question the relationships between teacher demographics on one hand and positive attitude toward karaoke on the other hand are examined by means of the Kruskal-Wallis test.

RESULTS AND DISCUSSION

Student questionnaire results

Gender distribution in the filled-out student questionnaires is given in Figure 1.

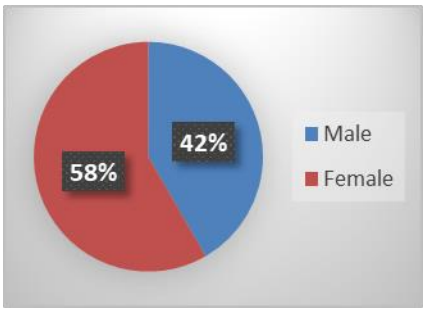

Figure 1. Gender distribution in the student sample

The study group is composed of fourth to eight grade students. The most represented age is twelve (Figure 2).

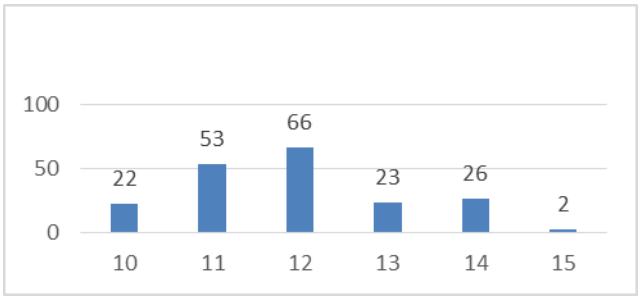

Figure 2. Age distribution in the student sample

The first hypothesis is that **there is** no **association between student gender and willingness to use karaoke** and it is examined by means of the chi-square test of independence. The hypothesis is rejected since the obtained chi-square value is extremely statistically significant (χ^2=12.695, d.f.=1, p<0.01).

The second hypothesis is that the willingness to use karaoke occurs equally frequent for all age categories. Since there are only two students who are of age fifteen, the variable value fifteen is merged with the value of fourteen (Figure 3). According to the chi-square test results, the null hypothesis is rejected, i.e. the willingness to use karaoke does not occur equally frequent (χ^2=16.931, d.f.=4, p<0.01). In other words, **age is related to the willingness to use karaoke**.

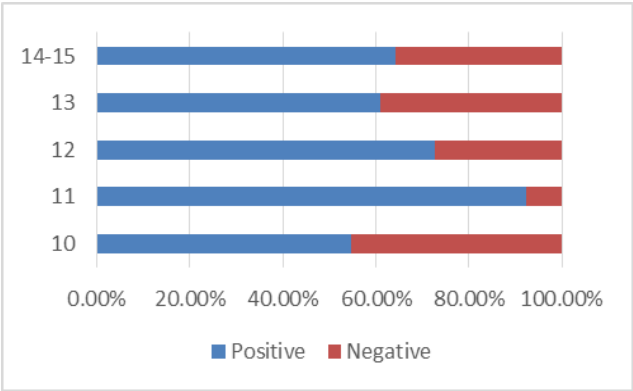

Figure 3. Student sample general attitudes toward karaoke in class displayed by age

As far as favorite subject is concerned, the students could choose between Croatian Language, Mathematics, Foreign Language, Nature and Society / Biology, History, or list their own choice under the category Other. Mathematics and Foreign Language are chosen by 16% of the students each, followed by Physical Education (13%), Croatian Language (12%), Nature and Society / Biology (10%), and History (9%) (Figure 4).

