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& INTE-2021*

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What He Would Say if ...
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An Investigation into the Pre-Service Science Teachers' Material Design Skills and Attitudes towards the Course and Views

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ABSTRACT

This study aimed to examine the effect of visual and digital materials designed within the scope of the Instructional Technologies and Material Design course on pre-service science teachers' attitudes towards the course and to determine the material design skills and their views on material design. In this study, case study was adopted, and the participant group was composed of 48 pre-service science teachers studying at a state university. In the research, the Attitude Scale towards Instructional Technologies and Material Design Course, material design assessment rubrics, and semi-structured interviews were used as data collection tools. The data are currently in the analysis phase and the dependent groups' t-test, descriptive statistics, and content analysis are used. As a result of the research, it was determined that the application of the cooperative material development was significantly effective in improving the attitudes of pre-service teachers towards the course. It was determined that the design scores of the teacher candidates are at a good level. Pre-service teachers think that the designs have positive aspects such as instructing, introducing different applications, developing imagination, entertaining, concretizing, providing permanent learning, motivating, and supporting professional development.

Keywords: Online education, digital learning, material design skills, pre-service science teachers, attitude, perception.

INTRODUCTION

Education teaching programs aim at raising individuals who are investigating, questioning, able to apply what they have learned to the problems encountered in daily life, producing effective solutions to problems, and structuring information (Aydoğdu, et al., 2019). Especially today, the teachers are effective in raising these individuals and in the process of behavior change. It is more important to provide these qualifications for the teachers during pre-service undergraduate education rather than they are on the job (Gökbulut, Keserci & Akyüz, 2021). Therefore, pre-service teachers need to provide some skills in terms of their professional development. Thus, pre-service science teachers have the necessary knowledge and competencies related to their fields. In addition, their self-efficacy beliefs towards the teaching profession increase, they develop a positive attitude towards the profession. It helps them gain high-level skills such as creativity skills required by the teaching profession (Bakaç & Özen, 2016). One of the skills that pre-service teachers need to learn is to design materials suitable for the content of the course. Because of this, materials are important in science education to facilitate learning by visualizing concepts, performing them in a meaningful way, and helping the individual learn meaningfully (Gülen & Demirkuş, 2014). It has features such as stimuli in the classroom environment, shortening the time spent in teaching, reinforcing the knowledge, and making the knowledge permanent (Şahin, 2016). The materials may be visually, audibly, and digitally used by the course content. Also, the use of visual and digital materials in the education process is an important element that supports learning, accelerates learning, ensures the permanence of what has been learned, and makes the learning-teaching process more interesting (Duman, 2013). However, materials prepared in a digital environment may be more remarkable than other materials. Moreover, most studies in the literature show that digital learning materials are more effective in attracting and directing attention than non-digital learning materials (Coşkun & Alper, 2019). Digital materials are instructional materials that provide students with the opportunity to learn more than once and learn outside of school at their learning pace. It has also been thought of as a tool for online or offline learning activity through wired or wireless networks (Anttila, et al., 2012; Lin & Chen, 2017). In addition, they are the materials that provide the opportunity to teach by visualizing experimental studies that can cause dangerous results when brought to the classroom environment or when real models are not available (Lee, 2012; Ministry of Education, 2018; Şahin, 2016). While these materials are used during lectures, digital learning environments supported by diagrams help students to construct knowledge (Huang et al., 2012). It is possible to come across many studies in the literature about the materials used in the lessons. In these studies,

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mostly branch teachers and pre-service teachers' perceptions, attitudes, competencies, usage levels, as well as the level of acceptance of technology in education were investigated (Gökbulut, Keserci & Akyüz, 2021; Instefjord & Munthe, 2017; Kabaran, 2020; Koray Gümüsoğlu, Akay, 2017; Mercado & Ibarra, 2019; Soydan, 2018; Şad, Açıkgül & Delican, 2015; Teo, Ursavaş & Bahçekapili, 2012; Yurdakul, 2011; Wang, Ertmer, & Newby, 2004). As a result, it has been determined that the use of materials generally has positive effects on students, as well as teachers and pre-service teachers have positive perceptions and attitudes toward the use of materials. In addition, there are teachers' opinions that digital materials should be used in education. Moreover, pre-service teachers stated that designing material increased their self-efficacy. They saw themselves at a sufficient level, and they were willing to design. In some studies, to be said that pre-service teachers are moderately competent in material design (Gökbulut, Keserci & Akyüz, 2021; Yurdakul, 2011). However, in some studies, it has been stated that they do not have adequate equipment for material design, and they have problems about designs (Brinkerhoff, 2006; Dursun Sarıtepeci, Durak & Seferoğlu, 2016). Therefore, there is a need to train pre-service teachers on digital content creation, Reisoğlu & Çebi, (2020), and material design (Keser & Çetinkaya, 2013). Because it is to increase the need for teachers day by day to improve the digital competencies of the students studying in the Ministry of Education, and it is to use digital technologies effectively in the learning-teaching process (Redecker, 2017). For pre-service teachers to be actively involved in digital societies, they need to be equipped with digital competencies as well as their pedagogical competencies in their professional careers (Instefjord & Munthe, 2017; Soydan, 2018). Because, in terms of both pedagogical and technical, the field of digital teaching is rapidly changing and developing (Cai, Fan & Du, 2017; Lin & Chen, 2017). In addition, it can be said that digitalization is the most in contact with life, and its effects are felt the most (Parlak, 2017).

In other words, the importance of digital competencies of educators comes from the rapid spread of digital learning. This situation increases the importance of digital materials (Gökbulut, Keserci & Akyüz, (2021; Sarıtaş & Barutçu, 2020). Accordingly, there is a need for digital educators who can integrate technology into education in the digital age (Ally, 2019). This situation makes it a necessity for pre-service teachers to have the skills to integrate technology into education (Duncan, 2010; Lin & Chen, 2017; Holzberger, Philipp & Kunter, 2013). Therefore, higher education teacher education programs make it necessary to help pre-service teachers develop their material design skills for digital learning (Becker et al., 2018; Bower, et al., 2013). In addition, there are targets for teachers in the Ministry of Education 2023 education vision. Among these goals, there is the training of teachers who have acquired a culture that using and developing digital content effectively, ensuring this culture is widespread in schools, associating digital materials with printed materials, and ensuring that digital materials are used as main teaching materials (Ministry of Education, 2018). Therefore, it is important to train teachers, because teachers, who have an important role in students' learning, need to be able to use technology effectively and integrate it effectively with teaching activities. In addition, it is considered important in terms of increasing the effectiveness of teaching and raising individuals who can use technology effectively as required by age (Kabaran, 2020). The Instructional Technologies and Material Design (ITMD) course partially provides these competencies to pre-service teachers. In addition, pre-service teachers can design creative materials in groups and individually and improve students' creative thinking skills in this course (Yanpar, 2019).

Considering all these situations, this research aimed to examine the effects of visual and digital materials designed within the scope of Instructional Technologies and Material Design course on the attitudes of pre-service science teachers towards the course and to determine their material design skills and their views on material design. This study aims to find out answers to the following research questions:

1. What is the effect of pre-service science teachers' material designs on their attitudes?
2. What are the views of pre-service science teachers on material design?
3. What is the level of pre-service science teachers' ability to transfer their design skills to their designs?

METHOD

Research Design

In this study, a case study, one of the qualitative research designs, was used as it is the most appropriate approach to determine the effect of cooperative material design applications on pre-service science teachers' attitudes towards the course, material design skills, and opinions of material design. It is stated that case studies are suitable for research in the field of education since educational processes involve multiple situations or variables (Meriam, 2009). A case study is a method in which one or more situations, groups, events, or interconnected systems are studied in detail (Glesne, 2011; McMillan, 2000).

Participants

The participant group of the research consists of 48 third-year pre-service science teachers studying at a state university. The appropriate sampling method was used to include pre-service teachers in the study. This sampling method is an economical sampling method in terms of time, cost, and labor in which the researcher chooses a

situation that is close and easy to access (Büyüköztürk et al., 2015).

Data Collection Tools

Attitude Scale Towards Instructional Technologies and Material Design Course

The Attitude Scale towards Instructional Technologies and Material Design Course used in the research was developed by Çetin, Bahçeci, Kinay, and Şimşek (2013). The first group, in which the construct validity, internal consistency reliability, and item analysis studies of the scale were carried out, consisted of 358 students, the second group in which the concordance validity study was conducted, 79, and the third group, in which the test-retest reliability study was conducted, consisting of 106 students. In the concordance validity studies, the Attitude Scale towards Instructional Technologies developed by Metin, Kaleli Yılmaz, Coşkun, and Birişçi (2012) was used. Explanatory Factor Analysis and Confirmatory Factor Analysis were performed for construct validity studies. The calculated internal consistency Cronbach Alpha reliability coefficient was between .94 for the whole scale and between .78 and .95 for the sub-dimensions of the scale; test-retest reliability was calculated between .90 for the whole scale and between .76 and .88 for the sub-dimensions of the scale. The scale consists of 33 items and the maximum score that can be taken from the scale is 165 and the minimum score is 33. For this study, confirmatory factor analysis was performed in validity studies and it was determined that the goodness of fit indices was within the desired range. The Cronbach Alpha reliability coefficient for this study was calculated as .93. It was calculated as .99 for the usefulness sub-dimension, .95 for the liking sub-dimension, and .97 for the denial sub-dimension of the scale.

Material Design Assessment Rubrics

In the evaluation of material designs, material evaluation rubrics created by considering the existing material evaluation rubrics in the literature were used. When the rubrics were created, they were first presented to the opinion of the science field experts who conducted the material course. As a result of the opinions of two field experts, it was determined that several criteria should be adjusted. The criteria were adjusted as suggested by the experts. The evaluation of 10 materials previously developed using rubrics was carried out by two researchers independently of each other. The correlation between the evaluation results of the two researchers was examined and it was determined that there was a high level of positive correlation. The rubrics consist of 25 items in the form of a quadruple rating. The maximum score that can be obtained is 100 and the minimum score is 25.

Semi-Structured Interview

A semi-structured interview form was used to determine the opinions of pre-service teachers about the material, and digital material design collaboratively. Interview questions were prepared and presented to the opinion of two field experts. In line with expert opinions, it determined that it can use the interview questions as they formed. A pilot study was conducted with two pre-service teachers who had taken the course before. As a result of the analysis of the data obtained from the pilot application, it was determined that the questions were clear, and understandable. The interview form was presented to the pre-service teachers in the online environment and the opinions were taken online again. Before the answers were evaluated, the response time of the pre-service teachers for each question was examined.

Analysis of Data

In the analysis of the data obtained from the attitude scale towards the course, firstly, the normality values were examined. In the analysis of normality values, kurtosis-skewness coefficients, measures of central tendency, and Shapiro-Wilk test results were taken into account. Since the data provided the assumption of parametric tests, dependent groups t-test analysis was used in the analyses. Descriptive statistics (minimum-maximum values, mean, median, and standard deviation) were used in the analysis of data obtained from material design evaluation rubrics. SPSS 22 program was used in the analysis of quantitative data and the significance value was accepted as .05.

Content analysis was used in the analysis of the researcher's notes about the evaluations and the views of the pre-service teachers about the designs. The data were analyzed independently by two researchers. The percentage of agreement between the analyzes of the two researchers was calculated with the Miles Huberman formula. The percentage of agreement for the researcher's notes was 79%, and the percentage of agreement for the opinions of the teacher candidates was calculated as 76%. It can be said that reliability is achieved if the compliance percentages are 70% or more (Miles & Huberman, 1994).

Application

The applications within the scope of the course were completed in eight weeks in the online environment. Pre-service teachers were divided into heterogeneous groups of three, taking into account the variables of attitude towards the course, gender, and academic achievement. An explanation was given about cooperative work, material, and digital material design processes. Material design forms and evaluation criteria were shared with the

teacher candidates. The platform provided by the university where they can carry out their online cooperative work, Zoom, and Google Classroom, information about the applications. During the process, each group made two designs, one material, and one digital material. They came together on their chosen online platform to plan and realize the designs. Researchers were informed about this issue and participation links were shared. Researchers participated in the activities as observers at any time of the study and observed the collaborative working situations of pre-service teachers. The groups gathered and took the records of each meeting they worked on and shared them with the researchers. Groups were required to implement their digital materials but were not required to implement the design for the material (as they did not have the opportunity to come together in a real environment and create the material in three dimensions). Web 2.0 tools such as Canva, Coggle, Edpuzzle, Kahoot, Storyboardthat, Thinglink, Popplet, Scratch were used in the design of digital materials. The groups prepared the design forms for their designs in the desired format and shared them with the researchers the day before the material was presented. Researchers made a preliminary evaluation by examining the form. Each group was given one lesson hour (50 minutes) for the presentation of material designs. Presentation dates were determined by the researchers and if the group made its first presentation in the first week, it was planned to make its second presentation in the last week. During the presentations, the researchers continued their evaluations. Evaluations were carried out independently of each other and rubrics were used. In addition, the researcher notes about the evaluations were taken.

FINDINGS

Table 1 shows the results of the dependent groups' t-test analysis conducted for the first research question in which the effect of cooperative material design application on pre-service teachers' attitudes towards the course.

Table 1: Dependent groups t-test analysis results of pre-service teachers' attitudes towards the course

Sub-dimensions	Measurements	N	X	sd	df	t	p*
Usefulness	Pretest	48	41.27	13.82	47	-18.265	.000
	Posttest	48	69.00	12.35			
Liking	Pretest	48	26.02	7.33	47	-24.674	.000
	Posttest	48	34.29	7.20			
Denial	Pretest	48	20.21	5.53	47	-2.458	.018
	Posttest	48	22.25	5.82			
Total	Pretest	48	87.50	17.12	47	-24.611	.000
	Posttest	48	125.54	16.39			

According to the analysis results given in Table 1, the usefulness ($t(47)=-18.265$; $p<.05$; $\eta^2=.95$), liking ($t(47)=-24.674$; $p<.05$; $\eta^2=.93$) and denial ($t(47)=-2.458$; $p<.05$; $\eta^2=.11$) and general attitudes ($t(47)=-24.611$; $p<.05$; $\eta^2=.93$) was found to be statistically significant in increasing. The calculated eta-square effect sizes are classified as very large effects for the usefulness and liking sub-dimensions and general attitude, while they are classified as medium effects for the denial sub-dimension (Cohen, 1988). According to this, it can be said that the variability observed in the attitudes of the pre-service teachers towards the course is 95% for the usefulness sub-dimension, 93% for the liking sub-dimension, 11% for the denial sub-dimension, and generally 93% due to the collaborative material development practices.

The analysis results of the design scores of the pre-service teachers are given in Table 2.

Table 2: Analysis results of pre-service teachers' design scores

Design Type	Min	Max	Median	X	Sd
Materiel	54.00	90.00	78.50	77.02	10.38
Digital Material	37.00	97.00	73.50	74.50	19.86

As can be seen from the analysis results given in Table 2, it was determined that the minimum design score of the pre-service teachers was 54.00 for material and 37.00 for digital material, and the maximum design score was 90.00 for material and 97.00 for digital material. It can be said that the material ($X=77.02$, $sd=10.38$) and digital material ($X=74.50$, $sd=19.86$) design scores of the teacher candidates are at a good level.

The results of the content analysis of the evaluations of the designs made by the pre-service teachers are given in Table 3.

Table 3: Content analysis results of the evaluations of the designs made by the pre-service teachers

Theme	Code	Material	Digital Material
		f*	f*
Situations That Are Good In Designs	Enjoyable	12	8
	Suitable for subject content	11	6
	More visual	-	6
	Permanent	-	6
	Remarkable	10	3
	Easy to apply	8	5
	Highly educative	4	1
	Original	4	4
	Associated with daily life	4	2
	Truthful	3	1
	Concretizing abstract concepts	-	3
	suitable for student level	2	1
	Competitive	2	
	Intriguing	2	1
	Can be used in different stages	1	-
	Suitable for students of different levels	1	-
	Updatable	1	-
	Emphasis is used correctly	1	1
	Rich in content		3
Total		66	51
Situations That Need Improvement In Designs	Not relevant to the subject	3	4
	Application is not enough	2	4
	Not original	2	-
	Not remarkable	2	-
	Language is not clear	1	-
Total		10	8

*Researchers have expressed more than one opinion.

According to the results of the analysis given in Table 3, it was determined that the materials designed by the pre-service teachers were fun, suitable for the subject content, remarkable, and easy to apply. It was determined that the digital materials designed by the pre-service teachers were fun, suitable for the subject content, visual, permanent, and easy to apply. It has been determined that teacher candidates' designs should be developed in terms of suitability for the subject and inadequacy of implementation.

The analysis results of pre-service teachers' views on designs are given in Table 4.

Table 4: Analysis results of pre-service teachers' views on designs

Theme	Code	f*
Positive Aspects of Design	Instructive	16
	Introduce the different applications	15
	Developing the imagination	14
	Enjoyable	12
	Concretization	11
	Ensuring permanent learning	11
	Motivate	10
	Support professional development	10
	Developing communication skills	9
	Providing active learning	9

	Introduce different materials	8
	Increase self-confidence	6
	Ensuring responsibility	5
	Increase the interest in technology	5
Total		141
Aspects of Designs that Need to be Improved	Difficulty of working online	10
	Connection problems	6
	Lack of theoretical knowledge	5
	More studies	4
	Scarcity of programs	4
	Inability to determine common time	4
	Difficulty using the program	3
	Less lesson time	3
	Problems in group work	3
	Insufficient computer knowledge	2
	Materials are not original	2
	Not feeling enough	1
	Insufficient foreign language knowledge	1
	Inability to generate creative ideas	1
	No need to improve	8
Total		57

* Pre-service teachers expressed more than one opinion.

According to the results of the analysis given in Table 4, pre-service teachers think that the designs have positive aspects such as instructing, offering different applications, developing imagination, entertaining, concretizing, providing permanent learning, motivating, and supporting professional development. It was determined that the prospective teachers thought that the aspects of the designs such as the difficulty of working online, connection problems, and insufficient theoretical knowledge should be improved.

CONCLUSIONS

As a result of the evaluation of pre-service science teachers' material design skills, attitudes, and opinions towards the course, the following has been reached:

The result showed that material design applications by collaboration increase the attitudes of pre-service science teachers such as usefulness and enjoyment. In addition, it has been revealed that the sub-dimensions of usefulness and enjoyment greatly affect their general attitudes. This result is similar to other studies (Bakaç & Özen, 2016; Güneş & İskenderoğlu, 2014; Metin, et al., 2012). However, the denial sub-dimension had a moderate effect, contrary to the studies of Güneş & İskenderoğlu (2014). One of the reasons for the increase in the usefulness and enjoyment sub-dimensions may be that the lesson was pleasurable and enjoyable for the pre-service science teachers and contributed to their professional development. It may be caused by the fact that pre-service teachers were given tasks that they had rarely encountered before, such as designing three-dimensional material and preparing computer-aided presentations. In the study of Bakaç & Özen, (2016), It was shown that the pre-service classroom and social sciences teachers designed more materials by considering the level of student development to concretize to course, compared to the other pre-service teachers studying in other branches, and this situation had a positive effect on their attitudes towards the ITMD course.

Another result is that , the digital material and non-digital material design scores of the pre-service teachers are at a better level. Due to the fact that when the designs of the pre-service teachers were assessed, it was determined that designed the non-digital materials could be fun, remarkable, and easy to apply. In addition, while the designs of the digital materials were fun, visual, permanent, and easy to apply.

This result is similar to the study (Çelik & Aytin, 2014; Demirkan, 2019; Yordming, 2017) in which pre-service teachers expressed their views on what pre-service teachers found useful, remarkable, and interesting digital teaching materials. However, when the designs were examined, it was determined that they needed to improve situations such as the inadequacy of their application to the subject.

As a result of the opinions of the pre-service teachers about the designs they made in the ITMD course, they stated that the designs had positive aspects that were instructive, offering different applications, developing imagination, entertaining, concretizing, providing permanent learning, motivating and supporting professional development.

This result is in line with the views of (Güneş & İskenderoğlu, 2014; Uzunöz, Aktepe & Gündüz, 2017) that the ITMD course contributes positively to the perspectives of pre-service teachers on educational environments. They stated that the considerable contribution of the ITMD course was to provide them with teaching experience and to gain a sense of teaching. At the same time, it showed that pre-service teachers strongly agree that the ITMD course was beneficial, and they enjoyed this course. However, they also stated that there was difficulty in studying online, they had connection problems, got lack theoretical knowledge, and need to improve.

According to the results of the study, different contributions were made to the collaborative designs of pre-service science teachers within the scope of the ITMD course. Most of these contributions are the gains related to cognitive and affective domains. In other words, besides concretizing the concepts, the materials; contributes to learning by having fun, supporting creative thinking, using it in measurement and evaluation, arousing curiosity, improving visual memory, learning by doing, and increasing motivation (Dere, 2019). However, it is thought that it would be beneficial to allocate more time for pre-service teachers to develop their material design skills and to make practical programs in the ITMD course. In this direction, it is recommended that such practices should be continued, since pre-service teachers present and share their designs in ITMD courses in the classroom environment, making a significant contribution to their professional development. In addition, in the ITMD course, individual applications for preparing 2D, 3D, and digital materials can be made and an environment where they can evaluate the teaching materials together with their friends can be provided. In this way, it can be ensured that the knowledge, skills, and attitudes of teacher candidates towards preparing materials can be improved. In addition, necessary support can be provided for pre-service teachers to implement the materials they have made in the internship schools they attend.

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Covid - 19 Educational Technologies in the Pandemic Era

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ABSTRACT

In a globalized world, an advanced point is reached by arguing about the production and consumption of information. Information technologies used in the production of information are also increasingly diversified. Information technologies have a serious role in the formation of today's conditions. The expansion of these technologies helps to improve many jobs, vital changes. In this way, it is seen that many business processes are getting better in speed, time, and even spatial situations.

On the other hand, a new type of corona virus (COVID-19), which originated in Wuhan, Hubei Province, China, has been declared a global epidemic, spreading rapidly all over the world. The pandemic process which began in December 2019 and is still ongoing today has brought with it many disadvantages. As the world grapples with an epidemic of corona virus, the rate of increase in cases in China has come to a standstill and the process of normalization has begun. There is no doubt that information technologies have contributed to this situation. The effects of the outbreak have also profoundly affected educational institutions. In our country, Primary School, Secondary School, Secondary Education and higher education institutions are working on the implementation of distance learning methods.

In addition, educational technology according to the situations that arise during the course of the pandemic; globalizing world, educational policy, educational technology, and the concept of remote education, the importance of educational technology, distance education distance education and emergency, concrete and abstract learning technologies, teachers and educational technology, the situation in the world of educational technology research, distance education, technology, events, relationships, the process of universities in the overall assessment of the pandemic discussion and conclusion with recommendations in higher education, the economic dimension in the context of the evaluations reviewed.

The main goal of the research is to determine what higher education institutions should do by revealing the differences in risk management, the reactions they will give, and methods they will use. It is of great importance, especially in terms of directing the work to be done after the pandemic outbreak.

Keywords: Covid-19 Pandemic, Educational Technologies, Current Trends in Educational Technology, Distance Education, 21st Century Learning Teaching Skills

1. INTRODUCTION

Globalization seriously affects the structure and life of today's society in its positive and negative aspects. Currently, we are witnessing a historical phenomenon that is held together with the British Industrial Revolution in terms of its social, political, geographical and economic effects, described as a process of transition to the new "age of Informatics" or a trans-industrial society.

This phenomenon is more noticeable by the radical change in the technology base on which the business process of the production structure is based. Unorthodox developments in Information Technology have a decisive role in this change. "Globalization" which means that a certain civilization, economic or political norm, value judgment or institutional structure becomes the only model, the only value judgment, structure that is valid in this context, is intertwined with the reformation change process mentioned above. The constant progress of technology has brought people closer, as well as the interaction has been involuntary. Education and training practices also keep up with changes; reorganization is studied by almost all nations.

In education-training, the absolute truths approach is replaced by more sensitive emotion-based approaches. Believing in the necessity of the integrity of nature, societies are asked to acquire an appropriate way of life with nature for all species of living beings. In this context, students should have the ability to participate effectively in "learning", such as producing technology to be involved with technology. Students must be planned, programmed and grow their acquired equipment as a "Citizen of the World".

It is a planned process designed to improve students understanding and use of technologies, their ability to create solutions to possible problems, and their confidence. Technology, as knowledgeable members of people, helps them develop enlightened and resourceful. The definition and application of educational technology varies from country to country. The reason is because of cultural differences. Globalization is expected to bring together the diversity between countries in educational technology at a common point.

What is our country's place in the globalizing world? Turkey which is trying to find a place in the new order is one of the countries that live in the hottest form. Being able to keep up with the age of technology and being among the countries that are competent in renewal is our only strategic method. In this direction, education has an important place, especially unique to providing people with technology literacy competence. Qualified manpower will be able to minimize the problems of economic, political, internal, cultural and technological conflict that globalization will cause, and our country will be able to take advantage of this situation.

1.1. PURPOSE OF RESEARCH

The purpose of this study the use of new technologies are transferred to the field of education and educators, benefit, required to be very well trained to inform you to obtain and maintain the quality of service is very significant for improving the quality of education. The use of modern technology in education is the development of recommendations for students to learn easier and faster, as well as to ensure job satisfaction, eliminating the shortcomings of educators.

1.2. IMPORTANCE

It is related to the advancement of technological developments in educational institutions, the upward movement of changes in the field of education, and the well-known conceptual and practical dimensions of the process of the impact of these technologies on learning. People are often the users of changes that an insufficient number of people or organizations have put forward in the name of theory or practice. How this use became widespread was one of the study topics of the social sciences and theories were developed. It is hoped that this research will contribute to the development of an appropriate model for the possible repercussions of world developments in virtual higher education in the conditions of our country.

1.3. SAMPLING

The universe of research consists of articles on educational technologies published in SSCI journals. First, journals containing articles published by researchers in the field of educational technologies were identified, and articles published in these journals in the last decade were investigated. Magazines, articles while examining lists of educational technology primarily in the field covered by the SSCI are removed, then the name is "in the COVID-19 pandemic, education, educational technologies, learning, teaching, current trends in educational technology, teacher, learner, distance learning, internet, computer, 21st century teaching and learning skills, technology, research contains the word" magazines have been identified. For this reason, 121 journals were identified as part of the research that included studies in the field of educational technologies, and 674 articles published in these journals between 2000-2020 were carefully studied in terms of various variables.

1.4. ANALYSIS OF THE DATA

By analyzing the content within the scope of the study, the data obtained from the examined articles were analyzed using descriptive statistical methods (%). As for the data stored in the created database, percentage ratios of the data are presented to correspond to the answer of each research question.

2. GLOBALIZING WORLD

As a word, the concept of globalization means the siege, winding, integration of the whole. In general, it is defined as the spread of material and spiritual values and the accumulations formed within these values across the world, crossing national borders. The idea of universalization of ideas such as the political system to be adopted, democracy, human rights, religion and secularism, environmental consciousness, common thoughts about the functioning of various markets in countries and the connections of these markets to each other is included in the phenomenon of globalization. The uninhibited development in communication and transport technologies is both the engine and product of globalization. For these reasons, globalization is recognized as the socio-economic and political system of the 21st century. The final act of Uruguay round also brings with it a legal order that guarantees the protection of patents and similar intellectual property rights all over the world (WTO). Moreover, the same promissory note sets out the rules for which areas of economic activity to what extent and under what conditions the state can provide support, and also sets out the sanctions that will be applied at the international level to states that do not comply with these rules (WTO). Information technology, advanced material technologies, biotechnology, which constitute the source of the transformation in production systems and business process, are an indicator of "globalization". The "globalization" process another aspect of geography emitting an entire world

of manufacturing activities the giant transnational or multinational companies, as a world-system is the role played in the settlement of this process. These companies which originated from countries that dominate science and technology are the de facto owners of today's technology-world technology. It is seen that a political process in which the National motif is increasingly gaining strength is intertwined with the process of "globalization". Moreover, nations that see that they cannot maintain their competitive abilities alone are pursuing regional blockades. Regional blockades, in this sense, are the new political- economic-social formulation of the ability to protect national interests. In short, "globalization" on the one hand, and on the other hand, the process of creating a world dominated by inter-bloc competition is witnessed. The European Union (EU), the Association of Southeast Asian Nations, and the North American Free Trade Agreement (NAFTA) are the main blocs. It is clear that the blocks are formed on the axis of countries with the superiority of Science-Technology-Industry, and more often by the coming together of countries with this quality. Countries that are excluded from the bloc are countries that do not have the ability to industry science and technology, and in a world controlled by regionally consolidated power centers, these countries will have almost no right to life. Turkey which has not been able to convert its candidacy status to full membership in the European Union for more than 40 years is one of the countries that have experienced the problem of finding a place in the blocky world.

3. EDUCATION POLICIES

In recent years, when rapidly developing technologies bring societies closer and inter- community interaction is inevitable, the sovereignty of educational systems to the individual is discussed by almost all nations. In teaching, the unconditional truths approach is replaced by more sensitive intuitive approaches. Then, believing in the necessity of natural integrity, people acquire all living species and a way of life compatible with nature. In this context, the difference between learning and teaching is remarkable. In learning, while the student is decisive, the teacher takes this role in teaching. This situation, which should not be considered a detail, requires that the school be transformed into a learning environment, not a teaching environment. In this environment, the concept of "Teacher" is replaced by the concept of "Learning Partner", and student participation becomes important. These new conditions require the learning partner to have an identity that can be effective guidance does not consider the exam as a trump card or threat to the student, and considers it part of the learning process as it allows the economic situation that constantly equips itself with changes. The new millennium will be the stage for the achievements of societies consisting of individuals who can not only avoid responsibility thinking about usefulness, but also feel the beauty of differences, discover themselves, make peace with them, reconcile, productive, solve problems, and feel the universality of aesthetic criteria. Fears are growing that today's technology revolution will lead to widespread unemployment around the world. These fears are especially expressed in Europe, where despite all the measures taken, the number of unemployed cannot be reduced and the proportion of the total population in the 15-64 age group is more than 35% (Employment in Europe 2002). Even in the United States, where the unemployment rate is still half the European average, there are those who suggest that 3 out of 4 jobs will be lost to robots and computers. As a matter of fact, looking at the technology revolutions in the world over the last 200 years, it is seen that every revolution has created a lot of new jobs. It is important that the new technology can train people of the quality they want. This requires very serious teaching and education efforts.

4. CONCEPT OF EDUCATIONAL TECHNOLOGY AND ITS PLACE IN DISTANCE EDUCATION

In education-training, technological tools are used to increase qualifications. It is believed that the use of modern technological tools in education will facilitate learning. Regardless of formal education or non-formal education, at this point, the tools and equipment used cover new technological products. Recently, views such as educational technology and technology in education have become used interchangeably. "Technology in education" usually means the use of technology products in different services in the field of education. This term does not mention a technology specifically for educational science. "Technology in education" means a more content goal in education which includes using technology. Educational technology is a discipline based on regularly designing, implementing, evaluating and developing teaching learning processes together with the necessary road stages in order to achieve the decision making goals that deal with the entire educational program. Recently, increasing technology is gaining a separate place in the European Union. Especially in the last 30 years, the European Union has emerged as a model of technology-centric educational technology. Educational technology, only as the concept of "technology", it is not correct to talk about the use of tools and equipment in the educational system. It is a word that covers training and presentation forms, provided that they are communicated to the group, by organizing them in such a way as to eliminate the diversity of individual culture, talent, intelligence, understanding in those selected as the target audience. Accordingly, the educational technology approach applies in the European Union.

4.1. IMPORTANCE OF EDUCATIONAL TECHNOLOGY

Advances in science and technology also require a number of changes in educational practices. The use of technology in the learning environment is increasing. Educational technology is related to the learning process and helps achieve the goals set. But there is a difference between the concept of educational technology and the concept

of educational technology. “Instructional technology” is a term related to technology that is regulated depending on the fact that “teaching” is a sub-concept of education and takes into account the specific aspects of certain teaching disciplines, for example, “science teaching technology”. “Educational technology” is the related element (manpower, information, methods, techniques, tools, equipment, etc.) in order to systematically analyze problems that include all aspects of the phenomenon of “human learning” and develop solutions to them is a complex process that develops implements and evaluates appropriate designs by running to work. The term “educational technology” emphasizes a discipline related to learning-teaching processes. On the other hand, the term “instructional technology” refers to the effectiveness of guiding learning in the teaching of a subject (Alkan, 1998:16; Yılmaz, 2007:156-158). According to another definition, “Educational Technology predicts the most efficient and effective service of the elements that will create a purposeful and planned teaching” (Doğdu and Arslan, 1993:7). It is an indisputable fact that the use of tools and tools in teaching increases learning. The benefits of using tools during teaching activities can be briefly listed as follows: they provide a multiple learning environment; tools help to achieve permanent learning by increasing the number of senses involved in the learning process (Yalın, 2003:82; Yılmaz, 2007: 156-158). Because according to research, to keep time constant, people remember 10% of what they read, 20% of what they hear, 30% of what they see, 50% of what they see and hear, 70% of what they say, and 90% of what they do and say (Çilenti, 1991:36; Yılmaz, 2007: 156-158). They help students meet their individual needs: Students have different learning needs. For this reason, not all students benefit equally from the same learning and teaching activities. Some of the students can learn by listening to the lesson and discussions, some by seeing, some by reading, and some students can learn when the information is presented with different tools. As the number of tools and accessories used in teaching increases, the probability that each student will have a teaching channel that matches their individual learning needs increases. They attract attention: If the teaching is presented by audiovisual means, it will attract the attention of the students and motivate the student by creating emotional reactions for the student. It is expected that students learning will be more permanent and more effective with a well-organized learning environment and tools. The more sensory organs of an individual are addressed, the better learning is from this point of view, it is necessary to be very careful about describing people as talented or incompetent. Because being successful or unsuccessful for many times occurs not because the main brain model is insufficient, but as a result of whether this person corresponds to other brain models or basic programs that he or she has a relationship with. If mutual communication cannot be achieved, it will also be difficult for what has been learned to be kept in the brain and remembered later.

4.2. EMERGENCY DISTANCE EDUCATION AND DISTANCE EDUCATION

With the covid-19 pandemic, it was observed that the existing educational systems in the world and in Turkey were unprepared to ensure the continuity of education in all circumstances, and that learners were physically separated from their schools, teachers and other learners (Bozkurt ve Sharma, 2020; Bozkurt, 2020:116). In addition, during the crisis (emergency), it was observed that misinformation about distance education spread at the same speed as the virus; decisions taken by creating arguments on these concepts are tried to ensure crisis management. Applications made with false concepts to save the day in the short term will eventually face greater disadvantages in the long term (Coeckelbergh, 2020; Daniel, 2020; Bozkurt, 2020:116). In this context, it is thought that conceptual discussions are important in order to prevent the negative perception of distance education and the negative experiences that students and teachers who experience distance education for the first time will experience. In general, pandemic psychology has three stages: fear, explanation, and action (Strong, 1990; Bozkurt, 2020:116). In this context, urgent distance education practices can be characterized as the stage of action of stakeholders related to education. In light of these considerations, it is important to define applications made during the covid-19 crisis as urgent distance education (Bozkurt and others, 2020; Hodges, Moore, Lockee, Trust & Amp; Bond, 2020; Bozkurt, 2020:116), so as not to turn to the wrong applications through misconceptions (Bates, 2008; Bozkurt, 2019a; Bozkurt and others, 2020; Bozkurt, 2020:116) and not to increase the current negative thoughts about distance education. Distance education applications in Turkey and has established a long history (Bozkurt, 2017; Bozkurt, 2020:116) dates to the period of human history from the perspective of unstructured learning very ancient, although it has a history of about 300 years in the context of structured learning (Bozkurt, 2019b; Bozkurt, 2020:116). In order to better understand and interpret the discussions surrounding the relevant concepts, it is necessary to mention the important differences between the concepts of immediate distance education and distance education. Although these two concepts are similar, they have subtle but important details that separate from each other (Bozkurt & Amp; Sharma, 2020; Bozkurt and others, 2020; Hodges and others, 2020; Huang, Liu, Tlili, Yang & Amp; Wang, 2020; QAA, 2020; Bozkurt, 2020:116). These distinctions Bozkurt et al (2020) described as follows: The first distinction is that immediate distance education is a necessity, but distance education is an option. The second important distinction is that urgent distance education tries to create workarounds for the current need while distance education tries to create ongoing and permanent solutions within the framework of lifelong learning. The third distinction is that while emergency distance education is an effort to keep education afloat with the available opportunities in a time of crisis, distance education is an effort to make education sustainable with planned and systematic activities for a specific purpose, theoretical and practical accumulation specific to the field.

Finally, the concept of distance education the English equivalent of the fourth immediate distinction, “emergency remote education” with the concept of distance education English equivalent of the concept of “distance education” concept. Although the concept of distance is expressed in the same word in Turkish, the concept of “distance” emphasizes physical distance while the concept of “distance” emphasizes physical, interactive and psychological distance. After the pandemic, the new normal, planned educational actions in the context of blended learning (Bonk & Amp; Graham, 2012; Bozkurt 2020:117) applications, as well as HyFlex (flexible hybrid) (Beatty, 2014; Maloney & Amp; Joshua Kim; 2020: Bozkurt 2020:117) an orientation towards the application is expected to be. Although online distance education applications offer solutions such as openness, accessibility, and flexibility in education, the need for self-directed and self-managed skills (Knowles, 1975; Bozkurt, 2020:117) highlights the HyFlex learning model in the context of the new normal learner choosing what content they can access. However, especially self-directed and self-directed learning skills applications that require more supporting learners in practice which caters to adult learners and learners K12-level guidance to provide meaningful learning experiences, it should be noted that it is important for. In addition, it is believed that the flexible roles that new traditional educational institutions will take on and the efforts of learners to access information from different environments will add more value to informal learning processes. One of the best examples of the need for certain skills, such as self-directed and self-directed learning, is described by a 13-year-old eighth grader (Mintz, 2020; Bozkurt, 2020:117). He stated that the current education system was flawed and that he learned better through distance education. He also stated that during distance learning, he had the opportunity to explore his strengths and weaknesses, had more autonomy and control over the learning process, could communicate with other learners using online technologies and be involved in collaborative learning processes. Mintz noted that in addition to these definitions, students who are distracted in the learning process and teachers who cannot fully control these learners can devote more time to their lessons and do not experience a waste of time in the process, and stressed that re-monitoring course records provides great flexibility. One of the events observed during the pandemic is comparisons between distance education and face-to-face training. At this point, when approached from a critical point of view, the success indicators of most universities in the context of Turkey, as well as the quality of education and educational materials, are open to discussion. Therefore, comparing distance education and face-to-face education is an artificial basis for discussion. According to a meta-analysis study by Russel (Bozkurt, 2020:118), there is no difference between educational technologies and distance education with face-to-face training when configured correctly. As explained in the theory of equality in interaction, learner-learner, and learner or teacher-content interaction is one of the types in meaningful learning experiences can take place even at high levels when provided quality educational interaction (Anderson, 2003; Bozkurt, 2020:118). In light of these considerations, improving quality in content and learning processes, strengthening educational interaction and communication can be considered as the largest investment in the future of education in the world and in Turkey. The effect can last a very long time (Azevedo et al.; 2020; Bozkurt, 2020: 118) with this pandemic, the largest social experiment in the history of the world took place naturally with approximately 1.6 billion students (Anderson 2020; Zimmerman, 2020; Bozkurt, 2020:118). Along with this process, it is inevitable that these experiences will be reflected in the general educational paradigm in the long term. Each crisis creates some opportunities in its continuation. In this context, many failures as well as success stories and experiences (Ferdig, Baumgartner, Hartshorne, Kaplan-Rakowski ve Mouza, 2020; Bozkurt, 2020:118) can be turned into an opportunity (Keskin ve Özer Kaya, 2020; Telli ve Altun, 2020; Reimers ve Schleicher, 2020; Bozkurt, 2020:118). However, the pandemic draw lessons from what happened to critically evaluate (Costello, Brown, Donlon and Girmé 2020; Bozkurt 2020:118), and in this context has become essential to develop new policies (Eren, 2020; Bozkurt 2020:118).

4.3. CONCRETE AND ABSTRACT EDUCATIONAL TECHNOLOGIES

One of the most common situations during the Covid-19 pandemic was the introduction of solutions based on online education technologies, especially within the scope of emergency distance education. The perception that technology-oriented solutions will be solutions to problems in education is not a pandemic-specific situation (Mishra, Koehler, & Kereluik, 2009; Rushby, 2013; Teräs, & Curcher, 2020; Weller, 2020). Reactions at the time when the pandemic reached its peak and training was interrupted were often no different, and it was thought that only technology-oriented solutions would eliminate the problems experienced. As mentioned above, unlike emergency distance education, distance education is a set of planned and purposeful practices carried out within the framework of a system approach. Apart from this, educational technologies are not just concrete technologies (for example, computer, smart phones, and learning management systems) also consist of abstract technologies (e.g., educational theories, approaches, strategies) (Bozkurt, 2020). Therefore, one of the points that should be considered in the new normal is the introduction of concrete technology-oriented solutions, as well as abstract technologies that reflect the direct invisible part of educational technologies. Examples of common use of concrete technology include the use of learning management systems, live lesson tools, or the use of environments that can only be accessed by a computer. Although learning management systems are effective in presenting content to the masses (Almaiah, Al-Khasawneh & Althunibat, 2020), they also have a number of limitations in the context of

supporting social learning processes and creating a learning ecology. In this context, the need to design teaching/learning with concepts such as blended learning, flipped learning is important in the context of achieving effective learning outcomes as well as successful and learner satisfaction.

4.4. TEACHER AND EDUCATIONAL TECHNOLOGY

Currently, the speed of development of science and technology has reached an incredible dimension. Science and Technology Society are changing society's expectations, even its culture. Educational institutions and individuals must also keep up with this change. It is essential that teachers are trained very well before the service and use the developing science and technology to maintain this quality within the service. The use of new technologies by transferring them to the field of education is extremely important in terms of improving the quality of education and training. The use of modern technology in education will make it easier for students to learn faster, as well as provide job satisfaction for teachers. Integrating teachers and technology in modern education will help improve the quality of education. Davis (2003) stated that using information and communication technologies in teacher education will help equip society with the human qualities it needs in the information age. Educational technology aims to use advances in science and technology, inventions made in educational activities. As a result, individuals who follow technological innovations and adapt to innovations are brought up. The role of teacher has changed in today's education system. Now, instead of passing information to the student, the teacher is in the position of a guide showing ways to access information. In parallel, the training of teachers has changed (Yılmaz, 2007: 161-162). It is not possible to think about the education system independently of society and social needs. All countries organize school and teaching activities in a style that will respond to changing modern production styles and methods. Rapid changes in the economic, social and technological fields in our age also affect social and educational institutions, and educational systems also feel the need to renew them (Duman, 1991:1; Yılmaz, 2007: 161- 165). No matter how advanced the technology is, the classroom environment cannot be run without a teacher. The important thing is how the teacher will take a position in the face of this rapid development. In the face of developing and changing science and technology, studies show that classroom teachers cannot educate themselves according to these developments and have significant deficiencies in their use of educational technologies (Yılmaz, 2007: 162). The importance of technology education in Turkey is not understood. This education, in most cases today, is viewed with a traditional understanding away from the concept of technology; in the age of technology, a functioning devoid of technology culture continues. One of the main reasons for this is that school administrators and supervisors are unfamiliar with the subject; the second is the lack of education of teachers working in the field. There are two main dimensions of teacher training: quantity and quality. Past examples in Turkey show that practices that emphasize only the size of quantity by ignoring quality are practices that address the problem of teachers in one dimension. These practices create effects that go back rather than improve the quality of education. Thus, while the teacher requirement seems to be met formally, the unqualified workforce entering the system also leads to the product of the education system being unqualified. In this regard, it is necessary to focus on the quality dimension as well as the quantity in meeting the teacher requirements needed in technology education (Uluğ, 2000:8; Yılmaz, 2007: 161-165). Teachers have been the cut who closely follow the changes that are taking place today and have to comply with the change the most. Like other people, teachers have to deal with the effects of both past events and current events in today's global environment. In this environment, teachers' task includes complex elements such as protecting children and young people from the identity of the society in which they live, as well as preparing them for the global world in question. This places new burdens on teachers. Teachers need to improve themselves in order to handle this burden. If we want to create a qualified structure, we have to use qualified material.

5. GENERAL ASSESSMENT OF UNIVERSITIES DURING THE PANDEMIC PROCESS

During the pandemic, the transition of universities to distance education was rapid. 121 out of 189 universities (64%) on 23 March 2020, 41 (21.6%) on 30 March 2020, 25 (13.2%) on 6 April 2020 switched to distance education. In 2019-2020 spring semesters, the number of courses to be opened formally in higher education institutions is 736.341 while with the transition to distance education 663.808 courses are opened and 90.1% of courses are given by distance education. Looking at the application areas of the courses opened, it was found that 91% in Social Sciences, 78% in science, 77% in engineering sciences and 54% in Health Sciences. In the distance education process in higher education institutions, student evaluation methods have also been varied. 66% of the assessments were online exams, 91% were homework, 83% were projects, and 58% were quizzes. Assessment methods given show that more than one assessment method is used in one course (YÖK Assessment Report, 2020).

6. CONTROVERSY AND CONCLUSION

An instructor is the person who will determine the future of a country. All members of the community find shape in their hands, grow and develop about the future of the country. Today's science and technology is rapidly changing. Day by day, the old ones are being renewed and changed. These changes lead people to live more comfortably. Because of that a number of changes have also occurred in the duties of the teacher. It is likely to be

said that the current instructors are seriously inadequate in terms of using educational technology. For this reason, the necessary importance should be given to the educational technologies or material development courses taught in their faculties. The number and time of courses related to the subject should be increased. Their instructors, in particular, should reveal their reasons for not using technological tools and equipment. If there are educators who do not tend to use tools and equipment, a different way should be followed to eliminate this attitude. Instructors should update, deepen their knowledge and skills, follow technological developments closely throughout their professional lives, and, if necessary, provide in-service training for teachers. In this way, they will have knowledge about the use of tools and equipment; as a result, they will be free from prejudices such as “if I use this tool, I will break it” and remove the barrier between students. With a separate emphasis, seminars should be organized to ensure that instructors benefit from educational technology. In this way, the relevant units should be made more effective and the instructors should try to eliminate the missing ones. The standards of educating instructors must be set. The advancement of technology foresees getting rid of the rote program understanding and preparing the utility according to effective learning principles and training instructors in this direction. If the aim of Modern education is to educate people who produce, use and are creative, the understanding of teaching should also have this goal and strive to achieve this goal.

7. SUGGESTIONS

Educational technology centers which are considered to be existing or new can be developed by taking into account the functions determined as a result of this article. Educational technology centers can also be a guide in determining how best to use new technologies in the context of the country's economic situation needs and cultures. It is also very important to enrich the teaching-learning processes in Instructor Training Institutions. By developing strategies and plans, they can perform their functions by ensuring that future educators are prepared to use new tools in their training processes.

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Determination of the Leisure Time Satisfaction Status of Active Athletes Using the Sports Center

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ABSTRACT

The aim of the research is to determine the attitudes of active athletes who are members of sports centres towards leisure time. In this context, the sample of the research consists of the athletes who actively use the sports centres in the TRNC, while the sample consists of 200 athletes, 100 female and 100 male active athletes. As a data collection tool The Leisure Satisfaction Scale (LSS) was used, which was developed by Beard and Ragheb (1980) and validated and reliable in Turkish by Gökçe and Orhan (2011). In the analysis of the data, MANOVA test and Pearson Correlation analysis was applied to determine the relationship between the scales. According to the results of the analysis; it was concluded that the psychological and relaxation scores of the female participants are higher than the scores of the male participants in the gender variable, the sub-dimension scores and the scores of the graduates of the individuals who graduated from university and graduated or continuing their education in the sub-dimension of "Relaxation" are higher in the Educational Status variable, the average scores of the participants who frequently participated in weekly physical activities in all sub-dimensions and the scores of the participants who rarely participated in the activities are higher than the average scores of the participants who frequently participated in the activities and the sub-dimension scores of the individuals who sometimes participated in the weekly Physical Activity Participation Frequency variable. As a result, it was found that leisure satisfaction and participants differ according to various demographic characteristics.

Keywords: Leisure Time Satisfaction, Recreation, Leisure Time, Athlete, Sports

INTRODUCTION

It is known that people's leisure time is gradually increasing thanks to the facilities provided by the developments in the field of modern technology (Roberts, 2018). In leisure time, which is associated with fun, enjoyable and rewarding experiences that take people away from their routine lives and offer the opportunity to get rid of the tensions of daily life for a while (Iglesias & Bello, 2019), individuals can escape from the boring aspects of life and create opportunities for their personal development (Mattingly & Bianchi, 2003). According to Maslow's Theory of Needs, it is predicted that when people's physiological needs are met, they will seek higher satisfaction and self-actualization (Kuo, 2013), therefore, the need for leisure time will result in people's participation in certain activities and resulting in satisfaction or dissatisfaction. Demir and Demir (2014) stated that this situation causes the concept of leisure time satisfaction to emerge. Although the goals of participation in leisure time activities of people are different from each other, they all have a common purpose. People participate in leisure time activities to get pleasure and to get satisfaction as a result of the pleasure they receive (Çelik, 2011). Leisure satisfaction, which means the degree of pleasure or satisfaction that individuals derive from their leisure experiences, generally results from the satisfaction of individuals' emotions, conscious and unconscious desires (Lee & Fang, 2013).

Leisure activities are generally related to positive health or well-being situations that arise directly or indirectly as a result of the activities individuals participate in (Yamashita et al., 2018). In recent years, people's participation in leisure and physical activities has increased; while increasing their aerobic capacity and self-esteem, it helps to reduce their tendency to obesity and disease or premature death (Rojek, 2005). In their research on the benefits of leisure time, Driver and Brown examined the motivations, expectations and past experiences of individuals for recreational activities and included the outputs obtained as a result of activity participation (Brown, 2016). It is known that individuals' health perceptions differ as a result of participation in leisure time activities, and individuals generally participate in leisure activities in order to prevent a bad situation in terms of their health, to improve their health status and to realize their psychological experiences.

On the other hand, when Gürbüz and Henderson (2013) examined the studies on leisure time in developed countries such as America, Canada and England, they stated that scientists mostly focused on issues such as motivation, obstacles and attitudes. From this point of view, the aim of this research, which is thought to make important contributions to the leisure literature, is to determine the relationship between the leisure time attitudes, leisure satisfaction levels and perceived health outcomes of individuals who are members of health and wellness centres.

Leisure time activities are generally defined as activities such as exercise and socialization that individuals participate in their free time (Pressman et al., 2009; Paggi et al., 2016). According to another definition, leisure activities are defined as activities that individuals engage in to achieve pleasure and well-being, independent of work or daily life activities (Verghese et al., 2006). Today, although people seem to use their leisure time in similar ways (Roberts, 2011), cultural differences, individual perceptions and preferences and perceived barriers may arise (Gürbüz & Henderson, 2014). From this point of view, Demirel and Harmandar (2009) stated that although individuals' participation in leisure time activities has positive benefits, people do not participate in these activities for different reasons or cannot participate due to various obstacles. The concept of leisure time barriers was first discussed by Crawford and Godbey and the factors hindering leisure time participation; classified into three groups as individual, interpersonal and structural (Sarol, 2017). On the other hand, Hsieh (2009) defines leisure benefits as subjective perceptions of individuals participating in various activities in their free time in order to improve their personal conditions and meet their individual demands.