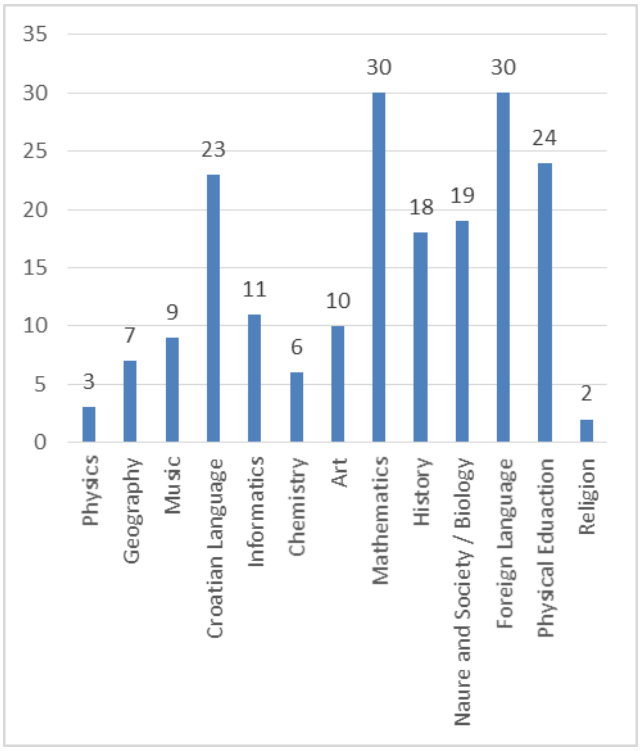

Figure 4. Favorite subjects in the student sample

Students were also asked to self-assess their musical level on a five-point scale with elaborate explanations of the scale provided to them in brackets. A total of 20% of students report low musical skills (non-existent or they do not sing nor memorize songs), while 33% report average musical skills and find themselves in the category *Average* or *Very good* (Figure 5).

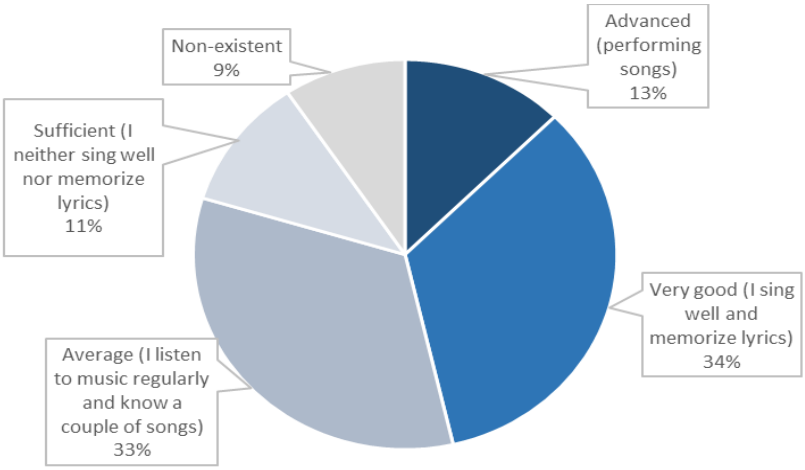

Figure 5. Self-assessment of musical skills in the student sample

The third hypothesis that **there is** no **difference between student musical ability** (H stands for high, A for average, L for low) **and response to karaoke** (Table 1) is evaluated with the Kruskal-Wallis test as an alternative to a parametric one-way ANOVA due to variance heterogeneity. Positive responses differ significantly among the three levels of musical ability. The null hypothesis is rejected. The H statistics of 17.81 has a probability of occurrence by chance alone of less than 0.01 if there is no significant difference between the groups.

Table 1: Distribution of positive and negative answers with respect to musical ability

	Positive			Negative		
	H	A	L	H	A	L
I would like to use karaoke in class.	78	45	18	11	19	21
Karaoke makes classes more fun.	79	48	21	4	9	9
Karaoke in class enhances learning and deepens understanding.	75	45	18	5	7	9
Karaoke in class relieves from stress.	70	40	18	5	9	11
Karaoke in class increases motivation.	73	40	16	6	9	9
Karaoke in class deconcentrates.	69	34	15	0	9	4
Karaoke preps take too much time.	64	38	21	5	5	1

The level of agreement with the next two statements is measured on a five-point Likert scale. The choices range from *Strongly agree* to *Strongly disagree*, and include a mid-point *Neither agree nor disagree*, for those who are neutral on the subject matter. According to the first such statement, only 57 students perform karaoke in their free time (students who agree or strongly agree), 38 students are neutral, while 97 students disagree. Furthermore, 65 students use karaoke for foreign language learning, 44 of them opt for a neutral answer, while 83 students do not use it for foreign language learning. Students find that karaoke can help them learn new vocabulary (109 students), practice pronunciation (94 students), practice reading (71 students) and learn grammar (55 students). They also give their own answers, among the pre-defined ones, and find that they can learn or improve their singing skills, have fun, cheer up, learn foreign language in general, practice rhythm and intonation. Only couple of them find that singing cannot make them learn anything useful. Eleven percent of students report using karaoke in the classroom. They report doing a cloze exercise while listening to a song. After checking the answers, they all engage in group singing. Seventy-three percent of students report that they would love to use karaoke in the classroom. Since they enjoy listening to music, they find it would be fun to sing, learn, and write lyrics of different songs. It would positively affect their motivation, expand their vocabulary, and help them in pronunciation. The stress associated with learning would be relieved and they would be more relaxed. Those who vote against karaoke give arguments such as discomfort caused by singing in front of public and singing in general, and find karaoke demotivating.

Some students suggest preparing for a lesson by having to learn lyrics at home in order to avoid discomfort caused by not knowing the lyrics and then to engage in group singing. Students report that they would like to learn about foreign performers and to sing their songs, e.g. Ariana Grande, Bruno Mars, One Direction, Abba, Queen, Nena, Imagine Dragons, Katy Perry, Adele, Celine Dion, Nneka, and Eminem. They also list couple of domestic performers. They opt for foreign language courses as the best candidates for karaoke, and Croatian Language, Music, and Religion as somewhat less suited. Only couple of students mention Mathematics, Physical Education, and History in this respect.

The last question consists of six statements, which are evaluated on a five-point Likert opinion-related scale. It is evident that the level of agreement with all six statements speaks in favor of karaoke. All four positively framed statements have agreement over 67%, either strong or weak, while both statements framed negatively have the level of disagreement over 64% (Figure 6).

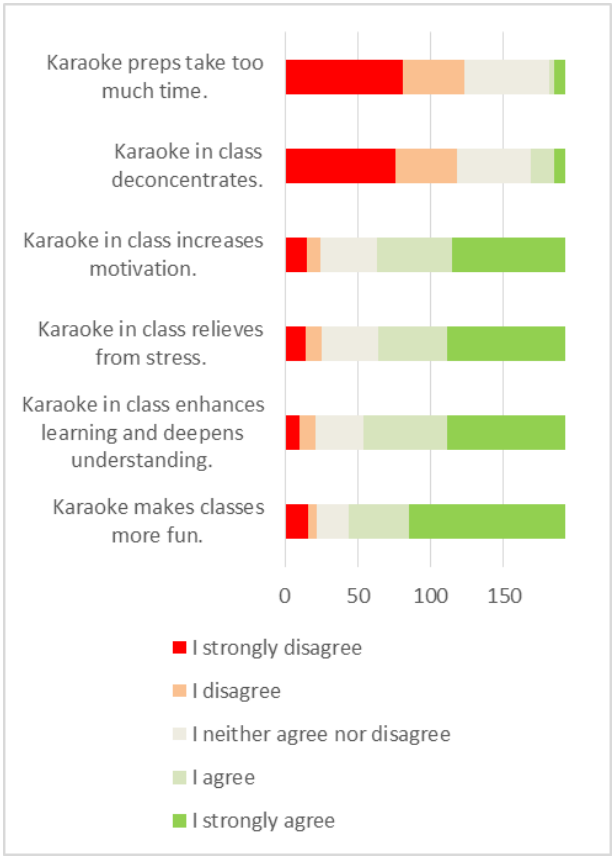

Figure 6. The level of student agreement with karaoke related statements

The t-test is used to evaluate the hypothesis that students report significantly more positive responses to karaoke-related questions (Table 2). Overall, positive students' responses to karaoke are significantly more common than negative ($t=43.59$, $d.f.=10$, $p<0.01$).

Table 2: Student perceptions of karaoke

Statement	Strongly agree	Agree	Disagree	Strongly disagree
… makes classes more fun.	62.94%	24.12%	3.53%	9.41%
… enhances learning and deepens understanding.	50.94%	35.85%	6.92%	6.29%
… relieves from stress.	52.94%	30.72%	7.19%	9.15%
… increases motivation.	50.33%	33.99%	5.88%	9.80%
…deconcentrates.	4.96%	11.35%	29.79%	53.90%
… preps take too much time.	5.22%	2.99%	31.34%	60.45%

Teacher questionnaire results

Female respondents prevail in the questionnaires filled out by teachers (Figure 7). The highest number of teachers in the sample teaches English, followed by lower elementary teaching, Mathematics, Croatian Language, and Informatics (Figure 8).