Leisure time satisfaction was first discussed by Beard and Ragheb to determine individuals' leisure satisfaction levels. Leisure satisfaction is a type of satisfaction that includes life satisfaction and social satisfaction (Yerlisu Lapa, 2013). The concept of leisure satisfaction is expressed as the positive perceptions or feelings that emerge as a result of the leisure activities that individuals prefer to participate in (Beard & Ragheb, 1980; Doğan et al., 2019). They stated that leisure time satisfaction is a complex human need that is met by producing and consuming individual enjoyable experiences (Amestoy et al., 2008). Chick et al. (2016), on the other hand, stated that leisure satisfaction can be seen as a function of the difference between the situations that individuals think they deserve, expect or desire and what they actually experience. Comprehensive leisure satisfaction are activities that consists of activities in which individuals participate actively or passively voluntarily, without any external pressure, to have feelings of health, social, cultural, entertainment, renewal and happiness, to gain new skills, to meet the expectations of individuals, and in these activities, earning is only satisfaction without any financial gain (Yerlisu Lapa et al., 2012).

Purpose of the Research

The aim of the research is to determine the attitudes of active athletes who are members of sports centres towards leisure time.

Sub-Problems of the Research

1. Is there a difference between the LSS scores of the individuals participating in the research according to the gender variable?
2. Is there a difference between the LSS scores of the individuals participating in the research according to the variable of educational status?
3. Is there a difference between the LSS scores of the individuals participating in the research according to the frequency of participation in weekly physical activities variable?

Research Method

Model of the Research

Quantitative data collection techniques were used in the study to determine the attitudes of active athletes who are members of sports centres towards leisure time. It is aimed to reveal the existing situation. This study is descriptive and cross-sectional as it reveals an existing situation. This model aims to explain the person, situation or object in the research as it exists in the conditions it is in. In addition, it is an inferential research model as it is investigated whether there is a relationship between personal information and the questionnaire (Karasar, 2019).

Universe and Sample

The universe of the research consists of the athletes who actively use the sports centres in the TRNC, while the sample consists of 200 athletes, 100 female and 100 male active athletes.

Data Collection Tools

The Leisure Satisfaction Scale (LSS), which was developed by Beard and Ragheb (1980) and validated and reliable in Turkish by Gökçe and Orhan (2011), was used as a data collection tool in the study. The sub-dimensions of the scale, which consists of 24 items and 6 sub-dimensions, are respectively; (1) Psychological, (2) Educational, (3)

Social, (4) Physiological, (5) Relaxation, and (6) Aesthetic. As a result of the study conducted by Gökçe and Orhan (2011), the total internal consistency coefficient of the scale was found to be .90. The internal consistency coefficients of the sub-dimensions were respectively calculated as Psychological sub-dimension (.77), Educational sub-dimension (.77), Social sub-dimension (.76), Physiological sub-dimension (.79), Relaxation sub-dimension (.80) and Aesthetic sub-dimension (.79). In our study, the internal consistency coefficients of the sub-dimensions are calculated as Psychological sub-dimension (.88), Educational sub-dimension (.85), Social sub-dimension (.84), Physical sub-dimension (.82), Relaxation sub-dimension (.86) and Aesthetics sub-dimension (.86). Items on the scale calculated on a 5-point Likert type; 1 “Almost Never True”, 5 “Almost Always True” (Gökçe & Orhan, 2011). The items related to the sub-dimensions of the scale are Psychological sub-dimension (1-4 items), Educational sub-dimension (5-8 items), Social sub-dimension (9-12 items), Physiological sub-dimension (13-16 items), Relaxation sub-dimension (17 -20 items), and Aesthetics sub-dimension (21-24 items).

Analysis of Data

SPSS 25 package program was used in the statistical analysis of the study. After the socio-demographic descriptive statistics of the data were made, it was checked whether the survey results obtained from the individuals were normally distributed. Tukey test and Manova analysis tests were used since the assumption of normal distribution was provided.

FINDINGS

Table 1. Distribution of Participants by Demographic Characteristics

	Variables	f	%
Gender	Female	100	50
	Male	100	50
Education Status	Primary	21	11,4
	High School	78	41,1
	University	97	43,1
	Postgraduate	4	4,4
Marital Status	Married	102	51,0
	Single	98	49,0
Frequency of Participation in Physical Activities	Very Rare	48	17,6
	Sometimes	94	52,3
	Frequently	58	30,1

Table 1 shows the distribution of individuals participating in the research by gender. According to the results of the analysis, 50% of the individuals participating in the research are "Women", while 50% are "Men". The distribution of the individuals participating in the research according to their educational status is included. According to the results of the analysis, 11.4% of the individuals participating in the research were graduated from "Primary Education", 41.1% from "High School", 43.1% from "University", while 4.4% of them still studying or graduated their "Postgraduate" education. The distribution of individuals according to their marital status is included. According to the results of the analysis, 51.0% of the individuals participating in the research are "Married", while 49.0% are "Single". The distribution of the participants according to the frequency of their participation in weekly physical activities is included. According to the results of the analysis, 17.6% of the individuals participating in the research participate in weekly physical activities "Very Rarely", 52.3% "Sometimes", and 30.1% "Frequently".

Distribution of Scale Scores

Table 2. Distribution of Scale Scores

	Scale Sub-Dimensions	n	Lowest	Highest	Av.	Ss.
LSS	Psychological	200	1.00	5.00	3.56	0.99
	Educational	200	1.00	5.00	3.71	0.90
	Social	200	1.00	5.00	3.65	0.88
	Relaxation	200	1.00	5.00	3.78	0.90
	Physically	200	1.00	5.00	3.64	0.88
	Aesthetic	200	1.00	5.00	3.71	0.90

Table 2 shows the distribution of scale scores. When the sub-dimension scores of the scale were examined, it was determined that the highest average was found in the "Relaxation" (3.78) sub-dimension, and the lowest average was in the "Psychological" (3.56) sub-dimension in the LSS sub-dimension. The lowest score obtained by the participants from the LSS was 1.00, while the highest score was 5.00.

Analysis Results Regarding the Leisure Time Satisfaction Scale

Table 3. MANOVA Results of Participants' LSS Scores by Gender

Dependent							
Variable	Gender	n	Av.	Ss	Sd	F	p
Psychological	Male	100	3.47	1.00			
	Female	100	3.63	0.97	1-1916	12.052	.001**
Educational	Male	100	3.68	0.90			
	Female	100	3.74	0.91	1-1916	2.220	.136
Social	Male	100	3.63	0.88			
	Female	100	3.67	0.89	1-1916	.757	.384
Relaxation	Male	100	3.69	0.90			
	Female	100	3.85	0.90	1-1916	15.126	.000**
Physically	Male	100	3.62	0.87			
	Female	100	3.66	0.89	1-1916	.798	.372
Aesthetic	Male	100	3.68	0.91			
	Female	100	3.73	0.89	1-1916	1.424	.233

* $p < 0.05$

Table 3 shows the results of the MANOVA test regarding the scores of the participants in the sub-dimensions of the Leisure Satisfaction Scale (LSS) according to the gender variable. The results of MANOVA analysis showed that the main effect of the gender variable on the sub-dimensions of "LSS" is significant ($p < 0.05$). However, in terms of the main effect of the gender variable, it is determined that there is a significant difference in the "Psychological" sub-dimension ($p < 0.05$) and "Relaxation" sub-dimensions of the participants' SBRS ($p < 0.05$). It is determined that the psychological and relaxation scores of the female participants are higher than the scores of the male participants.

Table 4. MANOVA Results of Participants' LSS Scores by Educational Status

Dependent	Education							
Variable	Status	n	Av.	Ss	Sd	F	p	Dif.
Psychological	Primary School	21	3.58	0.87				
	High School	78	3.56	0.97				
	University	97	3.53	1.03	3-1914	.886	.448	
	Postgraduate	4	3.71	1.08				
Educational	Primary School	21	3.76	0.81				
	High School	78	3.69	0.90				
	University	97	3.72	0.91	3-1914	.455	.714	
	Postgraduate	4	3.76	1.05				
Social	Primary School	21	3.68	0.84				
	High School	78	3.63	0.89				
	University	97	3.65	0.88	3-1914	.508	.676	
	Postgraduate	4	3.74	0.94				
Relaxation	Primary School	21	3.73	0.92				
	High School	78	3.71	0.94				2-3
	University	97	3.84	0.86	3-1914	5.217	.001*	2-4
	Postgraduate	4	4.03	0.88				
Physically	Primary School	21	3.64	0.89				
	High School	78	3.60	0.89				
	University	97	3.67	0.86	3-1914	2.108	.097	
	Postgraduate	4	3.82	0.85				
Aesthetic	Primary School	21	3.73	0.87				
	High School	78	3.70	0.90				
	University	97	3.70	0.91	3-1914	.782	.504	

Postgraduate 4 3.85 0.94

* $p < 0.05$

Table 4 shows the results of the MANOVA test for the sub-dimension scores of the Leisure Satisfaction Scale (LSS) according to the educational status of the participants. The results of the MANOVA analysis revealed that the main effect of the participants on the sub-dimension scores of LSS according to their educational status is significant ($p < 0.05$). In terms of the main effect of educational status, it is concluded that only the "Relaxation" sub-dimension scores of the participants' "LSS" differs statistically significantly ($p < 0.05$). According to the results of the Tukey test, which was carried out to determine which group the differentiation is in, it is determined that the sub-dimension scores of the individuals who graduated from university or continue their education in the "Relaxation" sub-dimension are higher than the scores of the individuals who graduated from high school.

Table 5. MANOVA Results of Participants' LSS Scores by Frequency of Participating in Weekly Physical Activities

Dependent Variable	Frequency of Participation in PA	n	Av.	Ss	Sd	F	p	Dif.
Psychological	Very Rarely	48	3.48	0.99				
	Sometimes	94	3.46	0.96	2-1915	17.618	.000*	1-3
	Frequently	58	3.76	1.00				2-3
Educational	Very Rarely	48	3.69	0.94				
	Sometimes	94	3.62	0.85	2-1915	16.588	.000*	1-3
	Frequently	58	3.89	0.94				2-3
Social	Very Rarely	48	3.60	0.96				
	Sometimes	94	3.58	0.82	2-1915	12.245	.000*	1-3
	Frequently	58	3.80	0.93				2-3
Relaxation	Very Rarely	48	3.76	0.94				
	Sometimes	94	3.66	0.89	2-1915	26.410	.000*	1-3
	Frequently	58	4.00	0.86				2-3
	Very Rarely	48	3.57	0.92				1-3

Physically	Sometimes	94	3.53	0.86	2-1915	32.635	.000*	2-3
	Frequently	58	3.88	0.84				
	Very Rarely	48	3.68	0.95				
Aesthetic	Sometimes	94	3.61	0.89	2-1915	17.334	.000*	1-3
	Frequently	58	3.89	0.86				
	Very Rarely	48	3.68	0.95				

** $p < 0.00$, * $p < 0.05$

Table 5 shows the MANOVA test results regarding the scores obtained by the participants in the sub-dimensions of the Leisure Time Satisfaction Scale (LSS) according to the frequency of their participation in weekly physical activities. Results of MANOVA analysis revealed a statistically significant difference in the main effect of "LSS" on sub-dimension scores according to the frequency of participation in weekly physical activities ($p < 0.05$). It is concluded that the results of the analysis showed statistically significant differences in all sub-dimensions of the "LSS" of the participants. According to the results of the Tukey test, which was conducted to determine which group the differentiation is in, it is concluded that the average scores of the participants who frequently participated in weekly physical activities in all sub-dimensions and the scores of the participants who rarely participated in the activities were higher than the average scores of the participants who frequently participated in the activities and the sub-dimension scores of the individuals who sometimes participated.

DISCUSSION AND CONCLUSION

The aim of the research is to reveal the attitudes of active athletes who are members of sports centres towards leisure time. When the demographic characteristics of the individuals participating in the research are examined, 50% of the individuals are female, 50% are male, and when their educational status is examined, 11.4% are primary school graduates, 41.1% are high school graduates, and 43.1% are university graduates, 4.4% of them are continuing their postgraduate education or graduated and considering the marital status, 51% of the individuals are married while 49% are single. When the frequency of participation in weekly physical activities of the participants is examined, it is determined that 17.6% of them participated in weekly physical activities very rarely, 52.3% sometimes participated in them, while 30.1% often participated in them. In the sub-dimension scores of the scale, it is determined that the highest average is found in the "Relaxation" (3.78) sub-dimension, and the lowest average is in the "Psychological" (3.56) sub-dimension at the LSS sub-dimension. The first sub-problem of the study, "Is there a difference between the participants' LSS scores according to the gender variable?" in terms of the main effect of the gender variable on the question, it is determined that there was a significant difference in the "Psychological" sub-dimension and the "Relaxation" sub-dimensions of the participants' LSS scale. It is determined that the psychological and relaxation scores of the female participants are higher than the scores of the male participants. While the results of this study show parallelism with the results of the study conducted by Serdar and Ay (2016), Vong Tze (2005), Kabanoff (1982) and Ngai (2005), the results of this study do not coincide with the results of the study conducted by Ardahan and Yerlisu Lapa (2010), Çelik (2011), Ayyıldız (2015). When Kalfa (2017) compared leisure satisfaction levels according to gender in his study, "psychological" and "physiological" sub-dimension scores differed statistically significantly according to gender; concluded that male participants has higher satisfaction levels in psychological and physiological sub-dimensions. In the study of Güngörmüş et al. (2018), the "psychological", "educational" and "social" sub-dimension scores of individuals differed statistically significantly according to their gender; on the other hand, Gökçe (2008) examined leisure satisfaction levels according to gender in his study; while a significant difference was found in the "relaxation" and "physiological" satisfaction sub-dimensions, it was concluded that there was no significant difference in other sub-dimensions according to gender. In the study conducted by Küçük Kılıç et al. (2016), it was concluded that female participants had higher leisure time satisfaction in the "psychological", "educational", "social" and "relaxation" sub-dimensions

of the research group. We find similar findings in the literature. Although there are similarities; it can be said that the reason for the differences is the date of the study, sample groups and socio-demographic variables.

According to the second sub-problem of the research, "Is there a difference between the participants' LSS scores according to the Educational Status variable?" it is determined that the main effect of the question on the sub-dimension scores of "LSS" according to their educational status is significant. In terms of the main effect of the education status, it is concluded that only the "Relaxation" sub-dimension scores of the participants' LSS differed statistically significantly. On the other hand, it is determined that the sub-dimension scores and the scores of high school graduates were higher in the sub-dimension of "Relaxation" of the individuals who graduated from university or postgraduate or continue their education. In his master's thesis study, Öztaş (2018) concluded that the "educational status" and "vocational years of work" variables of the participants did not differ significantly in the sub-dimension level of the Leisure Satisfaction Scale.

In the third sub-problem of the research, "Is there a difference between the participants' LSS scores according to the Variable of Frequency of Participation in Weekly Physical Activities?" according to the frequency of participation in weekly physical activities to the question, a statistically significant difference is found in the main effect of the "LSS" on the sub-dimension scores. It is concluded that the results of the analysis showed statistically significant differences in all sub-dimensions of the "LSS" of the participants. According to the results of the Tukey test, which was conducted to determine which group the differentiation is in, it is concluded that the average scores of the participants who frequently participated in weekly physical activities in all sub-dimensions and the scores of the participants who rarely participated in the activities were higher than the average scores of the participants who frequently participated in the activities and the sub-dimension scores of the individuals who sometimes participated.

As a result, as the leisure time of the participants increases; it can be interpreted that the number of activities participated in increases and the level of satisfaction will be higher than other groups.

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Evaluation of the Electronic Applications Used in the Turkish Education System in the Context of School Administration

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Abstract

Technology increases its impact in every aspect of life. Because technology is a multidimensional concept, it can be defined in different ways. Şimşek & Akın (2013) define the concept as the whole of the techniques that people use in their interaction with their environment. Technology has an impact on education as in other fields. Filho, Manolas & Pace (2008) state that the use of technology in education is necessary for sustainable development. For the desired development in education, school administrators, who are responsible for managing the school, are expected to benefit from technology while performing their duties. School administrators can benefit from technology for various purposes. Among these purposes, administration works, education and training, that is, student-centered works, making plans and programs (Makewa, Meremo, Role & Role, 2013; Page-Jones, 2008; Xiong & Lim, 2015); providing opportunities for teachers to benefit from technological applications (Kızıltepe-Ayhan, 2017); development and evaluation, support, encouragement, planning and supervision, ethics and safety issues (Baykara, 2018; Gökoğlu, 2014).

When the literature on the subject is scanned, it is seen that technology is predominantly evaluated in the context of leadership and student success (Aktaş, 2018; Baykara, 2018; Engür, 2014; Gökoğlu, 2014; Gürkan, 2017; Güven, 2015; Kızıltepe-Ayhan, 2017; Scale, 2014; Prokopiadou, 2011; Ulukaya, 2018; Weng, Tang, 2014; Yılmaz, 2018). It is thought that the current research will contribute to the field by examining the technology-school management relationship in terms of various electronic applications. The aim of this research is to understand the effect of electronic applications on school management and administrators.

The research was conducted in the qualitative research method and case study pattern. 15 school administrators participated in the research. Data were collected through interviews.

In the research, it is seen that electronic applications, which have been used in the Turkish Education System especially after 2007, have contributed a lot to school administrators. Among these, it can be stated that it contributes to the faster and more comfortable work, saves time and documents, facilitates accessing and archiving information, and speeds up communication. It is understood that infrastructure such as the internet, computers, and the ability of managers to use technology are sufficient to achieve the specified benefits. Although electronic applications are used, it is understood that there are situations where previous applications should be used, albeit limited. However, there are also shortcomings of the applications such as not updating the trainings over time and having factors that reduce motivation.

The interaction of electronic applications with the education system makes itself felt both formally and informally. It is understood that it has transformed the bureaucratic structure, which is identified with paperwork, workload and work intensity, in a way that will please the employees. In addition, it is among the positive reflections that it contributes to organizational memory by providing easy access to the desired information at all times. The provision of all these benefits is not only possible with electronic applications determined by the senior management. In addition, school administrators benefit from the applications they use in their daily lives while performing their duties. In this way, time and communication-based gains can be achieved.

Based on the data, the following can be recommended for practitioners: Electronic applications can be updated. Based on the update, periodic trainings can be given to increase the ability of school administrators to use these applications and to increase their knowledge on how to use the system.

For researchers, the following can be suggested: More comprehensive research can be conducted based on new applications that may arise due to the increasingly intense use of electronic applications. Research can be done to include teachers.

Keywords: Turkish Education System, School Management

INTRODUCTION

Technology increases its effect in all areas of life. Technology can be defined in different ways as it is a multidimensional concept. Şimşek & Akın (2013) defines this concept as the whole of the techniques people use in their interaction with their environment. Appelbaum (1997) argues that technological applications should include various social aspects. These are the impact of technological procedures and supporting systems on the organization and people, whether technological changes cause social resistance, the interaction of technological changes with the current structure, the state of readiness for technological changes, and finally the level of strengths and weaknesses of technological changes. It would be more appropriate for the organization to integrate technological (electronical) applications, taking into account both technical and social contributions together (Mariani, 2019). Technology is also considered as one of the five components that make up the structure of the organization (Figure 1).

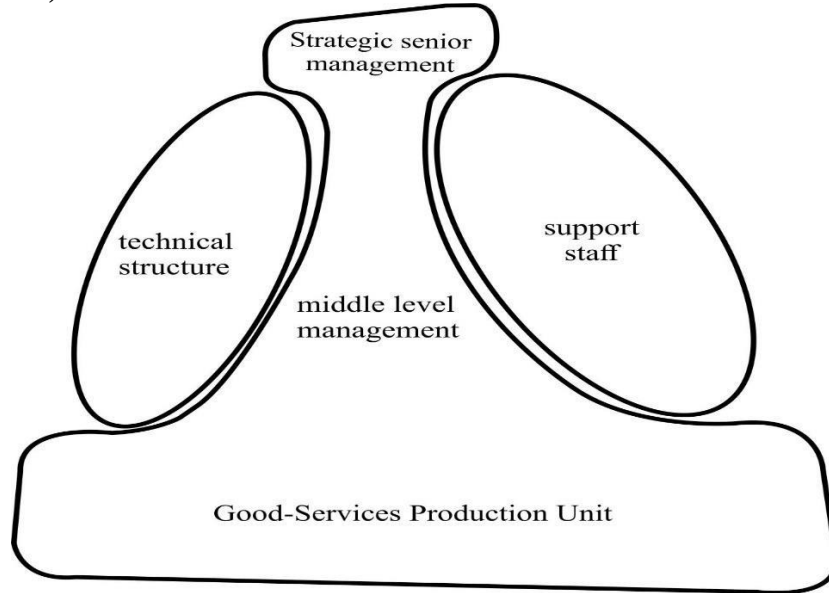


Figure 1: Five components of an organization (Mintzberg, 2014, p. 20)

As is seen in Figure 1, technology has an integral and valued component that forms the organization and contributes to the development of the organization. It contributes to the administration in fulfilling the function of the organization.

As in other fields, technology affects education. Filho, Manolas & Pace (2008) state that the use of technology in education is necessary for sustainable development. To achieve the desired improvement in education, school administrators who are responsible for administrating the school are expected to benefit from technology while performing their duties. School administrators can benefit from technology for various purposes. Some of these purposes are carrying out administrative tasks, education and training works, student-centered works, and preparing plans and programs (Makewa, Meremo, Role & Role, 2013; Page-Jones, 2008; Xiong & Lim, 2015); providing opportunities for teachers to benefit from technological electronic applications (Kızıltepe-Ayhan, 2017), and paying attention to development and evaluation, support, encouragement, planning and supervision, ethics and safety issues (Baykara, 2018; Gökoğlu, 2014). However, the attitudes of school administrators and their attitudes towards teachers are determinative in bringing the technology to the school environment, using it effectively, and making it

a part of life (Aktaş, 2016; Ölçek, 2014). These issues indicate that the use of electronic applications in education will continue to increase (Berry & Marx, 2010; Gürkan, 2017).

School administrators mostly benefit from the use of technology. Some of the advantages are being better perceived and accepted by teachers (Yılmaz, 2018); increasing the speed of works, and having an effect on carrying out the works in line with their purposes (Engür, 2014; Güven, 2015; Ulukaya, 2015), and affecting student success (Morrow, 2010). Factors such as age, type of school, place of residence, and time spent with computers (Çevik & Baloğlu, 2007), and skills and knowledge regarding the electronic applications that may be beneficial to students (Bakioğlu & Şentuna, 2001) can be effective in school administrators' use of technology at the desired level. The findings are indicating that school administrators are sufficient in terms of the specified factors and technological infrastructure in schools and that they can use technology effectively (Eren & Kurt, 2011; Fraillon, Ailley, Schulz, Friedman & Gebhardt, 2013; Görgülü, Küçükali & Ada, 2013).

Using technology at school positively influence the school climate (Baş, 2012); provide teamwork and a learning organizational environment (Banoğlu, Vanderlinde & Çetin, 2016); ensure the development of positive attitudes towards technology (Prokopiadou, 2011); increase the influence of the school administrators in the school (Weng & Tang, 2014); establish a digital archive and contribute to the development of teachers and administrators technologically (Akgün, 2019); provide information administration, communication, problem-solving, and sharing (Fraillon, Ailley, Schulz, Friedman & Gebhardt, 2013); increase the level of communication with the environment (Esposito, 2013); make it easier for the administrators to administrate the school (Puckett, 2014), increase teachers' skills, sense of responsibility, and motivation to use electronic applications (Bulden, Hurt & Richardson, 2017; Kuo, 2015). To realize the mentioned advantages, it is necessary to ensure collaboration in the school and to benefit from experts who will bring out the potential (Bouchard & Stegemoller, 2019).

School administrators can benefit from tools and applications such as E-school, MoNEIS (Ministry of National Education Information System), mobile phones, and social media to use technology beneficially for themselves and the school (Abrego & Jauregui, 2019; Akin, 2016; Garcia; Gökalp, 2018; İbil, 2012). However, such applications also affect the existing structure (bureaucratic structure) in the school. The researcher believes that electronic applications have different reflections on bureaucracy. Electronic applications reduce the effect of bureaucratic practices in the organization and cause change. Electronic applications and bureaucracy can also be determinant in terms of whether the organization has an effective structure or not. At that point, bureaucracy has a negative effect on the change of organizational structure and the effect of technological applications (Kim, Paik & Lee, 2014). Also, electronic applications contribute to the reflection of the bureaucracy's features such as hierarchy, standard business procedure creation and filing, to maintain order in the organization (Dormann, Hinz & Witmann, 2019).

The Turkish education system reflects the effects of electronic applications. Electronic (technological) applications have been used in the Turkish education system especially since 2007 (Table 1).

Table 1: Electronic applications used in the Turkish education system

The Electronic Application Used	Year of Commencement	The Purpose of the Use
e- school	2007	To be able to follow the students' work and transactions related to the school
e- parent	2007	Parents' access to school information related to the student
KBS (Public Expenditure and Accounting Information System)	2009	Easier processing and archiving of personnel salary transactions in digital environment
MEBBİS (Ministry of National Education Information Systems)	2007	Personnel monitoring their own information and easily accessing the institution's information about the personnel.
TEFBİS (Information Administration System of Education Financing and Education Expenses in Turkey)	2010	Monitoring the income and expenses of the institution.

e-informal education	2010	Monitoring the vocational, sports and exercise activities carried out through public education centers.
School Milk	2012	Encouraging healthy nutrition by providing students with the habit of drinking milk daily.
EBA	2014	Providing distance education opportunities for students to continue their educational activities.
e-course	2016	Supporting students for their lessons.
DYS (Document Management System)	2017	Ensuring that correspondence between institutions is done in digital environment.

(Table was created by benefiting from www.meb.gov.tr)

As is seen in Table 1, school administrators have used electronic applications increasingly and intensely for various purposes in the Turkish education system since 2007. Applications include both educational and administrative affairs.

Research gap and research questions

While searching this issue in the literature, the following points draw the researcher's attention. First, the researcher has noticed that technology is intensely discussed in the context of leadership and student success (Aktaş, 2018; Baykara, 2018; Engür, 2014; Gökoğlu, 2014; Gürkan, 2017; Güven, 2015; Kızıltepe-Ayhan, 2017; Ölçek, 2014; Prokopiadou, 2011; Ulukaya, 2018; Weng & Tang, 2014; Yılmaz, 2018). Second, the researcher has come across studies that include different findings on the reflection of technology on the current school administration structure (Kim, Paik & Lee, 2014; Dormann, Hinz & Witmann, 2019). Third, as the mentioned in Table 1, the researcher hasn't found enough research on the reflection of the applications used in the Turkish Education System on the school administration. Current researches include a few of the 10 applications stated in Table 1 (Akin, 2016; Gökalp, 2018; İbil, 2012). Finally, technology has a social dimension (Appelbaum, 1997; Mariani, 2019). Therefore, based on the above-mentioned points, the researcher could not access up-to-date, comprehensive and sufficient research on the interaction between school administration and technology. The present study is significant as it examined the relationship between technology and school administration in terms of various electronic applications, taking into account the comprehensive and current situation, revealing the interaction with the existing structure, and displaying the effect of technology in school administration. The researcher believes it can be useful in terms of providing practical data to the field as well as to the policy makers in education. This is because the electronic applications specified in Table 1 are increasingly used by school administrators. This situation shows that electronic applications have serious effects on school administration. In this study, the researcher aimed to reveal the reflections of electronic applications used in the Turkish education system on school administration because electronic applications increasingly have reflections on school administration from different aspects and also there is not enough research on this issue. Thus, the researcher looked for answers to the following questions:

1. According to school administrators, what are the reflections of the electronic applications used in the Turkish education system on the school administration?
2. According to school administrators, how does the electronic applications used in the Turkish education system interact with the current structure?

METHOD

The electronic applications used by school administrators in their daily lives and the opinions of the two academics researching the field provided the opinion that the qualitative research method was suitable for this specific study. Qualitative research aims at revealing how people make sense of their lives through their experiences (Creswell, 2016, p. 44). Electronic applications that have been used in the Ministry of National Education since 2007 were considered. Therefore, a case study design was preferred. A case study is a design aiming to reveal the experiences in real environments in a deep and meaningful way (Yin, 2014, p. 16).

PARTICIPANTS

The study group consisted of fifteen school principals and assistant school principals working in public schools in Istanbul province, Turkey, in the 2019-2020 academic year. The data regarding the participants are shown in Table 2.

Table 2: Participant information

Branch							
Class	Religious Culture and Moral Knowledge	Science and Technology	Mathematics	Information Technology	Turkish	Social Sciences	
5	3	2	1	1	2	1	
Role							
School Principal	Assistant School Principal						
10	5						
Professional Seniority							
0-5 years	6-11 years		12-17 years		18-23 years		24 years and over
1	5		5		3		1
Administration Seniority							
0-5 years	6-11 years		12-17 years				
8	6		1				

According to Table 2, school administrators with different qualifications in terms of branch, role, and seniority participated in this study. The diversity of the participants is important in terms of including different perspectives and experiences in the study. Thus, the emergence of a one-sided mindset can be prevented by addressing the issue only from the perspective of the school administrators or assistant principals. This situation may also contribute to the reliability-validity of the research. It was determined that school principals participated more. In this study, an easily accessible situation sampling method was used as the school administrators who were observed in various environments and with whom the research subject was shared. In addition to this, the criterion sampling method was used as the opinions and suggestions of the participants were taken into account. Miles & Huberman (2015, p. 28) state that easily accessible sampling is preferred for time, financial reasons, and flexibility while Yıldırım & Şimşek (2011, p. 112) state that criterion sampling is preferred as it is based on the pre-established criteria.

Data collection and analysis process

The data were collected through semi-structured interviews and documents. The interview form was prepared by considering the literature and taking the opinions of two school administrators expected to participate in the study, two academicians working in this field, and language experts. The pilot application of the prepared interview form was applied to two participants and the results were evaluated with the above-mentioned experts. Other interviews (thirteen interviews) were conducted as the questions in the interview form were considered to be suitable for this study. The same approach was followed for the interview data and research report. The data related to the subject were reflected in the research report. The interview form included questions about the electronic applications used by school administrators, their effect on the school administration, and the comparison of before and after the applications. The interview form consisted of two parts. The first part asked for participants' demographic information (Table 2). In the second part, 13 questions were asked to the participants. Two questions were related to the method (the relevance of questions to the subject) and ethics (the use of research permission and data). The contents of the remaining 11 questions were as follows: The thoughts on electronic applications, the effect and reflection of these applications on school administration (in terms of time administration, bureaucracy, archive, infrastructure), comparison of pre and post electronic applications in terms of school administration, evaluation of electronic applications in terms of their use, comparison of electronic applications in terms of formal and informal aspects, and finally, taking the thoughts to be added about the subject. The secondary data source of this study were documents. Eight documents regulating the official acts of school administrators - one Presidential Decree, one regulation and circular, and five directives - were analyzed. According to the literature, official documents can be used in document analysis (Patton, 2014, p. 4). When analyzing the data, the descriptive analysis technique was used as it was aimed to reflect the opinions of the participants to the research. The descriptive analysis technique is important in terms of revealing the opinions of the participants in the research in a meaningful way (Yıldırım &

Şimşek, 2011, p.224). In this study, the content analysis technique was also used to reach new meanings from the data in terms of school administration (Table 3). The purpose of content analysis is to reach new meanings by making systematic inferences from the data (Krippendorff, 2004, p.18). Special attention was paid to obtain individual and institutional permissions. For quotation, the real names of the participants were not used. Another reason for gathering sufficient data during the research process is thought to be the sincere behaviors of the participants. This is due to the voluntary participation of the participants in the study. Finally, it can be stated that the research process was completed smoothly as planned by the researcher.

Validity and reliability

Five of the strategies recommended by Christensen, Johnson & Turner (2015, p. 405) were used to ensure the validity-reliability of this study. These are i) Data diversification: Interviews (15 interviews) and documents (8 official documents) were used in this study. ii) External auditing: The whole process was evaluated by two researchers, one school administrator, and language-expression expert. iii) Quoting: Some of the opinions that could contribute were also included. iv) Peer evaluation: The opinions of two other researchers and one school administrator about this study were obtained. v) Reflective thinking: It is considered that the fact that the researcher worked as a school administrator in the past and used electronic applications would contribute to a better reflection of the situations desired to be explained through the data.

FINDINGS

In this study, the findings were obtained from the interviews and documents.

Findings obtained through the interviews

2 categories, 8 subcategories, and 27 codes emerged in this study (Table 3).

Table 3: Categories, sub-categories and codes emerged in the research

	Categories	Categories
Categories	Evaluation of Electronic Applications Used in the Turkish Education System since 2007	Interaction of Electronic Applications Used in the Turkish Education System with the Current Structure since 2007
Sub-categories	Evaluation in terms of use	Interaction in terms of bureaucracy
	Speeding up the works	Workload
	Unity in electronic applications	Waste of time
	Providing flexibility	Paper works
	Making archive works easier	
	Reducing workload	
Codes	Making works easier	
	Ease of control	
	Requiring various arrangements and updates	
	Reducing motivation	
	Affecting health	
Sub-categories	Evaluation in terms of school administrators	Interaction in terms of organizational memory
Codes	Using technology	Providing convenience in accessing and storing information
	The adequacy of the training provided	Saving time and space
	Learning style	
	Obtaining opinions	
Sub-categories	Evaluation in terms of time administration	Interaction in terms of unofficial electronic applications
Codes	Saving time	Speeding up the communication
	Increasing workload	Making works easier
Sub-categories	Evaluation in terms of infrastructure	
Codes	The technical infrastructure of the school	
	The adequacy of the user infrastructure	
Sub-categories	Evaluation for comparing the applications with the previous ones	
Codes	Improved	
	Maintaining the previous one as it is	

According to Table 3, the emerging categories, sub-categories and codes were the evaluation of electronic applications used in the Turkish education system and their interaction with the existing structure. According to the relevant table, electronic applications had intense and different effects on the education system.

Category 1: Evaluation of electronic applications used in the Turkish education system

Five sub-categories and twenty codes emerged in this category.

Evaluation in terms of use

The participants addressed electronic applications from two perspectives. These perspectives suggested that the applications were useful and some aspects needed to be improved. The participants attached importance to the electronic applications as a solution to the reduction of bureaucracy-based workload, which they considered as a problem the most. In this regard, Hüsametdin stated that *“it reduces the use of documents”* while Muhammet stated that *“there were systems that relieved the school administrators very much in terms of following up the completed works, and reducing the bureaucracy and paperwork”*. The participants also emphasized that one of the advantages was speeding up the works and, thus, making works easier. Hüsametdin clarified his opinions as follows: *“Official electronic applications have functional aspects such as facilitating, accelerating, providing unity in implementation, and providing data for central planning”*. Another advantage of these applications was their contribution to the archive services. Participants considered that an application in which they could use the information they needed later was useful. Ramazan’s opinions were as follows: *“...the positive aspect of these applications is that they are ideal in terms of storing information and accessing ready information...”*. The participants also emphasized that this allowed the applications to be used at the desired time (flexibility) by avoiding confusion through unity in electronic applications and provided ease of control. Some of the opinions of the participants were as follows: Salih: *“...Mistakes are determined instantly. They can be monitored continuously. As there is no time and place limitation, we can do these procedures when we are not at school”*. Rüştü: *“...As it is gathered under a single-center, it can be used wherever you go in Turkey”*.

The participants expressed that the technological applications were not only beneficial but also they had negative aspects that needed to be improved. Betül clarified supporting the existing electronic applications with various applications as follows: *“It would be appropriate to apply 3 types of more simple and useful (primary, elementary, and high school) fixed themes and provide the opportunity to add information more easily”*. Rüştü provided his opinions on the inclusion of situations that may negatively affect their motivation from time to time as follows: *“I support the use of BİMER (Prime Ministry Communication Center) and ALO 147, but we administrators suffer a lot as these channels are misused sometimes. These situations do not comfort us, but stress us out”*. Tarık expressed administrators’ becoming dependent on the computers as follows: *“It requires a person to always depend on a computer”*.

Evaluation in terms of the effect on school administrators

According to the participants, electronic applications showed an effect in two perspectives. First of them was the effect in terms of the knowledge and skill of the school administrators in using technology. The reasons like the school administrators’ ability to use the technology individually, their interest in technology and their ability to keep up with the time can be the basis for the infrastructural skills of the school administrators in technology. Moreover, school administrators followed technological applications closely and they used these applications when performing their duties. Abdullah: *“We can follow the digital application through mobile phones from wherever we are. We don’t even have to be at the school”*. Muhammet: *“These applications make everything easy for the school administrators who are already good at using technology”*. Ramazan: *“We use it effectively...”* Second, the participants noted that although school administrators receive training for these applications, it becomes inadequate in time because there are no updates for the training. The participants stated that the training is useful, and it needs to continue. Serdar: *“However, this training is inadequate”*. Abdullah: *“This training is insufficient”*. As expressed by the participants, Abdullah and Serdar learned these applications by themselves or asking the others, as Salih and Emin noted too. Salih: *“After the system started to be implemented, we could learn the mistakes or what we didn’t understand from the instructors or the other users over time”*. Emin: *“We got training for 2 days for the last DMS, but it is not possible to learn it only with the training, it has to be acquired by practicing.”* Moreover, the researcher considered that the applications should be updated according to the users’ comments and some precautions should be taken for the unwanted situations. Rüştü: *“Provided that the positive and negative aspects of the applications are compensated by the superior authorities, we can always update the system”*. Abdullah: *“We come across various difficulties or good aspects when applying these systems. Our friends can discover the innovations and they inform us about the deficiencies”*.

Evaluation in terms of time administration

The participants agreed that electronic applications were time-saving. These applications can be quite useful in making time for different works simultaneously. Mustafa: *"We can make more time for school"*. Hasan: *"These applications save time for us. We use the time more productively thanks to these applications"*. However, the participants also expressed that there were negative aspects of the applications along with the positive ones. The researcher saw that these applications brought about new workloads, and this would compromise their advantages although they make it easier to perform the works. Ahmet: *"Although it saves time for us, we cannot use its advantages as the workload increases over time."*

Evaluation in terms of the infrastructure

The participants evaluated the infrastructure in two perspectives: The technical infrastructure of the school and the infrastructure of the users. The participants, except for three (Emine, Rüstü, Zeynep), expressed that schools have adequate infrastructure to be able to use the applications despite the deficiencies. This situation indicates that there have been improvements in schools in terms of infrastructure over time. Hüsamettin: *"The infrastructure at schools is good in general but the systems have to be improved for busy periods"*. Abdullah: *"We experience some slowdown in the network compared to past but it is fine in general"*. The participants agreed on the fact that the users didn't have any difficulties in keeping up with the infrastructure and that they could use the applications smoothly. However, opinions were reflecting that some school administrators experienced difficulties using these applications. Tarık: *"The school administrators adapted to the system, too. Those who didn't adapt themselves got retired and took themselves out of the case"*. Hasan: *"Our friends, who had been school administrators for a long time, stayed inactive because they were not willing to learn this kind of application. On the contrary, others, who had been administrators for 5-10 years, were very eager and successful in this regard"*.

Evaluation of the applications for comparing with the past

The participants compared the situation before and after they used electronic applications when expressing their opinions. The participants stated that they experienced positive aspects after they started to use these electronic applications. These positive aspects were the acceleration of the processes by finishing the work easily, using the time productively and efficiently, and easy access to information. Some of the opinions were as follows: Tarık: *"The current situation is more comfortable and practical. Any information is there for the taking: there is no need to look for information about the students or staff from the archive"*. Ramazan: *"Let me give an example: Our school is old and our graduate students demand their diplomas. In past, we had to search for their documents year by year and rewrite them on the computer. Finally, we were getting the hard-copy and signing it. But now we just need their ID number to find the needed information immediately. Later, we just get it printed and sign it to deliver"*. However, it may be necessary to use the previous methods by necessity even if electronic applications are preferred more. Previous methods are still useful when there are some problems with the network or computer infrastructure (especially for the procedures before 2007). Emine: *"I use it in case there is a problem with the computer"*. Muhammet: *"For example, we go downstairs for the diploma records of our students graduated before 2007. We look at the promotion records in the archive"*.

In this category, the researcher determined that the participants were pleased with the electronic applications as they contributed to the work by making it fast, easy, effective, and productive. Electronic applications had negative aspects and they needed to be improved along with their advantages. Although electronic applications were generally used in the system, previous applications were also used from time to time to perform the work.

Category 2: The interaction of the digital applications in the Turkish education system with the current structure

In this category, there were three sub-categories and seven codes.

Interaction in terms of bureaucracy

The participants considered that digital applications brought along the characteristic alterations and improvements within the current structure. The participants also considered that bureaucracy was drastically reduced with the help of digital applications, which they especially identified with the workload, waste of time, and paperwork. The participants were satisfied with this alteration. The researcher understood from the opinions that electronic applications led to transformation and advancement in the current structure. Some of the opinions were as follows: Salih: *"Actually, all applications reduce our workload because they provide us with the chance to work independently of setting, warn us immediately about the mistakes, and delivering the information instantly to the other side without wasting time"*. Serdar: *"These applications have countless positive aspects. They speed up the bureaucracy..."* However, some opinions reflected that different kinds of work emerged and the workload increased because of the ease and speed of communication. Abdullah: *"Of course, the applications make things easier but sometimes they make it harder, too"*. Zeynep: *"It's like bureaucracy is increasing with the ease of work"*.

Interaction in terms of organizational memory

The participants attached importance to the archive studies which can be seen as the most significant element of the organizational memory at the school. School administrators expressed that electronic applications contributed positively to archive studies, too. Along with bringing up a novel approach to archive studies, its positive contributions were as follows: Preventing information loss, facilitating the access to information, saving from time and space. Some of the opinions in this regard were as follows: Hüsamettin: *"I think that it affects the organizational memory positively without doubt as it records the activities."* Rüştü: *"It reduced the archive studies. Now it comes from the DMS and we put it into the folder after adding the appendix. We don't print it if it has nothing to do with us. We don't file them anymore. Moreover, the document record book is no longer used either. The incoming or outgoing document record book is not used anymore, too".*

Interaction in terms of informal applications

The participants didn't only use formal applications with a perspective to running the work faster and easier but they also used informal applications when handling the formal works. According to the participants, these applications contributed to the work being done relevantly as much as the formal ones. Therefore, these applications help the work to progress faster and provide both formal and informal communication between employees. In short, this aspect of electronic applications can be useful both individually and organizationally. Some of the opinions were as follows: Tarık: *"We use them. Our school has a WhatsApp group, a Twitter account, a Facebook profile, a Gmail account, and an SMS group. We use them all"*. Muhammet: *"We don't only use the formal systems. Why? Because they are faster in terms of communication. For example, we use WhatsApp the most"*. Emin: *"We also use informal applications such as WhatsApp, mail, Twitter, Facebook. We use these informal applications especially to share the activities and communicate quickly."*

In this category, the participants stated that electronic applications had interaction with the current structure in both formal and informal ways. The participants especially emphasized its contribution in terms of performing the works faster and easier, easy access to information, and archiving the available information. The researcher made an inference that the most important contribution of the electronic applications to school administration was that they enabled the bureaucratic structure to be managed in a better, faster and flexible way.

The findings obtained through the documents

The following points attracted attention in eight documents (one Presidential Decree, one apiece regulation and circular letter and five directives) included in this study:

1. Being included in the 10th chapter of the Presidential Decree and being one of the articles regulating the Ministry of National Education, Article 322, Directorate for Information Technologies is the unit managing and leading the electronic applications within the scope of Turkish Education System.
2. The applications that should be used most by the school administrators were E-School (Electronic School), MoNEIS (Ministry of National Education Information Systems), EIN (Education and Information Network), IMSFEEET (Information Management System of Financing of Education and Education Expenses in Turkey), PEAI (Public Expenditures and Accounting Informatics), and DMS (Document Management System).
3. There were items regulating the infrastructure for giving and receiving education, network connection, and Internet usage.
4. It was requested to include the electronic applications in the plans to be applied in schools.
5. It was requested that the internal and external stakeholders of the school benefit from these electronic applications.
6. It was aimed to get the desired efficiency from applications through terms like education media and e-content. The data obtained through the opinions and documents showed that school administrators used electronic applications increasingly day by day. This was because that these applications were accessible and practical, they have the alternatives (formal and informal applications), they enable access and preservation of information, the infrastructure was improved day by day, and bureaucracy was implemented more flexibly at school as a natural result of these. In this regard, it can be concluded that the information obtained through the interviews and the documents were in parallel with each other.

RESULTS AND DISCUSSION

In this study, which was conducted with the qualitative research method, it was seen that electronic applications started to be used in the Turkish Education System especially after 2007 had many contributions to the school administrators. Some of these were contributing to making works faster and more comfortable, saving time and documents, facilitating the process of accessing and archiving information, and speeding up the communication. It was understood that infrastructure such as the internet, computer and the ability of administrators to use technology was sufficient to achieve the above-mentioned advantages. Although electronic applications were used, it was understood that there were cases where previous applications should be used, even if they were limited.

However, these electronic applications also had deficiencies such as not updating the training over time and having factors that reduce motivation. In the literature, it was expressed that technology-based electronic applications facilitate access to data, unity in electronic applications, and access to information (Gökalp, 2018), increase communication, collaboration, and, therefore, performance (Stephenson, 2007), provide practicality and suitable opportunities for the works, facilitate access to the resources, and allow easy and flexible work (Unger & Tracey, 2013). It is seen that it is important to follow and pioneer innovations to benefit from the technology-based electronic applications as desired (Huber & Hiltman, 2010), providing the tools to be used and providing the appropriate environment (Gürfidan & Koç, 2016; Sugar & Holloman, 2009), provide resources, increase motivation, and consider subordinates' opinions in administration (Armağan, Öz & Sever, 2020). On the other hand, in related studies, the school administrators stated that they were sufficient for these infrastructure services expected from them. In addition to this, they also expressed that they used applications such as e-school and MoNE DPS, but sometimes it was necessary to benefit from the previous applications (Akdemir, 2015; Baycan, 2018; Yörük, 2017). It is considered that the above-mentioned studies support the current study; however there is not enough data for electronic applications. The reason for this is considered to be because electronic applications were started to be used in the Turkish education system since 2007 and the studies generally focused on technology-leadership and technology-student success.

The interaction of electronic applications with the education system is felt formally and informally. It is understood that it transforms the bureaucratic structure, which is generally identified with especially paperwork, workload, and work intensity, in a way that satisfies the employees. In addition to this, one of the positive reflections was that it contributed to the organizational memory by providing easy access to the desired information. Achieving all these advantages is not only through electronic applications determined by senior administration. The school administrators also benefit from some applications they use in their daily lives when performing their duties. In this way, they can achieve gains in terms of time and communication. In literature, Şeker & Şeker (2009) define bureaucracy as reducing the workload and making things easier -changing the bureaucratic structure- while Balıkcı & Aypay (2018) define it as a combination of workload, paperwork, and time-consuming work. Yıldırım, Yılmaz & Balıkcı (2018) emphasize that Document Administration System (DMS), one of the systems used in the Turkish education system, is beneficial in terms of speeding up the work by recording and storing information and documents, but it needs to be updated and developed over time, and Chen (2013), Claudet (2002), Rikkerink, Verbeeten, Simons & Ritzen (2016) emphasize that making innovations will lead to new opportunities and developments for both professional and personal development of school administrators and teachers. It is seen that the school administrators use applications such as social media, e-portfolio, e-textbook by not only using computers, official applications, but also mobile phones, tablets, etc. (Bayram, 2017; Berry & Marx, 2010; Duran & Bayar, 2020; Mashaqbeh & Shurman, 2015) and, therefore, the use of technology provides benefits for teachers and students in terms of educational activities and the general works are sustained more effectively and efficiently (İra, Çolak & Geçer, 2019). It is seen that the results of the above-mentioned studies are generally in parallel with this study. However, it is considered that unofficial electronic applications are not partially in parallel with the results of this study due to insufficient reflection in the literature. This is because electronic applications have both social and technical contributions to the organization (Appelbaum, 1997; Mariani, 2019). For example, social media can make it easier for administrators to get enough information and access new information (Cao, Ali, Pitafi, Khan & Wagas, 2020). Also, it enables sustainable and quality administration programs to be organized. Therefore, it can pave the way for administrators to perform more effectively (Chaudhuria & Jayaram, 2019; Tofur, 2017). The aforementioned studies emphasize that the social dimension of technology should be considered with informal applications. However, the present study found that research did not focus on the social dimension (motivation, health, communication, etc.) of school administrators' interest in technology sufficiently. This shows that the current research confirms the relevant literature in terms of technology use such as speed, convenience, and decreasing workload. However, the findings of the current research did not coincide with the social dimension. The current research is considered to contribute to the literature in terms of emphasizing the social dimension of technology.

LIMITATIONS AND IMPLICATIONS FOR RESEARCH AND PRACTICE

The present study has two limitations. First, inferences were made by taking into account the opinions of 15 school administrators. Second, electronic applications that were put into practice between 2007 and 2017 were considered.

Based on the data, the following recommendations can be made for the practitioners: Although the advantages of electronic applications are generally listed, some unwanted aspects (the presence of applications that can reduce motivation, adverse effects on the health, the need to update applications) are also encountered. The applications can be updated based on the opinions of the school administrators. Based on these updates, periodic training can be provided to increase the skills of school administrators for using these applications and increasing their knowledge on how to use the system. Based on some electronic applications, applications that increase and occupy school administrators' workload and reduce motivation can be reviewed and improved. The use of these

applications can be monitored to include more frequently used and concrete data. Irregularities that may occur can be prevented by introducing regulations for unofficial but frequently used electronic applications by school administrators. The following recommendations can be made for the researchers: Studies can be conducted based on new applications that may emerge due to the increasing use of electronic applications. Teachers can be included in such studies. Different methods can be used when conducting these studies. New theories can be put forward in the field of school administration by comparing the existing study results with the results of the studies conducted with different methods. It can be ensured that both theorists and practitioners are aware of the results by presenting the research results on different platforms. Thus, new research fields can be created for the theorists and a starting point can be established in the arrangements to be made for the practitioners.

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Generic Competences at University. An Innovative Curricular Subject Proposal for their Development

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ABSTRACT

This study suggests a curricular subject on personal competences valid for any university study plan. Its objective is to develop the most demanded generic or transversal competences both in the personal-social and academic-professional spheres. In this sense, it can be said that this subject contributes to respond to the mission of the university and the European Higher Education Area, since the development of transversal competences favors the integral formation of the university student. Training that puts students at the center and makes them protagonist of their own learning. The aim of this study is to demonstrate how students who take this subject make more progress in the development of generic competences than students who do not take it. To this end, this research works with a total sample of 610 undergraduate students, of whom those who take the subject form the experimental group and those who do not take it form the control group. All the students answered, at the beginning and end of the course, the same questionnaire about generic competences, which was sufficiently valid and reliable. The contrast of hypotheses confirms that those students who have taken the course improve significantly more in the development of generic competences than those who have not taken the course. In this sense, it confirms the validity of this type of subject as suitable for the development of transversal competences; competences that are in great demand both in higher education and in the business world. For this reason, universities should think about incorporating this type of subjects in their curricula.

Keywords: competence, generic competences, subject, questionnaire, higher education.

INTRODUCTION

Universidad Francisco de Vitoria (UFV), through the subject: Personal Competences (PC), develops personal competences, especially those of a transversal nature. This subject tries to give an answer to the demand of the business world and higher education, as indicated by the European Higher Education Area (EHEA).

In the labor field, competences emerged in the 1970s with the contributions of David McClelland (1973), who warned of a serious problem regarding the predictive capacity of aptitude and intelligence tests with respect to excellent performance. McClelland (1973) observes that behaviors hold the key to being able to predict excellent performance (and not intelligence as previously thought). In this sense, McClelland (1973) seems to refer to competences as those characteristics and behaviors or ways of doing things of those who present, in a given position or activity, an excellent performance.

Since then, relevant authors on competences in the workplace, such as Boyatzis (1982), Spencer and Spencer (1993), Bunk (1994), Mertens (1996), Levy-Leboyer (1997), Le Boterf (1998), Miranda (2005), Cardona and García-Lombardía (2007), Gutiérrez Tobar (2010) and González Ariza (2017), have observed how competences have been gradually introduced in business management, to such an extent, that nowadays not only talk about competency-based training, but also about competency-based selection and assessment; for both job-specific competences, known as hard skills, and generic competencies, common to different jobs, known as soft skills.

In the field of higher education, it is noted that since 1956 several predecessor theories of competencies have emerged, such as Bloom's taxonomy (1956), Goldstein's social skills (1980), Gardner's multiple intelligences (1983), the emotional intelligence studied by Salovey and Mayer (1990) and disseminated by Goleman (1995, 2018) and the Delors Report (1996); until 2000 when the Tuning project includes the need to train in competencies at university, both: specific (those that are specific to each area or degree) and generic (those that are common to different subjects or degrees) (González and Wagenaar, 2006).

Therefore, it seems that training in personal competencies, especially those of a transversal nature, is a relevant issue for the university educational community since its reason for being is to be able to respond to this social, educational and labor need. In addition, this proposal is innovative; since it is proposed a specific subject to develop and train especially these competences. A compulsory subject for all first year university students, regardless of

the degree or qualification.

Thus, this research has two objectives: 1) to make a formal proposal of a subject for the development of generic competencies, and 2) to demonstrate how this type of course is valid for the development of these competencies.

THE STUDY

Research question and design

This research aims to answer the question: are there significant differences in the degree of development of generic competences between first-year university students who take the PC subject and those who do not?

The type of research is quasi-experimental, with a non-equivalent control group. The main independent variable of this study refers to taking or not taking the PC course. The secondary independent and control variables are age, sex and faculty. The dependent variable refers to the degree of development of generic competences.

Population and Sample

The population is made up of all first-year university students of Madrid. The sample is made up of first-year university students taking PC (students of the Universidad Francisco de Vitoria: UFV) and first-year university students not taking PC (students of the Universidad Complutense de Madrid: UCM). The former will be referred to as the Experimental Group (EG) and the latter as the Control Group (CG).

The Ene.3.0 statistical program was used to calculate the sample size; and as can be seen in the following table, in general terms, the sample was larger than that indicated by the Ene 3.0 program; with a total of 166 more subjects (Table 1).

Table 1. Ideal vs. actual sample

Total ideal sample (Ene 3.0)		Total final sample	
UFV Students	227	UFV Students	387
UCM Students	217	UCM Students	223
Total sample	444	Total sample	610

HCP subject design (educational intervention)

PC is a subject specifically designed for the development of personal competences, especially of a generic nature, for all first-year students, regardless of the degree. The ultimate goal of this course is to accompany students on their path to maturity, excellence and fulfillment, through the development of personal competences, especially the transversal ones (Crespí & García-Ramos, 2021).

We understand personal competences as “the dynamic set of knowledge (knowing), skills or abilities (knowing how to do), attitudes, values and universal principles (knowing how to be) that, internalized and embodied in our acts, behaviors or ways of doing, put us on the path of our own maturity, excellence and fullness” (Crespí, 2019, p.98).

PC mainly develops transversal competences; that is, those that allow us to perform excellently in any situation or area of life, whether personal, social, academic or professional; generic competencies for higher education and soft skills for the company.

The course, focusing mainly on the development of generic, intrapersonal and interpersonal competencies, is developed in two main areas:

1. Mentoring: individual development space for the student, in which he/she is accompanied by a mentor for six meetings of one hour each.
2. The classroom: a space for community development for all students, in which they are accompanied by their teacher and the rest of their classmates.

The CP teaching guide includes the description, the general and specific objectives, the syllabus, the competencies to be developed, the learning outcomes, the methodology, the distribution of work time, the activities to be carried out, the evaluation system and the bibliography.

Measuring instrument

To measure the dependent variables (generic competences), defined in different dimensions and subdimensions, a questionnaire on generic competences was designed with a Likert-type scale (1-6), which was first validated by a panel of 18 experts.

Subsequently, the usual validation analyses were carried out: reliability, validity, homogeneity and item validity analyses and, finally, exploratory factor analyses. Thus, it was possible to conclude that the questionnaire is highly reliable (with a satisfactory assessment of all dimensions and subdimensions, as well as of all items with respect to their intra- and interpersonal dimensions), acceptably valid and whose factor analyses show an evident relationship between its theoretical and empirical structure (Table 2).

Table 2. Reliability and validity of the instrument

Dependent variables (competences)		Intra-personal Dimension	Deep look Sub-dimension	Excellence pursuit Sub-dimension	Inter-personal Dimension	Teamwork Sub-dimension	Communication Sub-dimension
Reliability (rxx)		0,90	0,83	0,83	0,90	0,83	0,86
Validity (rxy)		0,64	0,60	0,59	0,65	0,54	0,63

FINDINGS

The results of the main hypotheses of the research are presented below.

First hypothesis

The first hypothesis states that there are significant differences in the degree of development of generic competences among university students who have taken the PC subject (UFV students) compared to those who have not taken it (UCM students). This hypothesis involves 7 implicit assumptions; the results are presented below (Table 3).

Table 3. First fundamental hypothesis

H.1. There are significant differences in favor of the students who followed the PC course (UFV>UCM):	Averages differences UFV-UCM	T Student	Sig. (bilateral)	E.S. partial eta squared	Significant differences
Total Score. UFV superior	20,81	13,64	0,00	0,25	Yes
Intrapersonal Dimension. UFV superior	12,73	15,78	0,00	0,31	Yes
Deep look Subdimension. UFV superior	5,92	13,18	0,00	0,24	Yes
Excellence pursuit Subdimension. UFV superior	6,81	15,13	0,00	0,30	Yes
Interpersonal Dimension. UFV superior	8,08	9,56	0,00	0,14	Yes
Teamwork Subdimension. UFV superior	2,85	5,97	0,00	0,07	Yes
Communication Subdimension. UFV superior	5,22	10,56	0,00	0,17	Yes

As can be seen, there are statistically significant differences in all cases in favor of the students who attended the training program (PC subject) in all dimensions and subdimensions of the generic competencies measured. Furthermore, the effect size (E.S) is large in all cases, except in the subdimension of teamwork, where the effect size (0.07) is medium or moderate.

Second hypothesis

The second hypothesis states that there are significant differences in the degree of development of transversal personal competences between the Education students of the UFV (who took PC subject) and the Education students of the of the UCM (who did not). This hypothesis involves 7 implicit assumptions; the results are presented below (Table 4).

Table 4. Second fundamental hypothesis

H.2. There are significant differences in the faculty of education in favor of the students who followed the PC course (UFV>UCM):	Averages differences UFV-UCM	T Student	Sig. (bilateral)	E.S. partial eta squared	Significant differences
Total Score. UFV superior	27,65	11,19	0,00	0,33	Yes
Intrapersonal Dimension. UFV superior	16,24	12,67	0,00	0,39	Yes
Deep look Subdimension. UFV superior	7,83	10,37	0,00	0,30	Yes
Excellence pursuit Subdimension. UFV superior	8,41	11,58	0,00	0,35	Yes
Interpersonal Dimension. UFV superior	11,40	9,08	0,00	0,20	Yes
Teamwork Subdimension. UFV superior	5,05	7,74	0,00	0,14	Yes
Communication Subdimension. UFV superior	6,36	8,52	0,00	0,18	Yes

As can be seen, again there are statistically significant differences in all cases in favor of those who took the training program (PC subject). Furthermore, it can be added that the effect size is very relevant in all cases. Therefore, it can be affirmed that:

The final development of transversal competences in students who took the subject is significantly higher than that achieved by students who did not take the course in all cases.

The final development of the transversal competences in the students of the Faculty of Education of the UFV (who took the course) is also significantly higher than that achieved by the students of the Faculty of Education of the UCM (who did not take the course) in all cases.

CONCLUSIONS

As mentioned above, both business and higher education allude to the need for training in this type of generic competences (also known as soft skills or transversal competencies).

This study presents results that demonstrate the effectiveness of training in personal competences, especially transversal competences, at university. And this is done through the teaching of a subject aimed at their training in the first year of degree.

The results obtained allow us to affirm that:

1. Personal competencies can be effectively trained in the university.
2. A specific training course (CP subject) is validated for the development of personal competencies, especially those of a transversal nature, at the university.
3. Students who take the course develop generic competencies in a higher level than students who do not take the course.

In this sense, it is proposed that the university community evaluate the possibility of including this type of subject in the study plans, so that the generic competencies proposed by the EHEA through the Tuning project can be developed; since, if the development of this type of competencies is so important, they should be given a specific space for their development.

At the moment, among Spanish universities, only the UFV teaches a curricular subject in this direction, and in all its university curricula. A subject that, precisely, tries to train in these competencies and does so effectively.

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Information Technology Teachers' Views on the Use of Tinkercad

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ABSTRACT

This study aims to determine the opinions of Information Technologies teachers who teach Tinkercad about this program. The research is a qualitative case study. The study group consists of eleven Information Technologies teachers. Research data was collected using the teacher interview form for the use of Tinkercad software. The teachers have focused on using Tinkercad's 3D design menu according to research findings. Training activities are carried out individually and in groups. It has been observed that individual work contributes to the development of students' creativity skills, while group work emphasizes peer learning, cooperative learning, and respect for different ideas. While Tinkercad's interface and ease of use are determined as the advantage of this program in the studies conducted, the fact that it is browser-based and does not work offline is seen as its disadvantage. Tinkercad is an effective program for students to acquire many cognitive, affective, and psychomotor acquisitions. Tinkercad activities can be used as a tool to affect the creativity, algorithmic thinking, collaboration, critical thinking, and problem-solving sub-dimensions of students' computational thinking skills. However, this process did not proceed in a planned way, as the teachers did not have sufficient knowledge about computational thinking skills.

Keywords: 3D design, Computational Thinking, Information Technology Teacher, Tinkercad, 21st Century Skills.

INTRODUCTION

The technologies that emerged in the Twenty-First Century affect the way of life of individuals on the one hand, and shape the way of their thinking on the other hand. In this century, information is conveyed about how to use new technologies, how they can benefit, and most importantly, what they can do with them, instead of ensuring that students receive information and retain it in their memory with rote logic. It is understood that it is very important to include interactive 3D technologies in education, as most of the young people today are "digital natives" and students who demand the use of "up-to-date digital" applications (Papp, Tornai & Zichar, 2016). The projects carried out with the technologies used both enliven the imagination of the students and enable them to gain production skills with technology. This changes the dynamics of consumer culture by transforming users from passive consumers to active creators. (Papp et al, 2016).

In addition to the technologies used, the acquisition of 21st-century skills depends on the knowledge, skills, and attitudes of the trainers or teachers who teach technology towards new technologies. In this case, besides providing students with basic skills related to ICT, schools, and teachers have the most important role in effectively integrating technology into the learning-teaching processes of different courses (Şad and Nalçacı, 2015).

In line with the goal of our country's 2023 Education Vision, Tinkercad is used to help middle school students acquire IT production skills, and with its 3D Design, Circuit, and Code Blocks menus, students gain design and production skills (The Ministry of National Education, 2018). In a study conducted on teacher candidates, it was found that Tinkercad is effective in permanent learning. Also, the candidates stated that Tinkercad could be effective on students' interests, attitudes, and motivations (Doğan & Kahraman, 2020). Besides, Tinkercad's cheapness, user-friendliness, and ease of use are stated as their advantages (Mohapatra et al., 2020). Given the different perception systems, students can understand both theoretical and practical concepts using the Tinkercad tool. Also, students can easily increase their programming knowledge when they use their programming knowledge effectively (B. Mohapatra, Mohapatra, Jijnyasa & Zagade, 2020).

The Aim of the Study

It is thought that the good integration of Tinkercad into the educational environment will be through determining the opinions of teachers about Tinkercad. It is important to determine the knowledge, skills, and attitudes acquired by Information Technology (IT) teachers in this process in terms of being a new technology of Tinkercad, for its features to be fully understood by all Information Technologies teachers and to be used within a common curriculum. In this context, answers to the following research questions were sought:

1. What are the opinions of IT teachers about Tinkercad 3D design projects?

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2. What are the opinions of IT teachers about conducting Tinkercad training activities individually or as a group works?
3. What are the opinions of IT teachers about the achievements that Tinkercad aims to bring to students?
4. What are the opinions of IT teachers about the advantages and disadvantages of using Tinkercad?
5. What are the opinions of IT teachers about improving computational thinking skills to students with Tinkercad?

RELATED RESEARCHES

Studies have shown that when Tinkercad is used in combination with different technologies, studies have been conducted that contribute to enriching students' learning experiences. For example, a study was conducted in which students showed 3D models designed using Tinkercad with augmented reality technology (Yamasima & Hori, 2021). In a study conducted by a group of primary school children in Valparaíso-Chile using Scratch and Tinkercad to improve their programming and Arduino-based computing-electronics competencies, it has been determined that these tools can effectively develop students' theoretical and practical skills, as well as gain students' ability and enthusiasm to know more advanced skills and applications related to detection systems. (Silva, Malebran & Pereira (2019).

Due to the Covid 19 outbreak, educational activities have shifted to online classes. Therefore, in another study, Arduino IDE micro controller online training was designed using free Tinkercad simulation. Results show that students have a high interest in online workshop (Amalia, Igaamoka, Septiani & Fazal, 2020) In the case of Covid 19, Tinkercad helps students to connect and create their plans with a different equipment without the need for any equipment or physical hardware such as switches, cables, LED lights (Mohapatra et al., 2020; M. Vera, Vera, Vásquez and Panez, 2018).

Díaz, Hernández, Ortiz, and Lugo (2019) made Tinkercad's Codebloks menu available to students studying in different undergraduate programs in a summer course. Students who thought it was difficult before using this application enjoyed it later. However, the fact that the tool is new and has a limited scope of application (3D modeling only) causes insufficient information on its use.

In the study conducted by Deniz (2020) with 583 middle school students and Lim and Kim (2019) with 25 sixth grade students, it was found that Tinkercad is an effective tool for students to gain computational thinking skills. Also, Tinkercad is used in South Korean 3D modeling education to improve the computational thinking skills of South Korean primary school students (Yi, Jung & Lee, 2017).

On the other hand, it is seen that Tinkercad is also used in different areas. Cherry (2016) taught students to design 3D characters through Tinkercad to be used in short film animation. Kuo, Lai, and Kao (2018), on the other hand, enabled students to print out their dessert designs designed in Tinkercad using 3D Food printers. Madar, Goldberg, and Lam (2018) enable students to see the designs they make in Tinkercad (for example, home design) as a prototype by transferring them to a virtual reality environment and share the latest developed version with their peers via the web environment with C3d.io, a special tool they have developed. Ng (2017) used the effect of 3D CAD and 3D printing to make it easier for students to learn solid volume in math class.

METHOD

The research was carried out using the case method, one of the qualitative research methods. "Case study" is defined as a method in which one or more events, settings, programs, social groups, or other interconnected systems are examined in depth. (Büyükoztürk et al., 2019, p. 268).

Study Group

While determining the study group of the research, private course centers, private schools, and public schools that provide Tinkercad education in their institutions were taken into consideration. Among these institutions, the private course center and private school provide Tinkercad training to their students in line with their means. It was determined that state schools, on the other hand, provided Tinkercad training to their students within the scope of the facilities provided to their schools within the scope of the "IT production" project. In this context, 11 Information Technologies teachers participated in the study. 7 (63.6%) of these participants are female and 4 (36.4%) are male teachers. It was determined that 9 of the teachers participating in the study were working in Ankara, 1 teacher was working in Siirt and 1 teacher was working in Afyon.

Data Collection Tool

The semi-structured interview form (Teacher Interview Form for the Use of Tinkercad Software) prepared to get teachers' opinions about Tinkercad software was developed by referring to the expert opinions of seven academicians for language and field evaluation. Afterward, the applicability of the form was tested by taking the opinions of three teachers. The form prepared with the last corrections consists of 11 items.

Data Collection

While collecting the research data, it was first tried to identify the Information Technology teachers in Tinkercad education schools. In this context, a semi-structured interview form was applied by interviewing the Information Technologies teachers who were determined to be trained. Also, a semi-structured interview form was conducted through Google Forms by reaching six ITC teachers who teach Tinkercad via social media. The opinions obtained from the teachers within the scope of this study were coded as T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, and T11 and explained in the findings section of the research.

Analysis of Data

The qualitative data collected by using the Teacher Interview Form for the Use of “Tinkercad” Software was analyzed using the content analysis method, one of the qualitative data analysis methods. Content analysis is used to determine the existence of words, concepts, themes, idioms, characters, or sentences in one or more texts and quantify them (Seggie & Bayyurt, 2015, p.253-254). For this reason, the data obtained from the semi-structured interview form applied to 11 Information Technology teachers were interpreted by descriptive analysis within the scope of the questions in the interview form determined as the theme.

FINDINGS

1. Teachers' Opinions on the Usage of Tinkercad Menus

The preference of teachers for 3D Design, Circuit, and Code Blocks menus in Tinkercad to prepare 3D projects is presented in Table 1 by structuring under 3 categories. The aims of teachers to prefer Tinkercad menus are structured under 9 codes and presented in Table 1.

Table 1: Teachers' Views on Tinkercad 3D Design, Circuit and Code Blocks

Categories	Codes	Sample Sentences	f	%
3D Design	Giving perspective from different viewpoints	<i>“3D Design provides the settlement of 3-dimensional concepts and gaining perspective from different viewpoints while designing it. The students enjoyed seeing how a figure they drew looks like in any size and being able to draw exactly the shape of the object.” (T1)</i>	1	7,1
	Teaching a new program	<i>“I used almost all the parts of 3D Design ... As for starting a new program, I encountered reactions such as curiosity and interest from my students. . However, the students who used the program before had also had irrelevant attitudes.”(T3)</i>	1	7,1
	Being interesting	<i>“It was an educational program that attracted their attention and was interesting. Students created enjoyable and lovely projects.” (T9)</i>	5	35,7
	Teaching 3D Design	<i>“I used it in computer-aided design in the Technology Design course. Students better grasp three-dimensional design” (T6)</i>	4	28,5
	Improving students' visual and spatial perceptions	<i>“We used 3D design to help my students improve their visual-spatial perception and bring their ideas to life. (T2)</i>	2	14,2
	Make the students draw their dreams with 3D	<i>“They drew everything in their dreams as they wished in 3D.”(T4)</i>	1	7,1
Total			14	100
Circuit	Teaching the circuit concept before Arduino training	<i>“We made drawings to prepare prototypes for the projects they developed. Circuit was used for understanding the circuit concept before proceeding with Arduino training.”(T2)</i>	4	80

	Increasing Motivation	<i>“Students made simple circuit designs. Before making the circuits concretely, we designed them to see them in a virtual environment. They were very excited. Their motivation increased.” (T4)</i>	1	20
Total			5	100
Code Blocks	Enjoying Tinkercad	<i>“They used 3D design and code blocks menus. The student loved Tinkercad. If I do not give another activity, the student is busy with Tinkercad all day. He liked Tinkercad more than Robotics” (T7)</i>	1	100
Total			1	100

When the table is examined, it is emphasized that the teachers prefer the 3D design menu as the "interesting" code. The fact that three-dimensional design develops students' imagination, is remarkable and intriguing, has added weight to the use of this menu. It also contributed to the development of students' visual and spatial skills. While the circuit menu provides circuit design before Arduino, the Code Blocks menu was determined to be used by only 1 teacher because the students love to code.

2. Findings Regarding 3D Projects Made Using Tinkercad Software

Project preferences used by teachers while creating 3D designs are presented in Table 2 under 2 codes.

Table 2: Teachers' opinions about the project preferences they used while creating 3D designs

	Codes	Sample Sentences	f	%
Project Preferences Of The Teachers	Ready-made projects in Tinkercad	<i>“Especially Tinkercad has many ready-made designs. Students had the opportunity to use most of them following the given application assignments.” (T3)</i> <i>“Making a pizza, How to build a log cabin, Fruit still life” (T11)</i> <i>“We used many community-created shapes for 3d design in our projects.” (T2)</i>	3	27,2
	Instead of a ready-made project, students make their designs	<i>“Students like to use tools such as home sofa while designing their home.” (T4)</i>	8	72,7
Total			11	100

When the table is analyzed, it is seen that most of the teachers allow students to make their designs instead of ready-made projects. When asked about the aspects of the ready-made projects that the teachers liked, it was seen that 5 teachers stated that the projects contributed to gaining ideas. The favorite aspects of using ready-made projects were stated as follows by some participants:

“Ready-made projects helped me get ideas”(T11)

“A good support educational material for visual study for fifth and sixth-grade students without the need for a very high-level computer at a basic level” (T2)

“It makes learning easier by explaining all the skills needed to learn the application step by step as a project.” (T3)

When the teachers were asked about the aspects of the project designs that they disliked or thought to be improved, many teachers stated that they did not like them, but some of the teachers included the problems they encountered. The disliked aspects of using ready-made projects were stated as follows by some participants' expressions:

“We are having language difficulties. Translation tool fails to explain exactly what the training means”(T3)

“If we consider the interdisciplinary course design, projects that emphasize other lessons can be added.”(T11)

6 teachers (T2, T3, T6, T7, T8, and T11) stated that they use "Sketch Up", "Thingiverse", "Adobe Illustrator", "Sculptris" and "Solidworks" as 3D software other than Tinkercad.

3. Findings Regarding Teachers 'Views Regarding Students' Conducting Activities as Individual or Group Work

The tasks that teachers give to students in individual studies are structured under 4 codes and shown in Table 3. The way teachers create group work is structured under 3 codes and shown in Table 3.

Table 3: Teachers' opinions on the way of giving individual activities and forming groups

	Codes	Sample Sentences	f	%
Individual work	Drawing of a specific object	“A pen holder and a home garden with their names written” (T1), “Home design, rocket design”(T5), “Mug and phone case”(T6), “Geometric shapes or objects”(T7), “Button design”(T8)	5	50
	Free design	“Free design” (T4)	2	20
	Integrated STEM Applications	“I used the integrated STEM education applications I developed in my thesis..” (T3)	1	10
	Basic works of Tinkercad	“First of all, I had studied the basic tasks such as moving objects, sizing, aligning, and drilling. Then I asked them to design their rooms. (T11)	2	20
	Total		10	100
Group work	The teacher created the group and determined the task himself/herself	“Each student was assigned to do a part of the project” (T1)	5	71,4
		“Students become responsible for doing a part of the design and finally combine it and complete it, strengthening the communication and social bond between them.” (T2)		
		“I made a group of those who can use the program well and those who cannot use it well so that they will learn to use the program.” (T6)		
		“I divided the design to be made and assigned the students accordingly” (T10)		
		“Each application had its instructions and I wanted teams of usually 4-6 people to be set up. I wanted the students to do the task distribution here themselves. Thus, I wanted the awareness of responsibility to be developed.” (T3)		
	Students formed a pair of groups according to their choices.	“I let them create groups of two according to their choices.” (T8)	1	14,2
	The teacher created a group according to the interests of the students.	“I formed groups according to the areas they are interested in. Working in the field of their interest increases their motivation. I created homogeneous groups because I work with the younger age group.” (T11)	1	14,2
Total			7	100

When the table is examined, it is seen that the teachers assigned tasks to the students for "drawing a certain object" in individual tasks. While teachers were doing group work, "they did the task of forming groups and determined the task themselves". It is observed that teachers take different needs into account when forming groups. The advantages expressed by teachers for individual activities are presented in Table 4, structured under 7 codes. The disadvantages of these activities are presented in Table 4, structured under 3 codes.

Table 4: Opinions of Teachers Regarding Conducting Activities Individually

	Codes	Sample Sentences	f	%
Advantages	Developing the imagination of students	<i>"As the needs of each change, it allows them to develop different ways of imagination and solution."(T1)</i>	1	14,2

	Increasing the learning speed of students	<i>“Students' learning speed is increasing and each individual's imagination cannot be restricted by someone else.” (T5)</i>	1	14,2
	Students can be able to master all the lines of the subject	<i>“The student can fully master all the lines of the subject” (T3)</i>	1	14,2
	Students seeing their own mistakes	<i>“Giving students individual activities allows students to see their own mistakes”(T4)</i>	1	14,2
	Students gain experience	<i>“Everyone gaining their own experience” (T6)</i>	1	14,2
	Students progress at their own learning pace	<i>“Students progress at their own learning pace” (T8)</i>	1	14,2
	Students gain the ability to design	<i>“The advantage of doing it individually is to gain the ability to do it alone or in group work.” (T11)</i>	1	14,2
	Total		7	100
Disadvantages	Students staying away from different ideas	<i>“Students stay away from different ideas and group dynamics with individualized learning” (T11)</i>	1	16,6
	Designs take time	<i>“Students are stuck at some points”(T4) “Designs take a long time”(T6)</i>	2	33,3
	No Peer Learning	<i>“Students can't learn from others”(T2) “Individual studies will emphasize competition by nature. This can cause classroom conflicts. There will be no peer learning-. It can cause students to behave selfishly. In short, it will eliminate sharing and cooperation.”(T3)</i>	2	33,3
	Not enough computers	<i>“There are not enough computers in our school” (T10)</i>	1	16,6
	Total		6	100

When the table was examined, teachers expressed many advantages for individual activities. In particular, it was found that providing learning opportunities by taking into account students 'own learning needs is important for students' individual development. As a disadvantage, the code "designs take a long time" and "no peer learning" come to the fore. Also, a teacher expressed a deficiency by stating that there were not enough computers for every student in their school.

The advantages and disadvantages expressed by the teachers for conducting the activities as group work are presented in Table 5, structured under 4 codes.

Table 5: Teachers' Views on Holding Activities as a Group

	Codes	Sample Sentences	f	%
Advantages	Providing peer learning	<i>“They can manage ' (T2 and T10), speed up and exchange ideas</i>	2	20
	Ensuring cooperative learning	<i>“When students have difficulty, they can assist and help each other.”(T3 and T8) “Teamwork has indirect and direct positive effects on the development of important skills such as interpersonal communication, collaboration, respect for different ideas, and sense of responsibility.” (T4)</i>	3	30
	Respecting different opinions	<i>“Students understand that there can be different ideas and perspectives.” (T5)</i>	3	30
	The emergence of better designs	<i>“Teamwork has often encouraged solidarity and revealed the team spirit. Studies with different ideas have been enriched” (T11)</i>	2	20
	Total		10	100
Disadvantages	Negativities in the Classroom	<i>“School environment or working environment is not always suitable” (T2)</i>	1	12,5

Designs do not fit together	<i>“Designs do not fit together.” (T3)</i>	2	25
It creates a conflict environment due to the unequal sharing of workload between students	<i>“The motivation of the students who do not comply with the team spirit decreases. In the team, the workload of more working students and the weakness of others' contribution to the work may result in discussions.” (T10)</i>	3	37,5
Creating an intergroup competitive environment	<i>“I think it is necessary to pay attention to this competitive element. Various conflicts can arise within the group. Students who are not responsible within the group can cause problems.” (T4)</i>	2	25
Total		8	100

When the table is examined, it is seen that the codes of “ensuring collaborative learning” and “being respectful to different ideas” stand out as advantages of group work. However, group work creates a disadvantage if “it creates a conflict environment due to the unequal sharing of workload between students”. In this case, it can be interpreted that teachers should work in a way that minimizes the formation of conflict while creating a competitive environment in the classroom while doing group work.

4. Views on Targeted Gains for Students Related With Tinkercad

The situations of Tinkercad to provide students with cognitive, affective, and psychomotor gains are structured under 3 codes and presented in Table 6.

Table 6: Teachers' Views on the Effect of Tinkercad on Cognitive, Affective, and Psychomotor Gains

	Codes	Sample Sentences	f	%
The Effect of Tinkercad on Cognitive, Affective and Psychomotor Gains	Effective in all cognitive, affective, and psychomotor gains	<i>“I think Tinkercad is effective in all cognitive, affective, and psychomotor domains. Cognitive-spatial thinking, the motivation to do as a result of affective-production and design, and effective mouse use with Psychomotor Learning” (T11)</i>	8	80
	There is no common gain program, the teacher sets it up	<i>“There was no explanation from the National Education regarding the achievements that were required to be gained during the teaching of the program. For this reason, the program was not made to a certain extent. When the student sees any object such as glass, if he has an idea about how to draw this glass, the student has achieved the goal.” (T7)</i>	1	10
	Teachers' attitudes and behaviors are effective in achieving the gains	<i>“Whether these variables will have a positive effect is a matter of how you integrate this program into the course process.” (T3)</i>	1	10
Total			10	100

When the table was examined, most of the teachers stated that Tinkercad was effective in the acquisition of three gains. However, a teacher stated that there is no common outcome program determined by the Ministry of National Education and that the outcomes are usually determined by teachers' wishes. This situation has brought the conclusion that Tinkercad education is not taught from the center under a certain plan and program, therefore students who receive education do not acquire common gains. Another teacher points out that teachers' attitudes and behaviors are also effective in the acquisition of the outcomes.

Since the teachers did not implement a common Tinkercad training program, it is seen that they made different applications in the acquisition of cognitive, affective, and psychomotor gains. Teachers coded T4, T5, T6, T9, and T11 provided design tasks and achieved the targeted gains. Some of the teachers' duties are stated as follows with their expressions:

“Cognitive - applications were made where they could show how to use Add-ons and what shapes to use. Emotionally, they found the opportunity to value and appropriate themselves through their names or by giving examples that they could draw their own houses. For the objects we give psychomotor, they are free about the hole

types or sizes that will reflect their feelings in works such as wood or pencil case. Thus, their stimulation and skills are increased.” (Ö1)

“In one example, we decided to make students' prosthetic hand design. In this process, children researched and learned how joints in human hands work, then they contacted and empathized with people who needed a prosthetic hand and learned their needs. Finally, they designed the prosthesis and implemented it.” (T2)

5. Findings of Teachers on Advantages and Disadvantages of Tinkercad Software

The advantages of using Tinkercad are structured under 5 codes, and the disadvantages are structured under 3 codes and presented in Table 7.

Table 7: Teachers' Views on the Advantages and Disadvantages of Tinkercad Use

Advantages and Disadvantages of Using Tinkercad				
	Codes	Sample Sentences	f	%
Advantages	Its Interface and Ease of Use	“Objects are easy and measure input is easy. It has advantages such as remote control and maintaining classroom order.” (T1) “Easy to use, ideal for middle school students and ready-made shapes available” (T2)	5	38,4
	Available Online	“Being online” (T10) “Saving all of Tinkercad's works without deletion” (T4)	2	15,3
	Having 3D Design, Circuit and Code Blocks menus	“Tinkercad can teach and apply many areas such as 3D design, coding, Arduino circuit setup.” (T5)	1	7,6
	Developing many skills such as 3D thinking, critical thinking, creative thinking	“Tinkercad enables students to think in three dimensions. Due to Tinkercad, students' drawings are improved. Tinkercad has reduced game addiction.” (T9) “I have seen that they have indirect or direct positive effects on many skills such as critical thinking, creative thinking, scientific creativity, which are defined as 21st-century skills.” (T3)	4	30,7
	Being entertaining	“entertaining”(T8)	1	7,6
	Total		13	
Disadvantages	Being a browser-based program	“It is a browser-based program. In cases where there is no internet, it can sometimes cause problems since it doesn't work. Also, students who consider everything as 2 dimensions may have problems when they first encounter the 3rd dimension.” (T4)	2	50
	Not working in offline mode	“Not being offline and requiring a working environment outside of class hours. Therefore, students cannot practice adequately.” (T2)	1	25
	Limited for detailed designs	“Limited for detailed designs” (T3)	1	25
	Total		4	100

When the table is examined, it is seen that many of the teachers emphasize the advantages of Tinkercad software with the statements as "its interface and it's easy to use". Also, its advantages include “developing many skills such as 3D thinking, critical thinking, and creative thinking”. However, Tinkercad's being a browser-based program, not working in offline mode, and not allowing detailed designs were evaluated as disadvantages. One teacher stated the disadvantage of Tinkercad in his own words:

“The disadvantage of Tinkercad is that it is online. Also, registration with an e-mail address created a problem for us; because our working group is 10-13 years old. At this age, they cannot legally receive e-mail. It is not ethical. The work took a long time because we were dealing with parental permission. This situation was tiring us.” (T5)

6. Findings on Teachers 'Use of Tinkercad Software to Improve Students' Computational Thinking Skills

When teachers were asked about the effect of Tinkercad on the sub-dimensions of computational thinking (problem-solving, algorithmic thinking, creativity, cooperative learning, critical thinking), it was seen that teachers did not have sufficient knowledge about computational thinking. It can be said that this is effective because computational thinking is a new concept and an agreed definition has not yet been reached. After explaining to the teachers about computational thinking, most of the teachers explained that Tinkercad is an effective program in all sub-dimensions of computational thinking skills. Some of the participants stated as follows:

“Tinkercad is a learning platform that will contribute to each of the sub-dimensions. 3D is useful for the student to create something of their own and for collaboration among students.” (T1)

“Problem-solving, creativity. The designs he draws in the 3D design are a product of the creativity of the student and are effective in all sub-dimensions of computational thinking.” (T7)

“Tinkercad promotes creativity and critical thinking. The student designs with an idea. After a few days, he designs again with his new knowledge. Critical thinking comes into play at this point” (T4)

“While 3D develops itself in areas such as problem-solving and analysis while designing, it helps the development of critical thinking, creativity, algorithmic thinking skills in the coding part” (T5)

“Tinkercad contributes to algorithmic thinking, the student designs the object to be designed by thinking step by step. It is effective in the development of creativity and the emergence of different designs.” (T11)

“Tinkercad creates creativity, different drawings, and objects, enables algorithmic thinking and critical thinking, questioning causes and solutions, and provides problem-solving and finding alternative solutions.” (T9)

“The use of the 3D design in education with Tinkercad, which also contributes to computational thinking from the whole to the part, supports this mindset of children.” (T11)

Also, teachers made the following explanations to the programs that can be used in the development of computational thinking skills: T1 “Mine craft education or scratch JR”, T4 “Flow chart”, T5 “Scratch, Mblock”, T6 “Sketchup, Code.org, blockly, scratch, s4a, mblock”, T10 “S4A, mBlock, Scratch”, T11 “Sketchup can be used as a 3D program” T7 “3D programs, programming languages, photoshop... All available”.

CONCLUSION, DISCUSSION, AND SUGGESTIONS

This study was carried out with 11 Information Technologies teachers. It is seen that teachers focus on the 3D Design section from the menus in Tinkercad. It has been determined that teachers prefer this situation because Tinkercad is "interesting". In a study by Ng (2017), it was stated that one of the students explained this situation with the statement "I liked this project because it was fun to create something and show my ideas in a 3D model". Design activities support a student's active participation in the learning process by providing opportunities to create products that improve cognitive strategies and processes (Aydoğdu and Çakir, 2019). While the circuit menu is used for pre-Arduino circuit design, the Kodblocks menu is not used by many teachers because it is a newer section. It is seen that teachers prioritize students to use their designs instead of using ready-made projects in three-dimensional design educations. It is thought that this situation provides an opportunity for students to draw the objects in their imaginations more comfortably. According to Leinonen, Virnes, Hietala, and Brinck (2020), 3D activities in school should be planned accordingly to develop creative learning and design thinking skills. It is demonstrated that design thinking can provide students with a general understanding of the creative and complex process in digital fabrication processes (Smith, Iversen, & Hjorth, 2015).

Design activities can be done individually or as group work. Both cases have their advantages and disadvantages. In the individual study, skills that support students' creative skills come to the fore, while in group studies, peer learning, collaborative learning, and respect for different ideas come to the fore. In individual work, lack of peer learning, staying away from different ideas, and taking time for designs are seen as disadvantages. This situation causes 3D design activities that take time to not be trained during the Information Technologies and Software course in our schools. Since Tinkercad is a browser-based program and does not work in offline mode, it creates a problem for students who do not have a computer at home. In group work, this situation, which the group environment will bring along with a noise environment in the classroom, is seen as a disadvantage because it creates an environment of conflict within and between groups.

Also, Tinkercad was found to be effective in students' acquisition of many cognitive, affective and psychomotor acquisitions. However, because Tinkercad has been trained in certain schools within the scope of the "production with informatics" project and teachers determine the gains themselves, it has been found that students do not receive education within the scope of a common acquisition program. This situation also clarifies the case of differences in individual or group activities given to students. Therefore, Özdemir (2019) applied a lesson plan prepared by Tinkercad to investigate the effect of primary and secondary school students' cognitive rotation skills. In the individual study, lack of peer learning, distance from different ideas, and time-consuming designs are seen

as disadvantages. This causes time-consuming 3D design activities to be unable to be trained during the Information Technology and software course in our schools.

It is stated that Tinkercad's interface and ease of use provide an advantage for students to develop many thinking skills such as 3D thinking, critical thinking, and creative thinking. In a similar study conducted by Doğan and Uluay (2020), 40 pre-service science teachers stated that they did not have any difficulties while using and practicing Tinkercad. These thinking skills are related to problem-solving, creativity, collaborative learning, algorithmic thinking, and critical thinking sub-dimensions of computational thinking skills. It has been found that the studies conducted in Tinkercad affect students' computational thinking skills (Deniz, 2020). However, considering the explanations made by the teachers, it was determined that the teachers did not have enough knowledge about computational thinking skills, therefore they did not use Tinkercad consciously to improve students' computational thinking skills. This situation is thought to be because computational thinking is a new skill, yet it has not been defined clearly and has not been integrated into the curriculum comprehensively.

Considering that 3D printing technologies will become part of our daily lives like other technological products, Tinkercad is an important tool for students to acquire this skill at an early age. For this reason, considering the advantages and disadvantages of Tinkercad education, it is important to design the educational environment in a way that stimulates the students' interests, curiosity and motivation and minimizes their learning barriers for this education to achieve the desired success.

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Instructors' Views on Distance Education during the Pandemic Period

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ABSTRACT

In this study, it is aimed to determine the views of instructors on distance education and the reflection of the Covid 19 epidemic on their views. For this purpose, the opinions of the instructors who had not taught with distance education before the pandemic were examined both before the experience and after teaching during the pandemic process. Case study, one of the qualitative research methods, was used. Data were collected with the 20 instructors who participated in the study, with an interview form containing semi-structured questions before and after the experience. At the end of the study, it was seen that positive expressions were expressed more in general thoughts and evaluations made in terms of students and instructors before the experience, but there were more teachers who thought their success would be negatively affected. It is considered that distance education is not suitable for practical courses. After the experience, most of the instructors had change of thought. It is seen that this change is both positive and negative. It is possible to say that there are nearly half of the positive changes in the changing thoughts of the instructor and student. More than half of the instructors felt themselves productive in this environment. It is seen that interaction problems before and after experience cause concern. For this reason, it is recommended to apply methods that will increase interaction in the trainings provided.

Keywords: distance education during the pandemic period, Instructor's thoughts, changes of thought in distance education

INTRODUCTION

Some studies point out that distance education, which provides any individual with educational opportunities, has become widespread in the last 20 years (Lackey, 2011), whereas others suggest that this has been the case in the last decade (Healey, 2012). The flexibility that online education provides as regards students' attendance time (Willett et al., 2019) and its positive impact on learning (Smith, 2016) are increasing the demand for online courses. Harden (2013) states that university classrooms are on the verge of becoming virtual. However, Mitchell et al. (2015) suggests that the use of online technology in higher education has not yet been fully adopted. Some researchers believe that faculty members may be reluctant as regards online teaching due to such reasons as fear of change that they may encounter in a new environment, technology- and interaction-based concerns, and the issues associated with workload (Bacow et al., 2012; Betts & Heaston, 2014; Bolliger & Wasilik, 2009).

Keegan (1996) argues that distance education is parallel and complementary to traditional education. With the Covid-19 pandemic affecting the whole world in 2020, one can argue that this view is accurate. Distance education can be suggested to have become indispensable throughout the globe during the pandemic period because students can choose distance learning not only because they really prefer this method, but also because they cannot use traditional education due to reasons such as work, family, geographical distance, and financial problems (Holmberg, 1995). According to UNESCO data (2020), a large number of countries have had to implement school closures due to the pandemic. During this period, the number of students affected by the pandemic period has constantly changed. In 2020, the highest number of students who were affected due to school closures that took place in 165 countries was 1,478,702,369 students, virtually 84.5% of all. The majority of the students whose schools are closed continue distance learning, which has increased the prevalence of it even more. As online education has been widespread, quality education and the choice of strategy to be used by the instructors have become more significant (Crawford-Ferre & Weist, 2012).

It is clear that the participants involved in the distance education process, which has become much more important today, have different roles compared to those in formal education. Faculty members, who constitute a substantial part of these participants, have many duties in the distance education environment. Unlike face-to-face education, the instructors who teach in this environment are supposed to possess the technical knowledge required to manage the course, as well as the teaching skills to meet the needs of online students (Lackey, 2011). Holmberg (1986) points out that faculty members in distance education also have a role in providing motivation, making learning enjoyable, including the subjects related to the interests and needs of students, creating a sense of mutual

understanding between learners and distance education institutions, providing access to the course content, incorporating learners into activities, discussions, and decisions and establishing useful and real communication with them in general.

During the pandemic period, many instructors have had to continue to provide education in distance education environments, which can be described as new to them. It has been argued that people, individually or as a group, initially react negatively to the change they encounter, and that this reaction depends on the degree of individuals' involvement in the change process (Lawrence, 1969). It can be suggested that individuals participating in different aspects of the change are less resistant to it (Mitchell et al., 2015). Similarly, it is evident that instructors with online teaching experience yield a more positive reaction than those without one (Alshangeeti et al., 2009; Lloyd et al., 2012). During the pandemic period, there has been a necessity for transition to distance education in many institutions, including the ones with instructors who are inexperienced. This study investigated the perspectives of the instructors who were obliged to teach in distance education both before and after their experience of distance education in order to determine their views on distance education. Determining the views of faculty members who have a variety of responsibilities in the distance education environment is crucial in terms of online course behaviors such as the realization of an effective and efficient education process in this environment (Dooley & Murphrey, 2000), learning success (Harris & Krousgrill, 2008), students' learning process, and general satisfaction (Otter et al., 2013).

There are other studies as regards the perceptions of instructors on distance education. Some of these studies investigated solely the opinions of instructors who teach in distance education (Conrad, 2004; Morgan et al., 2014; Otter et al., 2013; Walters et al., 2017; Ward et al., 2010), while some of them studied the views of those both experienced and inexperienced in this field (Alshangeeti et al., 2009). Some other studies analyzed the views of instructors who had not taught in the distance education environment (Gürer et al., 2016; Tuncer & Tanaş, 2011; Willett et al., 2019), the opinions of teacher candidates (Gündüz & İşman, 2018; Paydar & Doğan, 2019; Uzoğlu, 2017), and the previous studies regarding the views of instructors (Wingo et al., 2017). This study examined the views of the instructors who had to teach in a distance education environment on account of the pandemic. During the pandemic period, other studies have been conducted in order to examine the views of instructors (Dolmacı & Dolmacı, 2020; Kaya, 2020; Şeren et al., 2020) and the opinions of teacher candidates about distance education (Karakuş et al., 2020; Karatepe et al., 2020). However, this study examined the views of the instructors before and after the experience of distance education, which makes it more comprehensive. The following questions were sought to answer in order to realize the aim of the study:

- Before their experience, what are the views of the instructors who have had to teach in the distance education environment during the pandemic period about distance education?
- After their experience, what are the views of the instructors who taught in the distance education environment for the first time during the pandemic period, and have their opinions changed?

METHOD

Research Pattern

In this study, a case study design, one of the qualitative research methods, was used in order to determine the views of the instructors on distance education who had to teach with distance education during the pandemic period. A case study analyzes an event or phenomenon by focusing on the questions of how and why (Yin, 1984). In these studies, in order to evaluate a specific situation or event in a certain period of time, it is defined and examined in-depth via data collection tools such as interviews and observations (Creswell, 2007).

Working Group

The study included 20 instructors teaching in the Department of Anthropology (2 participants), Department of Computer Engineering (6 participants), Department of Business Administration (5 participants), Department of Fine Arts (4 participants), Department of Mathematics (2 participants), and Department of Atatürk's Principles and History of Turkish Revolution (1 participant) in a state university in the Spring Semester 2021. 60% of the participants were women and 40% were men. The age range varied between 30-35 (6 participants), 36-40 (11 participants), and 41-50 (3 participants).

Data Collection Tool and Data Collection Process

Semi-structured interview forms prepared by the researcher were used to collect the data. There were eight questions in the interview forms used both before and after the experience. After the interview forms were prepared, the opinions of 3 experts in the field of distance education were received and the forms were finalized. The finalized questions were shared with the instructors via Google Forms. Pre-experience questions were directed

to the instructors who had never taught in the distance education environment before the Fall semester 2020. Following online teaching during the specified period, the post-experience interview forms were shared.

Data Analysis

Qualitative method was used to analyze the interview forms filled out before and after the instructors' experience. For this purpose, the qualitative data analysis, which involves the basic stages of "data reduction", "data display", and "conclusion drawing/verification" was conducted (Miles & Huberman, 1994). Firstly, the data were analyzed and coded in the analysis process. Afterwards, the categories and subcategories were created for the codes. After this process, the data were re-examined; codings and categories were organized, and eventually thematic codings were created. In the study, the agreement percentage between coders was used for the purpose of reliability (Miles & Huberman, 1994), and for this purpose a comparison was made with the coding made by another expert. The percent agreement was calculated 82%. The codings that produced the difference were examined and then finalized by consensus.

Findings

This section covers the general views of the instructors before and after their experience as well as the changes in their opinions. Table 1 includes the general views of the instructors about distance education before teaching.

Table 1. General views before the experience

Category	Subcategory	Code	n	f
Advantage (%63,15)	Flexibility	Location independence	9	23.68
		Time independence	5	13.16
		Freedom	1	2.63
	Accessibility	Equality of opportunity	4	10.53
		Easy Accessibility	1	2.63
	Opportunity	Learning fast	2	5.26
		Solution during a crisis	2	5.26
Disadvantage (%36.83)	Interaction	Lack of communication	4	10.53
	Before lectures	Preparation for a long time	2	5.26
		Distressful method	1	2.63
		Obligation to upload files	1	2.63
	Discipline	Not taking the lecture seriously	1	2.63
	During lectures	Being dependent on the computer	2	5.26
		Not being suitable for practical courses	1	2.63
		Insufficient training	2	5.26

The views of the instructors, who had not yet taught in the distance education environment, were grouped into two categories: positive views as "advantage" and negative views as "disadvantage". The study revealed that, among the codes created in this category, the expressions regarding "advantage" were used the most, and that they constituted 63.15% of all expressions. The category of "advantage" consists of the sub-categories of "flexibility", regarding the independence of individuals, "accessibility", about the opportunity to access courses, and "opportunity" as regards the opportunities that students have. The codes mostly mentioned were "location independence" (23.68%), "time independence" (13.16%) and "equality of opportunity" (10.53%). The codes in the category of "disadvantage" were divided into four sub-categories; that is, "interaction" regarding the lack of mutual communication, "before lectures", "during lectures", and "disciplinary issues". The code of lack of communication (10.53%) was mentioned the most.

The instructors had various views in terms of how teaching in the distance education environment would affect their own success. Three participants stated that there would be no change in their success as they believed education environment does not affect the level of success. Five participants believed that this environment would have a positive impact on their success. All the five instructors, thinking that they would be affected positively, suggested that their success would increase since they would be able to spend more time for their scientific studies. 12 instructors, 60% of all participants, argued that this environment would affect their success adversely. The reasons for the instructors' thinking that it would affect them negatively are given in Table 2.

Table 2. Reasons why the instructors thought they would fail

Category	Subcategory	Code	n	f
Individual	Personal	Not being able to use body language	1	5.26
		Having to teach the subjects too quickly	1	5.26
		Lack of technology	1	5.26
Lecture process	Discipline	Not taking the lecture seriously	1	5.26
	Practice	Not suitable for practical courses	2	10.53
		Not being able to access the instructional materials physically	3	15.79
		Not being able to use the whiteboard	1	5.26
		Inefficient education	2	10.53
	Interaction	Lack of communication	4	21.05
		Feeling of being in the virtual environment	1	5.26
		Not being able to give feedback	1	5.26
		Not being able to see the student who is not paying attention	1	5.26

The reasons for failure in the distance education environment is categorized as "individual", which includes the issues related to the instructors, and "lecture process", involving the problems that are likely to be experienced during the lecture. The category of "individual" consists of the sub-category of "personal", which includes the lecturer's not being able to use body language, the belief that he/she will have to teach the subjects too quickly, and the possibility of experiencing technological difficulties, as well as the sub-category of "discipline", which involves the belief that he/she will not take the lecture seriously. "Lecture process", on the other hand, contains two sub-categories, one of which includes the problems that may occur during the practicing process in the lecture. The other one, "interaction", involves the issues that may arise during the mutual communication process. In their statements, the instructors mostly mentioned the codes of the lack of communication, the feeling caused by not being able to touch the educational material physically, and the inefficient education. For instance, the statement of the participant coded with K8 which includes the codes of "lack of communication", "not being able to give feedback", and "not taking the lecture seriously" was as follows:

K8: "I don't think I will be very successful in this environment; there may be a decrease in my success when compared to in regular education because there'll be only one-way communication during the practical courses and also it won't be possible to see the students. We might behave indifferently due to the lack of feedback to the message provided."

The statement of the participant coded with K13 with regard to "not being able to use the whiteboard" and "not being able to see the student who is not paying attention" was as follows:

K13: "The lectures I deliver requires me to use the board frequently. I believe that using the board in science courses can bring about more success, but I will not be able to use it in this environment. Also, it is easier to notice a student who has difficulty in understanding the subject in the classroom environment."