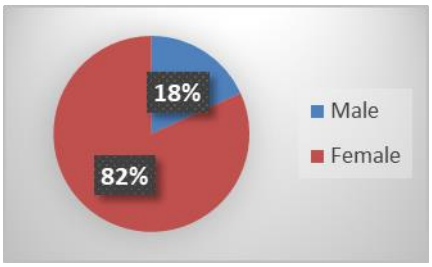

Figure 7. Gender distribution in the teacher sample

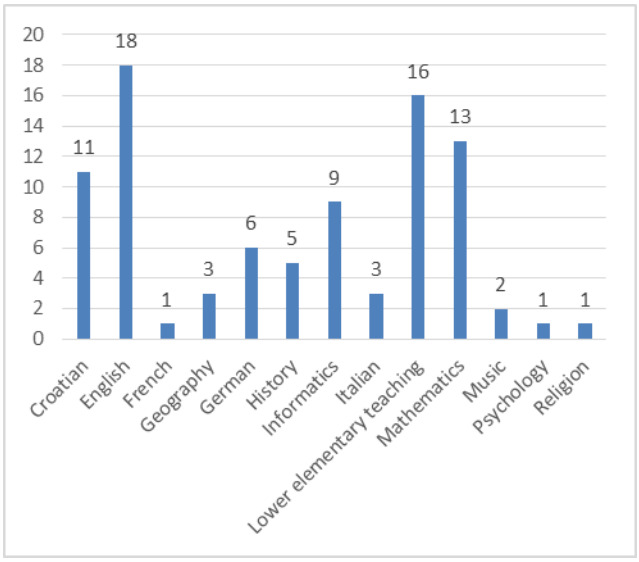

Figure 8. Subject distribution in the teacher sample

In the open-ended question soliciting opinion on the influence of karaoke on students, many teachers (64) report a positive influence on motivation and cooperation. Some answers also highlight that karaoke represents an interesting way of learning foreign languages. The answers also point out that karaoke helps students overcome their fear of public performance, facilitates creativity, increases self-confidence, and brings students closer to each other. The answers with counter-arguments (11) find karaoke childish and embarrassing, which opens up space for mocking. A total of 13 respondents do not show any preference.

The last question consists of the same six statements, which are present in the questionnaire designed for students. Teachers give their five-point Likert opinion-related evaluation (Figure 9). It is once again evident that the level of agreement with five statements speaks in favor of karaoke. The only statement in which the answers are somewhat evenly distributed is the one related to the time required to prepare a karaoke activity.

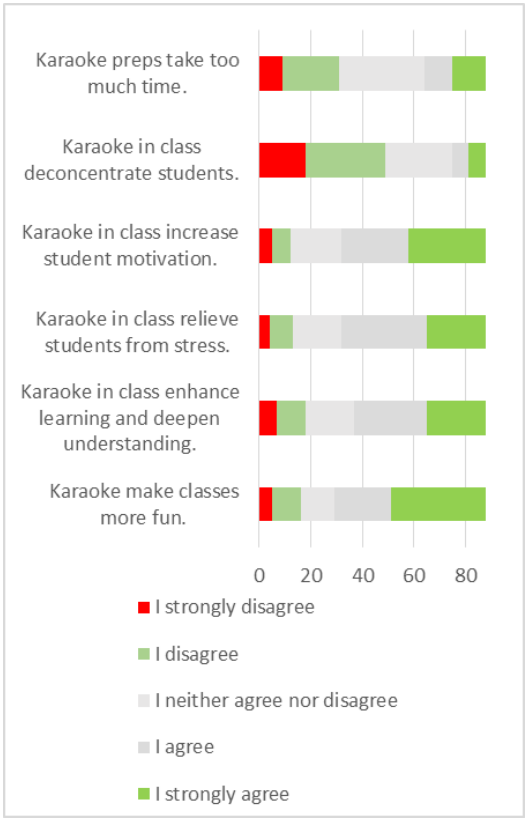

Figure 9. The level of teacher agreement with karaoke related statements

The hypothesis that there is no difference between gender and response to karaoke is evaluated with the Kruskal-Wallis test. **Positive responses differ significantly with respect to gender.** The null hypothesis is rejected since the H statistics of 8.31 has a probability of occurrence by chance alone of less than 0.01 if there is no significant difference between the groups.