The aspects that the instructors considered positive and negative as regards themselves before experiencing distance education were categorized in Table 3.

Table 3. Positive and negative aspects of distance education as regards the instructor

Category	Subcategory	Code	n	f
Positive (%58.93)	Environment	Not having situations that might hinder the lecture	6	10.71
		Location independence	3	5.36
		Recording lectures	1	1.79
	Physical	Feeling of comfort	4	7.14
		Requiring less energy	4	7.14
	Opportunity	Access to plenty of instructional materials	4	7.14
		Opportunity to prepare instructional materials	1	1.79
		Opportunity to improve yourself	1	1.79
	Saving	Saving time	7	12.50
		Saving money	2	3.57
Negative (%41.07)	Classroom	Fear of not being able to convey the content	3	5.36
	Management	Not being able to monitor the student	3	5.36
		Distressful method	2	3.57
		Difficulty in time management	1	1.79

	Using only lecture method	1	1.79
Before lectures	Obligation to prepare instructional materials	3	5.36
	Preparation for a long time	2	3.57
Interaction	Lack of interaction	8	14.29

Before having distance education experience, the instructors mostly mentioned the positive aspects regarding themselves with a rate of 58.93%. Four sub-categories were created in the category of “positive”: “positive aspects of distance education environment”, “positive situations which the instructors will experience physically”, “opportunities”, and “saving”. The instructors mostly mentioned “saving time” (12.50%) and “not having situations that might hinder the lecture (10.71%)”. The difficulties that may arise in the classroom management process, the tasks to be done before the lecture, and the interaction problems constitute the category of “negative” and include 41.07% of the statements. Lack of interaction (14.29%) took the first place among all the negative aspects the instructors believed they would suffer from. The statement of the participant coded with K5 about “not having situations that might hinder the lecture”, and that of the participant coded with K10 about “opportunity to prepare instructional materials” were as follows:

K5: "I think the best thing in this environment will be that, as there will be no factors that hinder the lecture, caused by the classroom environment, I won't constantly have to say such things as “Behave!” or “Stop talking!”.

K10: “I think it will be an important opportunity for us to compile knowledge and make it more efficient. We have few official resources for the course content. In this way, we will have the opportunity to convey our own resources to the student in written form. ”

The aspects that the instructors considered positive and negative for students before experiencing distance education were categorized in Table 4.

Table 4. Positive and negative aspects of distance education for students

Category	Subcategory	Code	n	f
Positive (%56)	Flexibility	Location independence	10	13.33
		Time independence	8	10.67
		Individual study	2	2.67
	Accessibility	Equality of opportunity	3	4.00
		Opportunity to revise	3	4.00
		Easy Accessibility	2	2.67
	Opportunity	Physical comfort	3	4.00
		Understanding better	1	1.33
		Being able to receive good education	1	1.33
		Access to quality material	1	1.33
	Saving	Saving time	4	5.33
		Saving money	4	5.33
Negative (%44)	Interaction	Lack of interaction	7	9.33
		Lack of socialization	7	9.33
	Individual	Need for additional effort to learn	1	1.33
		Technical inadequacy	2	2.67
		Lack of technical equipment (pc, internet, etc.)	1	1.33
	Discipline	Lack of self-discipline	4	5.33
		Increase in lack of attention to the content	5	6.67
	Lecture process	Inefficient lecture	2	2.67
		Not being able to do hands-on activities	2	2.67
		Problems regarding the place where the instructor physically is	2	2.67

Before their distance education experience, the instructors mentioned the positive aspects for students, with a rate of 56%, and negative situations, with a rate of 44%. The positive aspects that distance education can offer to students consist of four sub-categories: “flexibility”, as regards the independence of individuals, “accessibility”, about the opportunity to access classes, “opportunity”, regarding opportunities students have, and “saving”. In the category of “positive”, the participants mostly mentioned the “location independence” and “time independence”, which are included in the sub-category of “flexibility”. The aspects that were considered to be negative for students involve four sub-categories: “interaction” regarding mutual communication, “individual” associated with the

situations based on individuals, “discipline”, and “lecture process” as regards the disruptions that may occur during the lecture. While the participants mostly mentioned about interaction, the concerns about the fact that some students would not have enough technical equipment and would need additional effort in distance learning were also among the negative codes. The statement of the participant coded with K5 about “the opportunity to revise”, “saving money”, “saving time”, that of the participant coded with K10 about “time and location independence”, and that of the participant coded with K11 about “lack of socialization” were as follows:

K5: “Students may have the opportunity to re-watch their lectures whenever they want; they can attend classes from home without having any financial difficulties. It will save both time and money spent on travelling.”

K10: “There were times when students were absent from class . They sometimes didn’t make an effort to catch up with the missed classes. Now, there won’t be such situations during this process. They can attend classes in their own conditions and comfort zone at any time.”

K10: “School is also an area where students socialize. Considering the process we are in, isolation is necessary. But I think that, when the conditions become normal, the school environment will provide students with positive contributions in terms of socialization and development. I think their being deprived of this could affect them negatively. ”

Only 2 of the instructors had positive opinions on whether distance education is suitable for every course. 18 instructors thought that this environment is not suitable especially for practical courses at all. The statement of the participant coded with K4, who mentioned that distance education is not applicable in terms of both courses requiring practical applications and the needs of students, was as follows:

K4: “No, I don’t think it will be an appropriate method, for example, for the courses in which practical applications are necessary. Rather, it will take more attention in the courses in the humanities if they are supported with visual materials. Apart from that, it can work for groups that are really willing to learn ... ”

While only 2 instructors favored students’ taking all their courses with distance education, 3 instructors argued that this approach is only for students who have the necessary skills for distance learning. 7 instructors thought that, while theoretical courses should continue through distance education, practical courses through formal education; however, 6 instructors, 30% of the participants, stated that they were absolutely against distance education.

Instructors' views following the distance education experience

The instructors who had not taught in the distance education environment previously were interviewed again after delivering lectures for a semester during the pandemic period. The study revealed that 80% of them changed their views after the experience. Table 5 shows the views which changed regarding students.

Table 5. Views which changed in terms of students studying in the distance education environment

Category	Subcategory	Code	n	f
Positive changes (%47.83)	Flexibility	Time independence	3	6.52
		Location independence	2	4.35
	Accessibility	Uninterrupted continuity of education	4	8.70
		Equality of opportunity	1	2.17
	Opportunity	Opportunity to revise	6	13.04
		Rich course content	2	4.35
		Comfort	1	2.17
		Rich communication tools	1	2.17
	Saving	Saving time	1	2.17
		Saving money	1	2.17
Negative changes (%52.17)	Interaction	Lack of communication	7	15.22
		Too many documentary materials	1	2.17
	Discipline	Not taking the lecture seriously	5	10.87
		No obligation to attend classes	4	8.70
		Increase in apathy	2	4.35
		Students’ lack of active participation	1	2.17
	Inequality	Limited internet access	3	6.52
		Students’ inequality of educational opportunities	1	2.17

After their distance education experience, the instructors stated that there were some changes in their views about

the positive and negative effects that this method would have on students. The study indicated that negative changes (52.17%) were slightly higher. The changes in the views regarding the positive aspects consist of four subcategories: “flexibility”, “accessibility”, “opportunity”, and “saving”, as in the previous tables. The instructors mostly mentioned “the opportunity to revise” in the sub-category of “opportunity” as a positive perspective change. “Uninterrupted continuity of education” ranked the second. Among the changes in the views regarding the negative aspects, instructors mostly mentioned the problems experienced in interaction. The views of the participant coded with K6 about “uninterrupted continuity of education”, those of the participant coded with K2 about “attendance” and “discipline”, and those of the participant coded with K14 about “increase in apathy” were as follows:

K6: "Being able to answer the questions of my students, even from a distance, and the fact that the education always continues is a feature that I did not think of before but I realized when I taught in distance education."

K2: “.. listening to the lectures arbitrarily and not failing due to absence couldn’t provide the serious atmosphere and concentration available in the classroom environment. I think a serious discipline problem has arisen."

K14: “Even when formal education was available, these students weren’t interested in learning sufficiently. They didn’t have the faintest idea what studying is. However, with distance education, students’ interest in learning and the act of studying is about to vanish entirely."

The opinions of the instructors which changed in terms of themselves after their experience are indicated in Table 6. In addition to positive views, there are also negative views.

Table 6. Views which changed in terms of instructors after the experience

Category	Subcategory	Code	n	f
Positive changes (%45)	Flexibility	Time independence	1	2.5
		Location independence	2	5
	Accessibility	Uninterrupted continuity of education	3	7.5
	Opportunity	Sharing rich content	1	2.5
		Comfort of home	1	2.5
		Time for researches	3	7.5
	Saving	Saving time	3	7.5
	Personal	Less fatigue	2	5
		No classroom management anxiety	2	5
Negative changes (%55)	Interaction	Lack of interaction	5	12.5
		Not being able to control whether the student understands	5	12.5
		Lack of instant feedback	2	5
		Not being able to control whether the student is paying attention	2	5
		Classes’ being dull due to students’ lack of participation	1	2.5
	Anxiety	Anxiety due to being recorded	2	5
		Not being able to concentrate	1	2.5
	Technical	Technical problems	4	10

The analysis of the statements revealed that 45% of the instructors’ opinions were about positive changes and 55% of them were about negative changes. The mostly mentioned codes were in the subcategory of “interaction” which belongs to “negative views”. The changes in the views regarding the positive aspects contain the subcategories of “flexibility”, “accessibility”, “opportunity”, “saving”, and “personal” which includes the codes of “less fatigue” and “less anxiety in classroom management”. The changes in the views regarding the negative aspects are grouped into the subcategories of “interaction”, “anxiety”, which includes mental issues the instructors suffered from, and “technical problems”. The codes mostly mentioned were “lack of interaction” and “not being able to control whether the student understands”. The statements of the participant coded with K2 about “saving time”, “time for researches”, “less fatigue”, and those of the participant coded with K5 about “lack of interaction”, “not being able to control whether the student can understand the subject” were as follows:

K2: “As distance education saves time, I have more time for myself, and it is possible for me to devote more time to researches, and also I feel less tired and more dynamic."

K5: "The most obvious problems I had were the lack of communication due to not being in the same physical environment with my students, not being able to ask and answer questions instantly, and therefore not being able to shape lecture contents according to those questions and reinforce them with examples, and thus not being able to determine whether students have comprehended the subjects or not."

The instructor coded with K18 expressed his satisfaction for focusing only on his lecture without worrying about classroom management as follows:

K18: "There are fewer question marks, which means less anxiety, in my mind over the efficiency of my lectures and now I think that I can shift my time and effort to the areas with higher marginal benefits."

While 9 of the instructors gave a positive answer to the question asked about their views as regards the sense of productivity that the instructors felt after the experience, 3 of them felt that they were partially productive, and 8 instructors, 40% of the participants, did not find themselves efficient at all. All of the instructors who thought they were not productive stated that the reason lying behind this was "not being able to communicate". The instructors who believed that they taught efficiently in this environment attributed it to the fact that they did their best. The instructor coded with K13 emphasized the contribution of preparing materials and stated:

K13: "I felt efficient. The presentations I prepared for the lecture enabled me to have some opportunities that I hadn't been able to obtain in the classroom environment. In this respect, I was able to explain more effectively what I had to tell."

55% of the instructors wanted to teach in the distance education environment again, whereas 25% did not. 20% of them stated that they could teach online if they had to because of the pandemic. The reasons why the instructors did or did not want to teach in the distance education environment again are shown in Table 7.

Table 7. Reasons for wanting and not wanting to teach in distance education again

Category	Subcategory	Code	n	f
Positive views	Flexibility	Being able to work from home	3	16.67
	Opportunity	Time for researches	1	5.56
		Recorded lectures	1	5.56
	Personal	No classroom management anxiety	4	22.22
		Less fatigue	1	5.56
	Saving	Saving time	2	11.11
Negative views	Interaction	Lack of interaction	3	16.67
	Lecture process	Inefficient lecture	3	16.67

Only 25% of the instructors had definitely negative opinions ("lack of interaction" and "inefficient lecture") about delivering lectures in distance education again. The statements of the instructors who wanted to teach in distance education again are grouped in the sub-categories of "flexibility", "opportunity", "personal", and "saving". The instructors mostly mentioned "not having classroom management anxiety in the distance education environment" and "being able to work from home" as positive views. The opinion of the instructor coded with K3 about the codes of "ease of classroom management" and "recorded lectures" was as follows:

K3: "Yes. I would like to teach in the distance education environment again owing to several positive aspects. For example, it doesn't involve any negative external factors such as the lecture's being interrupted by a latecomer, which helps you staying focused. Besides, you can record the lectures so that students can watch them again."

The exams conducted after the distance education process are also critical. However, none of the instructors who participated in the study had a positive opinion about exams. 50% of the instructors stated that students cheated during the exams, 50% of them expressed that exams could not measure or evaluate students' success, and 60% of them argued that it was not possible to provide control. 40% of the instructors stated that they evaluated their students by using assignments containing comments because of their negative opinions about exams.

CONCLUSION AND DISCUSSION

The study which involved the instructors who had not taught in distance education before the Covid-19 pandemic period determined the faculty members' views on this environment both before and after teaching in distance learning for a semester in the pandemic period. For this purpose, interviews were made with a total of 20 instructors from various departments and the following results were obtained through qualitative analysis.

The opinions of the instructors before teaching in distance education were as follows:

While 63.15% of the general opinions about distance education were in the category of "advantage", which included the codes of positive views, 36.83% were in the category of "disadvantage", which involved negative codes. Similarly, Alshangeeti et al. (2009) examined instructors' views on distance education in terms diffusion of innovations and determined that it was regarded as positive in terms of each factor. The survey conducted by the National Education Association (NEA, 2000) demonstrated that approximately 75% of the instructors felt

positive about distance education. According to the opinions of the instructors, three subcategories were created in the category of “advantage”: “flexibility”, regarding the independence of individuals, “accessibility” regarding the opportunity to access classes, and “opportunity” about the opportunities that the student has. Walters et al. (2017) determined that the instructors regarded “flexibility” and “accessibility” as important components in distance education. The study of Tuncer & Tanaş (2011) emphasized the educational opportunity for instructors. The category of “disadvantage” includes four sub-categories: “interaction” regarding the lack of mutual communication, “before lectures”, “during lectures”, and “disciplinary issues”. Hogan & McKnight (2007) stated that distance education can be considered as complicated and troublesome as there are many components such as interaction and solution of technical problems in the online environment. Tuncer & Tanaş, (2011) and Dolmacı & Dolmacı (2020) emphasized the negative impacts of the issues associated with interaction. The current study determined that the most positive aspects expressed by the instructors were related to the location independence and time independence, while the negative aspects were about the lack of communication. Dolmacı & Dolmacı (2020) and Şeren et al., (2020) also emphasized the significance of time and location independence.

60% of the instructors thought that their success would be affected negatively in the distance education environment where they had no previous experience. The reasons for this were grouped in the categories of “lecture process”, which included the reasons depending on the instructor, and “lecture process”, which involved the problems that might be encountered during the lecture. The most common reasons for failure were lack of communication and concerns about not being able to access the instructional materials physically. 25% of the participants stated that distance education would not take much time, and therefore they could devote more time to academic studies, which would increase their success. Contrary to this opinion, Tomei (2006) argued that teaching content, counseling, and student assessment take more time in distance education than in the traditional environment.

The study indicated that the participants mentioned positive aspects of distance education in terms of the instructor (58.93%) more than negative aspects (41.07%). Positive aspects were categorized under four sub-categories: benefits provided by the “environment”, “physical” comfort, “opportunities” offered by distance education, and “saving”. Saving time took the first place among all the positive aspects. Other studies, contrary to this, mostly maintain that teaching online will take more time than the traditional environment (McQuiggan, 2012; Otter et al., 2013). The negative aspects in terms of the instructors were grouped under three sub-categories: “classroom management”, requirements “before lectures”, and “interaction”. Among them, the lack of interaction was mentioned the most. Similarly, Willett et al. (2019) also mentioned the concerns about interaction. According to the current study, while the instructors found it positive to be able to access a wide range of materials in this environment, they considered the obligation to prepare materials as negative. However, the effort to prepare materials in the distance education environment is extremely important because the quality of the materials used in online education affects the quality of education (Chao et al., 2006).

The study also demonstrated that the participants mentioned the positive aspects of distance education in terms of students (56%) more than its adverse aspects (44%). “Flexibility”, “accessibility”, “opportunity”, and “saving” were the subcategories of the positive effects. The study revealed that the instructors mostly mentioned “time independence” and “location independence” as the positive aspects for the student, which were followed by “saving time” and “saving money”. Negative aspects, on the other hand, were grouped under four sub-categories: “individual”, “discipline”, “lecture process”, as well as “interaction”, which took the first place. The study by Otter et al. (2013) indicated that, while the students felt more disconnected from both their friends and instructors in the online environment, the instructors also agreed with this idea but emphasized it less. Morgan et al. (2014) showed that the instructors emphasized the importance of online group work. One can argue that group work is extremely important in distance education as it provides an increase in interaction.

90% of the instructors stated that distance education was not suitable to use in practical courses, and 30% of them did not find it appropriate for students to take all their courses with distance education. 15% of the participants thought that courses can be taken entirely in distance education, depending on the qualification of the student. Similarly, Willett et al. (2019) determined that the instructors who thought that distance education was not suitable for the department of sports management was in the majority. However, there were also those who found it suitable if the instructor was willing.

The following conclusions were reached about the opinions of the instructors after the experience: Most of the instructors (80%) changed their views after they taught in distance education. The changes of perception were examined in different categories in terms of the student and the instructor. The study revealed that the changes in the views about negative aspects were more than about positive aspects regarding both the student

and the instructor. The study by Şeren et al. (2020) demonstrated that the instructors mentioned the negative aspects of distance education more than its positive aspects. However, one can argue that the changes in the views about positive aspects in this study were nearly 50% in terms of both students (47.83%) and instructors (45%). Lloyd et al. (2012) indicated in their study that the instructors with distance education experience approached it more positively than those without experience. A 2001 study by Grenzky & Maitland demonstrated that, while the majority (72%) of distance education instructors' views about distance education were positive, 14% of them were negative.

The study indicated that 52.17% of the changes in the views were about negative aspects in terms of students, while 47.83% of those were about positive aspects. After their experience in distance education, the instructors frequently mentioned “students’ opportunity to revise”, and “ensuring uninterrupted continuity of education” among the positive aspects of distance education. Similarly, in the Grenzky & Maitland (2001) study, the first reason for the instructors’ positive attitude to distance learning was that it could increase students’ access to education. In addition, they emphasized the importance of being able to learn at a place of their choice (location independence). The instructors who had not mentioned “interaction” before the experience in terms of the negative aspects of distance education also stated that interaction was a huge problem. Likewise, Grenzky & Maitland (2001) determined that the instructors were concerned about the lack of interaction. In this study, the negative effects of the fact that the students were under no obligation to attend classes were also felt. Contrary to the study, Ulmer et al. (2007) determined that the instructors experienced in distance education found it effective in terms of student performance and teacher-student interactions. This study indicated that “disciplinary problems” were among the changes in the views about negative aspects. Similarly, the instructors participating Otter et al. study (2013) stated that students are supposed to become more disciplined in the online environment.

The study determined that the changes in the views about the negative aspects in terms of instructors were 55%, those about the positive aspects were 45%. The changes in the views about the positive aspects were also grouped in the categories of “flexibility”, “accessibility”, “opportunity”, “saving”, and “individual”. Ensuring uninterrupted continuity of education, the increase in time for researches, and saving time were the most frequently mentioned codes. As regards the changes about the negative aspects, three sub-categories were formed, including “interaction”, “anxiety of the instructor”, and “technical problems”. The instructors stated that they suffered from technical problems that they had not mentioned before. In addition, the study revealed that problems related to “interaction” took the first place. Similarly, in Lloyd et al. (2012) study, lack of communication and technological problems are defined as barriers.

It was determined that 60% of the instructors felt themselves partially or completely productive while teaching with distance education. The study demonstrated that “not being able to communicate” was on the basis of the views of all the instructors who thought they were inefficient. Similarly, Conrad (2004) examined the views of instructors before and after their experience in distance education and determined, from the views expressed by the lecturers about their own performance, that their awareness of cooperative learning, social presence or community role related to “interaction” was low.

The present study revealed that, while more than half of the participants (55%) in the study wanted to teach in distance education again, 25% were not in favor of teaching in this environment under any circumstances because of interaction problems and inefficiency. The study by Güner et al. (2016) indicated that the participants were against teaching online. However, in Hartman et al. (2000) study, it was determined that 93.6% of the instructors wanted to continue teaching online.

The current study concluded that interaction was considered as a critical issue for all the instructors, whether they were experienced or inexperienced in distance education. Thus, instructors can be trained as regards the methods that will enhance interaction and can be encouraged to employ such methods. The study demonstrated that, for some of the instructors, teaching in the distance education environment was considered as timesaving. However, various studies indicate that an effective learning process in this environment requires more time and effort than in the traditional environment. Awareness can be raised about this subject among the instructors.

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Learner Autonomy in an Asynchronous Distance Education Environment Implemented through Frequent Instructor-Involvement

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ABSTRACT

The current study aims to clarify the autonomy levels of the students taught English Composition through asynchronous distance education which refers to the separation of learners and instructors both in terms of place and time. The data collection process was conducted at a public university in Georgia, USA. 40 students taking online English Composition Course as a core class were included in this study. In order to collect data, two different online surveys were used; one of them was implemented to the instructors and the other one to the students. The aim of the survey implemented to the instructors was to clarify their profile and the details of their teaching through asynchronous distance education. On the other hand, the student survey was to reveal students' autonomy levels in an asynchronous distance education process provided through frequent instructor and student involvement. The results obtained from the student surveys revealed that most of the students were able to run their learning process in an effective way in an asynchronous distance education process.

INTRODUCTION

In today's world, distance education has become more common than ever with the outbreak of Covid-19. Indeed, it maintains its popularity for years. Even though it is a necessity because of the Covid-19 Pandemic today, there are also some other reasons behind distance education's popularity. Having no place or time limitation, technology's being able to act as a bridge between the learners and the instructor(s), providing big number of learners with the educational opportunities at once... etc. may be among the reasons of the popularity of distance education.

Distance education is defined by Moore (1990) as a planned instructional process implemented by means of technology to the people who were included in planned learning without place (or time) limitation (cited in Moore, Dickson-Deane & Galyen, 2011). The distance education can be implemented in synchronous and asynchronous way. In synchronous distance education the learners and the instructor(s) are separate only in terms of place; but in asynchronous distance education, the learners and the instructor(s) are separate in terms of both place and time (İşman, 2011).

As there is a physical separation of teacher and learners in both synchronous and asynchronous distance education, it is important for the learners to be able to direct their own learning processes in an effective way. This is related to the learner autonomy which is defined as "ability to take charge of one's own learning" by Holec (1981). Additionally as stated in Fotiadou, Angelaki & Mavroidis (2017) learner autonomy is explained as *"the willingness of learners to be active, take control and supervise their own learning as well as to take risks and also, as the learners' ability to set goals, to act independently and to take decisions about choosing materials, methods and tasks"*. As the learners and instructor(s) are physically separate in a distance education process and the students need to direct their own learning, the importance of learner autonomy for such a learning environment cannot be ignored. Considering the mentioned issue, this study aims to clarify the autonomy levels of the students who are taught English Composition class through asynchronous distance education implemented with the frequent instructor-involvement at a public university in the USA.

LITERATURE REVIEW

Learner autonomy has crucial importance in all of the educational stages, but it gains more importance in a distance education environment in which the students need to direct their own learning process. Both learner autonomy and distance education are considered from different perspectives by the researchers. For example, the relationship between academic success and learner autonomy was investigated by Güneş & Alagözlü (2020); Hashemian & Soureshjani (2011); Tilfarlioglu & Ciftci (2011). Both Hashemian & Soureshjani (2011) and Tilfarlioglu & Ciftci (2011) revealed a significant and positive relationship between learner autonomy and academic success. Additionally, Güneş (2018) compared asynchronous distance learning with blended learning in terms of learner autonomy, motivation and academic success.

As for the related research in terms of the current study, two studies conducted in Turkey before the Pandemic revealed a low autonomy level for the learners taught at a distance. Altunay (2013) investigated the autonomy level of the students who were enrolled Turkish Open Education System and taught English through asynchronous distance education. The results showed that the students who were included in the study did not present autonomous behaviors.

Similarly, Güneş (2018) investigated the autonomy levels of the students taught English as a foreign language through asynchronous distance education. As stated in Güneş (2018), the distance education process was implemented in the following way at the related public university in Turkey. Except for the students who were studying in English-related faculties or Medicine, Dentistry and Law faculties and the ones who are taught vocational English, all of the freshmen were taught English through distance education at the related university. Before the academic year started, the lecturers had determined the subjects of grammar-based curriculum for an academic term (fifteen weeks). They prepared power point presentations and exercises for each week. A video recording related to the grammatical subject of each week was prepared. While watching the videos, the students were able to see both the lecturer and the power point presentation on the screen. The videos and quizzes (with answer key) prepared for a term were uploaded to an online system at once. At the beginning of the academic term, the lecturers went to the faculties which they had been appointed to and had a face-to-face meeting with the students. The lecturers gave information about how the students could use the online system to follow the classes and gave their contact details in case the students might need assistance. Even though English was an obligatory class for those students; they did not have to participate in the online classes on a weekly basis. On the other hand, they had to take mid-term and final exams to be able to pass the class in a face to face environment. During the term, the students were not given many assignments; they took the responsibility to participate in distance education process and pass the exams. The lecturers provided assistance when needed, but they were not actively involved in teaching process. As a result of Güneş (2018), a low learner autonomy level was revealed for the participants who were taught English through asynchronous distance education.

Concordantly, Abdelrazek (2018) studied the perceptions of the university students about their instructors' roles in terms of fostering learner autonomy. 30 participants included in the study were learning English as a foreign language. As a result of analyzing qualitative data obtained from the interviews, it was revealed that most of the participants thought that the instructors/teachers should train or guide the students on the way of being autonomous learners.

METHODOLOGY

Setting: This study was conducted at a public university which has four different campuses in Georgia, USA. Having different campuses is one of the reasons lying behind being popular in terms of distance education. It also offers online certificate programs and distance education is implemented in an asynchronous way. The students of 4 different instructors were involved in the study. The instructors were asked to reply an online survey including questions about their ways of distance teaching. When the features of current asynchronous distance education context and those of the instructors are considered, following aspects were revealed as the results of survey implemented to the instructors:

- The instructors' years of experience in terms of teaching at a distance were between 4 and 15 years.
- The class size was between 9 and 25 students.
- The frequency of instructor-involvement was seen as daily or at least two or three times in a week.
- All four instructors provided students with opportunities for active participation on at least a weekly basis.
- For teaching a usual unit, the instructors began with presenting the objectives and overview of the unit. The students were provided with the course materials such as books, book chapters/parts, videos, links to videos and presentations. The students were also required to submit assignments or attend distance discussion forums on a weekly basis and the instructors sometimes set short deadlines for the assignments in order to keep students on track. Additionally, for the assignments, the students were provided with feedback on the discussion board or through announcements and class e-mails.
- Formative assessment was used by all of the instructors included in the current study. The grades were determined by means of quizzes, discussion posts, writing and research assignments.

Participants: Totally 40 students taking online English Composition class were included in the study. They were taking English Composition as a core class. 61% of them were female and 39% of them were male.

Instrument: The survey developed by Güneş (2018) was used in order to collect data for the autonomy levels of the students. There were two parts in the survey. The first part included demographic questions in order to indicate the profile of the participants. In the second part, there were 12 items related to the learner autonomy.

Procedure: Before collecting data from the students, required permissions and approval for the research were obtained from Institutional Review Board (IRB) of the related university. After the methods used by the instructors while teaching English Composition at a distance were clarified by applying an online survey, the autonomy survey was implemented to the students in an online manner as they were taught totally online.

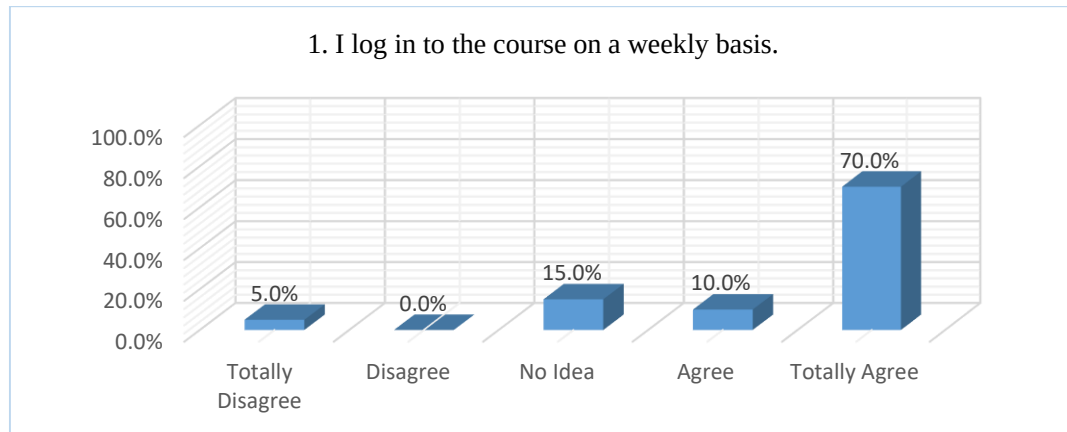
DATA ANALYSIS

The data derived from the surveys were analyzed statistically by using Jamovi (Version 1.0.1). The overall results for the autonomy levels of the participants are presented in Table 1 given below. It is seen that the mean autonomy score is 43, 20 out of 60. Additionally, as the Cronbach's Alpha value (0,815) revealed, the instrument used for collecting data is a highly reliable one.

Table 1. Autonomy level of the students participated in the current study

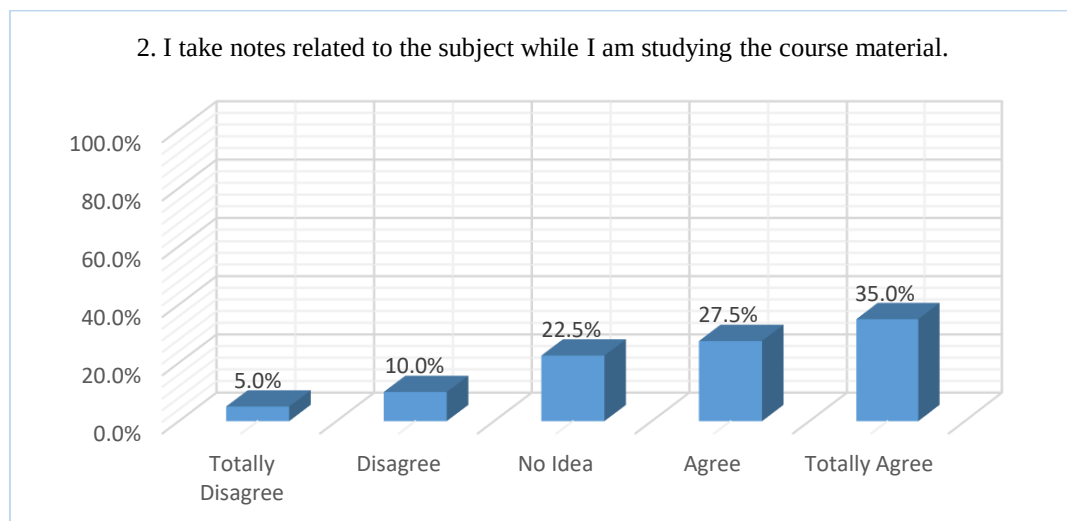
	Min.	Max.	Mean	SD	Cronbach's Alpha
Learner autonomy level	12	60	43,20	8,73	0,815

As for the participants' replies, following results are revealed. The results are presented by means of a graph for each item stated in the survey.



Graph 1. Results for Item 1 stated in the survey.

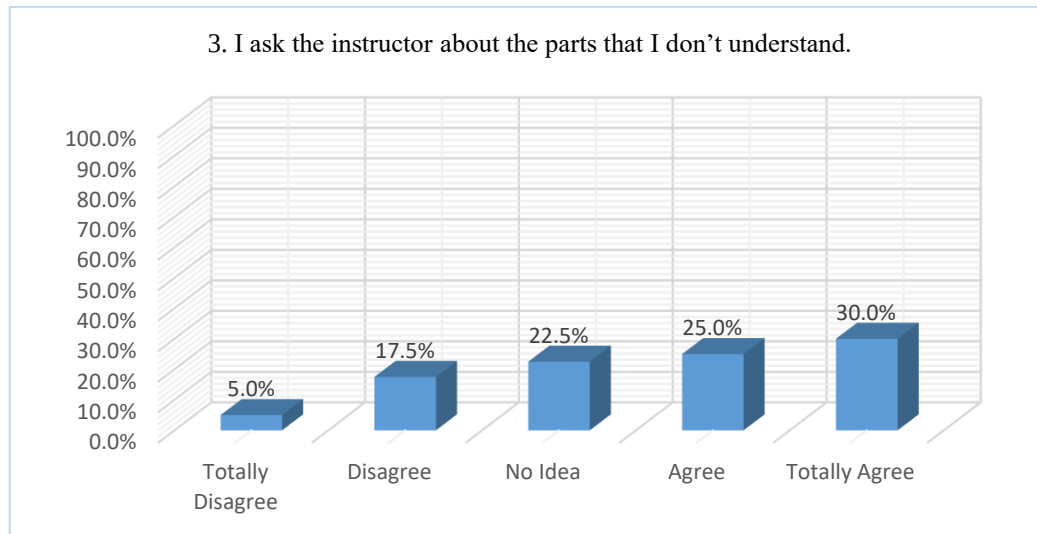
As seen in Graph 1, the students were asked whether they logged in to the online course on a weekly basis. When their answers for 'Agree' and 'Totally agree' are considered together, it is seen that 80 % of the students log in to the course regularly. Only 5% of the participants indicated a negative reply for this item.



Graph 2. Results for Item 2 stated in the survey.

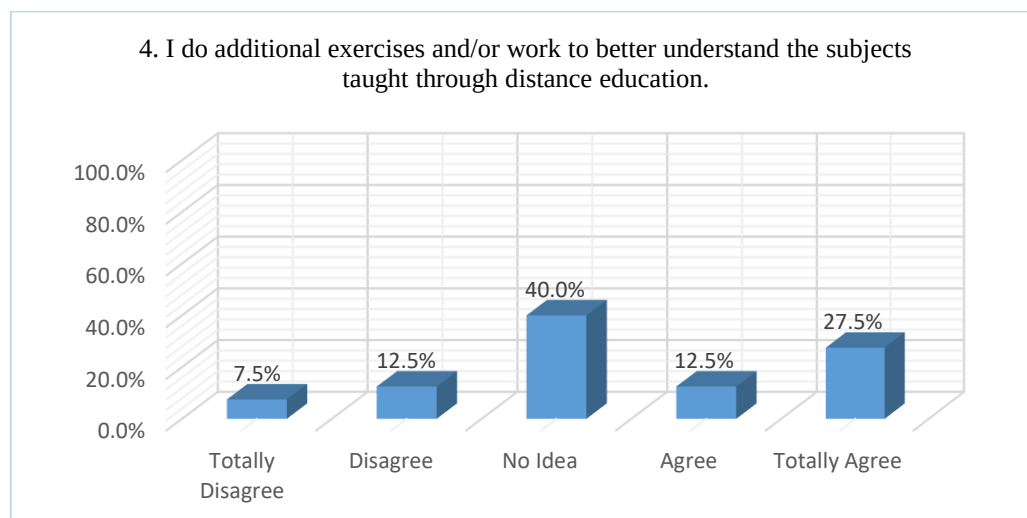
The second item of the survey was about whether the students took notes related to the subject while studying online course materials. The results revealed that 62, 5 % of the participants agree with this item (see Graph 2).

From far in the past, note-taking has been favored by the students as it is believed to effect the academic success in a positive way in terms of concentration, revision and recall, (Hartley & Marshall, 1974). It is also seen as a strategy used by autonomous learners (Xhaferi & Xhaferi, 2011).



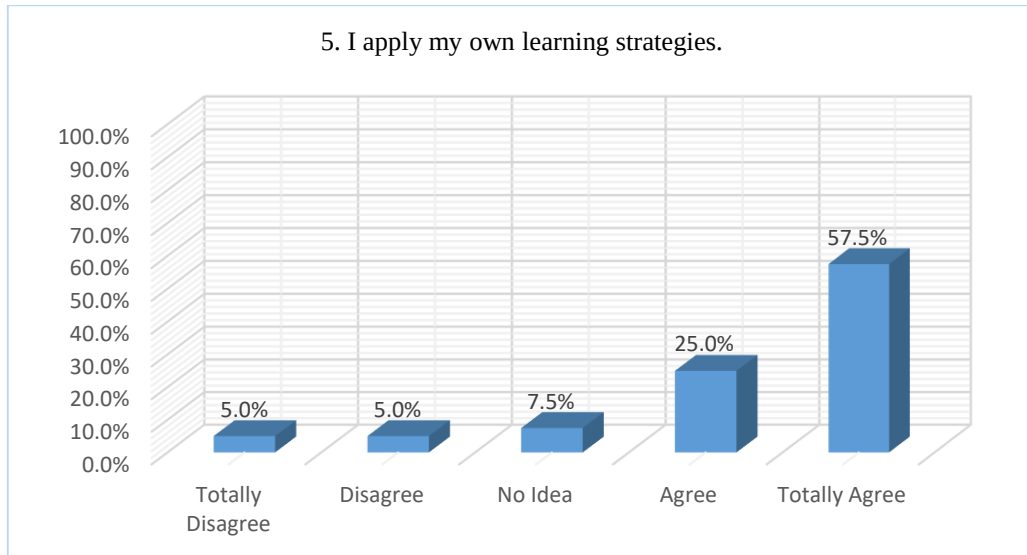
Graph 3. Results for Item 3 stated in the survey.

Having interaction with the instructor or asking the instructor while having a problem in terms of understanding what is taught shows that the students try to run their learning process effectively. These results reveal that more than half of the participants (55%) ask the instructor for support if they do not understand the subject (see Graph 3). According to the results of a research study (Xhaferi & Xhaferi, 2011), 65% of the students ask questions to get information that they need as a strategy for an effective learning process.



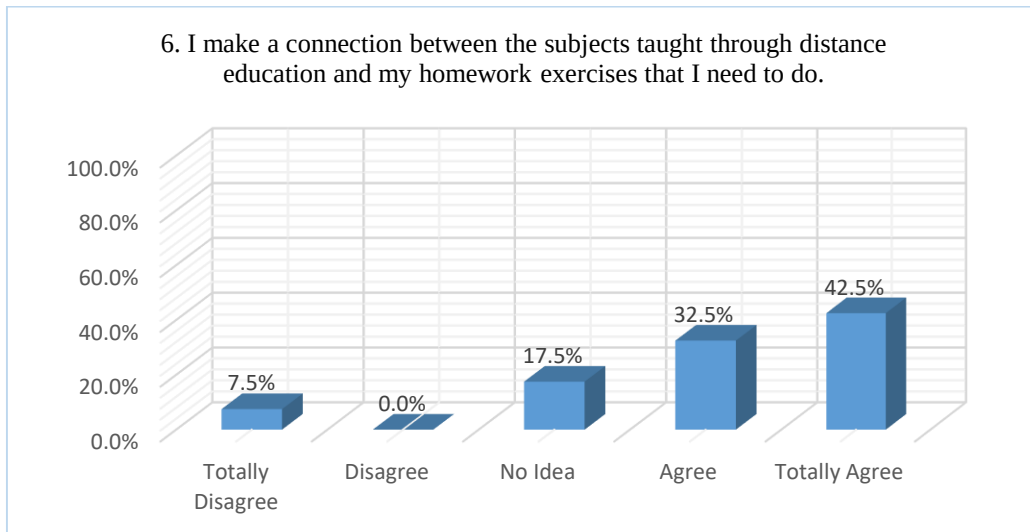
Graph 4. Results for Item 4 stated in the survey.

As shown in Graph 4, with this item, the students were asked whether they do additional exercises in terms the subjects taught through distance education or not. The results revealed that for a better understanding, 40% of the students do exercises in addition to the homework or exercises given by the instructor. 20 % of them do not do additional exercises.



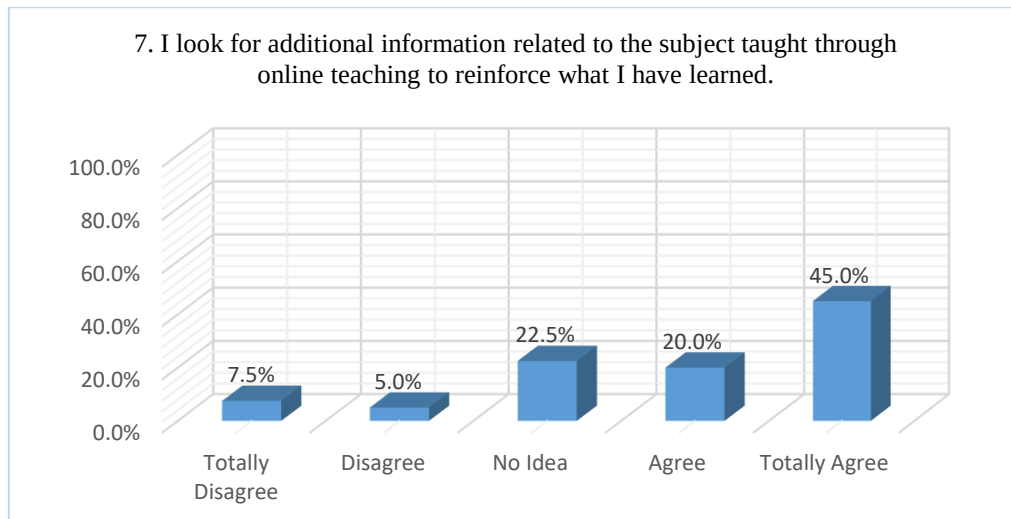
Graph 5. Results for Item 5 stated in the survey.

Graph 5 reveals the percentages of the students who apply their own learning strategies during the distance education process. According to the results, most of the students (82, 5%) apply their own learning strategies; because they are taught in an asynchronous way and they take the responsibility of their learning process with the guidance of the instructor. So, they need to find the best and most effective way for their learning. The results show that students included in the current study are aware of this and apply their learning strategies during asynchronous distance education.



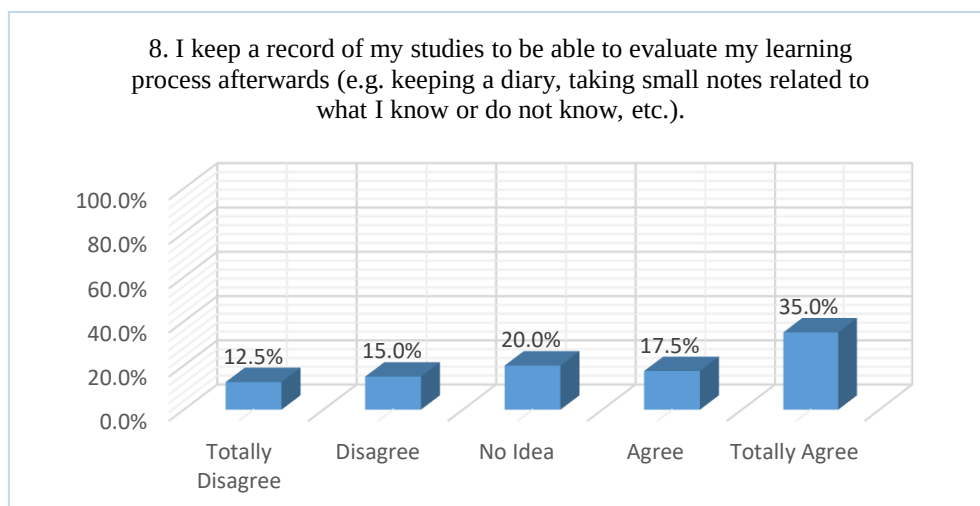
Graph 6. Results for Item 6 stated in the survey.

It is revealed by means of the results that 75 % of the students make connection between the subjects taught through distance education and their homework exercises; this means, they apply what is taught by the instructor to their own part of learning process and the rate of the participants who applied this strategy is high enough to mention about learner autonomy (see Graph 6).



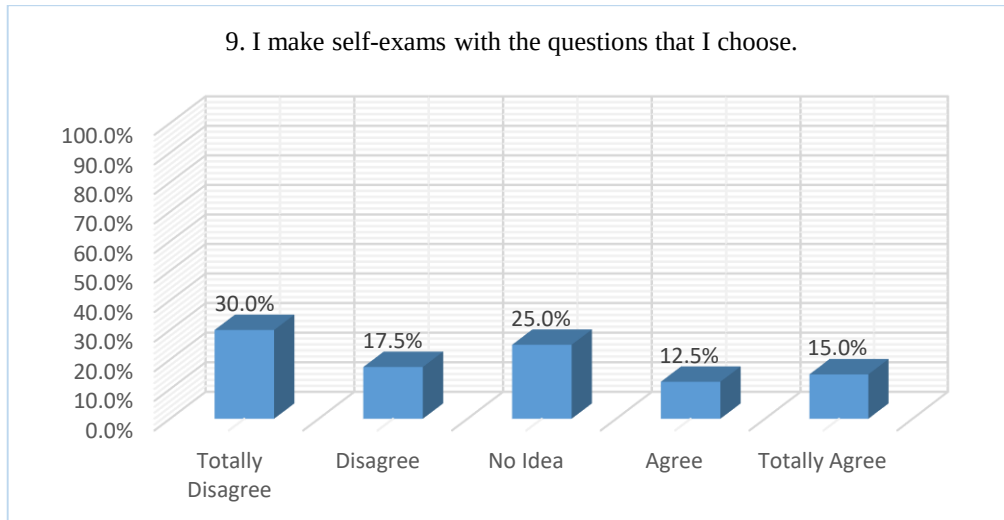
Graph 7. Results for Item 7 stated in the survey.

As stated in Graph 7, the students were also asked whether they look for additional information about what is taught through distance education to reinforce their learning. The results show that 65% of the students agree with this item. That is to say, they try to support their own learning in addition to what is taught by the instructor. The high ratio of the students who agree with this item may result from students' wish to contribute to their personal development in addition to reinforcing what they have learnt.



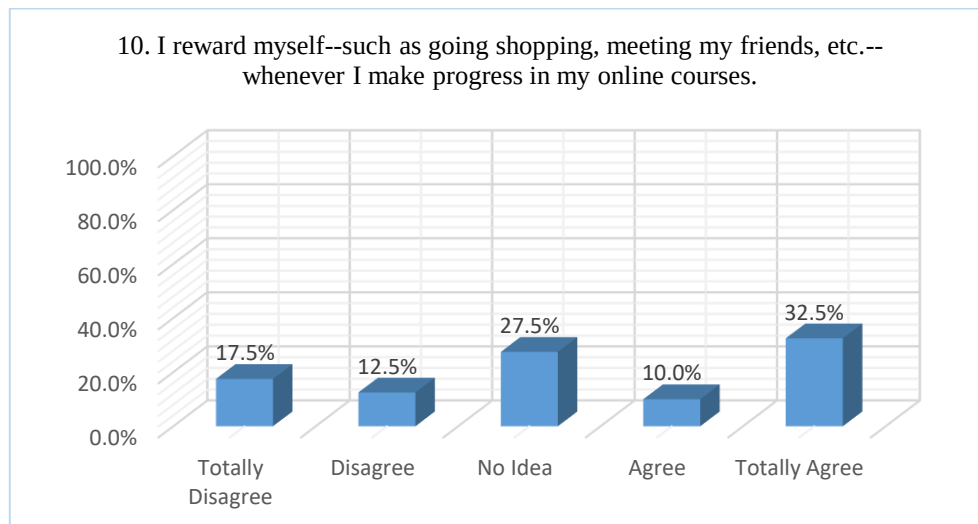
Graph 8. Results for Item 8 stated in the survey.

This item asking whether the students keep a record of their own studies in order to evaluate their distance learning process also aims to reveal whether the students have an effort to evaluate their distance learning process with its positive and negative sides. More than half of the students (52, 5%) included in the current study indicated a positive reply for this item (see Graph 8).



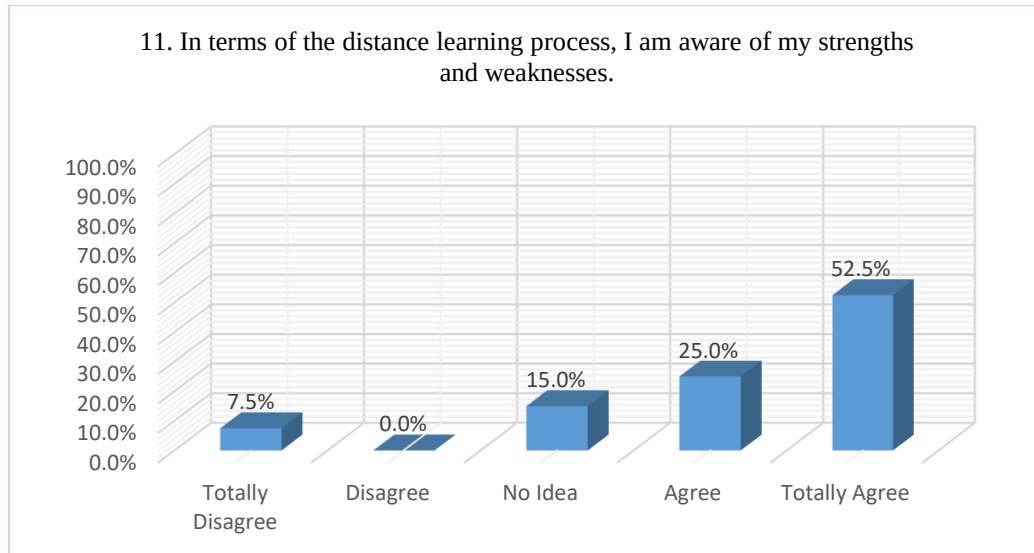
Graph 9. Results for Item 9 stated in the survey.

This item aims to clarify whether the students make self-exams with the questions that they choose in order to assess what they have learnt through distance education. A small rate of the students (27, 5%) agree and 47, 5% of the students do not agree with this item (see Graph 9).



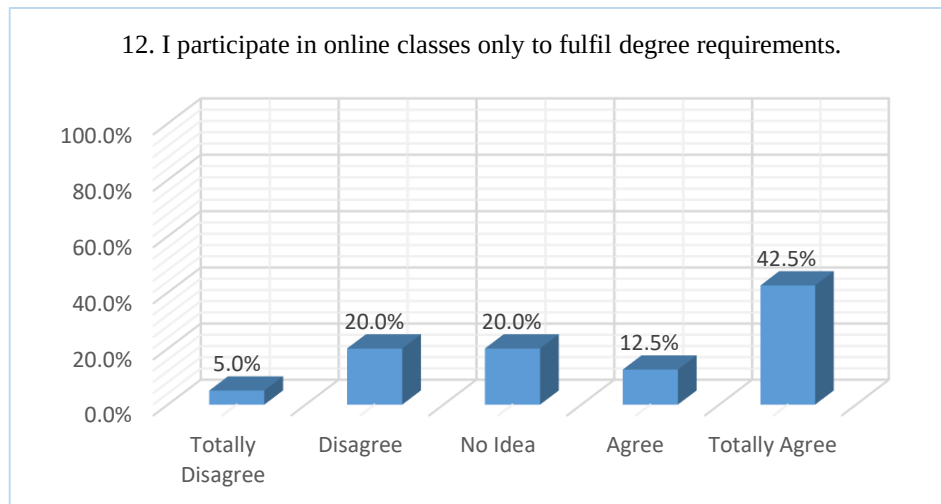
Graph 10. Results for Item 10 stated in the survey.

Motivation and autonomy are known to be correlated. Even if there are different opinions about the direction of the relationship between motivation and learner autonomy, it can be said that the more motivated a learner is, the more autonomous s/he will be or vice versa (Güneş & Alagözlü, 2020). Each learner motivates himself/herself in a different way. This item aims to clarify whether the students reward their progress in terms of what is taught through distance education. This may be a kind of motivating themselves in their learning process. 42, 5 % of the students agree and 30 % of them disagree with this item (see Graph 10).



Graph 11. Results for Item 11 stated in the survey.

This item aims to clarify whether the students are aware of their strengths and weaknesses in terms of their distance learning process; being aware of weaknesses and strengths in a learning process may be helpful for the learners to evaluate their learning. Additionally, this awareness may direct students to get rid of the deficiencies that they have in terms of their learning. As seen in Graph 11, 77, 5 % of the students participated in the current study agree with this item.



Graph 12. Results for Item 12 stated in the survey.

This item was placed in the survey in order to see whether passing the class or fulfilling the degree requirements was only reason of attending the classes regularly or the students attend the classes also for personal development. As shown in Graph 12, for 25% of the participants, fulfilling the degree requirements was not the only reason.

CONCLUSION and DISCUSSION

As stated previously, this study aims to reveal the learner autonomy level of the students taking English Composition as a core class at a public university in Georgia, USA. The statistical results revealed the mean score for the autonomy level of the participants as 43, 20 out of 60. It can be stated that most of the participants included in the current study presented autonomous behaviors in an asynchronous distance education environment. On the other hand, previous research studies that focused on students' autonomy levels in distance education environments clarified low autonomy levels for the students taught at a distance (Altunay, 2013; Güneş, 2018).

Altunay (2013) revealed that the students enrolled in Turkish Open Education system did not present autonomous behaviors while taking English classes through distance education. Similarly, according to the results of Güneş (2018), the mean learner autonomy score for the students who were taught English through asynchronous distance education was found as 22,89 out of 70 which refers to a low learner autonomy level. When the context and the

way of distance education are considered for Güneş (2018), it is seen that the instructor-involvement and interaction among the students and between instructor and students were at the minimum level. As stated in Güneş (2018), the low autonomy level might have resulted from the inadequate involvement of the instructors into the teaching process.

As for the result of the current study, a satisfactory autonomy level was clarified for the students who were taught English Composition class at a distance through frequent instructor-involvement. Both the result of this study and previous studies may be supported by the result of Fotiadou et al. (2017) who revealed a positive and significant correlation between learner autonomy and both student-student and lecturer-students interaction. Thus, the satisfactory autonomy level of the students in the current distance education context which was implemented through frequent instructor-involvement leading interaction among the students and between lecturer and students reveals the importance of instructor-involvement. Similarly, according to the results of Abdelrazek (2018), two-third of the participants included in his study think that learners need instructors' guidance or training to gain learner autonomy.

Another attention-grabbing feature for the current context is the formative assessment implemented by the instructors. The formative assessment may be helpful in terms of keeping students connection with the learning environment and materials (Güneş, 2018). Furthermore, by means of assessment tools implemented periodically, the students may be aware of their strengths and weaknesses and run their learning process accordingly.

PEDAGOGICAL IMPLICATIONS

The importance of learner autonomy is a nonignorable fact in an educational process; but it gains more importance in a distance education environment as the learners need to manage their own learning process. The guidance of the instructors have great importance for directing students on the way of being autonomous learners. So, the instructors should provide students with the guidance and the opportunities of active participation into the educational process. They should also take adequate time for virtual classes and keep students on track. It should always been considered that distance education is not leaving students alone after providing them with the course materials.

Furthermore, increasing learners' motivation may foster their autonomy as well. To present a content in accordance with the learners' needs, levels and background may be helpful in terms of increasing their motivation which may lead to a better autonomy level. Additionally, assessing students' achievement with a single instrument may decrease students' willingness to participate in the learning environment. Formative assessment may work to keep the connection between learners and learning environment; it also reveals students' strengths and weaknesses in the learning process. As Keller (2000) states students may wish to know what they have achieved; so receiving feedback, a fair grade or a promotion may help them feel the sense of achievement and all these may be possible with the adequate instructor-involvement.

To sum up, the research studies reveal different results in terms of different aspects that are effective in a distance education process. Even if there are many effective factors affecting the quality of distance education, the instructors should be aware of the importance of their roles and run the teaching process accordingly. In any case, instructors' involvement and correct guidance will open new doors for the students to be autonomous learners.

ACKNOWLEDGMENT

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Long-Term Effects on the Self-Perception of Biology Teachers about their Pedagogical Technological Content Knowledge (Tpack) Produced by an Online Teacher Development Program

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ABSTRACT

The objective of this study was to verify the immediate and long-term effects on the perception of 38 Biology teachers about their Technological Pedagogical Content Knowledge (TPACK) bases after their participation on an Online Teacher Development Program (TEP). These teachers answered the TPACK Questionnaire, which was applied as a data collection instrument inside the online course program. The comparison tests between the average scores obtained before and immediately after participation on the program showed that there are statistically significant differences in all post-tests obtained, with higher average scores than the respective pre-tests. The results of the average scores obtained in the post-test carried out immediately at the end of the course do not differ statistically from those obtained in the second post-test carried out one year after the end of the course. Taken together, the results indicate that foster a teacher training through online programs who focused on equipping the teacher to deal with the specific contents he has to teach in the classroom, coupled with the elaboration of action plans and subsequent reflection on the teaching practice, produced positive and lasting effects on their confidence in their TPACK knowledge bases.

Keywords: Pedagogical Technological Content Knowledge (TPACK), Biology Teaching, Teaching practice.

1. INTRODUCTION

Given the constant evolution of knowledge in today's society, the Brazilian government has encouraged and developed professional development programs for teachers as a means by which teachers can keep up to date (Brasil, 2006; Carvalho & Gil-Pérez, 2011; Gatti & Barretto, 2009; Rolando, Salvador, Souza, & Luz, 2014; Salvador, Crapez, Rolando, Rolando, & Magarão, 2010). This process of professional development starts from the initial training at the undergraduate level, corresponding to the learning period of future teachers in the qualification schools, as well as in the process of training in-service teachers, through programs promoted inside and outside of schools, considering different face-to-face and distance possibilities (Brasil, 2002).

Studies have indicated that participation in training processes, in which teachers can share their professional experiences, is an important opportunity to be offered in professional development programs (Bransford, Brown, & Cocking, 2007; Darling-Hammond & Bransford, 2005; Rolando et al., 2014; Shulman & Shulman, 2004; Villani, Almeida Pacca, & Freitas, 2009). From this perspective, the use of online professional development programs, including courses, activities and online interactions with tutors and peers (National Research Council, 2007; Treacy, Kleiman, & Peterson, 2002), especially promoting collaboration among teachers (Park, Oliver, Johnson, Graham, & Oppong, 2007; Rolando et al., 2014; Salvador, Rolando, & Rolando, 2012) would provide learning opportunities that, in a way, could meet the development needs of these professionals, as they this type of program takes advantage of the flexibility that the *Internet* can offer, giving teachers opportunities to keep up-to-date as they can access it at their convenience of time and space conditions (Dede, Jass Ketelhut, Whitehouse, Breit, & McCloskey, 2008).

Online professional development programs are provided through electronic technologies, and increasingly refer to web-based interactive experiences combining text, video and sound (National Research Council, 2007). Most of the time it is asynchronous, in that participants do not have to be involved in an activity at the same time, allowing more time for reflection on the proposed questions, questions and/or answers before interacting with tutors or peers (National Research Council, 2007). Thus, the potential benefits of an online professional development program are: flexibility and versatility; the potential for establishing teacher communities; and the possibility that teachers become more directly involved in their own learning and professional growth (Brown & Neal, 2013; National Research Council, 2007).

Regarding the focus of a professional development program for teachers, Bransford et al. (2007) state that the path to be built by researchers, managers of professional development programs and by the teachers themselves must be guided by a permanent search for better teaching, stimulating research and the implementation of new technologies in a contextualized way to the daily school life and, above all, for the reflection on the pedagogical action carried out. Thus, the exchange of experiences and the contextualization of shared knowledge in professional development activities should be related to the daily professional practice, in a continuous process of action-reflection-action (Alarcão, 2011; Bonzanini & Bastos, 2009; Schon, 1983).

In their daily routine, teachers experience complex situations, and to manage them, they need a set of knowledge that supports their decision-making processes for effective action in specific teaching and learning situations (Mishra & Koehler, 2006; Shulman, 1986, 1987). Among these types of knowledge are those related to the integration of information and communication technologies (ICTs) in teaching, especially Internet tools, which constitute a recently new set for current teachers, who for the most part cannot be considered digital natives - children and teenagers who have not known a world without internet (Prensky, 2001).

In fact, although in recent years international (BECTA, 2003; Crook, 2008; ISTE, 2008; UNESCO, 2008, 2011) and national institutions (Brazil, 2014; CONAE, 2010; Fidalgo-Neto et al., 2009) have identified the importance of integrating ICTs in the educational context, there seems to be a gap in relation to their use in teaching practice, since these tools remain on the margins of classrooms in basic education in Brazil (Couto & Filho, 2014). Some recent studies suggest that the use of ICTs by teachers is often limited to preparing texts for classes, downloading resources, personal email communication, and socializing with friends and relatives (Rolando, Salvador, & Luz, 2013; Rolando, Vasconcellos, Moreno, Salvador, & Luz, 2015). Few teachers use these tools in teaching practice (Rolando et al., 2013).

This study presents and discusses the results obtained from the responses of 38 biology professors to the Brazilian version of the TPACK Survey for Meaningful Learning questionnaire (Rolando, Salvador, Vasconcellos & Luz, 2018), before and after participating in an online professional development program. The teachers' perception of their TPACK knowledge prior to participating in the professional development program was compared with their own perception right after the end of the program, as well as their perception one year after the end of the program.

1.1. THE TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE THEORETICAL MODEL

According to the theoretical formulation outlined by Shulman (1987), an integration between the pedagogical knowledge and the specific contents to be taught would occur in the minds of experienced teachers. Based on experiences of teacher training for the integration of technology in teaching, Mishra & Koehler (2006) proposed the theoretical model called Technological Pedagogical Content Knowledge (TPACK), which adds the Technology component to the Shulman model (1987). The TPACK theoretical model can be schematically visualized from Figure 1, which presents the three primary knowledge bases (content [C], pedagogy [P] and technology [T]) and their connections, resulting in three new knowledge bases, in addition to the Pedagogical Content Knowledge proposed by Shulman. Altogether, these seven TPACK knowledge bases define a set of knowledge that teachers would need for an effective integration of technologies in teaching, which are characterized by Koh, Chai and Tsai (2012) as follows:

- Technological Knowledge (TK): Knowledge about technological tools.
- Pedagogical knowledge (PK): knowledge of teaching methods.
- Content Knowledge (CK): Knowledge of the content to be taught.
- Technological Content Knowledge (TCK): Knowledge of how to represent content using technology.
- Technological Pedagogical Knowledge (TPK): Knowledge of the use of technology to implement different teaching methods.
- Pedagogical Content Knowledge (PCK): Knowledge of teaching methods related to the content to be taught.
- Technological Pedagogical Content Knowledge (TPACK): Knowledge of the use of technology to implement teaching methods for different contents to be taught.

Shulman proposed that specific teaching topics could be represented through analogies, illustrations, examples, explanations and demonstrations in order to make the content more understandable to students. Mishra and Koehler (2006) claimed that new technologies could play an important role in each of these aspects. These technologies would have the potential to change the nature of the classroom, as they would provide a series of possibilities for representations and demonstrations that could help make the content more accessible to the student (Mishra & Koehler, 2006).

From this point of view, there is no single technological solution that applies to all teachers, courses, or pedagogical methods. Quality in teaching requires developing a nuanced understanding of the complex relationships between technology, content, and pedagogy. It also depends on knowing how to use this understanding to develop appropriate strategies and representations, specific to the context in question. (Koehler, Mishra, & Cain, 2013; Mishra & Koehler, 2006).

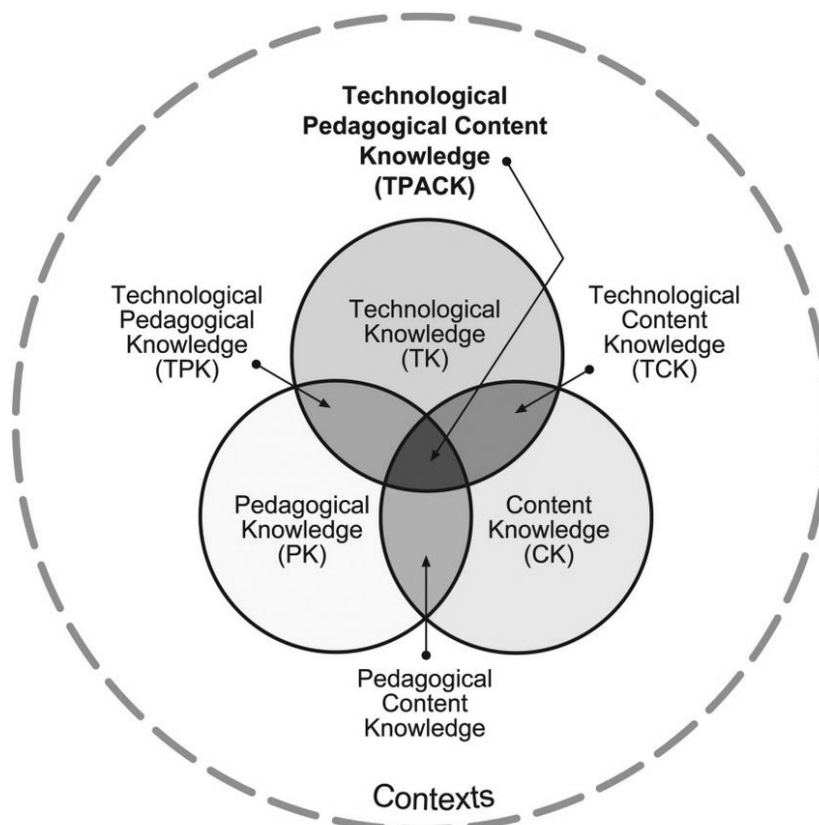


Figure 1: TPACK Framework

From the premises established in the TPACK framework, it is assumed that by relying on the content, pedagogy and technology tripod, online professional development programs could promote rich training environments. Such programs would aim to positively impact teachers' knowledge about the integration of ICTs in teaching practice. However, a recent systematic literature review, analyzing academic production about the TPACK framework in the Lusophone context, identified that none of the 60 articles found dealt directly with the assessment of teachers' perception about their TPACK bases (Rolando, Luz, & Salvador, 2015). Furthermore, no article proposed to analyze teachers' professional development strategies aimed at improving the knowledge bases involved in the CTPC model. In general, these studies investigated teachers' use made of technology, without actually making a methodological use of the TPACK framework in their research (Rolando et al., 2015). In other words, the possibility of evaluating the perception of teachers about their TPACK knowledge bases from their participation in professional development programs seems to be the threshold of current research.

The aim of the present study was to analyze the perception of Biology teachers about their knowledge bases related to technology, pedagogy and biology (content) after participating in an online professional development certificate program.

2. METHODOLOGY

2.1. STUDY CONTEXT

The Center for Science and Higher Distance Education of the State of Rio de Janeiro – Cecierj Foundation, an agency of the State Secretariat for Science, Technology and Innovation – SECTI, develops teaching and scientific dissemination activities in the State of Rio de Janeiro. Through the triad, higher education, university extension and Science public promotion, the Cecierj Foundation proposes that investing in the training of competent and autonomous professionals is the safest and most effective way to improve the State's Public Basic Education System. The Cecierj Foundation is the sponsor of the CEDERJ Consortium (consortium of the 7 public universities of Rio de Janeiro State) and collaborate with their Faculty and decision makers to create undergraduate and graduate online and blended degrees offered by these Universities.

In the last decade, Cecierj/Cederj Consortium has maintained Higher Education (undergraduate and graduate online programs) and extension actions in various areas of knowledge, offering many professional development actions to K12 teachers from the State of Rio de Janeiro. The production and management of online activities are centralized at its headquarters, with the support of information and communication technologies (ICTs), especially the Internet.

In 2012, a partnership was signed between the Cecierj Foundation and the Secretary of Education of the State of Rio de Janeiro (Seeduc), to offer a professional development graduate program through online and blended formats for teachers in the state education system in Rio de Janeiro. Teachers who complete a total of 6 courses in this program during the period of 18 months earn a Graduate Certificate degree in teaching practices in their area of expertise. The teachers were able also to use these earned credits into more advanced academic graduate programs offered for the Public Universities participants of the CEDERJ Consortium, who had previous collaboration with CECIERJ Foundation in this project and helped to develop these courses and programs. The goal of this graduate certificate program promoted by Seeduc and the Cecierj Foundation was to prepare a project that fill the gaps between the specific knowledge, didactic preparation and technology training for teachers by using the new curriculum proposed by the State of Rio de Janeiro. It happened through different actions including the elaboration of action lesson plans during the online courses, that increasingly seek the teacher's authorial autonomy (Rio de Janeiro State Department of Education, 2012).

2.2. THE ONLINE PROFESSIONAL DEVELOPMENT PROGRAM FOR TPACK TEACHER'S DEVELOPMENT

The courses from graduate certificate program offered by the Seeduc and Cecierj Foundation was characterized as an Online Educational program for Teacher Development, offered for the K12 teachers from the public schools of the state of Rio de Janeiro - Brazil. The course analyzed in this study was developed during the first two months of the 2015 school year, following the school calendar established by the curriculum of the state of Rio de Janeiro.

The course was structured and made available to participants in a virtual learning environment (VLE) built on the online educational platform Moodle (Modular Object-Oriented Dynamic Learning Environment). In the VLE there was the distribution of teaching material, the realization and delivery of online activities, as well as the interaction between the course participants and tutors responsible for conducting the online activities.

For a more interactive and personal relationship with the student, the distance tutoring system was used. In this system, each tutor attended about 15 participants during the entire period of the course. The tutor was responsible for guiding the participants in their doubts and evaluating the distance activities (DAs). Such assessments were based on comments that would lead the student to analyze and reflect on the concepts covered in the course. It was up to the tutors to also guide the course participants in the preparation of their action plan to be implemented in teaching practice. The focus of the tutoring was to create a relationship with the course participants that would reduce the effects imposed by geographic and temporal distance. The team of tutors was supervised by the team of teachers responsible for the program - Biology professors with a doctorate degree and experience in teacher training.

The dynamics employed in the course sought to establish a clear parallel between the topics proposed in the curriculum and classroom teaching. The course consisted of three stages: i) planning; and ii) implementation and iii) evaluation.

The planning stage lasted three weeks, in which the student became aware of the didactic material (set of texts, action scripts and learning objects aimed at teaching specific topics in Biology), participated in two thematic discussion forums and prepared an action plan related to one of the topics covered in the course: Biodiversity, Classification of living beings, Heredity, DNA and RNA, Evolution.

The action lesson plan is a didactic script prepared by the course teacher and applied in his classroom in basic education. The Action Plan is organized around the contents provided for by the curriculum for the current academic term. This plan contained the number of classes, the way in which the teaching topics would be worked with the students, the teaching and learning activities, the material and teaching resources to be used. The action lesson plan had the objective of previously organizing the performance of the course teacher in his classroom during the implementation/evaluation stage, as well reflect about the use in implementation of new educational technologies. At the same time the course participant prepared his action plan, he also participated in the online discussion forums, sharing information and ideas with his peers. In these forums, the course participants, along with the team of tutors, discussed the specific themes of the curriculum addressed in the course, especially, how to teach them and the use of possible new Educational Technologies.

The implementation and evaluation phases stage lasted two weeks. During this time, the teachers were part of in the “implementation online discussion forum”, while executing the action plan in their own classrooms. The purpose of this second discussion was to collaborate and share with their peers and instructors the progress of the action plan during the implementation process. At this stage, the evaluation process also took place collectively: the course participants exposed the issues and benefits related to the choices, resources and activities selected for their action lesson plans, in addition to exposing the barriers and successes in the real classroom application. Also as part of the evaluation phase, at the end of the course they submit a revised version of the action lesson plan with their reflections and analysis and self evaluation about the entire process.

2.3. PARTICIPANTS

The participants in this study were 38 Biology teachers from the state education system in the State of Rio de Janeiro. These teachers participated in the program offered by the Seeduc and Cecierj Foundation in 2015 and responded to the data collection instrument (see below). All teachers worked in the classroom at the time of the research.

2.4. DATA COLLECTION INSTRUMENT

To collect the data analyzed in this study, the Technological Pedagogical Content Knowledge Questionnaire (QTPACK) was used (Rolando et al., 2018). This instrument was translated, adapted and validated for the Portuguese language, from the original version developed and validated by Koh et al. (2012).

QTPACK contains 28 statements in a seven-point Likert scale format (strongly disagree, disagree, slightly disagree, neither agree nor disagree, slightly agree, agree, strongly agree). The purpose of the instrument is to measure the perception of teachers about their TPACK domain for the seven knowledge bases provided for in the TPACK framework.

The pre-test QTPACK was applied at the beginning of the course and the post-test QTPACK was applied immediately after the end of the course. 38 paired responses were obtained. One year after the end of the course, an invitation was made for these 38 respondents to respond to a second post-test. In all, 19 course participants answered the second post-test (50% response rate).

2.5. DATA ANALYSIS

Student's t-test (GraphPad Prism v.5 software) was used to compare the mean scores obtained from the QTPACK responses, for each of the seven TPACK knowledge bases.

3. RESULTS

Figure 2 shows the results of the mean scores for each of the seven TPACK knowledge bases obtained before the start of the course (pre-test) and immediately after its completion (post-test). Average scores of all post-tests were significantly higher than pre-tests. This dataset indicates that, on average, teachers felt more confident about their TPACK knowledge bases after participating in the online professional development program.

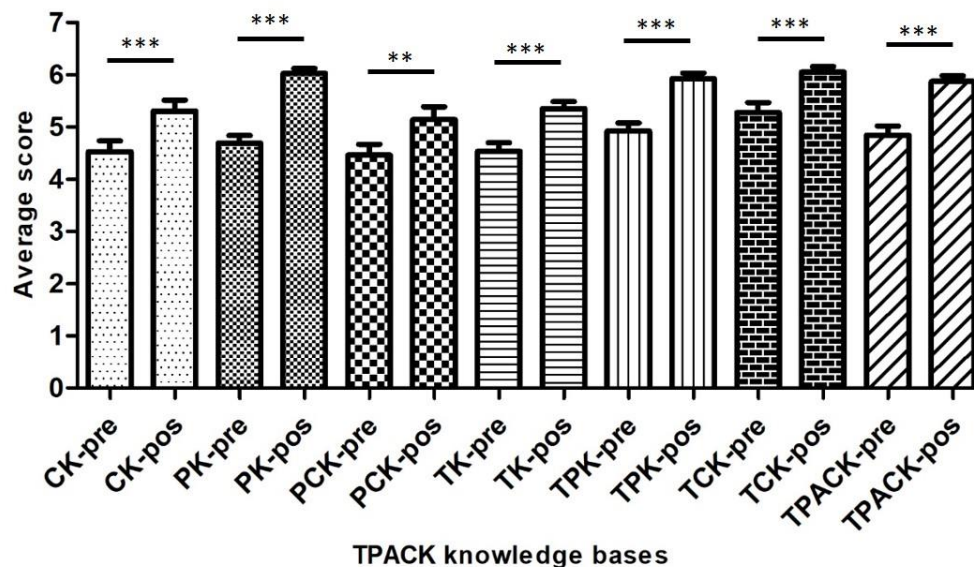


Figure 2: Comparison between pre and post QTPACK test. Teachers' perception of their knowledge bases (n=38, *** p<0,0001, ** p<0,001, t Student Paired).

Figure 3 shows the mean scores for each of the seven TPACK knowledge bases, obtained in the pre-test, post-test and second post-test of the 19 respondents who performed the three measurements. The comparison between the average scores obtained in the first post-test with those of the second post-test showed no statistically significant difference in any of the cases. That is, the variations between the average scores were minimal and possibly did not represent a change in the respondents' perception of their TPACK knowledge bases. These findings indicate that, one year after the end of the course, teachers remained more confident in relation to their knowledge bases TPACK.

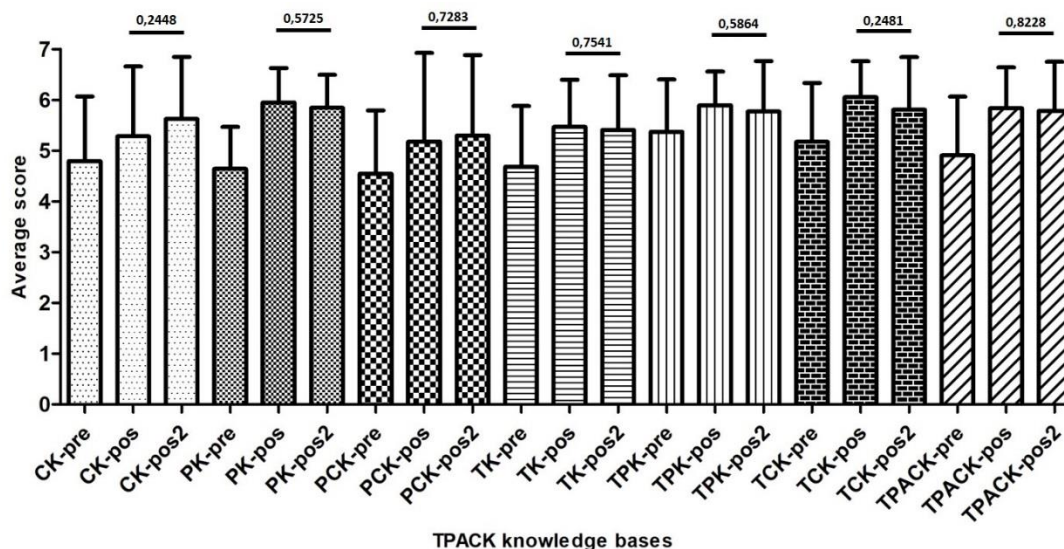


Figure 3: Comparison between mean scores after QTPACK tests. Teachers' perception of their knowledge bases (n=19, t Student Paired).

Table 1 presents a summary containing the details of the statistical comparison results between the average scores obtained before the start of the course (pre-test) and the average scores obtained in the first post-test, as well as the statistical comparison between the average scores obtained in the pre-test and the mean scores obtained in the second post-test of the 19 respondents who performed the three measurements. Except for two comparisons, CK-pre versus CK-pos, and TPK-pre versus TPK-pos2, in all other comparisons significant statistical differences were found, indicating that, in general, teachers felt more confident in relation to their TPACK knowledge bases, after participating in the online professional development program, even one (01) year after this participation occurred.

In general, the comparisons between the results of the average scores obtained in the pre-test and post-test indicate that there was a general, immediate, and lasting effect on the positive perception of teachers in relation to all seven TPACK knowledge bases.

4. DISCUSSION

The training of in-service teachers involves offering professional development opportunities based on an update process in relation to new technologies, conceptual discussions focused on the subject to be taught, in a search for reflection on the pedagogical action aimed at improving teaching (Bransford et al., 2007; Carvalho & Gil-Pérez, 2011; Darling-Hammond & Bransford, 2005). It should also consider opportunities for opportunities for exchanging experiences between teachers (Park et al., 2007; Rolando et al., 2014). The methodology presented in this study aimed to investigate whether the proposal to promote an online course would produce any change in their perception of their TPACK knowledge bases. This expectation of change was justified because the course was structured to pedagogically equip the Biology teacher to deal with the themes proposed in the curriculum. That is, what is required of the teacher to teach in the classroom, using for this the elaboration of an action plan and the subsequent reflection on the teaching practice performed.

The comparison between the results of the average pre-test and immediate post-test scores indicated that the general effect of participation in the course was the expansion of the teachers' positive perception in relation to all seven TPACK knowledge bases. More than that, when we verified the perception of a sample of these teachers one year after the end of the course, it was identified that the effects of increasing the scores remained.

Some studies carried out in the Asian context obtained results similar to those presented here. In Singapore, 343 trainee teachers participated in a 12-week course focused on preparing them to integrate ICT into teaching (Chai, Koh, Tsai, & Tan, 2011). The comparison between the mean scores obtained in the immediate pre- and post-test showed an increase in teachers' confidence in their knowledge bases CK, TCK, TPK and TPACK (Chai, Koh, Tsai, & Tan, 2011). The theoretical foundations of that course can be considered similar to those of the professional development program in this study. According to the authors, the growing perception of teachers in relation to the TPACK knowledge base indicates that they were more prepared to integrate ICTs in teaching after participating in the course (Chai, Koh, Tsai, & Tan, 2011).

In another study also carried out in Singapore, 102 practicing teachers participated in a professional development course focused on building lesson plans that integrate ICTs into teaching (Koh & Chai, 2014). The comparison between the average scores obtained in the immediate pre- and post-test indicated an increase in teachers' confidence in their knowledge bases TK, TPK, TCK and TPACK, that is, all knowledge bases related to the Technology component (Koh & Chai, 2014). According to the authors, these findings suggest that involvement in the development of teaching activities that integrate ICTs in teaching has a positive impact on teachers' perception of their knowledge bases (Koh & Chai, 2014).

Taking these results together we can speculate that participation in a professional development program was the only possible known variable that could cause a general increase in teachers' confidence about their knowledge bases. That is, the foundations on which the professional development program was established seem to be adequate to promote the lasting expansion of the teacher's confidence in their knowledge bases, especially those related to the integration of ICTs in teaching.

5. FINAL CONSIDERATIONS AND LIMITATIONS OF THE STUDY

The results presented in this study suggest that the use of an online professional development program for Biology teachers based on discussions of the subject to be taught, on the creation and application of teaching strategies and on reflection on pedagogical practice promoted an increase in perception of teachers in relation to their knowledge bases provided for in the TPACK theoretical model.

In general, the comparisons between the results of the average scores obtained in the pre-test and post-test indicate that there was a general, immediate and lasting effect on the positive perception of teachers in relation to all seven TPACK knowledge bases. Although these results of increased immediate perception and long-term retention on the TPACK knowledge bases are in agreement, it is worth noting that when we verify the average scores obtained in the pre-test and compare with those obtained in the immediate post-test and one after the end of the program (from the 19 teachers), no statistically significant differences were found between the CK-pre knowledge base and the immediate CK-pos knowledge base, as well as between the TPK-pre knowledge base and the TPK-pos 1 year knowledge base.

In the first case, the p value obtained for the Paired t Test was 0.0522, a value very close to the critical level of 0.05, which in statistics can be considered *approach significance*, which leads us to the hypothesis that a greater number of responding teachers could result in a p-value < 0.05. Corroborating this hypothesis, the comparison between the CK-pre knowledge base and the CK-pos 1-year knowledge base indicated that there was a statistically significant difference. Thus, we can speculate that this first case may be related to the small sample size, since the comparison between the CK-pre and immediate CK-pos knowledge base of the 38 respondent teachers was significant with a critical level value of $p < 0.0001$.

In the second case, although there was initially an increase in teachers' confidence in their pedagogical technological knowledge (TPK), this expansion was not maintained after one year. In this comparison, the p value was well above the critical value of 0.05, something that makes any speculation difficult from a statistical point of view.

A possible explanation for this result may be related to the fact that this knowledge base is not related to biological knowledge (CK). That is, since the professional development program was strongly linked to Biology themes, the TPK knowledge base, which deals with possible technologies that support pedagogical processes without emphasizing a theme of the curriculum addressed in the course, may not make much sense for the acting teacher in the classroom, especially after a long time has elapsed since the end of the professional development program.

Another limitation of the present study is related to the lack of control over possible intervening variables in the increase of teachers' perception in relation to their knowledge bases, since only teachers who participated in the course answered the pre- and post-test questionnaires. However, we must consider that the time elapsed between pre-test and the first post-test was relatively short. It seems unlikely, therefore, that the numerous differences observed in all bases in this period would have occurred with a group of teachers during their daily experiences, without any type of intervention. Still, new studies must be carried out, in order to corroborate or not these findings.

The use of a similar online professional development program could be tested with teachers from other areas of knowledge, basic education subjects such as Physics, Chemistry, Mathematics, Languages, History and Geography, in order to be able to generalize or not the confidence in the general fundamentals under which the specific program for Biology teachers was established.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study are available on request from the first author.

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Table 1: Summary of results comparing pre-test, first post-test and second QCTPC post-test. Teachers' perception of their knowledge bases (n=19, t Student Paired. Two-tailed. Number of pairs 19.
*p<0,05. **p<0,01. ***p<0,001).

Paired t test	P value	P value summary	Are means signif. different? (P < 0.05)	How big is the difference?			R squared	Correlation coefficient (r)	How effective was the pairing?		
				t, df	Mean of differences	95% confidence interval			P Value (one tailed)	P value summary	Was the pairing significantly effective?
CC-pre vs CC-pos	0,0522	ns	No	t=2.079 df=18	-0,4895	-0,9841 to 0,005188	0,1936	0,7020	0,0004	***	Yes
CC-pre vs CC-pos2	0,0107	*	Yes	t=2.849 df=18	-0,8263	-1,436 to -0,2169	0,3107	0,4882	0,0170	*	Yes
CC-pos vs CC-pos2	0,2448	ns	No	t=1.202 df=18	-0,3368	-0,9255 to 0,2518	0,07434	0,5634	0,0060	**	Yes
CP-pre vs CP-pos	P<0.0001	***	Yes	t=6.698 df=18	-1,305	-1,715 to -0,8958	0,7136	0,3736	0,0576	ns	No
CP-pre vs CP-pos2	P<0.0001	***	Yes	t=5.302 df=18	-1,200	-1,676 to -0,7245	0,6096	0,1207	0,3112	ns	No
CP-pos vs CP-pos2	0,5725	ns	No	t=0.5748 df=18	0,1053	-0,2795 to 0,4900	0,01802	0,2813	0,1217	ns	No
CPC-pre vs CPC-pos	0,0480	*	Yes	t=2.122 df=18	-0,6316	-1,257 to -0,006202	0,2001	0,6695	0,0009	***	Yes
CPC-pre vs CPC-pos2	0,0211	*	Yes	t=2.526 df=18	-0,7474	-1,369 to -0,1259	0,2618	0,6100	0,0028	**	Yes
CPC-pos vs CPC-pos2	0,7283	ns	No	t=0.3529 df=18	-0,1158	-0,8052 to 0,5736	0,006870	0,6353	0,0017	**	Yes
CT-pre vs CT-pos	0,0005	***	Yes	t=4.250 df=18	-0,7842	-1,172 to -0,3965	0,5008	0,7414	0,0001	***	Yes
CT-pre vs CT-pos2	0,0062	**	Yes	t=3.099 df=18	-0,7211	-1,210 to -0,2322	0,3480	0,6069	0,0029	**	Yes
CT-pos vs CT-pos2	0,7541	ns	No	t=0.3181 df=18	0,06316	-0,3540 to 0,4803	0,005589	0,6370	0,0017	**	Yes
CTP-pre vs CTP-pos	0,0154	*	Yes	t=2.677 df=18	-0,5263	-0,9393 to -0,1133	0,2848	0,5640	0,0059	**	Yes
CTP-pre vs CTP-pos2	0,2171	ns	No	t=1.279 df=18	-0,4000	-1,057 to 0,2570	0,08333	0,09828	0,3445	ns	No
CTP-pos vs CTP-pos2	0,5864	ns	No	t=0.5540 df=18	0,1263	-0,3527 to 0,6053	0,01677	0,3354	0,0802	ns	No
CTC-pre vs CTC-pos	P<0.0001	***	Yes	t=5.338 df=18	-0,8789	-1,225 to -0,5330	0,6129	0,8117	P<0.0001	***	Yes
CTC-pre vs CTC-pos2	0,0257	*	Yes	t=2.431 df=18	-0,6316	-1,177 to -0,08577	0,2472	0,4731	0,0204	*	Yes
CTC-pos vs CTC-pos2	0,2481	ns	No	t=1.194 df=18	0,2474	-0,1880 to 0,6828	0,07335	0,5159	0,0119	*	Yes
CTPC-pre vs CTPC-pos	0,0001	***	Yes	t=4.869 df=18	-0,9316	-1,334 to -0,5296	0,5684	0,6936	0,0005	***	Yes
CTPC-pre vs CTPC-pos2	0,0063	**	Yes	t=3.090 df=18	-0,8789	-1,477 to -0,2813	0,3466	0,3281	0,0851	ns	No
CTPC-pos vs CTPC-pos2	0,8228	ns	No	t=0.2272 df=18	0,05263	-0,4340 to 0,5393	0,002860	0,3595	0,0653	ns	No

Mobile Learning Motivation and Mobile Self-Efficacy of Pre-Service Teachers

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ABSTRACT

This study aimed at identifying mobile learning motivation and mobile self-efficacy level of pre-service teachers and relationship between mobile learning motivation and mobile self-efficacy. Concerning these aims, it adopted correlational design, which was one of the quantitative research approaches. 337 pre-service teachers were included in the study through convenience sampling. The participants were surveyed through two data collection tools which were Mobile Learning Motivation Scale (Okumuş Dağdeler, 2018) and Mobile Self-Efficacy Measure which was adapted from Computer Self-Efficacy Measure (Compeau & Higgins, 1995). The results showed that the pre-service teachers had a moderate and high level of mobile learning motivation and mobile self-efficacy. The mobile learning motivation and self-efficacy level of participants did not show any difference according to gender and field, while significant difference was observed in terms of mobile usage frequency. Furthermore, a linear positive correlation between mobile self-efficacy and mobile learning motivation was found. The regression analysis showed that mobile learning motivation was a significant predictor of mobile self-efficacy.

Keywords: mobile learning, mobile-self efficacy, mobile learning motivation, pre-service teachers

INTRODUCTION

The qualifications of teachers have been traditionally assessed through their professional knowledge which has three types: pedagogical knowledge, content knowledge, and pedagogical content knowledge. However, the era of information and technology has updated these qualifications. The classic model of professional knowledge is not sufficient to be an effective teacher today. Instructional planning, professionalism, learning environment, assessment, instructional delivery are some other main areas that a teacher should master (Stronge, 2018). Furthermore, some extra roles such as communicator, the learner, visionary, model, leader, adaptor, collaborator and risk-taker (Selli, 2017) are casted to teachers. In order to perform these roles successfully, teachers need some skills and affective behaviors such as motivation. Teachers are “transformational leaders” and “engine of this transformational drive” (p.3) of classrooms as they are in the best place for shaping them, and the thing that will provide this transformation is their motivation (Dörnyei & Kubanyiova, 2014). Thus, teacher motivation is also essential like student motivation for an effective educational environment. Not only motivation but also self-efficacy is crucial in this environment as people will have a more enhanced performance, creativity and persistence when they have self-efficacy for the action (Ryan & Deci, 2000a). Moreover, teachers require to have digital competence and knowledge nowadays when technology is interwoven in education. Being one of the latest theories combining education and technology, mobile learning has been affecting profoundly the learning processes. Considering this importance and potential relation between mobile learning, self-efficacy and motivation, this study examined the correlation between mobile self-efficacy and motivation for mobile learning which were addressed in the next section.

PEDAGOGICAL FRAMEWORK AND RELATED STUDIES

Mobile learning

Mobile learning presents new opportunities that surpass traditional practice, so it can be seen an obtrusive and transforming force (Kukulska-Hulme, 2019). Due to this force, it has taken its place in theory (research) and practice (classrooms) after the introduction and prevalence of mobile technologies. Early on, mobile learning, which is abbreviated as m-learning, is defined as any learning process using mobile devices in mobile environments (Trifonova, 2003; Ally, 2009; Colazza et al, 2003). However, it has been understood that there are some other “mobile” points other than technology in m-learning. According to MOBILEarn project (cited in Sharples et al., 2005), “it is the learner that is mobile, rather than the technology”. Similarly, El-Hussein and Cronje (2010) describe three areas of mobile learning which are mobility of technology, mobility of learning and

mobility of learners. They define m-learning as “any type of learning that takes place in learning environments and spaces that take account of the mobility of technology, mobility of learners and mobility of learning” (ibid, p.20). Kukulska-Hulme and Shield (2008) define m-learning as learning “anywhere and anytime”. It seems that using mobile devices for learning is not enough to describe m-learning. On the other hand, mobile devices are required to provide the mobility of learner and learning in that the situation of “anywhere and anytime” learning. M-learning unites the knowledge and techniques of conventional learning environments with the innovative characteristics of mobile devices in order to create an effective learning process (Khan & Gupta, 2021).

As m-learning is a new field of research, much attempt has been initiated in order to conceptualize it. Some researchers try to understand it by relating it to some previous theories such as Behaviorism, Constructivism, Blended Learning, Collaborative Learning, Active Learning, Situated Learning, Problem-based Learning, Conversational Learning, Socio-cultural Theory, Connectivism, Informal and Life-long Learning and Context Aware Learning (Taylor et al, 2006; Keskin & Metcalf, 2011; Özdamlı, 2012). M-learning benefits from these theories while forming its own theory. Some researchers try to present a pedagogical framework for m-learning. For instance, Park (2011) suggests four type of mobile-learning activities which are (1) high transactional distance socialized m-learning, (2) high transactional distance individualized m-learning, (3) low transactional distance socialized m-learning, and (4) low transactional distance individualized m-learning. Park (2011) grounds his pedagogy on transactional distance theory which is related to distance education. According to this theory, in distance education the learners and teachers are not only physically distant from each other but also psychologically (Moore, 1997). Moore (2007) defines transactional distance as “interplay of teachers and learners in environments that have the special characteristics of their being spatially separate from one another” (Moore 2007, p. 91). Based on this theory and the individuality and collaboration dichotomy of m- learning, Park (2011) categorizes m-learning into four types. The first type of m-learning which is high transactional distance socialized m-learning includes more psychological and communication space with instructors, group projects providing collaboration, predetermine program via mobile devices for learning materials and activities, and transactions mostly among the learners. In the second type which is low transactional distance socialized m-learning, we see again the psychological and communication space but here the transactions are mostly seen between content and learner. According to Park (2011), this type of m-learning is an extension of e-learning which is affected by context. Low transactional distance and socialized m-learning includes less psychological and communication space, not strictly structured instruction, social interaction, frequent communication, and group works trying to achieve a common goal. Lastly, low transactional distance individualized m- learning includes less psychological and communication space; it is not strictly structured instruction like type 3 but it differs from it in terms of individuality. This type involves interaction with the instructors who have control and lead the learners. Like Park (2011), Kearny et al. (2012) suggests three constructs that characterize the pedagogy of m-learning. These constructs are authenticity, collaboration and personalization. Personalization highlights self-regulation, autonomy, agency and learner choice. M-learning provides collaboration as it enhances peer interaction and feedback from instructors thanks to shared conversational space of mobile devices. Lastly, real-life practices, participatory and situated learning is emphasized in the construct of authenticity.

These frameworks imply that m-learning is not only related to presenting information through mobile devices but also to many other aspects of cognitive, affective and psychomotor domains of learning. As m-learning has also technological aspect, affective behaviors such as self-efficacy and motivation gain more importance as learners can be grouped as digital literal and non-literal who may not have sufficient technological skills and positive attitudes towards technology.

Mobile self-efficacy and motivation

Motivation is “a state of cognitive and emotional arouse, which leads to a conscious decision to act, and which gives rise to a period of sustained intellectual and/or physical effort, in order to attain a previously set goal (or goals)” (Williams & Burden, 1997; p. 23). Motivation is about a person’s “choice of a particular action, his/her persistence with it and her effort expended on it” (Dörnyei & Ushioda, 2012; p.4). According to Ryan and Deci (2000b) people can differ from each other in terms of level of motivation and motivation type. A classification of motivation that is mostly seen in literature is the dichotomy of intrinsic and extrinsic motivation. While intrinsic motivation is acting something out as “it is inherently interesting or enjoyable” (Ryan & Deci, 2000b, p. 55), extrinsic motivation is doing the action as it causes “a separable outcome” (ibid). Extrinsic motivation is related to external factors such as wishes to be awarded or appraisals for doing an action. On the other hand, intrinsic motivation comprises one’s own good feeling for doing an action. It is general thought that extrinsic motivation is less desired than intrinsic motivation. Lepper and Hodell (1989) address four sources of intrinsic motivation which are challenge, curiosity, control and fantasy (cited in Pintrich & Schunk, 2002). If the activities for the students are challenging, they feel more capable, which leads to a high self-efficacy. Some interesting or incongruous information that is different from what the students already know promotes curiosity which is

another source of motivation. Personal control on learning activities and intrinsic motivation have a positive correlation, and control enhances also self-efficacy. Finally, make-believe activities for students and fantasy will result in higher intrinsic motivation (Pintrich & Schunk, 2002). According to Pintrich and Schunk (2002), intrinsically motivated students practice and organize new information and relate it to their previous knowledge and use it in various context. These students also feel more efficacious. This process in a circular way as high self-efficacy enhances intrinsic motivation (Bandura, 1986, 1993). Cognitive self-motivation is mediated by affective self-evaluation, perceived self-efficacy and personal goal setting (Bandura, 1986). Ryan and Deci (2000a) also believe that people will have a more enhanced performance, creativity and persistence when they have self-efficacy for the action.

The abovementioned studies show that there is a strong relation between motivation and self-efficacy. Self-efficacy is people's belief in their skills required to perform the action (Bandura, 1977). According to Bandura and Adams (1977), self-efficacy affects individuals' effort and persistence in their experiences and obstacles that they face. High level of self-efficacy enhances more coping efforts. Thus, it is important to have high-level of self-efficacy what we need or want to achieve. Considering these findings, this study aimed at adapting this relation to mobile learning motivation and mobile-self efficacy.

The term of self-efficacy of Bandura (1977) has been adapted to technology in order to describe the technological efficacy of individuals sparking off the emergence of the concepts of "computer self-efficacy", "internet self-efficacy" and "mobile self-efficacy". Computer self-efficacy is the beliefs in one's own ability to use a computer (Compeau & Higgins, 1995) and internet self-efficacy is the personal judgement of ones' "capabilities to organize and execute courses of Internet actions required to produce given attainments" (Hsu & Chiu, 2004; p.369). In parallel with them, mobile self-efficacy (MSE) has been defined as "the judgment of one's capability to use a mobile device and its associated services, as well as judgment of the ability to apply those skills to broader tasks" (Lee & Hsieh, 2009, cited in Oakley & Palvia, 2012; p. 3). According to Keith et al (2011), as self-efficacy shows the belief in one's skills not the skill itself, it is important to understand the attitudes of learners towards mobile learning for comprehension of mobile self-efficacy. The research shows that the learners that have high level of self-efficacy have positive attitudes towards mobile learning. (Tsai et al., 2010; Yang, 2012, Nikolopoulou & Gialamas, 2017; Yorgancı, 2017). Like attitudes, MSE has also correlation with mobile device infusion, personal innovativeness, readiness towards m-learning, use intention, perceived ease of use, experience of technology use, learning achievement, perceived usefulness, smartphone and technology acceptance, and life-long learning attitudes of learners (Chen et al, 2011; Oakley & Palvia, 2012; Mahat et al, 2012; Ayub et al, 2018; Yorgancı, 2017; Chen, 2019; Bakhsh et al. , 2017; Hsiao & Chen, 2015; Liaw & Huang, 2015; Mac Callum & Jeffrey, 2013; Gan & Balakrishnan, 2017, Karaoglan Yılmaz, et al., 2018). The literature shows that mobile self-efficacy is in a relation with various variables. However, there is limited study on the correlation between mobile self-efficacy and mobile motivation although self-efficacy and motivation affect each other in their core concept. Moreover, the literature is lack of studies investigating pre-service teachers' mobile learning motivation and self-efficacy levels although there are some survey and experimental studies on students' motivation and self-efficacy for mobile learning (Olasina, 2012; Ciampa, 2013; Asplund, 2014; Lawrence, 2015; Huang et al. 2016; Okumuş Dağdeler, 2018; Nikou & Economides, 2018; Sari & Nurcahyo, 2018) In order to fill these gaps in literature, this study searched answers for those research questions:

1. What is the pre-service teachers' motivation level for mobile learning?
 - a. Does pre-service teachers' mobile learning motivation differ significantly in terms of their gender, field, grade and mobile application usage level and frequency?
2. What is the pre-service teachers' self-efficacy level for mobile learning?
 - a. Does pre-service teachers' mobile self-efficacy differ significantly in terms of their gender, field, grade and mobile application usage level and frequency?
3. What is the relationship between pre-service teachers' mobile learning motivation and mobile self-efficacy perceptions?
4. Is pre-service teachers' mobile learning motivation a meaningful predictor of their mobile self-efficacy?

METHODOLOGY

The relationship between pre-service teachers' mobile learning motivation and mobile self-efficacy perceptions was questioned in this study. The studies aiming at determining the presence or degree of co-change between two or more variables are carried out within the scope of correlational models (Büyüköztürk, Çakmak, Akgün, Karadeniz, & Demirel, 2017). Thus, the correlation between pre-service teachers' mobile learning motivations and mobile self-efficacy was revealed through correlational design with a descriptive perspective in accordance with the structure of quantitative research.

Population and sampling

The population of the research consists of pre-service teachers. Convenience sampling method was benefited to determine the sample and pre-service teachers studying at the education faculties of Sivas Cumhuriyet University, Tokat Gaziosmanpaşa University and Ondokuz Mayıs University were included in the study. During the research process, 382 pre-service teachers voluntarily expressed their views on their mobile learning motivations and mobile self-efficacy. As a result of the preliminary examination, it was observed that the data obtained from 337 pre-service teachers could be evaluated. The distribution of participants as to their gender, grade and field was presented in Table 1

Table 1: Distribution of participants in terms of gender, grade and field

Gender	n	%	Field	n	%	Grade	n	%
Male	51	%15.1	English Language Teaching	101	%30.0	1	45	%13.4
Female	286	%84.9	Pre-school Teaching	100	%29.7	2	166	%49.3
Total	337	%100	Elementary School Teaching	58	%17.2	3	67	%19.9
			Social Sciences Teaching	21	%6.2	4	59	%17.5
			Turkish Language Teaching	23	%6.8	Total	337	%100
			Other	34	%10.1			
			Total	337	%100			

Table 1 showed that the number of female pre-service teachers was higher than the male pre-service teachers. When the data of the Higher Education Council were examined, it was seen that there was a similar situation in terms of gender in education faculties (Higher Education Council, 2020).