In testing the last hypothesis only the most represented subjects are considered – Croatian Language, Mathematics, Informatics, and lower elementary teaching, while all foreign languages are grouped into one category. The response from one teacher who teaches both English and Croatian Language is disregarded. The hypothesis that there is no difference between school subject and response to karaoke is evaluated with the Kruskal-Wallis test. **Positive responses differ significantly among the school subjects.** The null hypothesis is rejected (test statistics H=22.0269, d.f.=4, the result is significant at $p<0.01$). Interestingly, out of all Informatics teachers there is only one positive response detected in relation to the time needed for preparations. This is probably because they are well aware that some extra time is needed in order to prepare a lesson including karaoke, as well as for meeting all the technical requirements.

Three-quarters of teachers do not use karaoke in their subjects. In the remaining quarter (22 teachers) are lower elementary teachers, and teachers of foreign languages and Music. Karaoke is mostly used in lower elementary teaching (Figure 10). The total sums up to over 22 because some teachers, who teach at more than one school level, possibly use karaoke in two or even three levels.

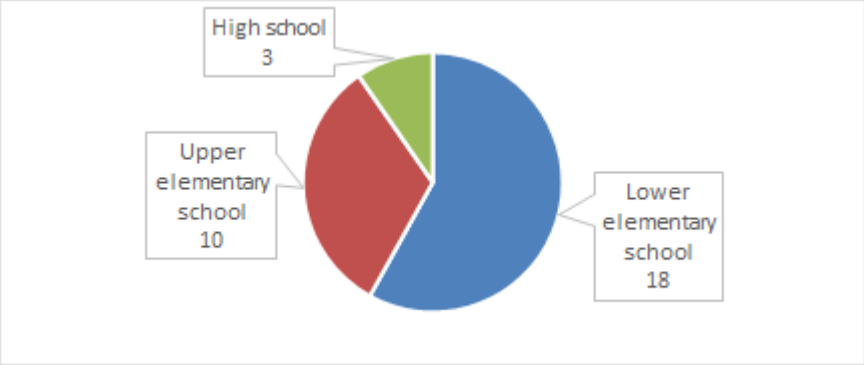

Figure 10. Karaoke usage per school levels

The teachers, who use karaoke, find that karaoke can help students learn new vocabulary (19 teachers), practice pronunciation (18 teachers), practice reading (14 teachers), and learn grammar (9 teachers). They also give their own answers, among the pre-defined ones, and find that karaoke helps students develop their singing technique (2 teachers) and good hearing (2 teachers). The rank of the chosen pre-defined options is the same as the one in the questionnaire filled out by students. Most of the teachers use karaoke in the final part of their class (77%), some of them in the middle part of the class (18%), and only one teacher uses karaoke in the introductory part of the class. The highest number of teachers report using nursery rhymes in foreign languages, songs recommended in school books, or foreign or domestic songs which students are familiar with and which are appropriate for their age.

DISCUSSION

The related work presented earlier in the paper is mostly concerned with specific subjects or courses, and with karaoke-related strategies tailored for these specific settings. They often present concrete subject-specific examples of exercises. A subset of the papers presented involves post-evaluation via questionnaires. Unlike the related work presented, the focus of this paper is put on the primary school education and is not related to any particular course. The pre-evaluation is devised in such a way to systematically examine the potential of karaoke as a teaching method in the primary school classroom. In order to identify ideal target group and in order to account for both student and teacher roles within the educational setting, certain demographic data such as age, musical skills, education, and gender are singled out and thoroughly examined through a questionnaire.

The results of the survey suggest that karaoke should be integrated into the classroom very early on since age is related to the willingness to use karaoke. However, contrary to some previous findings, musical skills affect responses as responses differ significantly among the three levels of musical ability. In addition, the association between gender and willingness to use karaoke is extremely statistically significant. Since positive student responses to karaoke are overall significantly more common than negative, this teaching method should not be dismissed. However, steps of precaution need to be made in order to create a positive and motivating

environment. A list of strategies for improving effectiveness includes asking students on their favorite artists at the beginning of the class, using popular songs, dimming the lights, making it a voluntary or a group activity, or even a contest, and playing the recorded voice along with the soundtrack. Moreover, the teacher might serve as an ice breaker and sing prior to anyone else.