Data Collection Instruments

Mobile Learning Motivation Scale (MLMS, hereafter) developed by Okumuş Dağdeler (2018) and Computer Self-Efficacy Measure developed by Compeau & Higgins (1995) and adapted to the mobile technology with the name of Mobile Self-Efficacy Measure (MSEM, hereafter) were used as the data collection instruments. In addition, a part where participants could specify their demographic information were created in the online survey in order to evaluate mobile learning motivations and mobile self-efficacy of pre-service teachers in terms of various variables such as gender, field, grade and level of mobile technology usage.

The validity and reliability studies of the MLMS were conducted, and it was found that the tool measured the mobile learning motivation with 17 items collected under 1 factor and explained 48.97% of the total variance. Cronbach Alpha reliability coefficient of the scale was 0.93. These results showed that the MLMS carried out valid and reliable measurements (Okumuş Dağdeler, 2018). The other scale used in the research process was the MSEM that was adapted from Computer Self-efficacy Measure (Compeau & Higgins, 1995). The scale was used, changing just the word of “computer” with “mobile learning”. Computer Self-Efficacy measure consisted of 10 items with 5 factors. Cronbach Alpha reliability coefficient of the whole scale was 0.87, which shows that it was a reliable scale.

Both scales were added to Google Forms. Firstly, the form was reviewed by two researchers, and then a pilot was done with 15 pre-service teachers. Based on this pilot phase, difficulties and problems (typing errors, narration errors, problems caused by the Google Forms application) were detected and corrected. Pre-service teachers were informed about the purpose of the research and how the research would use their answers. Pre-service teachers who confirmed to participate in this study voluntarily were expected to fill in the data collection instrument by accessing the relevant link. Data collection process continued between October 2019 - October 2020 due to the limitations of remote access. It was determined that a total of 382 data entries were made in Google Forms in this duration.

Data analysis

In order to analyze the data, data set including 382 participants was put into computer environment in Microsoft Office Excell format after retrieving from Google Forms. It was transferred to the SPSS 18 program. Before analysis, incorrect, extreme or duplicate data in the set were determined and it was decided not to include them in the research process. Thus, it was agreed on including the opinions of 337 pre-service teachers. Firstly, it was tested whether the data set met the normality assumption. In the Kolmogorov - Smirnov test results, it was observed that p values were below the level of 0.05. This situation can be interpreted as the data set did not show a normal distribution. However, Çokluk, Şekercioglu, and Büyüköztürk (2012) state that as the sample size increases, the probability of small differences to be significant also increases. For this reason, kurtosis, skewness coefficients, stem leaf plot, Q-Q plot and mean, mode, median values of the data were examined. These values related to MLMS and MSEM were presented in Table 2.

Table 2: Descriptive statistics on data set

Scale	N	Number of item	Mean	Median	Mode	Std. Deviation	Skewness	Kurtosis
MLMS	337	17	65.37	66.50	65	0.57	-0.17	-0.52
MSEM	337	10	35.03	34.40	35	0.32	0.12	-0.30

Table 2 indicated that the median, mode and average values of the MLMS and the MSEM were close to each other. Moreover, it was seen that the coefficients of skewness and kurtosis varied between -1 and +1 for both scales. These results can be interpreted in the way that data set was not far from the normal distribution, so it was decided to use parametric tests. T-test and One Way Analysis of Variance (ANOVA) test were used to test the significance of the differences between variables. Furthermore, correlation analysis and regression analysis were carried out to determine the relationship between mobile learning motivation and mobile self-efficacy perceptions of pre-service teachers through SPSS 18 program.

FINDINGS

The findings were presented in line with the research questions. Firstly, findings related to pre-service teachers' mobile learning motivation and mobile self-efficacy levels and then the correlation between them were given through tables.

What is the mobile learning motivation level of pre-service teachers?

The mean and standard deviation scores of the items in MLMS were presented in Table 3.

Table 3: Mean and standard deviation scores related to MLMS

Mobile learning motivations of pre-service teachers		$\bar{X}$	SS
1	I liked using mobile application.	3,70	0,96
2	I believed that I would learn the content as I worked on the mobile application.	3,64	1,01
3	The mobile application aroused curiosity.	3,55	1,02
4	I felt successful when I completed the activities in the mobile application.	3,79	0,99
5	The feedback given to the activities in the mobile application increased the feeling of receiving recompense for my efforts.	3,77	1,03
6	The variety of activities in mobile application enhanced my interest in learning.	3,65	1,03
7	The fact that mobile application was independent from the limitations of place and time increased my willingness to study.	3,89	1,07
8	Completing the activities in mobile application successfully increased my willingness to study.	3,89	0,99
9	I wanted to learn through mobile application as I was able to study in my own pace.	3,58	1,12
10	The organization of the content increased my belief on learning the content in the application.	3,62	1,00
11	I think that mobile application is a remarkable material.	3,69	1,09
12	Mobile application met my learning needs.	3,49	1,01
13	I learnt new things through mobile application.	3,98	0,95
14	It was funny to do the activities in the application.	3,68	1,05
15	The quality of the content in the mobile application provided the continuity of my attention.	3,51	1,10
16	I learnt better through mobile application.	3,52	1,11
17	It was important for me to complete the activities successfully in the mobile application.	3,89	0,98

Table 3 showed that mean scores of items were between 3.51- and 3.90, which could be commented as pre-service teachers' mobile learning motivation was at a moderate level. The findings related to the pre-service teachers' mobile learning motivation were presented in Table 4.

Table 4: Mobile learning motivation levels of pre-service teachers

Level	Frequency(f)	Percentage (%)	Range
Very low	12	3.5	0.00 – 1.80
Low	33	9.8	1.81 – 2.60
Moderate	76	22.5	2.61 – 3.40
High	120	35.8	3.41 – 4. 20
Very high	96	28.4	4.21 – 5.00
Total	337	100.0	

As can be seen in Table 4, %3.5 of the pre-service teachers had very low, 9.8% of them low, 22.5% of them medium, 35.8% of them high and 28.4% of them very high level of mobile learning motivation. Pre-service teachers' mobile learning motivation centered upon moderate and high levels.

Does the pre-service teachers' mobile learning motivation differ significantly in terms of their gender, field, grade, level and frequency and level of mobile application usage?

Table 5 shows the t-test results of MLMS based on the variable of gender.

Table 5: Gender differences in pre-service teachers' mobile learning motivation

Gender	n	$\bar{X}$	S	sd	t	p
Female	286	65.00	11.32	335	0.28	0.30
Male	51	65.44	10.45			

Table 5 indicated that there was no significant difference among pre-service teachers' mobile learning motivation levels in terms of gender ($p > 0.01$). According to the t-test results, gender did not have a significant effect on the mobile learning motivation of female ($=65.00$) and male ($=65.44$) pre-service teachers. ANOVA test results of MLMS based on teaching field were presented in Table 6.

Table 6: Teaching field differences in pre-service teachers' mobile learning motivation

Field	n	$\bar{X}$	Ss	Source of variation	Sum of squares	sd	Mean square	F	p
TLT	23	62.39	11.61	Between groups	1640.73	5	328.14	3.02	0.22
SST	21	61.47	10.24	Ingroups	35946.41	331	108.60		
EST	58	63.77	10.83	Total	37587.14	336			
PST	100	67.88	10.03	Groups showing difference (-)					
ELT	101	66.24	10.33	TLT: Turkish Language Teaching, SST: Social Sciences Teaching, EST: Elementary School Teaching, PST: Pre-school Teaching, ELT: English Language Teaching, OF: Other fields (Art Teaching, Music Teaching, Math Teaching, Science Teaching, Foreign Language Teaching)					
OF	34	62.58	10.32						
Total	337	65.37	10.57						

Table 6 indicated that the MLMS scores of the pre-service teachers did not show significant differences in terms of their field. ($F = 3.02$, $p = 0.22$). In other words, there was no significant relationship between the scores of MLMS and field. ANOVA test results of MLMS based on the variable of grade can be found in Table 7.

Table 7: Grade differences in pre-service teachers' mobile learning motivation

Grade	n	$\bar{X}$	Ss	Source of variation	Sum of squares	sd	Mean squares	F	p
1	45	66.24	9.70	Between groups	271.33	3	90.44	0.81	0.49
2	166	65.44	10.52	Ingroup	37315.80	333	112.05		
3	67	63.74	10.38	Total	37587.13	336			
4	59	66.37	11.56	Groups showing significant difference					
Total	337	65.37	10.57	-					

Table 7 showed that the MLMS scores of the pre-service teachers did not differ significantly in terms of their grade. ($F = 0.81$, $p = 0.49$). In other words, there was no significant relationship between MLMS scores and the grade of the pre-service teachers. ANOVA test results of MLMS based on pre-service teachers' mobile application usage level were as follows:

Table 8: Mobile application usage level differences in mobile learning motivation

Level	n	$\bar{X}$	ss	Source of variation	Sum of squares	sd	Mean squares	F	p
low	28	62.71	10.63	Between groups	3549.16	3	1183.05	11.57	0.00
moderate	141	62.27	10.47	Ingroup	34037.97	333	102.21		
high	123	67.44	9.57	Total	37587.13	336			
Very	45	71.08	10.05	Groups showing significant difference					
Total	337	65.37	10.57	low – high, low – very high, moderate – high, moderate – very high					

$p < 0.05$

As can be seen in Table 8, MLMS scores differed significantly in terms of the level of mobile application usage ($F = 11.57$; $p < 0.01$). Scheffe test was applied by taking the homogeneity test (Levene test = 0.65, $p = 0.58$) into account to determine which groups showed difference. The scores of pre-service teachers with a low level of mobile application usage (= 62.71) were lower than the scores of pre-service teachers with high (= 67.44). And very high (= 71.08) level of mobile application usage level. It was determined that the pre-service teachers whose mobile application usage level was medium (= 62.27) got lower scores than the pre-service teachers whose mobile application usage level was high (= 67.44) and very high (= 71.08). The pre-service teachers (= 67.44) with a high level of mobile application use got lower scores than the pre-service teachers whose mobile application usage level was very high (= 71.08). These findings showed that the mobile learning motivations of pre-service teachers differed according to the level of mobile application use. The pre-service teachers who had a high level of mobile application usage had high level of motivation for mobile learning. In addition, the mobile learning motivation of pre-service teachers with low and medium level of mobile application usage was lower than the pre-service teachers who had a high and very high mobile application usage level.

In Table 9, ANOVA test results of MLMS based on the variable of mobile application usage frequency were presented.

Table 9: Mobile application usage frequency differences in mobile learning motivation

Hours	n	$\bar{X}$	Ss	Source of variation	Sum of squares	Sd	Mean squares	F	p
1-2 hours	29	65.02	10.38	Between groups	1642.73	4	410.68	3.79	0.01
3-4 hours	40	60.45	10.28	Ingroup	35944.42	332	108.27		
1-2 hours day	125	65.02	10.38	Total	37587.14	336			
3-4 hours day	107	66.85	10.80	Groups showing significant difference					
5 + hours day	36	64.66	8.72	1-2 hours per day / 3-4 hours per week					
Total	337	65.37	10.57	3 – 4 hours per day / 3-4 hours per week					

$p < 0.05$

Table 9 indicated that there was a significant difference between pre-service teachers' mobile learning motivation in terms of frequency of mobile application use ($F = 3.79$; $p < 0.01$). According to the results of Scheffe test, which was applied considering the homogeneity test (Levene test = 1.04, $p = 0.37$) to determine between which groups the significant difference was, the scores of pre-service teachers whose mobile application use time was 1-2 per day (= 65.02) were higher than the pre-service teachers with scores of 3-4 hours in a week (= 60.45). It was observed that the pre-service teachers whose mobile application use time was 3-4 hours a day (= 66.85) got higher scores than the pre-service teachers whose mobile application usage duration was 3-4 hours in a week (= 60.45). According to these findings, pre-service teachers' motivations for mobile learning differed according to the frequency of mobile application use. It can be commented that pre-service teachers who used mobile applications for 3 - 4 hours in a day and 1 - 2 hours in a day had also high motivation for mobile learning.

What is the mobile self-efficacy level of pre-service teachers?

The mean and standard deviation scores related MSEM were presented in Table 10.

Table 10: Mean and standard deviation scores related to MSEM

I could use m-learning		$\bar{X}$	SS
1	even if there was no one around to tell me what to do.	3,77	1,02
2	even if I had never used a mobile device like it before.	3,83	0,93
3	if I had only the mobile device manual for reference.	2,83	1,17
4	if I had seen someone else using it before trying it myself.	2,77	1,21
5	if I could call someone for help if I got stuck.	3,40	1,10
6	if someone else had helped me get started.	2,97	1,21
7	if I had a lot of time to complete the task for which the mobile device was provided.	3,45	1,05
8	if I had just the built-in help facility for assistance.	3,43	1,06
9	if someone showed me how to do it first.	3,86	0,97
10	if I had used similar mobile devices before this one to do the same task.	3,81	1,05

As can be seen in Table 10, the mean scores of pre-service teachers regarding the items in MSEM varied between 2.77 and 3.90. Based on these findings, it can be said that pre-service teachers' perceptions of mobile self-efficacy were generally at medium level. Findings related to the pre-service teachers' perceptions of mobile self-efficacy were presented in Table 11.

Table 11: Pre-service teachers' mobile self-efficacy levels

Level	Frequency(f)	Percentage (%)	Range
Very low	15	4,5	0.00 – 1.80
Low	38	11,3	1.81 – 2.60
moderate	118	35,0	2.61 – 3.40
high	128	38,0	3.41 – 4. 20
Very high	38	11,2	4.21 – 5.00
Total	337	100.0	

Table 11 showed that 4.5% of the pre-service teachers in the sample had a very low level of mobile self-efficacy, 11.3% of them low, 35.0% of them medium, 38.0% of them high and 11.2% of them very high level of mobile self-efficacy. This finding can be interpreted as pre-service teachers' motivations for mobile learning were at moderate and high levels.

Does pre-service teachers' mobile self-efficacy differ significantly in terms of gender, field, grade, and mobile application usage level and frequency variables?

Table 12 shows the t-test results of MSEM based on the variable of gender.

Table 12: Gender differences in pre-service teachers' mobile self-efficacy

Gender	n	$\bar{X}$	S	sd	t	p
Female	286	34.90	5.78	335	0.94	0.46
Male	51	35.70	6.18			

According to the Table 12, there was no significant difference between pre-service teachers' mobile self-efficacy in terms of gender ($p > 0.01$). According to the t-test results, gender did not have a significant effect on the self-efficacy perceptions of female (34.90) and male (= 35.70) pre-service teachers using mobile technology. Table 13 shows the ANOVA test results of MSEM based on the variable of field.

Table 13: Differences related to field in pre-service teachers' mobile self-efficacy

Field	n	$\bar{X}$	Ss	Source of variation	Sum of squares	sd	Mean squares	F	p
TLT	23	34,18	5,55	Between groups	178,75	5	35,75	1,05	0,39
SST	21	35,75	6,01	Ingroup	11319,90	331	34,20		
EST	58	35,81	5,52	Total	11498,64	336			
PST	100	34,43	4,97	Groups showing significant difference (-)					
ELT	101	35,09	7,35	TLT: Turkish Language Teaching, SST: Social Sciences Teaching, EST: Elementary School Teaching, PST: Pre-school Teaching, ELT: English Language Teaching, OF: Other fields (Art Teaching, Music Teaching, Maths Teaching, Science and Technology Teaching)					
OF	34	34,47	6,14						
Total	337	35,03	5,85						

Table 13 showed that the scores of the pre-service teachers in MSEM did not differ significantly in terms of their field. ($F = 1.04$, $p = 0.39$). In other words, that there was no significant relationship between the field and mobile self-efficacy of pre-service teachers.

ANOVA Test results of MSEM based on pre-service teachers' grade were shown in Table 14.

Table 14: Grade differences in pre-service teachers' mobile self-efficacy

Grade	n	$\bar{X}$	Ss	Source of variation	Sum of squares	sd	Mean squares	F	p
1	45	35.00	4.80	Between groups	296.74	3	98.91	1.34	0.33
2	166	35.92	5.63	Ingroup	11201.90	333	33.64		

3	67	33.85	6.19	Total	11498.64	336
4	59	33.92	6.47	Groups showing significant difference		
Total	337	35.03	5.85	-		

As can be seen in Table 14, MSEM scores of the pre-service teachers did not differ significantly in terms of grade. ($F = 1.34$, $p = 0.33$). In other words, there was no significant relationship between the pre-service teachers' grade and mobile self-efficacy.

ANOVA test results of MSEM based on mobile application usage level were presented in Table 15.

Table 15: Mobile application usage level differences in pre-service teachers' mobile self-efficacy

Level	n	$\bar{X}$	ss	Source of variation	Sum of squares	sd	Mean square	F	p
Low	28	35.07	5.68	Between groups	502.24	3	167.41	5.07	0.00
Moderate	141	33.64	4.83	Ingroup	10996.40	333	33.02		
High	123	36.16	6.16	Total	11498.64	336			
Very high	45	36.29	7.12	Groups showing significant difference					
Total	337	35.03	5.85	<i>Moderate – High; moderate – Very high</i>					

$p < 0.05$

As stated in Table 15, MSEM scores showed significant difference as to the mobile application use level ($f = 11.57$; $p < 0.01$). According to the LSD test results, which was applied considering the homogeneity test (Levene test = 2.62, $p = 0.92$) in order to determine groups showing difference, the scores of pre-service teachers whose mobile application usage level was medium (= 33.64) were lower than pre-service teachers with high (= 36.16) and very high (= 36.29) level. According to these findings, the pre-service teachers' mobile self-efficacy differed according to the level of mobile application usage. The pre-service teachers who had a high and very high level of mobile application use had also a high level of mobile self-efficacy. In addition, the mobile self-efficacy of pre-service teachers whose mobile application usage level was medium was lower than the pre-service teachers whose mobile application usage level was high and very high.

ANOVA results of MSEM based on mobile application usage frequency were presented in the following table.

Table 16: Mobile application usage frequency differences in mobile self-efficacy

Hours	n	$\bar{X}$	Ss	Source of variation	Sum of squares	Sd	Mean squares	F	p
1-2 hours per week	29	35,21	5,72	Between	69,22	4	17,30	0,50	0,73
3-4 hours per week	40	34,23	5,33	Ingroup	11429,43	332	34,43		
1-2 hours per day	125	34,75	5,85	Total	11498,64	336			
3-4 hours per day	107	35,58	6,05	Groups showing significant difference					
5 + hours per day	36	35,14	6,05	-					
Total	337	35,03	5,85						

Table 16 indicated that the scores of the pre-service teachers in MSEM did not show significant difference in terms of mobile application usage frequency. ($F = 0.50$, $p = 0.73$). In other words, there was no significant relationship between pre-service teachers' mobile self-efficacy and frequency of mobile application use.

What is the relationship between pre-service teachers' mobile learning motivations and mobile self-efficacy perceptions?

Correlation Analysis results regarding the relationship between the pre-service teachers' scores of the MSEM and the MLMS were presented in the Table 17.

Table 17: Results of correlation analysis

Variable	n	r	p
Mobile learning motivation	337	0.48	0.00
Mobile learning self-efficacy			

$P < 0.01$

Table 17 showed that there was a significant relationship between the mobile learning motivations of the pre-service teachers and their mobile self-efficacy perceptions. It was observed that there was a moderate, positive ($r = 0.48$, $p < 0.01$) relationship between their mobile learning motivations and mobile self-efficacy.

Is the pre-service teachers' mobile learning motivation a significant predictor of their mobile learning motivations?

Regression analysis results analyzing the prediction of mobile learning motivations of pre-service teachers for mobile self-efficacy were expressed in Table 18.

Table 18: Regression analysis results related to pre-service teachers' mobile self-efficacy

R	R ²	ΔR^2		B	sd	β	t
0.48	0.23	0.23	Stable	34.87	3.07		11.33
			Mobile self-efficacy perception	0.87	0.87	0.48	10.07

P<0.01

The table indicated that the mobile learning motivations of pre-service teachers were a significant predictor for the mobile self-efficacy ($r = 0.48$, $r^2 = 0.23$; $F = 11.33$, $p < 0.01$). In addition, it can be stated that pre-service teachers' mobile learning motivations explained 23% of the total variance regarding mobile self-efficacy.

DISCUSSION

Motivation and self-efficacy are important for both learning and teaching processes. Being still students but also the future teachers, pre-service teachers need both learning and teaching motivation and self-efficacy. The age that we experience forces learners and teachers to use mobile technologies in their educational process. Thus, the terms of mobile learning motivation and mobile self-efficacy become under interrogation. This study investigated mobile learning motivation and self-efficacy level of pre-service teachers at the first phase as it was believed that mobile learning increased motivation (Sari, Nikou & Economides, 2018). It was found that the motivation level of pre-service teachers was at a moderate level. Some studies in the literature also show that motivation level of learners for mobile learning was high (Olasina, 2012; Asplund, 2014) and moderate (Lawrence, 2015). In this regard, this study supported the findings in the literature. Moreover, mobile technology usage frequency was found to be a significant variable for mobile learning motivation. The participants who used mobile applications more frequently had higher motivation. This finding contradicts with the study of Okumuş Dağdeler (2018) who found that there was no relationship between the frequency of using mobile applications and mobile learning motivation.

At the mobile self-efficacy dimension, it was found that mobile self-efficacy levels of pre-service teachers was at moderate and high level. Mahat et al. (2012) also found that self-efficacy of students for mobile learning was at moderate level while it was at a high level in the study of Yang (2012), and Nikolopoulou and Gialamas (2017). Moreover, this study found that there was not significant difference in pre-service teachers' mobile self-efficacy based on gender and field, which supported the findings of Yorgancı (2017).

The analysis showed similar findings for motivation and self-efficacy. Both motivation and self-efficacy of pre-service teachers were at moderate levels. Although mobile self-efficacy and mobile learning motivation of pre-service teachers did not show a relationship between gender, teaching field and grade, both of them were related with mobile technology usage frequency. Pre-service teachers using mobile applications more frequently had higher level of mobile learning motivation and self-efficacy. This finding is in parallel with some other studies focusing educational technologies. For example, Kutluca & Ekici (2010) found that computer usage frequency affected self-efficacy perceptions regarding computer-assisted education. Similarly, Efe and Baysal (2017) concluded that using educational technologies had a positive correlation with technology self-efficacy and motivation.

The correlation analysis supported the relation between mobile learning motivation and mobile self-efficacy. If mobile learning motivation increases, mobile self-efficacy also increases and vice versa. This finding is new to literature as studies on relation mobile learning motivation and mobile self-efficacy was not encountered in literature as to our knowledge. However, the strong relation between motivation and self-efficacy (Bandura, 1986; Ryan & Deci, 2000; Pintrich & Schunk, 2002) can be regarded as a base for the relation between mobile learning motivation and mobile self-efficacy.

CONCLUSIONS

The findings of this study which aimed at identifying pre-service teachers' mobile learning motivation and mobile learning self-efficacy and the relationship between them can be summarized as follows:

- The mobile learning motivation of pre-service teachers are at moderate level. Besides, their motivation does not differ as to their gender, field and grade while it differs as to mobile application usage level and frequency.
- The mobile self-efficacy of pre-service teachers are at moderate and high level. Besides, their motivation does not differ in terms of their gender, field, grade and mobile application usage level while it differs in terms of mobile application usage frequency.
- There is a positive relationship between mobile learning motivation and mobile self-efficacy of pre-service teachers.
- Mobile learning motivation of pre-service teachers is a significant predictor of their mobile self-efficacy.

Based on these findings, it is recommended for teacher educators to include mobile learning more often in their teaching process as the mobile application usage frequency increases both mobile learning motivation and mobile self-efficacy. Assisting teachers of future to be competent in technology is an important part of modern curriculums as technology literacy is one of the core components of 21st century skills which are thought of the key to success in 21st century societies.

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Secondary School Teachers' and Students' Attitudes towards the Use of Interactive Whiteboard in EFL Classrooms

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ABSTRACT

The use of technology in education has been playing an important role in the teaching and learning process over the past decades. It has positive and enormous effects on the field of education and helps students being much more creative and active. As part of the educational technology, the use of Interactive Whiteboards (IWB) has increased a lot in schools giving access to the Internet, videos, and other tools in the classroom environment. This study focuses on the attitudes of teachers and students towards the use of Interactive Whiteboards in teaching English as a foreign language. The study is conducted on secondary schools' EFL teachers and students. Two questionnaires are used to collect data quantitatively from 116 EFL teachers and 122 students in different secondary schools in Turkey. Quantitative data results are supported by qualitative data gathered from a small number of teachers through open-ended questions. The results show that both teachers and students have positive attitudes towards the use of IWBs.

Keywords: Interactive whiteboard (IWB), teachers' attitudes, students' attitudes, English as a foreign language

INTRODUCTION

Over the past decade, technology has played an important role in education. With the introduction of technology in education, traditional teaching techniques started to be replaced by more technological ones. They were firstly used in math and science classes, but then they spread to different areas of education. Recently these computer-based technologies have started to be used to teach and learn a language (Elaziz, 2008) and got important in both schools and universities (Amiri & Sharifi, 2014). According to Mathews-Aydinli and Elaziz "The rapidly increasing use of computer technology and computer-assisted language learning (CALL) has been argued to make language teaching and learning more enjoyable, effective, and versatile" (2010, p. 235). Podcasts, software, video clips, chat, email, e-Portfolio, voice/video conferences, virtual games, blogs, and interactive whiteboards are among the computer-assisted language learning applications. Some countries developed in the field of technology, such as the UK, USA, Canada, China, Japan, and Australia, put a great amount of money into IWBs, thanks to their awareness of using IWBs in teaching and learning (Çakıroğlu, 2016). The use of IWBs has become popular worldwide at all levels, but it increased especially in lower grades, as in primary and secondary grades. The Turkish government has invested billions of dollars in interactive whiteboards, computers, and the Internet since the FATİH project was initiated in Turkey (Balta & Duran, 2015). The Turkish government has distributed 16 million tablet PCs in primary schools under the FATİH Project by 2016. The reason behind it was to improve primary and secondary education and to increase educational technology conditions. (Çakıroğlu, 2016).

An IWB is a touchscreen whiteboard that can be used independently or by being connected to a computer from a projector. It can be controlled by either using your finger, by electronic pens or by peripheral devices (Singaravelu, 2017). IWBs are multifunctional devices, thanks to which teachers can drag, click, paste and copy items, take and add notes, highlight texts, make drawings, show pictures and videos to the whole class, save and edit documents, get access to the Internet (Balta & Duran, 2015). In essence, "interactive whiteboards are seen as combining all previously existing teaching aids such as chalkboard, whiteboard, television, video, overhead projector, CD player, and computer" (Gashan & Alshumaimeri, 2015, p. 176).

There are many positive effects of IWBs on the teaching and learning process. Thanks to IWBs, lecturers have had the opportunity to integrate more information and communications technology (ICT) into their classes and to use a wide range of web-based resources. In addition to this, with the use of IWBs, there has been an increase in students' motivation and participation in the lessons. The interactive whiteboard allows students to develop their skills personally and socially, and to expand their creativity in giving a presentation to the whole class (Öz, 2014). Moreover, other pedagogical benefits can be found when talking about the utilization of IWBs in L2 teaching and learning. According to Schmid and Schimmack (2010), four benefits of using IWBs in L2 classrooms should be emphasized: inclusion of new media in language classrooms, development of learners' interaction and

participation, improvement of “electronic literacies”, and opportunity to take into consideration students’ different learning style by using multiple media.

Furthermore, Gashan and Alshumaimeri (2015) focused on the fact that the utilization of IWBs helped education change from traditional instruction to a more interactive and constructive one. According to them, this technology supported teachers to use more contemporary methods during their classes, which made the learning process more effective. In fact, as Manny-Ikan et al. (2011) claimed, teachers had the chance to prepare more comprehensible lesson plans including lots of varieties in terms of materials.

Different research has been made about this topic and focused only on teachers’ or students’ attitudes towards the use of IWB in English classrooms. A few kinds of research focus on both attitudes and many of them are applied to a small sample. The present study is applied to a large sample and aims to explore secondary school EFL teachers’ and students’ perspectives on the use of IWBs in EFL classrooms in Turkey and to see if these attitudes differ according to some variables. Hence, this study was administered to answer these three points:

1. What are the teachers’ and students’ attitudes concerning the use of IWBs in EFL classrooms?
2. Do students’ attitudes towards the use of IWBs differ according to their gender, grade, language proficiency level, frequency of IWB use, and skills areas IWBs are used for?
3. Do teachers’ perspectives on the use of IWBs differ with their gender, years of teaching experience, weekly hours of IWB use, and skills areas IWBs are used for?

METHOD

Design

This study is a survey conducted on secondary school teachers and students to collect data about their attitudes towards the use of IWBs in ELT classrooms. For this purpose, a mixed-method design is used. As Creswell declared, “mixed methods involve combining or integration of qualitative and quantitative research and data in a research study” (2014, p.43) and it aims to minimize the weaknesses of each type of data. For this study, students and teachers are asked to participate in a Likert-scale questionnaire to get quantitative data. After conducting these questionnaires, some teachers are interviewed, and their answers are collected qualitatively to support the quantitative data.

Participants

A random sampling, thanks to which every single individual can be chosen, is applied in this study to generalize the population. 116 secondary school EFL teachers and 122 secondary school students selected randomly from different cities of Turkey contributed to this study. Here is the demographic information of them presented in the following tables:

Table 1. Students’ Gender and Grade

		Grade									
		5th grade		6th grade		7th grade		8th grade		Total	
		f	%	f	%	f	%	f	%	f	%
Gender	Male	14	11.5	5	4.1	18	14.8	9	7.4	46	37.7
	Female	33	27.0	7	5.7	20	16.4	16	13.1	76	62.3
	Total	47	38.5	12	9.0	38	31.1	25	20.5	122	100.0

As shown in Table 1, there are 47 5th (38.5%) grade, 12 6th (9.0%) grade, 38 7th (31.1%) grade and 25 8th (20.5%) grade students participating to the study aged 10-15 years. 62.3% (f=76) of them are female students and 37.7% (f=46) are males. Within 62.3% of female students, 27.0% (f=33) are 5th grade, 5.7% (f=7) are 6th grade, 16.4% (f=20) are 7th grade, and 13.1% (f=16) are 8th grade students. Among male students, 11.5% (f=14) are 5th grade, 4.1% (f=5) are 6th grade, 14.8% (f=18) are 7th grade, and 7.4% (f=9) are 8th grade students. Moreover, all of them attend a public school in Turkey. The hours of English class are very limited: only 3 hours for 5th and 6th grades, and 4 hours for 7th and 8th grades.

Table 2. Students’ Proficiency Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Elementary	21	17.2	17.2	17.2
	Intermediate	91	74.6	74.6	91.8
	Advanced	10	8.2	8.2	100.0

Total	122	100.0	100.0
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In Table 2 it is given the students' proficiency level. 17.2% (f=21) of students are at elementary level, 74.6% (f=91) of them are intermediate learners, while only 8.2% (f=10) are advanced learners.

Table 3. Where are Students from?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Afyonkarahisar	1	.8	.8	.8
	Amasya	30	24.6	24.6	25.4
	Bartın	30	24.6	24.6	50.0
	Bayburt	7	5.7	5.7	55.7
	İstanbul	3	2.5	2.5	58.2
	İzmir	2	1.6	1.6	59.8
	Malatya	2	1.6	1.6	61.5
	Muğla	1	.8	.8	62.3
	Ordu	40	32.8	32.8	95.1
	Sivas	5	4.1	4.1	99.2
	Gaziantep	1	.8	.8	100.0
	Total	122	100.0	100.0	

Table 3 shows the provinces where students study. As the table reflects, 40 students, who represent 32.8% (f=32.8) of the total population, are from Ordu. This is followed by Amasya and Bartın that share the same frequency of 30 students with the same percentage of 24.6%. 5.7% (f=7) of the students are from Bayburt, 4.1% (f=5) are from Sivas and 2.5% (f=3) are from İstanbul. To conclude, a very small percentage of the students are from İzmir and Malatya, with the same frequency of 2 (1.6%) and from Muğla, Gaziantep, and Afyonkarahisar, with the same frequency of 1 (0.8%).

Table 4. Teachers' Age and Gender

		Age											
		20-25		26-30		31-35		36-40		40+		Total	
		f	%	f	%	f	%	f	%	f	%	f	%
Gender	Male	1	0.9	5	4.3	3	2.6	3	2.6	2	1.7	14	12.1
	Female	17	14.7	18	15.5	33	28.4	21	18.1	13	11.2	102	87.9
	Total	18	15.5	23	19.8	36	31.0	24	20.7	15	12.9	116	100.0

Table 4 represents teachers' age and gender. Among 116 EFL teachers who participated to the study, 87.9% (f=102) of them are females, while only 12.1% (f=14) of teacher participants are males. According to the table, 36 EFL teachers are aged 31 to 35 and represent the majority of the population with a percentage of 31.0%. Among them, 28.4% (f=33) are females, while 2.6% (f=3) are male. However, with the percentage of 4.3% (f=5) the majority of male EFL teachers are 26-30 years old. Following the percentage of 31.0%, 20.7% (f=24) of the total population is aged 36 to 40, while 19.8% (f=23) is 26-30. In addition to this, 18 EFL teachers representing 15.5% of the sample are aged 20 to 25. Teachers aged more than 40 constitute the minority of the population with a percentage of 12.9% (f=15).

Table 5. Teachers' Years of Teaching Experience

		Years of Teaching Experience											
		1-4		5-9		10-15		16-20		more than 20		Total	
		f	%	f	%	f	%	f	%	f	%	f	%
Gender	Male	3	2.6	5	4.3	4	3.4	1	0.9	1	0.9	14	12.1
	Female	25	21.6	25	21.6	32	27.6	9	7.8	11	9.5	102	87.9
	Total	28	24.1	30	25.9	36	31.0	10	8.6	12	10.3	116	100.0

In table 5, it's given the teachers' years of teaching experience. As the table shows, 31.0% (f=36) of the teachers have 10-15 years of teaching experience. This is followed by 5-9 and 1-4 years with the frequency of 30 and 28, representing correspondently 25.9% and 24.1% of the total population. Moreover, while 10.3% (f=12) of EFL teachers have more than 20 years of experience in the field of ELT, only 8.6% (f=10) have been working for 16-20 years.

Table 6. The Regions the Teachers Work in Turkey

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Marmara Region	24	20.7	20.7	20.7
	Aegean Region	15	12.9	12.9	33.6
	Black Sea Region	22	19.0	19.0	52.6
	Central Anatolian Region	26	22.4	22.4	75.0
	Eastern Anatolian Region	9	7.8	7.8	82.8
	Southeast Anatolian Region	11	9.5	9.5	92.2
	Mediterranean Region	9	7.8	7.8	100.0
	Total	116	100.0	100.0	

Table 6 reflects the frequencies of regions where teachers work. According to the table, 22.4% (f=26) of EFL teachers work in the Central Anatolian Region. 20.7% (f=24) of them work in the Marmara Region, while 19.0% (f=22) works in the Black Sea Region. They are followed by the Aegean Region with a frequency of 15, which represents 12.9% of the total population. Moreover, 9.5% (f=11) of the teachers work in the Southeast Anatolian Region. Only 7.8% (f=9) of them work in Eastern Anatolian and Mediterranean Regions.

Data Collection

The study is conducted in the 2019-2020 academic year during the spring semester on an online platform. Two independent questionnaires adopted by Öz (2014) are used to collect data quantitatively. Then, an interview is held with some ELT teachers and this data is collected qualitatively. Thus, it is possible to say that the present study is conducted with a mixed-method design since both quantitative and qualitative data are used. The questionnaires about teachers' and students' attitudes towards the use of IWBs in EFL classrooms are prepared by using Google Forms. The student questionnaire is translated into Turkish for better understanding. The questionnaires are shared on different online platforms and participants contributed completely voluntarily by being anonymous. Both questionnaires included two parts. The first part of the student questionnaire asks secondary school students to state their gender, grade, frequency of IWB use, language proficiency level, and skills areas IWBs are used for. The second part consists of 26 five-point Likert-scale items divided into four sections: perceived learning contribution, motivation, perceived efficiency, and perceived negative effects. Similarly, the first part of the teacher questionnaire consists of questions about teachers' age, gender, years of teaching experience, weekly hours of IWB use, and skills areas IWBs are used for. The second part includes 25 five-point Likert-scale items separated into four sections: instructional effects of IWBs, general attitudes, motivational effects of IWBs, and need for training. Participants specified their agreement to the items in five points: 1-strongly agree, 2-agree, 3-neutral, 4-disagree, and 5-strongly disagree. For 25 items of the teacher questionnaire the reliability Cronbach's Alpha level is calculated as .75. As for social sciences, it is accepted as strong since it is more than .70. The reliability of Cronbach's Alpha level of the student questionnaire is .90. Since it is more than .70, it is also accepted as reliable. After applying the questionnaires, due to the Covid-19 pandemic and the difficulty to get in touch with a large number of teachers for the interview, only 10 teachers are interviewed and asked the following open-ended questions:

1. How often do you use the IWB in your classes?
2. What are the reasons behind your IWB usage in your classes?
3. What do you think are the advantages and disadvantages of using the IWB in EFL classrooms?
4. Do you think it has a positive effect on students? Why?

Data Analysis

For this research, two independent questionnaires are conducted for secondary school EFL teachers and students via Google Forms. The data is analyzed through SPSS 22.0. Some descriptive statistics are used for the analysis of the frequencies. Moreover, one-sample t-tests are utilized for sub-sections of both teacher and student questionnaires. Then, Mann-Whitney U Tests served to find the results for yes/no answers of IWB usage in terms of skills from both teachers' and students' points of view, and the results for sub-sections of the teachers' scale in

terms of gender. Finally, one-way ANOVA statistics are utilized in terms of the frequency of IWB usage and specifying their significant differences.

FINDINGS

In this part of the current study, the findings associated with the collected data are presented in tables following their explanations.

Table 7. Skills Used by Teachers When Using IWBs

	Reading		Writing		Speaking		Listening	
	f	%	f	%	f	%	f	%
No	2	1.7	36	31.0	31	26.7	2	1.7
Yes	114	98.3	80	69.0	85	73.3	114	98.3
Total	116	100	116	100	116	100	116	100

Table 7 shows the skills that teachers focus on when using IWBs. As seen, 98.3% (f=114) of the total population use the IWBs for reading and listening skills. They are followed by the speaking skill with the percentage of 73.3% (f=85) and the writing skill with 69.0% (f=80).

Table 8. Weekly Hours of IWB Use by Teachers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 5	20	17.2	17.2	17.2
	6-10	21	18.1	18.1	35.3
	11-15	24	20.7	20.7	56.0
	16-20	22	19.0	19.0	75.0
	More than 20	29	25.0	25.0	100.0
	Total	116	100.0	100.0	

The weekly hours of IWB use by teachers are represented in Table 8. Even if there is not a huge difference in the distribution of weekly hours of IWB use, a slight majority of EFL teachers use the IWBs more than 20 hours a week, which constitutes 25.0% (f=29) of the total population. 20.7% (f=24) of teachers use the IWBs 11-15 hours a week, while 19.0% (f=22) spend 16-20 hours with them. Meanwhile, 21 teachers representing 18.1% of the sample are found to use IWBs in their English classes 6-10 hours a week. However, 20 teachers utilize IWBs less than 5 hours a week.

Table 9. Descriptive Results of Items in Teacher Questionnaire

	Strongly agree		Agree		Neutral		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
I. Instructional effects of IWBs										
Q1	88	75.9	19	16.4	6	5.2	2	1.7	1	0.9
Q2	13	11.2	35	30.2	33	28.4	28	24.1	7	6.0
Q3	95	81.9	19	16.4	1	0.9	1	0.9	0	0.0
Q4	76	65.5	30	25.9	7	6.0	3	2.6	0	0.0
Q5	81	69.8	30	25.9	4	3.4	1	0.9	0	0.0
Q6	60	51.7	37	31.9	15	12.9	4	3.4	0	0.0
Q7	97	83.6	18	15.5	1	0.9	0	0.0	0	0.0
Q8	74	63.8	26	22.4	14	12.1	2	1.7	0	0.0
Q9	84	72.4	27	23.3	2	1.7	3	2.6	0	0.0
Q10	87	75.0	26	22.4	2	1.7	1	0.9	0	0.0
Q11	87	75.0	25	21.6	2	1.7	0	0.0	2	1.7
II. General attitudes										
Q12	96	82.8	19	16.4	1	0.9	0	0.0	0	0.0

Q13	13	11.2	7	6.0	23	19.8	26	22.4	47	40.5
Q14	89	76.7	25	21.6	2	1.7	0	0.0	0	0.0
Q15	0	0.0	1	0.9	22	19.0	21	18.1	72	62.1
Q16	3	2.6	3	2.6	23	19.8	28	24.1	59	50.9
Q17	2	1.7	2	1.7	33	28.4	38	32.8	41	35.3
Q18	1	0.9	4	3.4	21	18.1	36	31.0	54	46.6
Q19	0	0.0	1	0.9	26	22.4	39	33.6	50	43.1
III. Motivational effects of IWBs										
Q20	91	78.4	23	19.8	2	1.7	0	0.0	0	0.0
Q21	77	66.4	33	28.4	6	5.2	0	0.0	0	0.0
Q22	81	69.8	31	26.7	4	3.4	0	0.0	0	0.0
Q23	85	73.3	29	25.0	2	1.7	0	0.0	0	0.0
IV. Needs for training										
Q24	41	35.3	46	39.7	22	19.0	6	5.2	1	0.9
Q25	20	17.2	38	32.8	26	22.4	25	21.6	7	6.0

Table 9 shows the frequencies of the answers given to each question in the teacher questionnaire. In the first sub-section "Instructional effects of IWBs", the great majority of teachers "strongly agreed" with all the questions except for Q2 "When using IWBs in the classroom, I spend more time for the preparation of the lesson", with which 30.2% (f=35) of ELT teachers only "agreed". The "strongly agree" answers correspond to the 75.9% (f=88) of Q1 "Using the IWB resources reduces the time I spend writing on the board", to the 81.9% (f=95) of Q3 "Using IWBs makes it easier to reach different sources and display them to the whole class immediately", 65.5% (f=76) of Q4 "IWBs are beneficial for saving and printing the materials generate during the lesson", 69.8% (f=81) of Q5 "I can give explanations more effectively with the use of IWBs", 51.7% (f=60) of Q6 "With the help of using the IWB, I can easily control the whole class", 83.6% (f=97) of Q7 "I think IWBs can be a good supplement to support English teaching", 63.8% (f=74) of Q8 "Using IWBs makes me a more efficient teacher", 72.4% (f=84) of Q9 "Using IWBs makes it easier for an English teacher to review, re-explain, and summarize the subject", 75.0% (f=87) of Q10 "I believe IWB is a useful technology for English teachers to learn" and 75.0% (f=87) of Q11 "Using IWB makes the English lessons more interactive". The second sub-group "General attitudes" includes questions Q12 to Q19. While in Q12 "I like using IWB technology in my English lessons" and Q14 "I have positive attitudes toward the use of IWBs in language teaching" most of the teachers give the "strongly agree" answer with the percentages of 82.8% (f=96) and 76.7% (f=89), in the other questions for this sub-group the "strongly disagree" answer has the higher percentage with 40.5% (f=47) in Q13 "I feel uncomfortable using IWBs in front of my students", 62.1% (f=72) in Q15 "I have negative attitudes toward the use of IWBs in language teaching", 50.9% (f=59) in Q16 "I do not think my students are ready for this technology", 35.3% (f=41) in Q17 "What I do in class with traditional methods is sufficient for teaching English", 46.6% (f=54) in Q18 "I am not the type to do well with IWB-based applications", and 43.1% (f=50) in Q19 "There is no difference between my use of a traditional board and an IWB in terms of teaching techniques and methods". The third sub-group "Motivational effects of IWBs" consists of Q20 to Q23. A higher percentage of teachers strongly agreed with all these four questions. 78.4% (f=91) of EFL teachers think "IWBs make learning more enjoyable and more interesting" (Q20), 66.4% (f=77) of them "can keep their students' attention longer with the help of IWB technology" (Q21), 69.8% (f=81) thinks "IWBs increase the interaction and participation of the students" (Q22), while 73.3 % (f=85) thinks their "students are more motivated when they use an IWB in their lessons" (Q23). The "Needs for training" sub-section is the last one and includes Q24 and Q25. Most of EFL teachers gave the "agree" answer to both of them, correspondently with the percentage of 39.7% (f=46) for Q24 "I believe that training is required to teach with IWB technology" and 32.8% (f=38) for Q25 "If I do not get sufficient training, I do not feel comfortable with using IWBs in the classroom".

Table 10. One Samples T-Test Results for Sub-Sections of Teachers' Scale

	N	Mean	Std. Deviation	Sd	f	p
Sub-sections of Scale						
Instructional effects of IWBs	116	16.53	4.13	115	43.06	.000
General attitudes	116	27.14	4.15		70.41	.000

Motivational effects of IWBs	116	5.24	1.74	32.39	.000
Needs for training	116	4.63	1.85	26.90	.000

In Table 10, the one-sample t-test results for sub-sections of teachers' scale are shown. Paying attention to the mean results of each sub-section, p-values ($p \leq .000$) show that there is a very highly significant difference among these means. In fact, according to social sciences, when the p-value is less than .001 and .005, the result is taken as very highly significant.

Table 11. Mann-Whitney U Test Results for Sub-Sections of the Teachers' Scale in terms of Gender

Sub-Sections	Gender	N	Mean Rank	Sum of Rank	U	p
Instructional effects of IWBs	Male	14	76.82	1075.50	457.500	.029*
	Female	102	55.99	5710.50		
General attitudes	Male	14	68.54	959.50	573.500	.231
	Female	102	57.12	5826.50		
Motivational effects of IWBs	Male	14	51.93	727.00	622.000	.382
	Female	102	59.40	6059.00		
Needs for training	Male	14	69.39	971.50	561.500	.188
	Female	102	57.00	5814.50		

Table 11 gives the Mann-Whitney U test results for sub-sections of the teachers' scale in terms of gender. According to these results, it is possible to see a significant difference only in the mean ranks of the "instructional effects of IWBs" section in terms of gender, because the p-value is .029 ($p < .05$) and the mean rank is 76.85 for males and 55.99 for females. However, there is not a significant difference among the mean ranks of the other subgroups, because their p-values are all found to be above .05. In fact, the "General attitudes" sub-sections p-value is calculated as .231 ($p > .05$), the "Motivational effects of IWBs" subgroup's p-value is .382 ($p > .05$), while the "Needs for training" sub-section is .188 ($p > .05$).

Table 12. Mann-Whitney U Test Results for Yes/No Answers of IWB Usage in terms of Skills from Teachers' Points of View

Skills	Sub-Sections	Answers	N	Mean Rank	Sum of Rank	U	p
R E A D I N G	Instructional effects of IWBs	No	2	57.75	115.50	112.500	.974
		Yes	114	58.51	6670.50		
	General attitudes	No	2	68.00	136.00	95.500	.685
		Yes	114	58.33	6650.00		
	Motivational effects of IWBs	No	2	88.75	177.50	53.500	.150
		Yes	114	57.97	6608.50		
W R I T I N G	Needs for training	No	2	68.25	136.50	94.500	.674
		Yes	114	58.33	6649.50		
	Instructional effects of IWBs	No	36	69.43	2499.50	1046.500	.018*
		Yes	80	53.58	4286.50		
	General attitudes	No	36	53.31	1919.00	1253.000	.262
		Yes	80	60.84	4867.00		
S P E A K	Motivational effects of IWBs	No	36	64.50	2322.00	1224.000	.148
		Yes	80	55.80	4464.00		
	Needs for training	No	36	61.82	2225.50	1320.500	.468
		Yes	80	57.01	4560.50		
	Instructional effects of IWBs	No	31	65.77	2039.00	1092.000	.157
		Yes	85	55.85	4747.00		
S P E A K	General attitudes	No	31	51.81	1606.00	1110.000	.193
		Yes	85	60.94	5180.00		
	Motivational effects of IWBs	No	31	61.79	1915.50	1215.500	.475
		Yes	85	57.30	4870.50		
K	Needs for training	No	31	63.77	1977.00	1157.000	.299
		Yes	85	57.30	4870.50		

I N G L I S T E N I N G		Yes	85	56.58	4809.00		
		No	2	57.75	115.50	112.500	.974
	Instructional effects of IWBs	Yes	114	58.51	6670.50		
		No	2	50.25	100.50	97.500	.725
	General attitudes	Yes	114	58.64	6685.50		
		No	2	53.75	107.50	104.500	.821
	Motivational effects of IWBs	Yes	114	58.58	6678.50		
		No	2	80.50	161.00	70.00.	.342
	Needs for training	No	114	58.11	6625.00		
		Yes					

Table 12 represents the Mann-Whitney U test results for yes/no answers of IWB usage in terms of skills from teachers' points of view. The answers given by teachers for each skill are stated as number (N). A detailed explanation of these frequencies was given in table 7. According to Table 12, there is a significant difference among mean ranks only in the "instructional effects of IWBs" sub-section for the writing skill, since the p-value for this sub-group is calculated as .018 ($p < .05$). In the other three sub-sections for the writing skill and all the sub-groups for writing, speaking, and listening skills, the p-value is calculated as above .05 ($p > .05$). Thus, the mean ranks do not differ significantly.

Table 13. Descriptive Results of Items in Student Questionnaire

	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	f	%	f	%	f	%	f	%	f	%
I. Perceived learning contribution										
Q1	50	41.0	46	37.7	14	11.5	10	8.2	2	1.6
Q2	62	50.8	41	33.6	12	9.8	7	5.7	0	0.0
Q3	65	53.3	32	26.2	18	14.8	7	5.7	0	0.0
Q4	73	59.8	38	31.1	6	4.9	4	3.3	1	0.8
Q5	58	47.5	46	37.7	8	6.6	6	4.9	4	3.3
II. Motivation										
Q6	39	32.0	38	31.1	25	20.5	15	12.3	5	4.1
Q7	14	11.5	13	10.7	9	7.4	41	33.6	45	36.9
Q8	41	33.6	41	33.6	20	16.4	12	9.8	8	6.6
Q9	21	17.2	14	11.5	19	15.6	39	32.0	29	23.8
Q10	46	37.7	39	32.0	24	19.7	13	10.7	0	0.0
Q11	38	31.1	49	40.2	20	16.4	9	7.4	6	4.9
Q12	54	44.3	34	27.9	17	13.9	13	10.7	4	3.3
Q13	46	37.7	39	32.0	16	13.1	18	14.8	3	2.5
Q14	41	33.6	47	38.5	20	16.4	10	8.2	4	3.3
Q15	51	41.8	32	26.2	19	15.6	10	8.2	10	8.2
Q16	38	31.1	34	27.9	21	17.2	19	15.6	10	8.2
III. Perceived efficiency										
Q17	71	58.2	38	31.1	7	5.7	5	4.1	1	0.8
Q18	44	36.1	44	36.1	20	16.4	12	9.8	2	1.6
Q19	40	32.8	47	38.5	17	13.9	15	12.3	3	2.5
Q20	21	17.2	28	23.0	17	13.9	24	19.7	32	26.2

Q21	23	18.9	12	9.8	14	11.5	32	26.2	41	33.6
IV. Perceived negative effects										
Q22	60	49.2	37	30.3	7	5.7	10	8.2	8	6.6
Q23	18	14.8	25	20.5	25	20.5	37	30.3	17	13.9
Q24	11	9.0	14	11.5	23	18.9	41	33.6	33	27.0
Q25	20	16.4	21	17.2	16	13.1	36	29.5	29	23.8
Q26	10	8.2	18	14.8	16	13.1	37	30.3	41	33.6

Table 13 represents the frequencies of the answers given to each question in the student questionnaire. In the first sub-section “Perceived learning contribution”, most of the students give the “strongly agree” answer. 41.0 % (f=50) of them strongly agree to the fact that “they learn more when their teacher uses the whiteboard” (Q1). 50.8% (f=62) of them find it “easier to understand the lesson when their teacher uses an IWB” (Q2). Moreover, 53.3% (f=65) of students think that “using audio and visual materials with IWBs helps them understand the lesson better” (Q3), and 59.8% (f=73) finds “the opportunity to learn from different sources with the use of IWBs” (Q4). 47.5 % of the students strongly agree with Q5 “IWB use makes it easier for me to remember what I learned in class”. In the “Motivation” part, as in the first part, students have strongly agreed with most of the questions, except for Q7 “It seems difficult for me to use IWBs” and Q9 “It makes me uncomfortable when my work is shown to the whole class on the IWB”, with which most of them strongly disagreed with the percentages of respectively 33.6% (f=45) and 32.0% (f=39). 44.3% (f=54) of students strongly agree that IWBs make learning English more interesting and exciting (Q12). 41.8% (f=51) of them think IWB use increases their interest in the English lesson (Q15). 37.7% (f=46) of them concentrate better when their teacher uses an IWB (Q10) and keep easily their attention when an IWB is used during the lesson (Q13). 33.6% (f=41) prefer lessons that are taught with an IWB (Q8) and get easily motivated during the lesson when using the IWB (Q14). 32.0% (f=39) of students like going to the front of the class to use the IWB (Q6). Moreover, 31.1% (f=38) of them get to join in lessons more when their teacher uses an IWB (Q11) and enjoy lessons more if their English teachers use IWB more often (Q16). In the third sub-section “Perceived efficiency”, 58.2% (f=71) of the student strongly agreed that IWBs make the teachers’ diagrams and drawings easier for them (Q17). Q18 “The lessons become more organized when an IWB is used” has the same percentage of 36.1% (f=44) for both “strongly agree” and “agree” answers, while 38.5% (f=47) of students agree with Q19 “Using an IWB saves time, and the lesson moves smoothly”. Continuing, Q20 “There is no difference between my English teacher’s use of a traditional board and an IWB in terms of teaching techniques and methods” and Q21, “I think there is not much difference between an IWB and a normal whiteboard” are mostly answered with a “strongly disagree” constituting the percentage of respectively 26.2% (f=32) and 33.6% (f=41). In the last section “Perceived negative effects”, 49.2% (f=60) of the students answered with a “strongly agree” in Q22 “Sometimes deficiencies of the IWB screen and sunlight in the classroom make it difficult to see the things on the IWB”. 30.3% (f=37), 33.6 (f=41) and 29.5% (f=36) of them gave the “disagree” answer for respectively Q23 “IWBs often break down and recalibration causes a waste of time”, Q24 “When my teacher uses an IWB, I cannot keep up with the lesson because the pace of the lesson” and Q25 “During IWB use, there is a lot of noise in class”. On the other hand, 33.6% (f=41) strongly disagree with Q26 “IWB was exciting at the beginning but not anymore”.

Table 14. One Samples T-Test Results for Sub-Sections of Students’ Scale

Sub-sections of Scale	N	Mean	Std. Deviation	Sd	f	p
Perceived learning contribution	122	8.68	3.60	121	26.65	.000
Motivation	122	26.52	8.93		32.82	.000
Perceived efficiency	122	12.37	4.06		33.67	.000
Perceived negative effects	122	15.52	4.71		36.38	.000

Table 14 states the one-sample t-test results for sub-sections of students’ scale. Paying attention to the mean scores, it is possible to declare that they significantly differ from each other, since the p-values are all calculated as .000 ($p < .05$). Thus, mean values are calculated as 8.68 for the “Perceived learning contribution” sub-section, 26.52 for the “Motivation” part, 12.37 for the “Perceived efficiency” sub-group, and 15.52 for the “Perceived negative effects” part.

Table 15. Descriptive Results of One-Way ANOVA in terms of the Frequency of IWB Usage

Sub-sections of Scale	Frequency	N	Mean	Std. Deviation
Perceived learning contribution	Rarely	4	10.50	6.40
	Sometimes	25	9.88	4.10
	Often	53	9.04	3.44
	Always	39	7.33	2.75
	Total	121	8.71	3.60
Motivation	Rarely	4	23.50	10.85
	Sometimes	25	28.08	10.53
	Often	53	28.92	8.73
	Always	39	22.95	6.32
	Total	121	26.64	8.85
Perceived efficiency	Rarely	4	11.25	7.50
	Sometimes	25	12.88	4.00
	Often	53	13.19	4.05
	Always	39	11.23	3.38
	Total	121	12.43	4.02
Perceived negative effects	Rarely	4	18.75	4.27
	Sometimes	25	15.12	5.39
	Often	53	15.06	4.06
	Always	39	15.97	5.12
	Total	121	15.49	4.72

Table 15 expresses the descriptive results of one-way ANOVA in terms of the frequency of IWB usage. For all the sub-sections, 53 students often use the IWB, 39 of them always use them, 25 out of 121 students use the IWB sometimes, and only 4 of them use it rarely. In the first part, the mean value is higher for the “rarely” frequency and is measured as 10.50. However, the second and third sub-sections have the highest mean value, measured respectively as 28.92 and 13.19, for the “often” frequency. The last part, as in the first one, has the highest mean value of 18.75 in the “rarely” frequency.

Table 16. One-Way ANOVA Statistics in terms of Grades regarding the Frequency of IWB Usage

Sub-Sections of Scale	Source of variation	SS	df	MS	f	p	Significant difference
Perceived learning contribution	Between Groups	126.645	3	42.215	3.463	.019	Sometimes-Always
	Within Groups	1426.231	117	12.190			
	Total	1552.876	120				
Motivation	Between Groups	899.283	3	299.761	4.128	.008	Often-Always
	Within Groups	8496.436	117	72.619			
	Total	9395.719	120				
Perceived efficiency	Between Groups	97.227	3	32.409	2.060	.109	No difference
	Within Groups	1840.426	117	15.730			
	Total	1937.653	120				
Perceived negative effects	Between Groups	65.037	3	21.679	.974	.407	No difference
	Within Groups	2603.195	117	22.250			
	Total	2668.231	120				

Table 16 states the one-way ANOVA statistics in terms of grades and regarding the frequency of IWB usage. Given the one-way ANOVA statistics, according to the results shown under the significant difference between the

two sub-sections, it is found a significant difference in both “Perceived learning contribution” and “motivation” sections ($f(3, 117) = 3.463, 4.128 p < .05$).

Table 17. Mann-Whitney U Test Results for Yes/No Answers of IWB Usage in terms of Skills from Students’ Points of View

Skills	Sub-Sections	Answers	N	Mean Rank	Sum of Rank	U	p
R E A D I N G	Perceived learning contribution	No	76	63.78	4847.00	1575	.356
		Yes	46	57.74	2656.00		
	Motivation	No	76	64.51	4903.00	1519	.226
		Yes	46	56.52	2600.00		
	Perceived efficiency	No	76	63.99	4863.50	1558.5	.315
		Yes	46	57.38	2639.50		
W R I T I N G	Perceived negative effects	No	76	63.12	4797.00	1625	.514
		Yes	46	58.83	2706.00		
	Perceived learning contribution	No	68	58.97	4010.00	1664	.370
		Yes	54	64.69	3493.00		
	Motivation	No	68	55.98	3806.50	1460.5	.050*
		Yes	54	68.45	3696.50		
	Perceived efficiency	No	68	60.10	4086.50	1740.5	.621
		Yes	54	63.27	3416.50		
	Perceived negative effects	No	68	57.49	3909.50	1563.5	.159
		Yes	54	66.55	3593.50		
	Perceived learning contribution	No	95	62.54	5941.50	1183.5	.537
		Yes	27	57.83	1561.50		
S P E A K I N G	Motivation	No	95	64.41	6119.00	1006	.088
		Yes	27	51.26	1384.00		
	Perceived efficiency	No	95	62.90	5975.50	1149.5	.410
		Yes	27	56.57	1527.50		
	Perceived negative effects	No	95	61.56	5848.00	1277	.937
		Yes	27	61.30	1655.00		
L I S T E N I N G	Perceived learning contribution	No	33	64.47	2127.50	1370.5	.568
		Yes	89	60.40	5375.50		
	Motivation	No	33	69.85	2305.00	1193	.112
		Yes	89	58.40	5198.00		
	Perceived efficiency	No	33	64.73	2136.00	1362	.538
		Yes	89	60.30	5367.00		
	Perceived negative effects	No	33	63.41	2092.50	1405.5	.716
		Yes	89	60.79	5410.50		

Table 17 reports the Mann-Whitney U test results for yes/no answers of IWB usage in terms of skills from students’ points of view. In this table students’ answers are represented with N. The majority of students ($f=89$) claim that they use the IWB mostly for listening skills, 54 of them use it for writing, 46 students for reading, while only 27 students claimed to use it for speaking. Moreover, there is a significant difference only in the “motivation” sub-section for the writing skill since the p-value is .050 ($p \leq .05$).

DISCUSSION

The present study was conducted to investigate the attitudes of secondary school EFL teachers and students towards the use of IWB in English classrooms. According to the findings, secondary school EFL teachers use the IWB mostly for reading and listening skills. The reason behind this can be that receptive skills are more easily given with IWBs than productive skills. It can be harder for a student to write on the IWB than on the board and for what concern the speaking skill teachers can not need to use IWBs that much. Moreover, many EFL teachers use the IWBs more than 20 hours a week. The answers of teachers during the interview support this result. They said, “I use it in every lesson”, “I always use the IWB in my classes”, “I use the IWB at least once in every lesson”,

“I always use the IWB in my classes. It doesn’t matter what I focus on, IWB is a must during my teaching”. So, a lot of time is spent on the IWBs during EFL classrooms.

Taking the instructional effects of IWBs into account, teachers believe that IWBs help them use their time more efficiently by spending less time writing on the board and for the preparation of the lesson. They find them beneficial for saving materials, reaching different sources, reviewing, and summarizing a subject, and giving explanations more effectively. Secondary school EFL teachers have in general positive attitudes towards the use of IWBs, as they like using them in their English lessons, feel comfortable using them, and what is most important they think it differs using a traditional board and an IWB in terms of teaching techniques and methods. Almost all the teachers, during the interview, said that IWBs have only advantages by giving these reasons:

- *“I use IWB to show something related to the topic, to get some information, to play games, to show presentations to students. I don’t think there are disadvantages at all.”*
- *“IWBs make it easy to improve my students’ listening competence and are easy to use. One disadvantage maybe that one can become an IWB-dependent teacher.”*
- *“I didn’t observe any disadvantage for it. The advantage is the abundance of activities that can be done, the opportunity to focus on all skills, and saving on time. And it is less boring than just lecturing and writing on the board.”*
- *“I see no disadvantages. If the teacher is not fully capable of using IWBs, then some serious problems may arouse like misusing the IWB, etc. When it comes to advantages, I think the IWB usage is a must and vital for EFL classrooms especially for communicative classrooms.”*

Moreover, almost all of the teachers agree with the fact that IWBs affect positively students’ motivation during English classes. Findings of Manny-Ikan et al. (2011), Öz (2014), Türel and Johnson (2012), Balta and Duran (2015), Kalanzadeh and Valizadeh (2015) are in line with this finding. Some answers are taken from the interview support this result, as teachers said:

- *“Using technology makes them motivated and being motivated leads them to be successful learners, but this success depends on teacher’s ability to facilitate and utilize IWBs”*
- *“Whenever I do different activities with the help of the smart board, I can easily notice that students have more fun and are eager to participate, even the ones who don’t usually do. They feel like they play a game and that’s why the pressure on them remarkably decreases”*
- *“Because it makes the environment more vivid”*
- *“It provides both visual and audio effects”*

However, 39.7% of the participant teachers believe that training is necessary to teach with an IWB. Thus, they think that if they don’t get sufficient training, they don’t feel comfortable with using IWBs in the classroom. This finding is largely in line with the findings of different research (Öz, 2014; Türel & Johnson, 2012; Mathews-Aydinli & Elaziz, 2010). Öz (2014) claims that teachers can get in-service training workshops to get familiar with IWBs and use them correctly, with more confidence.

According to the findings retrieved from students, it has found out that they are aware of IWB’s effectiveness and contribution to learning and motivation. Many of them expressed to learn more when their teacher uses IWBs, to understand and remember what they learned easier, to concentrate better, to join lessons more, to get more interested and excited, to keep their attention easier, and to prefer lessons taught with an IWB. These results also support the idea of teachers who think IWBs affect positively the motivation of their students. As Mathews-Aydinli and Elaziz (2010) state, motivation in EFL classrooms has always been a problem in Turkey. This study showed one more time that IWBs are beneficial tools to help both teachers and students get motivated during English lessons.

However, contrary to what the majority of EFL teachers claimed, 40.2% of students strongly agreed or agreed with Q20 “There is no difference between my English teacher’s use of a traditional board and an IWB in terms of teaching techniques and methods.” This shows that for most of the students using an IWB or not during EFL classes is the same in terms of teaching techniques and methods. This finding may support the result found by Schmid and Schimmack (2010) that teachers require enhancing the skills and knowledge of how to use ICT in general and IWBs, in particular, to integrate them into practice.

CONCLUSION AND SUGGESTIONS

Different studies have been done during the last decades about the use of technology and IWBs. Earlier studies, as the previous one, show that IWB usage is considered to have positive effects on language teaching and learning by both teachers and students. Enhancing their motivation, creating a more interesting and entertaining atmosphere during English classes, helping students to be more active, and teachers to save their time and materials are among

some of the reasons why IWB usage has increased over the past decades and is still preferred by many teachers during their language classes. The present study aimed to focus on the attitudes of secondary school EFL teachers and students towards the use of IWBs in EFL classrooms. Both teachers and students have generally positive thoughts about the use of IWBs, as they especially enhance their motivation.

Moreover, further research can be done on single regions to compare if there is any difference in attitudes within these regions. Research can also include not only one single level of education, but they can compare results between different education levels. This study aimed to be mixed-method research, but it lacked a large amount of qualitative data due to the small number of teachers who participated in the interview. A big sample can reflect more reliable results in terms of qualitative data.

Seeing a significant difference only in the mean ranks of the “instructional effects of IWBs” section in terms of gender and only in the “instructional effects of IWBs” sub-section for the writing skill from both teachers’ and students’ points of view, further research should be held to investigate the relationship between other skills and sub-sections in a detailed way.

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Self-regulation in Obligatory Online Education: A Discussion from Social Interaction Perspective

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Introduction

Self-regulation refers to taking control over one's learning processes, spending extra time and effort, and employing strategies to experience more academic success. Learners' use of strategies for their own learning makes them more responsible for their learning and makes them self-regulated learners. These learners are the ones who control their learning processes, manage their abilities, and regulate their emotions and motivation by using various strategies. Zimmerman (1989) states that self-regulated learners establish a hierarchy of goals, have learning-goal orientation, and are highly self-efficacious. The use of cognitive and self-regulatory strategies requires more time and effort than normal engagement. To spend more time and effort, and to use various strategies, they must be motivated. Students who value their work are willing to spend more effort and time on their schoolwork. Students who set self-improvement and learning goals for themselves engage in various cognitive and metacognitive activities to improve their learning.

Zimmerman (1989) regards self-regulation as an individual, cognitive–constructive activity whereas the social constructivist (Vygotsky, 1978) and social cognitive (Bandura, 1986) theories state that it is more than an individual process which involves social interactions. The Vygotskian approach emphasizes that individuals co-construct knowledge through social interactions and focuses on individuals as constructors of knowledge. Whereas, the social cognitivist assume that self-regulation is a social process that is influenced by contexts and behavioral events in a reciprocal fashion. Effat & Gillies (2015) further explains self-regulation as the metacognitive, motivated, and strategic actions of learners, as Zimmerman (1998) put forward, occurring within a social context (classroom) that characterizes interactions between the teacher and students. It is a social process which occurs 'when students are motivated to reflectively and strategically engage in learning activities within environments that foster self-regulation' (Butler, 2002; p. 60). Thus, self-regulation is developed and supported as a socially-situated activity within a traditional classroom (Hadwin et al., 2011).

The coronavirus COVID-19 pandemic led education move to the virtual class meetings of various online learning platforms. Moving from the traditional classrooms to the virtual platforms forced teachers and students gain new skills to adapt themselves to the more autonomous nature of these new learning platforms. Therefore, regulation has become a useful trait for effective online learning since the learners have come across a great amount of freedom and control regarding the place, time, materials, content, and especially the strategy to study (Cunningham & Billingsley, 2003).

Meaningful and effective learning depends on students' ability to manage resources in such a way that will fit their goals and needs (Pintrich, 1999; Wolters & Hussain, 2015). Hong and Jung (2011) reported that cognition and metacognition skills seem to be among the more influential skills that explain distance learners' success. Studies indicated that technology-enhanced learning environments could support self-regulatory learning skills by providing opportunities for self-monitoring, mastery learning, peer interactions, and methods for cognitive apprenticeship (Barnard et al., 2009; Cho & Heron, 2015; Kramarski & Michalsky, 2010).

Efficient resource management is critical for successful online learning (HusseinFarraj et al., 2012; Selim, 2007). The online students asserted that the availability of the online materials on the course website and the use of the video-streaming platform helped them to manage, control, and handle the volume of information. Learning environments and activities that facilitate efficient resource management are significant for students' learning process and academic success (Pintrich, 1999; Zohar & Dori, 2012).

Barak et al. (2016) studied to identify self-regulation skills required for online learning and to characterize transfer skills of on-campus and online undergraduate students. Students who took the online course, received higher means

for both self-regulation and transfer skills, compared to the on-campus group. They also received higher mean scores on their final project and examination. Nevertheless, only a third of the course students chose to study it online. Most of the students still prefer to learn in a traditional, face-to-face, classroom setting. Their findings indicated that both on campus and online students maintained that successful online learning relies on ‘cognitive strategies’ and ‘regulation of cognition’ (a metacognitive skill). The online students indicated metacognitive skills, such as planning, controlling, and evaluation skills, as essential for meaningful distance learning, while the on-campus students asserted lack of self-discipline and limited communication skills as barriers to distance learning. The students asserted that by receiving support from peers and instructors in the online environment, they were better able to regulate their learning and become more confident as learners.

Online learning environments with their more autonomous nature have forced learners to adapt themselves to these artificial learning environments. It was thought that students would become better self-regulated learners simply from increased exposure to or experience with online courses. However, it lacked the direct and personal supervision of the instructor, which might result in learner’s sense of isolation and an accompanying lack of engagement (Barak et al., 2016). Taking into consideration the high degree of student autonomy resulting from the instructor’s physical absence, effective self-regulation strategies might be critical in online education situations. Unfortunately, not all students are self-regulated learners (Cho & Heron, 2015). Many are unmotivated and fail to use cognitive strategies, thinking skills, or do not have self-monitoring ability (Cho & Heron, 2015). Students lacking self-regulation skills may misinterpret the autonomy of the online learning environment and, as a result, may not accomplish the learning tasks as expected in online courses (Barnard et al., 2009).

The study

The primary aim of this study is to identify whether students are aware of self-regulation skills required for online learning and can apply them in their online learning process. Secondly, this research aims to figure out the possible advantages and disadvantages of their obligatory online education experience. The mixed method research model was applied, using both quantitative and qualitative methodologies in the analysis. The participants were 110 first grade students in the Department of English Language and Literature in Zonguldak Bülent Ecevit University, Turkey. 63 of them studied in English prep school in 2019-2020 fall term at school and received online education in spring term. They have spent one education-term together as two Prep classes which makes them a social community. 42 of them are the new students of 2020-2021 education year who do not know the other students in the class. The instructor used Perculus online education platform to teach. The lessons consisted of lecture videos without limited student participation (only through text messages they send during the actual lesson time). The maximum number of students in the lessons at the actual lesson time was 65. Thus, we might state that nearly half of the students tended to follow the lessons in the schedule they prefer.

The online survey was administered during the semester to identify students’ motivational self-regulation strategies. The interviews were based on students’ online learning experience and their use of cognitive and metacognitive self-regulation strategies. The semi-structured interviews were conducted at the end of the semester as a conversation based on questions and answers that the interviewer used to navigate the interview. In this study, Pintrich’s (1999) the taxonomy of self-regulation strategies and Wolters’ (2000) taxonomy of motivational regulation strategies are used.

According to Pintrich (1999), the taxonomy of self-regulation strategies include cognitive and metacognitive strategies. Cognitive learning strategies include rehearsal, elaboration, and organizational strategies. Rehearsal strategies involve having multiple exposures to items to be learned or saying words aloud as one reads the text. These strategies help students to select important information active in working memory. Elaboration strategies involve paraphrasing, summarizing the material to be learned, creating analogies, generative notetaking, explaining the ideas in the material to someone else for better comprehension, and asking and answering questions. Organizational strategies include behaviors such as finding the main idea in the text, outlining the text, and using various techniques for selecting and organizing the ideas in the material.

Pintrich (1999) explains metacognitive strategies as planning, monitoring, and regulation strategies. Planning activities include setting goals for studying, skimming a text before reading, and doing a task analysis of the problem. These activities help learners to organize material easily. Monitoring involves tracking of attention while reading a text, or listening to a lecture, self-testing by questions about the text material to check for understanding, monitoring comprehension of a lecture, and using test-taking strategies in an exam situation. These strategies show the learner his or her deficiencies in comprehension or attention that would benefit from improvement, using regulation strategies. Examples of self-regulation strategies include asking oneself questions after reading a text,

re-reading for better comprehension, slowing the pace of reading when reading a difficult text, reviewing a part for better comprehension, skipping questions and returning to them when taking a test.

Wolters (2000b) defines motivational regulation strategies as “various actions or tactics that students use to maintain or increase their effort or persistence at a particular task” (p. 283). He defines five types of motivational regulation strategies: self-consequating, environmental control, interest enhancement, mastery self-talk, and performance self-talk. Self-consequating as one motivational regulation strategy. He depicts it as increasing extrinsic reasons for completing the task, such as obtaining rewards or avoiding punishments. Environmental control involves arranging and controlling the study environment by getting rid of distracters to make work easier. Interest enhancement strategies include regulating engagement and willingness to make tasks more interesting, enjoyable, or challenging, and persisting through the manipulation of tasks. Mastery self-talk, his fourth motivational self-regulation strategy, involves emphasizing mastery-related reasons for becoming more competent and completing the task. Performance self-talk, unlike mastery self-talk, as emphasizing performance-related reasons to motivate oneself (i.e., getting the best grade and completing the task). Unlike mastery self-talk, learners remind themselves of normative evaluations and the consequences of performance that is better than the other students’ performance to complete the task or to persist in tasks.

The results

The semi-structured interviews were conducted to identify student attitudes towards online education and thoughts on their obligatory online learning experience. The participants composed of students who had face-to-face education with half of their current classmates at prep school and students who have just entered the university in 2020-2021 education year without any face-to-face university education experience. In this part, student answers are summarized.

The frequency test results indicate that students use motivational self-regulation strategies to regulate their effort and persist in tasks assigned in classes. They usually tell themselves that if they do the assigned work now, they can do something that they like later. In addition, they believe that they will be successful and get good grades if they do their assignments. They usually tell themselves that if they do the assignments, they will not be punished. Half of the students promise themselves rewards for doing the assignments. They connect what they are learning in English with their own experiences. They always study when they can be more focused, and when they get rid of distractions around them so as not to be disturbed by them. More than half of the students make changes in their surroundings to be able to concentrate. they challenge themselves to complete the work and learn as much as possible and persuade themselves to work hard for the sake of learning. They sometimes tell themselves to keep working just to learn as much as they can. They always work harder by thinking about earning good grades. They always remind themselves that their grades will be affected if they do not do the assignment or reading. They know that doing well on tests and assignments is important, and they need to keep studying to do well in school.

Table 1. Frequency Percentages of Motivational Self-regulation Strategies Items

Items	No	Very True/ True	Partially True/ Not True at All
Self-Consequating			
		Percentages	
4	I tell myself I can do something I like later if right now I do the work I have to get done.	88	12
9	I tell myself that if I do the assignments, I will not be punished.	75	25
14	I promise myself a reward if I get the assignment done.	48	52
19	I tell myself that if I do the assigned work on time, I will get good grades.	82	18
Interest Enhancement			
2	I make studying more enjoyable by turning it into a game.	28	72
12	I try to connect what I am learning to my own experiences.	90	10
17	I try to connect the material with something I like doing or find interesting.	60	40

	2	I make studying more enjoyable by turning it into a game.	28	72
Environmental Control				
	6	When studying for this language class at home, I change my surroundings so that it is easy to concentrate on the work.	66	34
	11	I try to get rid of any distractions that are around me when I am studying.	70	30
	16	I try to study at a time when I can be more focused.	90	10
	21	I make sure I have as few distractions as possible before I start studying.	73	27
Mastery Self-Talk				
	5	I persuade myself to work hard just for the sake of learning.	67	33
	10	I challenge myself to complete the work and learn as much as possible.	78	22
	15	I persuade myself to keep working on the material just to see how much I can learn.	55	45
	20	I tell myself that I should keep working just to learn as much as I can.	57	43
Performance Self-Talk				
	3	I try to make myself work harder by thinking about getting good grades.	92	8
	8	I remind myself how important it is to do well on the tests and assignments in school.	72	28
	13	I tell myself that I need to keep studying to do well in school.	63	37
	18	I think about how my grade will be affected if I do not do the assignment or reading.	94	6

The interviews were based on students' online learning experience and their use of cognitive and metacognitive self-regulation strategies. Both group of students were especially questioned about psychological and social aspects of their online learning experience such as motivation, discipline, and collaboration. The answers are grouped under regulation of cognition, regulation of resources, attitudes, social aspects and teacher intervention.

Regulation of cognition

Students from both groups indicated the importance of careful planning for successful online learning. Students seemed good at controlling their learning process. For example, one student asserted: "...in online learning, I can control various aspects of learning, including the lecture videos, which I can fast forward, stop, or replay." Students thought that online environments are effective method for evaluation, indicating the importance of immediate feedback and the ability to monitor their grades.

Resource management

Efficient resource management is critical for successful online learning (Hussein-Farraj et al., 2012; Selim, 2007). The online students asserted that the availability of the online materials on the course website and the use of the video-streaming platform helped them to manage, control, and handle the volume of information. Learning environments and activities that facilitate efficient resource management are significant for students' learning process and academic success (Pintrich, 1999; Zohar & Dori, 2012). This enabled students to recite and summarize different parts of the lecture and to assemble all parts to generate a better understanding of the learning materials. They emphasized the importance of processing: they indicated that they have developed strategies for summarizing the learning material, for creating analogies, and for note taking. They stated that effective online learning relies on the organization of the course website. For example: "When I was asked to perform a task, it is easy for me to find the information on the course website." For example, "I used the lecture notes and the related articles ... all the information was presented online in an orderly way, and in my opinion this arrangement is very convenient." Moreover, they pointed out that learning from a distance gives them flexibility with respect to time, pace, and place

and this helps them participate the lessons regularly. Despite having the flexibility in place, they tended to stay home to follow the lessons regularly. However, they tended to reschedule the lessons defined by the department taking advantage of the opportunity of replaying lesson videos to fit to their best times to study. Totally new students emphasized the importance of being independent and self-governing with relation to time and place of learning.

Self-discipline

It comes after the initial enthusiasm, helping students regulate their learning by taking responsibility and actions to pursue their learning goals. The students indicated the importance of self-discipline in their assertions. For example: “I am aware of my responsibility, I can only trust myself ...if I do not watch the videos or thoroughly read the articles, I will not understand the learning materials and probably fail the course”. Thus, most of the students reported that they read the articles before the lesson to get prepared. ‘Knowing myself as a learner’ refers to the need to be familiar with one’s own strength and weaknesses as a learner and taking actions to prosper in a certain learning situation. For example: “I am easily distracted by people or noise; therefore, I prefer to learn on my own in a quite environment”. Thus, they said that they try to follow the lessons in a room alone and tidy up the environment before the lessons. Moreover, they remind themselves that they must study to be successful, and they tend to study when they feel ready. For instance: “I am more productive in the evenings... it is difficult for me to concentrate in the mornings”. Although only half of the students indicated positive feelings about online learning, most of the students demonstrated strong motivation to complete the online course, they felt confident about their learning abilities. They emphasized that most of the problems they face in traditional education have disappeared, and they have all the ease and the comfort of the house and the family, so they force themselves to perform better.

Attitudes

Student attitudes that can facilitate productive learning in online environment when they are positively applied were grouped as: affective, self-discipline, and knowing myself as a learner, ‘Affective’ refers to students’ feelings about learning from distance, their reaction toward the virtual learning environment, and how they perceive the online course (contents and assignments). One student said, for example: I like learning from distance, I enjoy the idea that I am at my comfortable house and still be able to hear the lecture and do my assignments”. While more than half of the students stated that they liked online courses and the other half indicated their dislike, almost all students stated that they would prefer traditional classrooms since more than half of the students believed that they did not learn as much as in traditional classrooms. Half of the students indicated concerns about not having sufficient communication with the teacher, viewing it as an obstacle to online learning. For example, one student asserted: “I did not like learning from distance because the direct interactions with the lecturer are very important to me.”

Social aspects

The students who studied at prep school emphasized the importance of interactions with the lecturer and fellow students more than the other group, indicating social learning as an important feature of distance education. More than half of the students indicated that the most challenging thing in online education is lack of socialization and isolation. The students reported that the online forums helped them to interact with the teacher. Besides using forums for assistance, they formed small Whatsapp and Zoom groups to collaborate. For example: “The online forums encouraged effective communication...” I participated when I needed an answer and either one of the students or the teacher responded. The students kept track of due dates via small Whatsapp and Zoom groups. They mostly needed help about lesson notes and homeworks. The students try to find out how they are doing in their online classes in comparison to their peers. This supports the fact that the control of individual actions is influenced by the social situation in which an individual participates.

The related literature also suggests that communicating with another student regarding technical or academic difficulties in a course is easier than communicating such concerns to a faculty member for many students (Abdous, He, & Yen, 2012). Need to get ‘Socialized with their peers’ was identified as a metacognitive self-regulation skill that was highly expressed by the online students. The students asserted that by receiving support from peers and instructors in the online environment, they were better able to regulate their learning and become more confident as learners. This is in line with the findings of recent studies that indicated the importance of peer support and scaffolding for self-regulation in the classroom (Effat & Gillies, 2015) and in online environments (Rodicio et al., 2013& Barak et. al, 2016).

However, the other group members indicated that they do not need help or just do not ask for it even if they feel like. Few students explained the reason why they do not ask for help as they do not know how to do it or feel too shy to do so. As the related literature (Cheng et al., 2013) also suggests, the students who studied at prep school reported that they ask for help which is the sign of higher levels of self-regulation. The online environment may

present a barrier to some students to pursue the help they need. Students who need the most help can often be the ones to seek help the least (Cheng et al., 2013).

Teacher intervention

The students' were questioned on their perceptions about the effectiveness of teacher intervention to figure out its effect on their autonomous behaviors. Almost all students still prefer to learn in a traditional, face-to-face, classroom setting mainly due to the lack of face-to-face teacher-student interaction in online education. This preference may be in part due to the fact that Turkish learners are accustomed to a teacher-centered educational system. When students were further questioned on details about teacher-student interaction in class, they stated that they did not feel that they are learning effectively. Taking into consideration the importance of classroom interactions, the lack of such interactions would certainly cause negative feelings in students. Since teachers can engage students in higher-level thinking through scaffolding during classroom interactions which would then lead them to cognitive progress via socio-cognitive conflicts (Gillies et al., 2012; Psaltis, Duveen, & Perret-Clermont, 2009; Webb et al., 2009; Franke et al., 2009).

A considerable number of learners preferred the teacher to monitor their progress, even in a student-initiated task. The students who studied at prep school found teacher intervention as helpful and a source of motivation in online education. They also emphasized the importance of interactions with fellow students more than the other group, indicating social learning as an important feature of distance education. For example: "The online forums encouraged effective communication..." I participated when I needed an answer and either one of the students or the teacher responded. Besides using forums for assistance, they formed small Whatsapp and Zoom groups to collaborate. Another example: "working together in our small group throughout the semester strengthened our interactions and conveyed interesting discussions."

Online learning experience

The study identified certain obstacles for academic success in online education. Firstly, technical problems such as internet connection failures or technical errors in the virtual platform made students distracted. Secondly, they forced themselves to get focused and learn the subject thoroughly since they reported that it is difficult to understand from the videos. Too much pressure on disciplining themselves made them stressful. Moreover, being in a virtual environment without socializing with their peers made them feel isolated which in time caused demotivation. Students also reported that they sometimes get frustrated due to the lack of human contact, the absence of a teacher and an inability to discuss it with their classmates. Creating sense of community was found to be significantly associated with perceived learning (Rovai, 2002; Shea, Li, & Pickett, 2006).

Discussion

This study indicates that these students are aware of self-regulation skills, and they are able to apply them in their learning process; they control their learning processes, manage their abilities, and regulate their emotions and motivation by using various strategies. Control of individual actions is often related to independent or self-regulated forms of learning (Boekaerts et al., 2000). However, they reported that spending more effort to control their learning behaviors in a virtual environment alone rather than in traditional classroom environment caused too much pressure on them resulting in demotivation problems in time. Moreover, as they were accustomed to social interactions in traditional classroom mediated by the teacher, they felt frustrated during their online learning experience. Therefore, they evaluated their online learning experience as ineffective compared to traditional learning experience. The students reported that education should be in a social environment; thus, they felt the need to form small groups to cooperate. This supports the fact that perceived learning is significantly associated with creating sense of community (Rovai, 2002; Shea, Li, & Pickett, 2006).

The related literature suggests that regulation starts from the social/interpersonal level and eventually leads to self-regulation at an intrapersonal level (Nastasi et al., 1990; Boekaerts et al., 2000). Social interactions are strongly related to cognitive change (Lim, 2012). Nastasi, Clements, and Battista (1990) argued that higher level cognitive processes develop as a result of learners' engagement with cognitive conflicts and their resolution during social interactions. As the related literature suggests, this study also suggests and supports the fact that social interactions and self-regulation are closely linked, and social interactions are likely to influence the development of self-regulation.

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Teachers' Self-Efficacy in terms of Former Experience and Professional Development in the Turkish World Based on Talis 2018 Data: Sample of Turkey and Kazakhstan

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ABSTRACT

The purpose of this study is to determine the teachers' self-efficacy in terms of their former experience and professional development in the Turkish World (Turkey and Kazakhstan) based on TALIS 2018 Data. In this context, this study is conducted with the participation of 6.531 Kazakh and 3.828 Turkish teachers who teach at ISCED level 2. The data for this study are obtained from the official internet website of OECD. The results are obtained by utilizing three separate regression analyses by using IDB Analyzer program based on SPSS. According to the results, it is determined that the variance of teachers' former experience explains 2% of the variance in their self-efficacy in Turkey; 3% in Kazakhstan. On the other hand, the variance of teachers' former experience explains 3% of the variance in their professional development in Turkey; 4% in Kazakhstan. However, the variance of teachers' professional development explains 32% of the variance in their self-efficacy in Turkey; 23% in Kazakhstan. Moreover, there is a positive and significant relationship between both the self-efficacy and professional development of teachers (e.g. 'teaching practice', 'professional cooperation in lessons' and 'effective professional development') in Turkey and Kazakhstan. Therefore, it is important to support teachers' continuous professional development and empowerment to increase their self-efficacy through continuous professional development programs which focus on the practice, especially classroom practices. In addition, to prepare the qualified continuous professional development programs, faculties of education might strengthen their capacity to provide in-service training as well as pre-service training.

Keywords: Teacher competence, self-efficacy, professional development, former experience, quality of teacher

INTRODUCTION

Teachers are the most significant elements of the changes in education reforms in improving the education system (Villegas-Reimers, 2003). In order to keep up with the changes in the field of education, many factors related to teachers come to the fore (Buldu, 2004). Therefore, social change is the focus of current discussions on professional development (Krolak-Schwerdt, Glock & Böhmer, 2014). In this context, the importance of improving and strengthening teachers' competencies, especially self-efficacy, in terms of keeping pace with social changes and ensuring continuous developments in their profession emerges. It is also important to determine the factors that will affect the self-efficacy of the teacher and to carry out studies in this direction in order to have a positive effect on their perceptions such as taking responsibility and participating in studies for their profession. When the literature is examined, even though the knowledge acquired by teacher candidates in the pre-service period and further development of teachers in the in-service period are the prerequisites for becoming a qualified teacher, they need also former experiences on how to teach in order to be a successful teacher (Taşkın & Hacıömeroğlu, 2010). In this context, in this study, it is aimed to reveal the role between teachers' professional development and former experiences in the context of their self-efficacy in the Turkish World.

THE ROLE AND IMPORTANCE OF SELF-EFFICACY IN THE TEACHING PROFESSION

Teachers emerge as important actors in keeping pace with the changes in the education system and in solving of the problems they face up with in the classroom in today's conditions. Therefore, it is crucial to improve the professional competence of teachers. One of the significant components of teacher competencies is self-efficacy (Yılmaz & Çokluk Bökeoğlu, 2008). Self-efficacy is the internal belief of teachers about how well they can produce solutions to the problems they face in the education system and how well they can perform the activities they will perform (Kaçar & Beycioğlu, 2017). Teachers' perceptions of self-efficacy reflect their efforts (Aslan & Kalkan, 2018) and motivations (Arseven, 2016) for the profession. For this reason, in the learning-teaching process, teachers with high self-efficacy perceptions are needed (Baltaoğlu, Sucuoğlu & Yurdabakan, 2015). Teachers with high self-efficacy tend to make more qualified planning and organization in their professions (Koç & Deniz, 2020), and use student-centered approaches and various methods in the teaching process (Tekerek, Ercan, Udum & Saman, 2012). Therefore, in terms of the quality of the teaching process, teachers should have high level of self-efficacy for their profession and be able to develop this perception (Kaya, Polat & Karamüftüoğlu, 2014). In this way, teachers might provide the opportunity to increase student success (Arseven, 2016).

FORMER EXPERIENCES

Teachers should improve themselves well in their field in order to fulfill their responsibilities in the most efficient way in their profession (Gökyer, 2012). The quality of the teachers depends on their knowledge of the field, teaching profession and their skills, and general knowledge of culture before starting their profession, as well as the integrity of their knowledge and practices from their former experiences related to their profession (Özkan, Albayrak & Berber, 2005). One of the focal points for teachers to have stronger former experiences is the education they receive at the university. In this process, in addition to providing field courses in a qualified way, practice-based trainings (such as laboratory use, teaching technologies and material use) should also be included (Kavas & Bugay, 2009).

The more qualified pre-service education that the teacher candidates received, the higher the level of readiness when they started to work. No matter how good the pre-service training for teachers is, this training cannot be expected to prepare teachers for all the challenges they will face up with during their careers (OECD, 2009). Therefore, while teachers are performing their profession, they need to continue their personal and professional development in order to respond to the changes in the field of education. In addition, it is seen that former experiences are not sufficient to reveal all the skills of individuals and they discover their different skills after starting their profession (Taymaz, 1978). For this reason, teachers need the knowledge and skills they have acquired before teaching, as well as the knowledge and skills they will acquire in teaching. At this point, the significance of continuous professional development emerges.

CONTINUOUS PROFESSIONAL DEVELOPMENT

One of the key elements of the educational reforms is the professional development of teachers (Villegas-Reimers, 2003). Also, the factors affecting student learning in the education system is the quality of teachers and their professional development activities offered to them (İlğan, 2013). For this reason, the way to improve the educational outcomes of countries and to achieve the expected goals is to develop the teachers and increase their quality (Kesen & Öztürk, 2019).

The success of teachers in their profession is important for both individual and students' success (Can, 2019). However, although the crucial of professional development is accepted, the inadequacy of current professional development for teachers is also evident (Borko, 2004). In addition, teachers' professional development should be considered as a process rather than a situation or event (Patrinos, Velez & Wang, 2013). The continuous and sustainable professional development of teachers will contribute to the development of teachers both individually and professionally. In order to emphasize the continuity of professional development, the phrase 'Continuous Professional Development' is used in English. For this reason, the dissemination of continuous professional development programs in terms of both quantity and quality directly contributes to the development of teachers and indirectly contributes to the development of students.

When the related literature is examined, it is seen that there are many studies on teachers' self-efficacy (Koç & Deniz, 2020; Kaçar & Beycioğlu, 2017; Aslanve Kalkan, 2018; Baltaoğlu et al., 2015; Kaya et al., 2014) and teacher candidates' self-efficacy (Baltaoğlu, Sucuoğlu & Yurdabakan, 2015; Tekerek et al., 2012; Yokuş, 2014). It is also seen that studies have been conducted to reveal the effect of teachers' professional development (Bautista & Ortega-Ruiz, 2015; Karlberg & Bezzina, 2020; Opfer & Pedder, 2010) and teachers' former experiences on competence, especially self-efficacy (Özkan, et al., 2005; Gürbüz, Erdem & Gülburnu, 2013; Morgil & Yılmaz, 1999).

RESEARCH QUESTIONS

This study aims to determine the effect of professional development and former experiences of Turkish and Kazakh teachers on their self-efficacy based on TALIS (Teaching and Learning International Survey) 2018 data. For this purpose, the questions to be answered are as follows:

1. What is the role of former experience and professional development levels in predicting the self-efficacy of teachers working at ISCED-2 (secondary school) level in Turkey and Kazakhstan? What are the significant predictors of their self-efficacy?
2. What is the role of former experience level in predicting the professional development of teachers working at ISCED-2 (secondary school) level in Turkey and Kazakhstan? What are the significant predictors of their professional development?

RESEARCH METHODS AND DESIGN

In this large-scale research, the post-positive paradigm guides. The post-positive paradigm regards knowledge as a product of people's worlds of meaning and claims that it might be interpretable (İbrahimoglu, 2011). Therefore, this paradigm is regarded as critical realists due to the assumption that objective realism exists (Longuira, 2016). The paradigm on which many quantitative researches are based is the post-positive paradigm (Shy, 2019). Relational research method, one of the survey models, which is one of the quantitative research methods, was used in this study. Through this method, researchers try to determine the change and degree between two or more variables (Adal and Yavuz, 2017).

RESEARCH SAMPLE

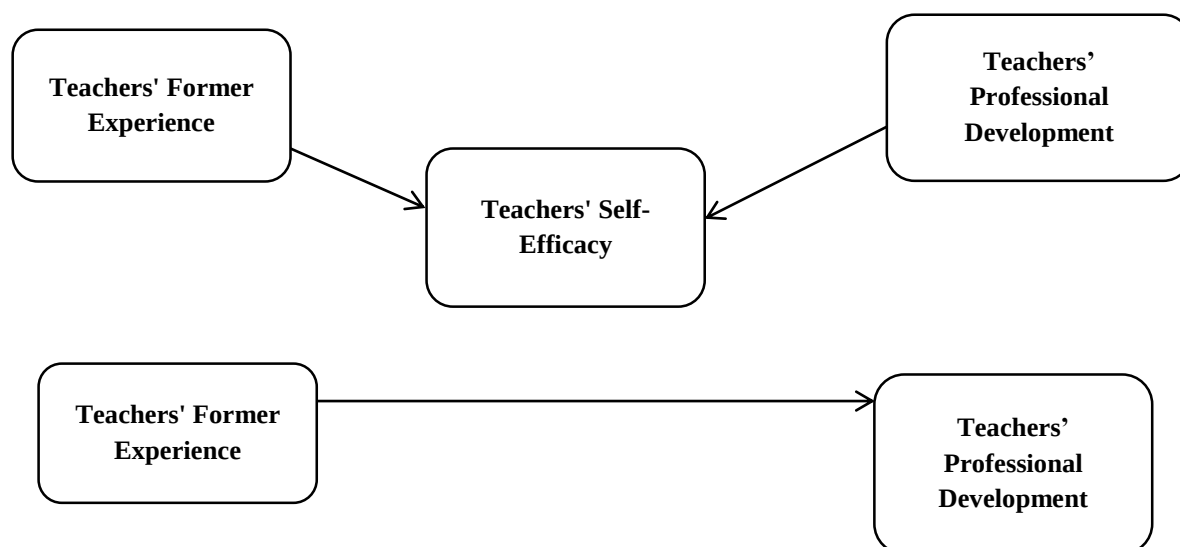
The research sample consists of 3.828 Turkish and 6.531 Kazakh Teachers teaching at ISCED 2 level. ISCED 2 level includes teachers who teach at the secondary school level.

DATA COLLECTION AND ANALYSIS

The research sample consisted of Turkish and Kazakh teachers who participated in TALIS 2018 research. The data were obtained from the OECD official website. SPSS-based IDB Analyzer program was used to analyze the data. As seen in Figure 1, three different regression models were created by using the IDB Analyzer-4 program and analyzes were performed. As the dependent variable, 'self-efficacy of the teacher' and 'effective professional development of the teacher' were used. Dependent and independent variables, items/indices obtained from TALIS 2018 teacher survey were used.

Model-I

Model-II



Model-III

Figure 1: Regression models created for research analysis

The findings were obtained by the regression analysis. The IDB Analyzer realizes its analyses with sample weights (Özkan, 2020). Missing data were extracted before the analyses. In the results obtained, when the t-value is greater than 1.96, the p-value ($p < .05$) shows that there are statistically significant differences at the 95 percent precision level. (OECD, 2019; Jung & Carstens, 2015).

FINDINGS

According to TALIS 2018 data, the first of the findings obtained by creating three different regression models is the results related to the predictors of the teachers' self-efficacy regarding their former (acquired during formal education) experiences (Table 1).

Table 1: Predictors of teacher's self-efficacy regarding their former experiences (acquired during formal education) based on TALIS 2018 data

Country	Variable	B	Standardized Coefficients (Beta)	Std. Error	t
TR	(CONSTANT)	12.19	-	0.07	163.25
	Content of some or all subject(s) I teach	0.14	0.04	0.09	1.66
	Pedagogy of some or all subject(s) I teach	0.10	0.03	0.07	1.39
	Classroom practice in some or all subject(s) I teach	0.12	0.04	0.06	1,89*
	Teaching cross-curricular skills (e.g. creativity, critical thinking, problem solving)	0.27	0.09	0.06	4,35**
	Use of ICT (information and communication technology) for teaching	0.07	0.03	0.05	1.50
KAZ	(CONSTANT)	12.17	-	0.10	125,71
	Content of some or all subject(s) I teach	0.06	0,01	0,08	0,78
	Pedagogy of some or all subject(s) I teach	0.12	0.03	0.06	1,96
	Classroom practice in some or all subject(s) I teach	0,23	0.06	0.07	3,50**
	Teaching cross-curricular skills (e.g. creativity, critical thinking, problem solving)	0,21	0.09	0.04	5,35**
	Use of ICT (information and communication technology) for teaching	0.12	0.05	0.04	3,28**
		R²	Corrected R²	Estimated Std. Error	
TR		,02	,02	,01	
KAZ		,03	,03	,01	

Note: TR: Turkey, KAZ: Kazakhstan, * p<.05, ** p<.01

The results of the regression analysis presented in Table 1 reveal that the teachers' former experiences explained 2% ($R^2 = .02$) of the variance in the teachers' self-efficacy in Turkey and 3% ($R^2 = .03$) in Kazakhstan. While 'classroom practice in subject(s) I teach' and 'teaching cross-curricular skills (such as creativity, critical thinking and problem solving)' have statistical meaning in Turkey, 'classroom practice in subject(s) I teach', 'teaching cross-curricular skills (such as creativity, critical thinking and problem solving)' and 'use of information and communication technology for teaching' are statistically significant in Kazakhstan.

Table 2 shows the results of the predictors of the teachers' self-efficacy regarding their professional development.

Table 2: Predictors of Teachers' Self-Efficacy for their Professional Development based on TALIS 2018 data

Country	Variable	B	Standardized Coefficients (Beta)	Std. Error	t
TR	(CONSTANT)	8.12	-	0.50	16.29
	Prof. Collaboration in lessons	0.10	0.12	0.02	5,56**
	Effective Prof. Development	0.05	0.05	0.02	2,47*
	Need Prof. Development for teaching for diversity	-0.07	-0.08	0.02	-3,27**
	Need Prof. Dev. in subject matter and pedagogy	-0,13	-0,13	0.03	-4,49**

KAZ	Teaching Practice	0,44	0,44	0.02	19,89**
	(CONSTANT)	4,91	-	0,33	15,06
	Prof. Collaboration in lessons	0,21	0,21	0.02	10,98**
	Effective Prof. Development	0,13	0,12	0.02	5,87**
	Need Prof. Development for teaching for diversity	0.04	0.04	0.02	1,95
	Need Prof. Development in subject matter and pedagogy	0.06	0,08	0,01	4,45**
	Teaching Practice	0,29	0,32	0.02	15,74**
		R²	Corrected R²	Estimated Std. Error	
TR		,32	,32	,02	
KAZ		,23	,23	,02	

Note: TR: Turkey, Kaz: Kazakhstan, * p<.05, ** p<.01

The results of the regression analysis presented in Table 2 reveal that teachers' professional development explains 32% ($R^2 = .32$) of the variance in their self-efficacy in Turkey and 23% ($R^2 = .23$) in Kazakhstan. All of the predictors selected in Turkey are statistically significant. 'Professional cooperation in lessons', 'effective professional development' and 'teaching practice' predictors have a positive effect and; 'need professional development for teaching for diversity' and 'need professional development in subject matter and pedagogy' have a negative effect. In Kazakhstan, four of the selected predictors ('professional cooperation in lessons', 'effective professional development', 'need professional development in subject matter and pedagogy' and 'teaching practice') have a statistically significant and positive effect.

Table 3 shows the predictors of teachers' professional development on their former (acquired during formal education) experiences.

Table 3: Predictors of teachers' professional development related to their former experiences (acquired during formal education).