Both null-hypotheses related to teachers are also rejected since positive responses differ significantly across both gender and school subjects. Moreover, teachers of Informatics seem to be most aware of how time-consuming the preparations for karaoke can become. Of course, the cost-benefit ratio can be optimized by using the resources which are already available online. A concluding remark on the findings presented in this paper is that some more extrovert cultures might suffer less from fear of public performance and thus adopt this teaching method more enthusiastically.

Karaoke singing can be performed on a computer, a DVD player with karaoke function, or a special karaoke machine. A number of both commercial and freeware karaoke players are available. Karaoke songs are available online both commercially and freely. Karaoke songs can also be found easily on Youtube uploaded in video formats by other users. Since karaoke involves reading lyrics running on the screen and singing them along the melody, karaoke also requires a screen and speakers. A microphone and headphones are desirable for better effect.

In order to flexibly use karaoke in the classroom and to be able to create their own karaoke songs, teachers need to master one of the tools or online services which would enable them to prepare a song for a lesson. URUWorks - Subtitle Workshop XE and Aegisub are both free software tools for subtitling or editing subtitles, which are supported on Windows, Linux, and Mac platforms. Dotsub is an online service, which requires registration prior to usage and offers basic package free of charge. We advise the teachers who use karaoke occasionally to use Dotsub or a similar service because it is the simplest of the three for preparing a teaching lesson. The service can be accessed from any computer connected to the Internet. Tools like Subtitle Workshop and Aegisub are better suited for frequent use. We find the simplicity of Subtitle Workshop user interface ideal for beginners. Aegisub, on the other hand, offers different possibilities, such as changing the position of subtitles or creating styles. However, advanced options for creating and editing subtitles can make its usage a bit cumbersome. Therefore, we suggest Aegisub for those who want to use its full functionality.

CONCLUSION

Over the past, education has been under constant change. The priority of every school is the well-being of their students. Everything has been changing for the benefit of students – teaching methods, teacher-student relationship, and school hour duration. The introduction of new teaching methods is thus inevitable. This is particularly true in the context of the educational systems in which a severe need for a curricular reform has been identified. Interesting and fun, karaoke is part of numerous celebrations. Karaoke is usually done at home, at different gatherings, or in bars. Its primary role is to create fun. However, karaoke can be used in the classroom since it includes reading the text from the screen, performing songs in front of friends or public, and learning new vocabulary. Children are more prone to learn while playing and having fun, which is most pronounced in lower elementary teaching. In general, they rarely think of karaoke as of their reading or homework assignment. Moreover, it has been shown that karaoke as a teaching method has beneficial effects even for grown-ups. Karaoke increases motivation, enhances learning, and deepens understanding. Since many songs contain inappropriate lyrics, selecting songs carefully is of high importance.

The research study presented in this paper shows that there is plenty of space to introduce karaoke as a teaching method in primary schools. Karaoke is mostly present in Music and lower elementary teaching. Based on the results of the questionnaires, it can be concluded that the relationships between student age and gender on one hand, and willingness to use karaoke on the other are statistically significant. Furthermore, positive response to karaoke differs significantly among the three levels of musical ability for the students, and among gender and school subjects for the teachers. Positive student attitudes toward karaoke are significantly more common than negative and show that they themselves believe karaoke can help them in the learning process. The focus they put on foreign language acquisition can be attributed to their intuitive assumptions and experience they have with karaoke. However, karaoke can be successfully implemented in other subject areas as evident from the related work section.

Since public performance, particularly singing, might take people out of their comfort zone, different strategies have been proposed to make the task less frightening, such as using popular songs, asking for volunteers, organizing a competition, etc. Moreover, the introduction of karaoke as a teaching method in the flipped classroom teaching mode might have even greater potential than in the regular classroom.

A major limitation of this research study is the constitution of the sample. Teachers and students who participated in the study are not selected from a larger population on a completely random basis but rather four schools were pre-selected for the participation in the study, though care was taken to include both rural and urban communities to avoid the sample being too homogeneous. Therefore, the results might not generalize to primary school teacher and student populations across the country, and especially the globe, due to cultural variation. Ideally, the study should also present evaluation after the introduction of karaoke as a teaching method, where applicable, however, for practical reasons this is left for our future work.

ACKNOWLEDGMENTS

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