Country	Variable	B	Standardized Coefficients (Beta)	Std. Error	t
TR	(CONSTANT)	12,42	-	0,13	95,68
	Content of some or all subject(s) I teach	-0,04	-0,01	0,11	-0,37
	Pedagogy of some or all subject(s) I teach	0,31	0,08	0.14	2,27*
	Classroom practice in some or all subject(s) I teach	0,23	0.07	0,11	2,17*
	Teaching cross-curricular skills (e.g. creativity, critical thinking, problem solving)	0,16	0.05	0,08	1,92
	Use of ICT (Information and Communication Technology) for teaching	0,15	0.06	0.07	2,21*
	(CONSTANT)	11,32	-	0.09	122,58
KAZ	Content of some or all subject(s) I teach	0,19	0.04	0.07	2,58*
	Pedagogy of some or all subject(s) I teach	0,21	0.06	0,08	2,63**
	Classroom practice in some or all subject(s) I teach	0,34	0.10	0.09	3,94**
	Teaching cross-curricular skills (e.g. creativity, critical thinking, problem solving)	0,20	0.10	0.05	4,27**
	(CONSTANT)	11,32	-	0.09	122,58

Use of ICT (Information and Communication Technology) for teaching	0.03	0.02	0.04	0,85
	R ²	Corrected R ²	Estimated Std. Error	
TR	,03	,03	,01	
KAZ	,04	,04	,01	

Note: TR: Turkey, Kaz: Kazakhstan, * p<.05, ** p<.01

The results of the regression analysis presented in Table 3 reveal that the teachers' former experiences accounted for 3% ($R^2 = .03$) of the variance in their professional development in Turkey and 4% ($R^2 = .04$) in Kazakhstan. While 'including pedagogy related to the taught lesson', 'including classroom practices related to the taught lesson' and 'use of information and communication technology for teaching' are statistically significant in Turkey, 'including the content of the taught lesson', 'including pedagogy related to the taught lesson', 'including classroom practices related to the taught lesson' and 'teaching cross-curricular skills (such as creativity, critical thinking and problem solving)' have a statistically significant and positive effect in Kazakhstan.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

In this study, in the light of TALIS 2018 data, it was tried to reveal teachers' their self-efficacy based on their professional development and former experiences in the Turkish (Turkey and Kazakhstan) World.

This study reveals that teacher' former experiences explain 2% of the variance in their self-efficacy in Turkey and 3% in Kazakhstan. On the other hand, teachers' former experiences explain 3% of the variance in their professional development in Turkey and 4% in Kazakhstan. However, teachers' professional development explains 32% of the variance in their self-efficacy in Turkey and 23% in Kazakhstan. It was revealed that the training received in in-service period contributes to teachers' self-efficacy more than in the pre-service period. For this reason, it is necessary to give more importance to continuous professional development programs to strengthen teachers in the Turkish world. Teachers with increased self-efficacy may have the opportunity to be open to further development, to follow developments in their profession and to keep up with the change in the education system more easily.

There is a significant relationship between both the self-efficacy and professional development of teachers in Turkey and Kazakhstan and the inclusion of 'classroom practices related to the lesson taught' in their pre-service education. Therefore, the ties between "School-University Cooperation" should be further strengthened to increase the quality of the practices of teacher candidates (Morgil & Yılmaz, 1999). In this way, they might gain more experience in teaching practice, so that this might contribute to their perceptions concerning teaching profession (Özkan et al., 2005). In addition, there is a significant relationship between both self-efficacy and professional development of teachers in Kazakhstan and 'the use of information and communication technology for teaching' and 'teaching cross-curricular skills (e.g. creativity, critical thinking, problem solving)'. Similarly, Gürbüz and others (2013) concluded that the teachers' subject knowledge and pedagogical knowledge, pre-service education and professional experience affect mathematics competence. In this study, while there is a positive and significant relationship between the self-efficacy of teachers in Turkey and Kazakhstan and 'teaching practice', 'professional cooperation in lessons' and 'effective professional development', there is a significant negative relationship between the professional development of Turkish teachers and 'professional development needs related to field and pedagogy', while there is a positive relationship in Kazakhstan. Similarly, 2008 and 2013 TALIS results show that, teachers who received more vocational development training stated that they worked more effectively (OECD, 2016). In addition, in TALIS 2018 report, it is concluded that one of the most important factors that stand out in teachers' professional development practices is working together (Toker, 2019). Therefore, both working in collaboration with colleagues and considering different disciplines as a whole will enable teachers to develop their 21st century skills.

As a result, in order to increase teachers' self-efficacy, they might be supported and strengthened continuously in their profession. Continuous professional development programs might be prepared on a practical basis, especially in classrooms. Since the importance of information and communication technology has become more evident especially during the epidemic period, continuous professional development programs might be prepared for teachers to develop these skills related to information and communication technology. The quality of the continuous professional development programs might directly affect teachers' self-efficacy. It implicitly means that it affects sustainable development and the success of students. In addition, in this process, to prepare the qualified continuous professional development programs, faculties of education might strengthen their capacity to provide in-service training as well as pre-service training.

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The Adaptation of the Instagram Addiction Scale (TIAS) into Turkish: Validity And Reliability Studies*

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ABSTRACT

In this study, the aim was to conduct Turkish linguistic equivalence, validity and reliability studies of The Instagram Addiction Scale (TIAS) developed by Sholeh and Rusdi (2019) so that it can be used in the Turkish sample. This measuring instrument consists of two parts namely Instagram Feed Addiction and Instagram Story Addiction compiled based on addiction components 1) Salience; 2) Mood modification; 3) Tolerance; 4) Withdrawal; 5) Conflict; 6) Relapse. In this study, TIAS was applied to a sample of 587 people across Turkey. Positive and significant values were obtained as a result of the Pearson correlation coefficients made to examine the compatibility between the English and Turkish forms of both scales. As a result of the exploratory and confirmatory factor analysis, the 20-item Instagram Feed Addiction Scale, originally consisting of 6 factors, consisted of 4 factors in Turkish scale. It was revealed that Instagram Story Addiction, consisted of 6 factors in the original scale and 3 factors in the Turkish scale. After the EFA and CFA, a 21-item and 3-factor Turkish ISA was obtained. The internal consistency coefficients of both scales ranged between .60 and .93. As a result, the factor structure of both scales was modeled and confirmed by confirmatory factor analysis, and the goodness of fit values was found acceptable.

Keywords: Instagram Addiction, Instagram Addiction Scale, Instagram Story, Validity, Reliability

INTRODUCTION

Addiction is an important chronic disease that scientists have been working on for centuries and trying to develop various treatment methods on how to overcome it. If this situation develops, addiction is not an innocent and easy phenomenon to get rid of. The development of addiction in substances such as cigarettes, alcohol, drugs or gambling is based on the changes in the pleasure pathways of the brain in the process.

In today's 21st century, the developing addiction related to the channels that can be accessed especially through the internet is one of the issues that should be emphasized. Recent studies on internet addiction, which has been one of the popular agenda topics of Clinical Psychology for more than twenty years, mentioned that internet abuse and internet addiction have a pathological side just like alcohol and substance abuse. While discussing the risk of daily behavior changing and becoming pathological (Billieux & et.al 2015), studies on overdose of internet use consistently provide data to prove that this behavior complies with addiction criteria (Kuss, Griffiths, Karila, & Billieux, 2014; Tarhan & Tutgun-Ünal, 2021).

The fact that the interest in social media is increasing day by day brings with some negative factors. Instagram, one of the social media platforms, has become one of the indispensable applications of the new generation smart phones, and when the most used category is examined, it is seen that it occupies the 5th place in the world ranking

* A brief summary of this study was presented at the International Educational Technology Conference 2021 (IETC2021) on September 2-3, 2021, Lefkoşa (Nicosia), Turkish Republic of Northern Cyprus.

(Tankovska, 2021). Instagram addiction has begun to turn into an increasing problem socially, physically and psychologically (Sholeh & Rusdi, 2019). Surely, it is of great importance today to prevent the increasing use and dependencies related to not only Instagram but also many social networking sites (Griffiths & et.al. 2020; Spence & et.al. 2020; Tutgun-Ünal, 2019, 2020a, 2020b, 2021; Tutgun-Ünal & Deniz, 2020).

When the published statistics are examined, it can be easily seen how serious the issue has become. While Instagram had 800 million active users all over the world in September 2017, this number reached 1 billion active users in June 2018. It is known that there are 38 million people actively using Instagram in Turkey. Turkey ranks 6th in the world with this number (Yılmaz, 2020). Although the application is still banned in China, it is one of the properties with four billion users owned by Facebook which is one of the most popular social platforms in the world (Tankovska, 2021).

Since the Internet has actively entered people's lives, it has brought many innovations and developments. One of these developments is that this type of social networks has begun to take their place in people's lives. Internet has many triggering factors and diversity, and this has affected individuals' tendency to use resources in different ways. The internet, which can offer different options to almost everyone, is divided into many sub-categories in its online platform features; social media collaborators (Wikipedia), social media blogs (WordPress), social media communities (Flickr), virtual worlds (Second Life) and social networking sites (Instagram) can be given as examples (Sholeh & Rusdi, 2019).

It is also extremely important to examine the factors that can develop addiction of Instagram, which contains more than one feature and offers new alternatives to its continuous user base. Among the factors that trigger addiction are Instagram users impulsively checking the people who look at their photos or videos, likes and comments, secretly checking profiles they know or do not know, or presenting themselves to the public in a different condition than they are. Being able to be used as desired, not limiting logins and logouts based on time, having a constant flow of movement can engulf the person with an uncontrollable effect, and excessive use can cause the person to be harmed in terms of bio-psycho-social aspects.

The results of a survey conducted by the Kingdom's Royal Society for Public Health show Instagram as the application with the strongest out-of-control effect, such as anxiety and depression, decreased sleep quality, bullying and FOMO (Fear of Missing Out) (Cramer & Inkster, 2017; Metin, Pehlivan & Tarhan, 2017; Tarhan, Ekinci & Tutgun-Ünal, 2021). In addition, it is stated in studies that Instagram posts also trigger voyeurism as a sexual disorder (Amâncio & Doudaki, 2017).

Although the history of addiction generally included issues related to alcohol, cigarettes or a drugs, and the internet or addiction to it was initially expressed by experts in the context of a problematic behavior (Carbonell & Panowa, 2017; Deniz & Tutgun-Ünal, 2016; Tutgun-Ünal & Deniz, 2015). However, the behavior changes the hormones secreted by the brain and its functions (Tarhan & Nurmedov, 2019). This state is characterized by some situations such as emotional discomfort, introversion, deterioration in social relations (Dalvi-Esfahania & et.al. 2019; Tutar, 2020), and it can also pose the danger of addiction (Leong & et.al. 2019), just like a double-edged knife.

Researches have also revealed that the interest of university students to be recognized on social media or to meet some of their social needs through this channel is an important factor in the development of addiction (Ponnusamy & et.al. 2020; Tutgun-Ünal & Deniz, 2016). For example, students in Italy spend most of their time on their phones and mostly spend time on Instagram (Longobardi & et.al. 2020).

Since easily portable phones, tablets and similar equipment make it easier to access these types of platforms, compulsive using and viewing anytime and anywhere deteriorates the usage behavior, leading to excessive use and related negative consequences (Choi & et.al. 2015; Montag & et.al. .2015). Due to the changing agenda within seconds, following the constantly renewed online world can turn into an unavoidable repetitive behavior after a while. This situation can create behavioral addictions with consequences such as relapse, withdrawal from society, developing tolerance, deterioration in life quality, withdrawal from hobbies, anxiety (Griffiths & et.al. 2020) as well as control problems (Griffiths, 2009; Wegman & et.al. 2017).

Emotional attachment to Instagram paves the way for ailments such as depression, stress, and anxiety, thus giving great importance to sharing can make a person more vulnerable in case of a negative situation (Lowe-Calverley, Grieve & Padgett, 2019). Being constantly on Instagram may cause poor performance in remembering the information stored in the short-term memory due to distraction while the news continues to flow with different images (Spence & et.al. 2020).

In the studies of internet addiction tendency conducted on the basis of gender, while some researches find results that women develop addiction more (Young, 1998), some researches mention that male individuals develop addiction more (Morahan-Martin & Schumacher, 2000). It is stated that due to the increase in use, the performance of the individual at work is negatively affected (Rozgonjuk & et.al. 2020), and individuals who use excessively, especially at a young age, show more symptoms of hyperactivity and attention deficit (Wang & et.al. 2017).

When the scales for Instagram addiction were examined in the literature, the thesis study titled “Examination of the Relationship Between Instagram Addiction, Personality Traits and Self-Liking in University Students” developed by Kırcaburun (2017) was found. While measuring Instagram Addiction, the researcher carried out his research by choosing “Instagram” instead of “Internet” expressions in the Internet Addiction Scale developed by Young (1996) and adapted into Turkish by Bayraktar (2001). Kırcaburun and Griffiths, published two articles about problematic Instagram use and the role of perceived feeling of presence, escapism and self-liking (Kırcaburun & Griffiths, 2018, 2019). Then, a study called “A Research on Measuring Instagram Addiction” by Aslan and Ezin in 2018 was found and the “Instagram Addiction Scale” developed by Kırcaburun (2017) was used in the study. Lastly, it was seen that Instagram Addiction Scale (IAS) adaptation study of Kavaklı and İnanc (2021), developed by D’Souza and colleagues (2018).

The first multidimensional developed scale for Instagram addiction is The Instagram Addiction Scale (TIAS) by Sholeh and Rusdi in 2019. TIAS itself consists of two scales; Instagram Feed Addiction and Instagram Story Addiction. Since linguistic equivalence studies have not yet been conducted in Turkish, it is considered important to bring these scales to Turkey. In this study, it is aimed to adapt the Turkish version of The Instagram Addiction Scale (TIAS) developed by Sholeh and Rusdi (2019), to be used in the Turkish sample and to carry out validity and reliability studies.

METHOD

Research Group

For the Turkish validity and reliability studies of The Instagram Addiction Scale (TIAS), the population was formed from people aged 15 and over. Accordingly, the sample of the study was composed of 587 people in Turkey. Since scale adaptation studies will be carried out, it has been tested whether the dataset is suitable for factor analysis. There are various opinions on this subject in the literature. It is stated that the sample size should be between 100-250 and the number of scale items should be at least five times or ten times (Preacher & MacCallum, 2002; Tavşancıl, 2002). In this study, the sample size was found to be sufficient as the number of items in the scales was 20 and 22.

When the sample is examined, 69.6% of the 587 participants are female and 30.4% are male. Their age distribution is between 15 and 70, with a mean age of 32. 50.7% of the participants are single, 41.6% are married. 51% of them have a university, 19.6% a master’s degree, 15.4% a high school, 7% a doctorate, 6% a higher education level.

Data Collection Tool

The Instagram Addiction Scale (TIAS)

The research data required for Validity and Reliability studies were collected with The Instagram Addiction Scale (TIAS) developed by Sholeh and Rusdi (2019). TIAS includes two scales. Accordingly, the first scale named Instagram Feed Addiction (IFA) consists of 20 items and 6 dimensions. The second scale was named Instagram Story Addiction (ISA) and consists of 22 items and 6 factors. The factor names of both scales are the same. Accordingly, the factors of “Salience, Tolerance, Mood Modification, Relapse, Withdrawal, and Conflict” represent addiction components. The 5-point Likert-type scales form the TIAS as two separate scales. Although the factor names are the same, the number of items under the factors is not the same in the two scales.

Sholeh and Rusdi (2019) conducted validity and reliability studies of the scales in their research and found appropriate values. Cronbach Alpha values, which are the internal consistency coefficients of IFA, ranged from .65 to .92. The internal consistency of the factor named “Salience” of the ISA was found to be .34. This value indicates low reliability. The highest Cronbach Alpha value was found to be .88. On the other hand, exploratory factor analysis (EFA) was performed with both scales, but confirmatory factor analysis (CFA) was not performed. In order to eliminate these deficiencies in the Turkish form, the scales will be subjected to linguistic equivalence studies and factor structures will be modeled and verified with EFA and CFA studies.

Process

Translation Work: In order to obtain the Turkish form of the TIAS, the items in the original inventory were first translated into Turkish by an expert who is competent both in Turkish and English. Then, it was ensured that the sentences were understandable by checking them by two field experts who knew both languages well.

Application of TIAS: Ethical approval was given to the research by the Üsküdar University Non-Interventional Research Ethics Committee with the number of 61351342/NİSAN2021-27. Data collection process was carried out on a voluntary basis by using an online survey form in 1-10 May 2021. The study group sample was randomly selected and consisted of people aged 15 and over. IFA and ISA scales were administered to the participants via an online questionnaire and it took an average of 15 minute to complete the questionnaire.

Data Analysis

Pearson correlation coefficient was used for the linguistic equivalence of TIAS, which is to determine the consistency between the Turkish and English forms. In order to test the construct validity of the TIAS, factor analysis was applied to 287 sections of the dataset consisting of 587 people. Afterwards, confirmatory factor analysis was applied to the section of 300 people. The Cronbach Alpha internal consistency coefficient was tested in the reliability studies. SPSS 26.0 statistical program was used for the validity and reliability analysis. Further, modeling was made for the relationship and harmony of the dimensions with the AMOS program and the goodness of fit values (Chi-square/freedom of degrees, RMSEA, NFI, NNFI, CFI, GFI and AGFI) were calculated.

FINDINGS

In this part of the study, evaluations are made for The Instagram Addiction Scale (TIAS). In this context, the findings obtained as a result of validity and reliability studies are included.

Linguistic Equivalence Study of TIAS

The English and Turkish forms of the TIAS were administered to 25 postgraduate students at the department of Psychology from Üsküdar University three weeks apart in Turkish and English. After the applications, the Pearson correlation coefficient was calculated. The time interval between the two tests is specified as 2 to 4 weeks or 3 to 6 weeks according to different opinions in the literature (Ergin, 1995; Özgüven, 1994).

It was made for two applications with Instagram Feed Addiction and Instagram Story Addiction scales. When the Pearson correlation coefficients were examined, the lowest value for both scales was .40 and the highest value was .82, and the correlation coefficient between the total scores of the items in the Turkish and English forms was also found to be positive and significant ($r: .77$; $p<0.001$). In addition, according to the independent group t-test for both scales, it was determined that there was no significant difference between the two applications ($t: .34$; $df: 23$; $p>0.05$). The results obtained showed that the consistency between the two applications of the scales was at an acceptable level.

Validity and Reliability Study of TIAS

Exploratory Factor Analysis (EFA) is frequently applied as one of the statistical calculation techniques made in accordance with a large number of variables within the scope of the construct validity of scale development (Balci, 2001; Bryman and Cramer, 1997; Büyüköztürk, 2018; Hovardaoğlu and Sezgin, 1998; Kalaycı, 2010; Kleinbaum, Kupper and Muller, 1998). When the literature is examined, there are some techniques used to determine whether the dataset is suitable for factor analysis. These are tests such as the Bartlett Test of Sphericity, the Kaiser-Meyer-Olkin (KMO) and the creation of the correlation matrix (Kalaycı, 2010; Tavşancıl, 2002).

Before applying EFA, Bartlett test and Kaiser-Meyer-Olkin (KMO) test were applied (Büyüköztürk, 2018). A KMO value of .90 and above is considered “excellent”, between .80-.89 “very good”, between .70-.79 as “good”, between .60-.69 “moderate”, .50-a range of .59 is considered “weak”, and anything below that is considered “unacceptable” (Kalaycı, 2010; Sharma, 1996; Tutgun-Ünal & Deniz, 2015). Also, the Bartlett Sphericity value is expected to be significant. Accordingly, the KMO coefficient value of the Instagram Feed Addiction Scale was found to be .902. The result of the Bartlett Test of Sphericity was found to be significant ($X^2=2747,466$, $df: 190$ $p=0.000$). Whereas, the KMO coefficient value of the Story Addiction Scale was found to be .902. The result of the Bartlett Test of Sphericity was found to be significant ($X^2=2747,466$, $df: 190$ $p=0.000$). The results showed that the data were suitable for factor analysis (Sharma, 1996).

Construct Validity Study of Instagram Feed Addiction Scale

Factor analysis for the construct validity of Instagram Feed Addiction (IFA) started with 20 items in the original scale form. After EFA was applied, since values with an eigenvalue greater than 1 were accepted for factor formation (Tinsley & Tinsley 1987), a 5-factor structure emerged in the first stage in IFA. When the item and size distributions in the rotation table were examined, it was found that 4 dimensions in the original scale were formed in the same way, but the other 2 dimensions were mixed. Therefore, it was tested manually with 4-factor EFA whether the two dimensions could be combined or not. Compliance was achieved in the first stage in line with the Varimax Rotation Table. Accordingly, the item loadings were found to be the highest .859 and the lowest .456 for 20 items. The explained variance ratio was found to be 60,31. The eigenvalues of the factors are given in Table 1.

Table 1. IFA Factor Structure and Explained Variance Rates

IFA	Eigenvalue	Variance	Cumulative Variance
1.Dimension	7,73	38,67	38,67
2.Dimension	1,53	7,65	46,32
3.Dimension	1,48	7,43	53,76
4.Dimension	1,31	6,55	60,31

As seen in Table 1, the exploratory variance rate of the factor with an eigenvalue of 7,73 is 38.67%. The variance rate explained by the second factor with an eigenvalue of 1,53 was 7.65%, the rate of variance explained by the third factor with an eigenvalue of 1,48 was 7.43%, and the variance rate explained by the fourth factor with an eigenvalue of 1,31 was 6.55%. The total explained variance rate was 60,31%, which was acceptable. It is ideal when the explained variance rate revealed by factor analysis varies between 40% and 60% in social sciences (Büyükoztürk, 2002; Deniz & Tutgun-Ünal, 2019).

Another method used to determine the factor structure is the scree plot. According to this graph, the points where the slope starts to disappear are taken into account in determining the number of factors. The line graph of Instagram Feed Addiction, which is seen to be in a 4-dimensional structure, is shown in Figure 1.

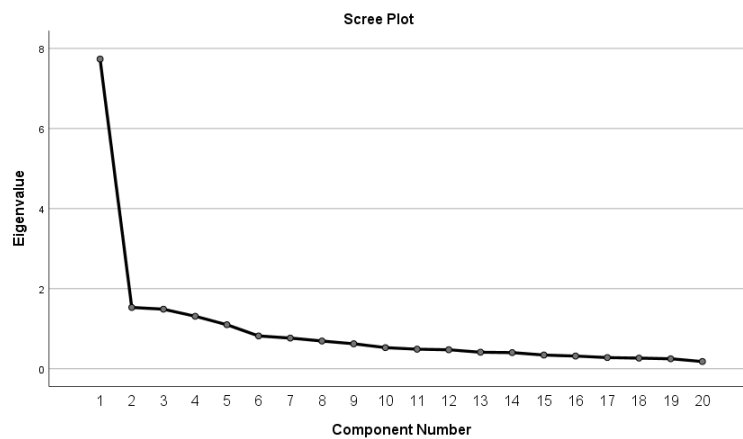


Figure 1. IFA Scree Plot

After determining the number of factors, item factor loadings were examined by applying the varimax rotation technique. Accordingly, the factor loading value of each item was checked for compliance with the lower cut-off point of ,45 and the factor structure was released. Accordingly, the item factor loading values of the 4-dimensional scale are given in Table 2.

Table 2. Factor Loading Values of Instagram Feed Addiction (IFA) Items

Items		F1	F2	F3	F4
Relapse / Withdrawal / Conflict ($\alpha=.90$)	18. I find it hard to share time for hobbies, rest, or exercise because I spend my time checking Instagram feed.	.756			
	17. I often see many contents of Instagram feed which cause me to neglect my work/lectures/study time.	.732			
	20. My family often complains because I spend too much of my time on Instagram (checking the feed).	.718			

	Items	F1	F2	F3	F4
	19. I find it hard to sleep early because I always see feed on Instagram.	.712			
	12. I decided to look at Instagram feed less often, but I did not manage to do it.	.692			
	16. I become anxious or I have problems if I am prohibited to check my Instagram (see the feed).	.689			
	13. I get easily irritated if I am prohibited from seeing the Instagram feed.	.647			
	11. I try to limit my time for Instagram (see the feed), but it does not work.	.627			
	15. I feel annoyed if someone else bothers me when I see Instagram feed.	.614			
	14. I often cancel appointments with other people because of Instagram (checking Instagram feed).	.537			
	10. I spend a lot of time looking at photo/video posts on Instagram feed.	.456			
Mood Modification ($\alpha=.79$)	9. I see the contents of posts on the Instagram feed to reduce restlessness.	.859			
	8. I see the contents of the Instagram feed to forget about personal problems.	.842			
	7. I see the contents of Instagram feed posts to reduce feelings of guilt, anxiety, helplessness, or depression.	.615			
Salience ($\alpha=.71$)	2. I often think about what is happening on Instagram when I do not access it.		.722		
	3. I keep thinking and feel curious when I do not see the contents of the Instagram feed.		.688		
	1. I often think of any photos/videos posted by others on the Instagram feed.		.650		
Tolerance ($\alpha=.60$)	5. I commented on photos/videos posted by friends on Instagram feed to get feedback.			.695	
	4. I post photos/videos on Instagram feed to attract others' attention.			.586	
	6. I always think of what filters and captions for the photos/videos that I will post on Instagram Feed.			.557	

When the item factor loading values were examined, the item loading values of the 4-factor structure of the scale took appropriate values. Items 1-10, which constitute separate factors in the original scale, formed a single factor together in the Turkish form. While naming the new factor, 3 words in the original scale were combined and named as “Relapse/Withdrawal/Conflict”. Other factors were also found to be compatible. Accordingly, by adhering to the original scale, 1st, 2nd, 3rd items were named as “Salience”; 4th, 5th, 6th items were named as “Tolerance”; 7th, 8th, 9th items were named as “Mood Modification”. On the other hand, while 10th item was under “Mood Modification” in the original scale, it was under the factor of “Relapse/Withdrawal/Conflict” in the Turkish

version. Considering the meaning of the item which describes excessive use, the distribution of this was found appropriate.

Then, in the confirmatory factor analysis performed with a different dataset of 300 people, the factorial structure obtained was tested. In other words, its accuracy and goodness-of-fit values were questioned by modeling.

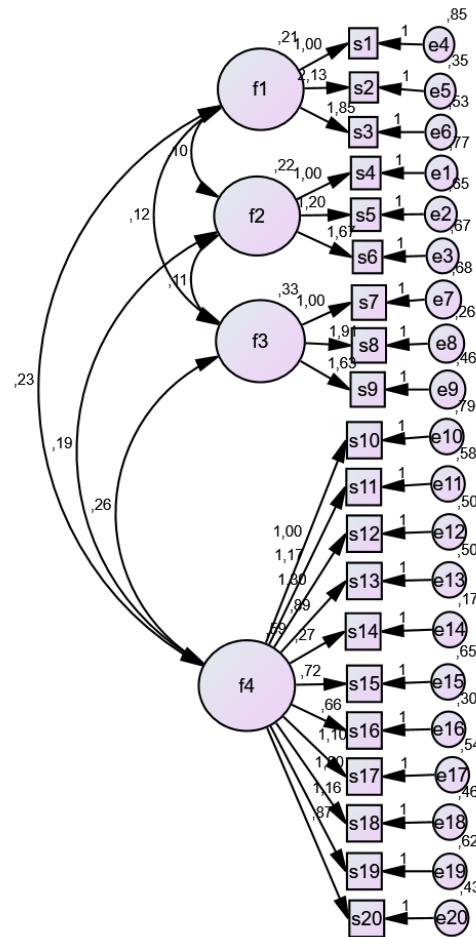


Figure 2. Confirmatory Factor Analysis of Instagram Feed Addiction

Table 3. IFA Goodness-of-Fit Indexes

Goodness-of-Fit Indexes	Acceptable Goodness-of-Fit Index Values	IFA Goodness-of-Fit Index Values
X^2/sd	<5	515,031/164= 3,14
RMSEA	<0,08	0,08
NFI	>0,90	0,81
NNFI	>0,95	0,88
CFI	>0,95	0,86
GFI	>0,90	0,82
AGFI	>0,85	0,77

Table 3 shows the Instagram Feed Addiction goodness-of-fit index values. According to the findings obtained in the confirmatory factor analysis, Chi-square/degrees of freedom was: 3,14; RMSEA: 0,08; NFI: 0,81; NNFI: 0,88; CFI: 0,86; GFI: 0,82 and AGFI: 0,77. Thus, these goodness-of-fit index values were found acceptable. It was concluded that the Turkish version of IFA consisted of 4 factors.

Construct Validity Study of Instagram Story Addiction Scale

Factor analysis was performed for construct validity studies with 22 items in the original scale. In the factor analysis performed without any intervention, the eigenvalue value created more than 1 factor and 4 factors emerged. However, in the comparison with the original scale, item factor distributions did not show a appropriate structure. For example, the 1st and 2nd items and the 3rd and 4th items formed a factor together in the original scale,

and in this study, they were all distributed into separate factors. Similarly, the 18th item formed a factor together with the 2nd and 4th items. In order to obtain a more meaningful structure, EFA was performed manually with 3 factors. Accordingly, the factor loading of an item was found to be low. Item 1 was eliminated with a load of .29, and EFA was performed again without including Item 1 and the appropriate structure was obtained. Accordingly, the explained variance rates obtained in the 3-factor structure of the Instagram Story Addiction Scale are given in Table 4.

Table 4. ISA Factor Structure and Explained Variance Rates

ISA	Eigenvalue	Variance	Cumulative Variance
1.Dimension	9,49	45,20	45,20
2.Dimension	1,99	9,49	54,69
3.Dimension	1,33	6,34	61,04

As seen in Table 4, the variance rate explained by the 1st factor with an eigenvalue of 9.49 is 45.20%. The variance rate explained by the 2nd factor with an eigenvalue of 1.99% is 9.49%, and the variance rate explained by the 3rd factor with an eigenvalue of 1.33 is 6.43%. The total explained variance rate was found to be 61.04%. The scree plot, which is another technique to determine the factor structure, is shown in Figure 3.

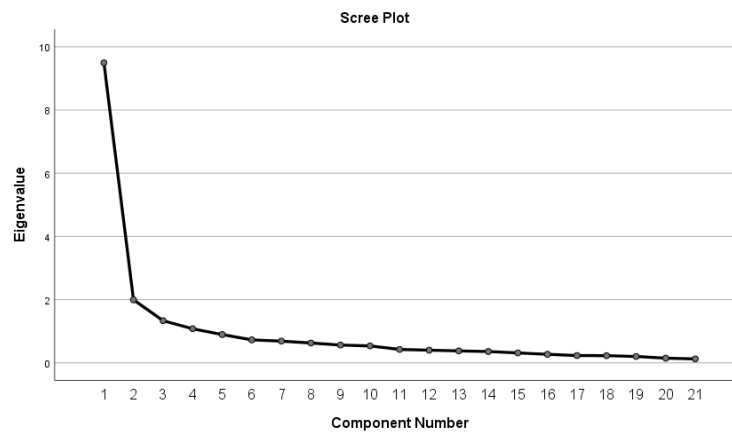


Figure 3. ISA Scree Plot

Table 5. Factor Loading Values of Instagram Story Addiction (ISA) Items

	Items	F1	F2	F3
Relapse / Withdrawal / Conflict ($\alpha=.93$)	15. I tried to less watching others' Instagram stories, but it did not work.	.756		
	14. I decide to see the contents of Instagram stories less often, but it didn't work.	.732		
	20. I watch Instagram stories too much that I neglect work/lectures/study time.	.718		
	22. I find it hard to sleep early because I always check Instagram stories.	.712		
	21. I find it hard to spend my time into hobbies, rest, or exercise because of Instagram stories.	.692		
	8. I feel there is an urge to continue checking Instagram stories continuously.	.689		

	Items	F1	F2	F3
	12. I spend a lot of time watching others' Instagram stories.	.647		
	16. I get irritated easily if I am prohibited from watching Instagram stories.	.627		
	10. I keep thinking and feel curious when I do not see Instagram stories.	.614		
	13. I check Instagram stories the first time I wake up.	.537		
	17. I feel annoyed if someone else is bothering me when I'm looking at the contents of Instagram stories.	.456		
	11. I feel bored if I do not see the contents of Instagram stories.			
	9. I often think about what others upload on Instagram stories.			
	19. I get nervous if I am prohibited from watching Instagram stories.			
Mood Modification ($\alpha=.89$)	6. I check the content of Instagram stories to forget personal problems.		.859	
	7. I see the contents of posts on the Instagram stories to reduce restlessness.		.842	
	5. I check the content of Instagram stories to reduce feelings of guilt, anxiety, helplessness, or depression.		.615	
Salience / Tolerance ($\alpha=.67$)	2. I often plan to do a live stream (live stream) on Instagram.			.722
	18. I often cancel appointments with others because I see Instagram stories.			.688
	4. I give comment on my friends' Instagram stories to get feedback.			.650
	3. I make Instagram stories about my activities to get others' attention.			

When Table 5 is examined, the dimensional structure of the original ISA scale differed by combining some dimensions in the Turkish Version. It was observed that semantic integrity was achieved in the combination of factors. Item 1 was eliminated from the scale because its loading value was low. 2nd, 3rd, 4th, 18th items were formed by the combination of two separate dimensions in the original scale and were named “Salience/Tolerance”. Although 18th item was under the “Withdrawal” dimension in the original scale, it was found to be significant under the “Salience/Tolerance” dimension in the Turkish version, since the item's content describes frequent use. The “Mood Modification” dimension, which includes the 5th, 6th, 7th items, is formed by the combination of the same items in the Turkish form. 8th, 9th, 10th, 11st, 12nd, 13rd, 14th, 15th, 16th, 17th, 19th, 20th, 21st and 22nd items were gathered together in a single factor. These items, which formed 3 different factors in the original scale, formed a factor called “Relapse/Withdrawal/Conflict” because they were combined in the Turkish scale.

The model confirmatory factor analysis created to confirm the 3-factor structure obtained after the EFA was verified. The CFA model made with a dataset of 300 people is shown in Figure 4. The goodness of fit values of the model are given in Table 6.

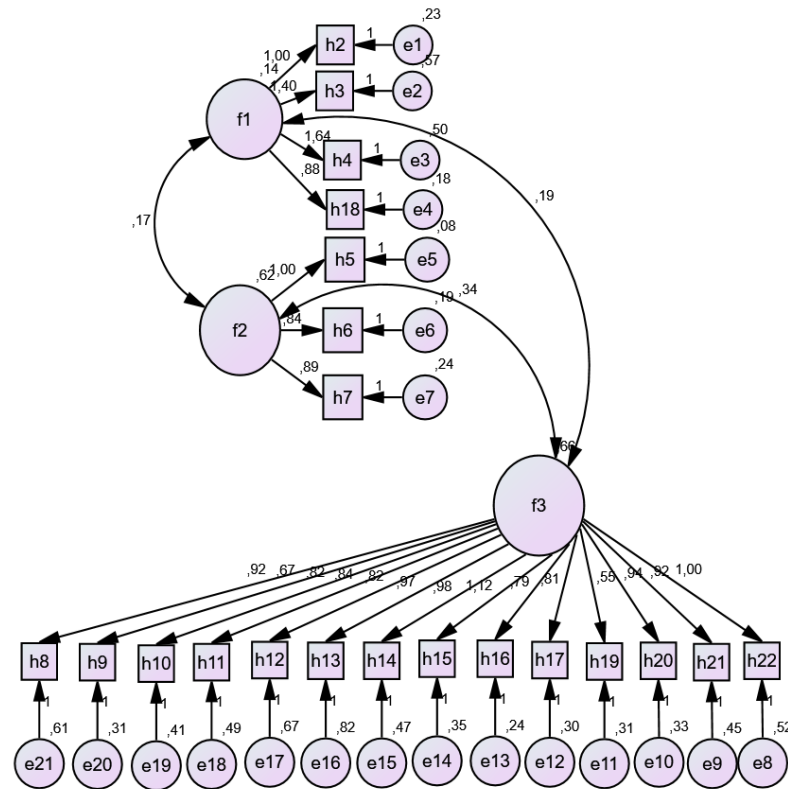


Figure 4. Confirmatory Factor Analysis of Instagram Story Addiction

Table 6. ISA Goodness-of-Fit Indexes

Goodnes-of-Fit Indexes	Acceptable Goodnes-of-Fit Index Values	ISA Goodnes-of-Fit Index Values
χ^2/sd	<5	782,537/186= 4,207
RMSEA	<0,08	0,08
NFI	>0,90	0,82
NNFI	>0,95	0,84
CFI	>0,95	0,88
GFI	>0,90	0,87
AGFI	>0,85	0,78

Table 6 shows the Instagram Story Addiction goodness-of-fit index values. According to the findings obtained in the confirmatory factor analysis, Chi-square/degrees of freedom value was: 4,20; RMSEA: 0,08; NFI: 0,82; NNFI: 0,84; CFI: 0,88; GFI: 0,87 and AGFI: 0,78. Thus, these goodness-of-fit index values were found acceptable. It was concluded that the Turkish version of the ISA consisted of 3 factors.

Since The Instagram Addiction Scale (TIAS) consists of two scales, validity and reliability studies of both scales were carried out. For the reliability studies of the Instagram Feed Addiction Scale, the internal consistency coefficient Cronbach Alpha values were calculated for each factor. Accordingly, these values given on the left side of Table 2 was found as .90 for the “Relapse/Withdrawal/Conflict” dimension, .79 for the “Mood Modification” dimension, .71 for the “Salience” dimension and .60 for the “Tolerance” dimension. The Cronbach Alpha values calculated for the Instagram Story Addiction Scale and included in Table 5 were found as .93 for the “Relapse/Withdrawal/Conflict” dimension, .89 for “Mood Modification” dimension, and .67 for “Salience/Tolerance” dimension.

Finally, the Pearson Correlation Coefficient values obtained as a result of the correlation test applied to the dimensions for IFA and ISA are given in Table 7 and Table 8, which show the relationship between the dimensions.

Table 7. Instagram Feed Addiction Scale Correlations

Subscale/Scale	Salience	Tolerance	Mood Modification	Relapse/Withdrawal/Conflict
Tolerance	,350			
Mood Modification	,373	,314		
Relapse/Withdrawal/Conflict	,543	,390	,543	
Instagram Feed Addiction (IFA)	,697	,572	,701	,939

Table 7 shows the coefficient values showing the relationship between Instagram Feed Addiction factors. Accordingly, it can be said that IFA has a relational structure within itself.

Table 8. Instagram Story Addiction Scale Correlations

Subscale/Scale	Salience/Tolerance	Mood Modification	Relapse/Withdrawal/Conflict
Mood Modification	,461		
Relapse/Withdrawal/Conflict	,525	,495	
Instagram Story Addiction (ISA)	,669	,648	,971

Table 8 shows the coefficient values showing the relationship between Instagram Story Addiction factors. Accordingly, it can be said that ISA has a relational structure within itself.

CONCLUSION AND DISCUSSION

This study aimed to establish the validity and reliability of the Turkish version of The Instagram Addiction Scale (TIAS) developed by Sholeh and Rusdi (2019) in a Turkey sample. At the beginning of the study, linguistic equivalence studies of two scales named Instagram Feed Addiction and Instagram Story Addiction in TIAS were carried out. As a result of the exploratory factor analysis and confirmatory factor analysis, it was found that both scales partially paralleled the original scale structure, but differed in some points.

Firstly, the Turkish construct validity studies of the Instagram Feed Addiction Scale consisted of 20 items in the Turkish scale form. It was found that 6 dimensions in the original scale exhibited a structure as 4 dimensions in the Turkish scale, and the 4-dimensional scale structure was confirmed in the model established with CFA. Accordingly, in the Turkish scale form, 3 items constitute the “Salience” dimension, 3 items constitute the “Tolerance” dimension, 3 items constitute the “Mood Modification” dimension and the remaining 11 items constitute the “Relapse/Withdrawal/Conflict” dimension. As can be seen, 3 different dimensions in the original scale were combined into a single dimension in the Turkish form. The scale structure was found to be acceptable in the analyses made with EFA and CFA and the factors are related to each other. The Cronbach Alpha internal consistency coefficients of the factors were found to be the lowest .60 and the highest .90.

The other scale, Instagram Story Addiction, created a structure with 21 items in the Turkish form, although there were 22 items in the original form. Since the factor loading of the 1st item in the Turkish version of this scale was found to be low, it was eliminated from the scale. The 21-item Instagram Story Addiction Scale consisted of 6 factors in the original scale form, while some factors were combined in the Turkish scale form. It consisted of 3 factors and it was seen that one item was under a different dimension. Accordingly, the EFA results showed that 4 items constitute the “Salience/Tolerance” dimension, 3 items constitute the “Mood Modification” dimension, and the other 14 items constitute the “Relapse/Withdrawal/Conflict” dimension. With this structure, the model established in AMOS was validated with CFA and the reliability coefficients were found to be the lowest .67 and the highest .93. It was found that the 21-item and 3-factor structure of the ISA was relational and significant. The scales are in 5-point Likert type, graded between “Strongly disagree” and “Strongly agree”.

All validity and reliability studies have shown that Turkish TIAS is a current, valid and reliable scale that can be used in studies to be conducted in Turkey. It is natural that some differences occur in the Turkish scale form compared to the original scale, because cultural differences may differentiate the answers given to the scale. On the other hand, it is thought that some of the deficiencies in the original scale, such as the low internal consistency of one dimension of the ISA, and the fact that the factor structure was not tested with confirmatory factor analysis, were eliminated in the Turkish scales. Thus, two scales in TIAS have been added to the literature so that they can be used to measure Instagram Addiction of social media users of various ages. Factors can be tested by remodeling in new research on different samples.

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The Complex Image of Turkey on Chinese Media: Through the Lens of Xinhua News Agency

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Abstract

The past decade saw the rise of Turkey as an influential regional power. Numerous international news platforms have increased their coverage of the country, including the Chinese media. As one of China's "Big Three" state-run news organizations, Xinhua News Agency offers comprehensive coverage of Turkey, reflecting the various ways China often perceives Turkey. Ankara's role—at times a strategic partner and advocate and at other times a critical geographical player and regional influencer—has contributed to Turkey's complex and sometimes conflicting image viewed by the Chinese audience. Previous research involving content analysis of the increased Chinese media coverage on the country has remained inconclusive. By analyzing Xinhua's news reports on Turkey at selected points throughout the ongoing Covid-19 pandemic, this paper discusses the framework Xinhua uses in its coverage of Turkey and how it may have shaped Turkey's complex national image in Chinese media. The implications of these findings will contribute to the sub-field of China-Europe relations and international journalism.

Keywords: Xinhua News Agency, News Coverage, National Image, Turkey, China, Sino-Turkish Relations

Introduction

The past decade saw the rise of Turkey as an influential regional power. The Turkish-speaking region, including Turkey and North Cyprus, connects the East and the West geographically, culturally, and economically. In the past decade, Turkey has received increasing media attention on numerous international news platforms. In the meantime, as China continues to expand its global influence, its interests in the region have significantly grown. Historically, the root of Sino-Turkish relations can be traced back 2000 years, long before most of today's modern countries came into existence. Nevertheless, this age-old connection is now rife with potential conflicts and disagreements against the backdrop of complex and ever-evolving international geopolitics, despite common interests between the two nations. On the one hand, China uses the Cyprus question as leverage to enhance its economic priorities in the region; on the other hand, the Uyghur issue is regarded as a "bottleneck" for bilateral relations. Strategically, Turkey is seen as a crucial player in China's "Belt and Road Initiative." However, the Chinese media has also paid attention to its recent military actions in Northern Syria. In fact, despite the tremendous effort from both sides to improve economic and trade relations, the two nations do not seem to have achieved the expected results.

The Year 2021 marked the 50th Anniversary of modern China-Turkey diplomatic relations. While celebrations are publicized on the official website of the embassies in Beijing and Ankara, ordinary Chinese citizens appear to have scant knowledge of Turkey, which may seem paradoxical. A survey conducted in 2017 shows that 76.3% of Chinese respondents consider themselves at least somewhat ignorant in regard to Turkey. Moreover, only 15.9%

of respondents correctly named Ankara as its capital. Based on responses collected for this survey, the most recognized symbols of Turkey are Turkish kebab (27.5%), The Blue Mosque (12.8%), and Turkish coffee (10.6%). Since the 1980s, numerous communications scholars have examined the mass media's impact on public sensibilities. For example, Graber described the psychological processes for news audiences to choose and internalize information from the media. McNamara introduced the much-debated premise that media both reflect and shape public opinion and government actions. In addition, the critical social theory raised by Stockett and Kekkonen has provided ground for framing this issue in the media.

For Chinese viewers, state-run media is the dominant source of international news. Consequently, assessing the framework of China's news coverage of Turkey provides a perspective on Chinese media's intentions, mechanisms, and Turkey's national image in China. Much of Western academia believe it is of minimal value to apply communication theories to Chinese mainstream media due to it being run by the State. However, some scholars argue that as an authoritarian regime, the Chinese government can benefit from a more sophisticated media control strategy, permitting reporters to work aggressively on exposing low-level malfeasance to improve governance. Thus, following the dynamics of Chinese media can enrich our understanding of the Chinese government's strategic direction concerning the Turkish-speaking region. Furthermore, it provides research facts for foreseeing future trends.

In the studies of Sino-Turkish political communications, scholars from China, Turkey, and the West have long recognized the significance of research areas such as the military, diplomatic relations, religion, and trade. In recent years, the public's view and national image has been the focus of a group of Chinese and Turkish scholars such as Liu Zuokui, Zao Tao, Ulas Basa Gezgin, and R. Kutay Karaca. Those scholars have discussed the lack of public recognition and knowledge for each other among Chinese and Turkish media viewers. On media coverage research, Chinese scholar Tang Qingye has asserted in his paper that China's coverage was "positive and objective" based on his analysis of three major Chinese newspapers. The framework of the research, however, remains incomplete without adequate supporting analysis from English language academia. To date, scholars have performed little research addressing the current conditions of Sino-Turkish relations, especially during major global affairs such as the Covid-19 pandemic.

Methodology

As one of China's "Big Three" state-run media organizations, Xinhua News Agency is the country's most prominent and most influential news organization. In terms of worldwide correspondents, it is also the largest agency globally. This paper relies on a content analysis of Xinhua News Agency's coverage of Turkey during four selected time frames. It explains how Chinese mainstream media has shaped the national image of Turkey. To do this, the quantity and content of Turkey-related reports are examined.

The main keyword used in the report search is the Chinese word for "Turkey" (土耳其). The final selection from a much larger number of reports is made based on four two-month time frames. On March 11, 2021, Xinhua News reported on Turkey's first Covid-19 case. Based on the rise and evolution of the COVID-19 pandemic, reports from 9/11/2019 to 11/10/2019 (six months prior to the first reported case), from 3/11/2020 to 5/10/2020 (first two months of the pandemic), from 9/11/2020 to 11/10/2020 (six months into the pandemic) and 5/30/2021 to 7/29/2021 (two months before the presentation of this paper) are selected. The Covid-19 period was set as an anchor point for time frame selection for three reasons:

1. Covid-19 has been a global health crisis since early 2020. Monitoring the development offers us a fresh perspective on the most recent reports from Xinhua News Agency.
2. The pandemic has impacted the Chinese media's editorial preference for Turkey in several ways. Observing and comparing reports produced during different phases of the Covid-19 pandemic will enable us to navigate the differences and results.
3. With the pandemic ongoing, this up-to-date analytical comparison will shed some light on the future trend of Xinhua News Agency's news framework.

Within the chosen time frames, 387 news reports on the official website of Xinhua News Agency are identified and collected for this content analysis.

Xinhua's News Coverage of Turkey

Table1

<i>Time Period</i> <i>Category</i>	<i>9/11/2019 to</i> <i>11/10/2019</i>	<i>3/11/2020 to</i> <i>5/10/2020</i>	<i>9/11/2020 to</i> <i>11/10/2020</i>	<i>5/29/2021 to</i> <i>7/28/2021</i>
<i>Total Number of News Reports</i>	144	80	68	95
<i>Covid</i>	0	56	7	5
<i>Sino-Turkish Relations</i>	16	6	2	14
<i>Politics</i>	14	2	21	6
<i>Military</i>	89	8	8	34
<i>Disaster and Emergency</i>	3	1	22	12
<i>Immigration</i>	7	4	0	1
<i>Culture and Technology</i>	5	2	2	1
<i>Economy</i>	5	1	4	5
<i>Sports</i>	5	0	2	17

Table 1 displays the categorization of news reports on Turkey across the selected time frames. Notably, Xinhua's reports of Turkey have been comprehensive and have covered basic categories in media reporting. The available content is reflective of Turkey's major domestic and international affairs, usually covered by other mainstream international media. For example, in October 2019, Turkey launched a military offensive in northern Syria, resulting in 89 reports published on Xinhua News, many reflecting China's interest in the region. Similarly, in the early stages of the Covid-19 pandemic, Xinhua News Agency mainly focused on the live updates of Turkey's Covid-19 case count. By and large, this content was refreshed every few hours. Moving toward the end of 2020, when an earthquake hit Turkey and Greece, 22 reports were produced covering the natural disaster and subsequent fatalities. Most recently, Xinhua News offered a wide range of coverage on Turkey's military actions, including its arms deal with Russia, involvement in Afghanistan, and several other regional issues. Xinhua's news coverage of Turkey serves its viewers beyond China's own national interests. The most frequent topics include Turkey's military actions, domestic/international politics, and regional immigration issues. A considerable number of these issues are not directly related to China and are unfamiliar to Chinese viewers.

TABLE 2

Country	Number of Reports	GDP Rankings
United States	10000 (maximum limit reached)	1
Japan	9408	2
Germany	7552	3
England	6687	5
Russia	6476	10
France	5611	6
India	4978	4
South Korea	4127	11
Iran	3974	25
Brazil	3493	7
Israel	3444	30
Italy	3123	8
Australia	2768	12
Turkey	2654	16
Spain	2135	13
Thailand	1927	24
Canada	1400	9
Mexico	1334	14
Saudi Arabia	1159	18
Belgium	1043	23

(1) The website of Xinhua News Agency typically maintains an archive of news reports for up to two years. This number reflects the search result at the point of this research. Moreover, these counts may include duplicate items due to reproduced reporting.

(2) The search results indicate that the number of news reports in the United States is 10,000 because it has reached the search engine's limit. The United States has significantly more reports than any other country.

Table A ranks the number of news reports produced for each of the major countries. Any discrepancies between the coverage ranking and the gross domestic product (GDP) ranking reflect whether or not a country's news coverage on Xinhua News is proportional to its economic status. While traditional global powers, such as United States, Japan, and Germany, garner the most attention, several other countries, including Russia, South Korea, Iran, and Turkey, have a higher exposure level than their GDP ranking might indicate. Unlike the other three countries, Turkey is not a traditional geopolitical partner to China. Moreover, the level of exposure has indicated Turkey's significant value to international news reporting for Xinhua News Agency.

Turkey's National Image on Xinhua News

Based on content analysis and peer discussions, conclusions can be drawn that the national images of Turkey on Xinhua News are as follows:

- Turkey is a partner of China (economic and cultural exchanges, Turkey's endorsement of China's vaccine program)
- Turkey is a key geographical player (military actions and regional conflicts)

- Turkey is a regional influencer (sports, culture, and technology development)

(1) Turkey as China's partner

Of the 144 reports from 9/11/2019 to 11/10/2019, 16 focus on the positive development of Sino-Turkish relations, highlighting Turkey's role as a partner of China and endorser of China's development programs. Three articles presented interviews with pro-China Turkish interviewees to emphasize their approval of China's international position. Highlighting its pro-government propaganda, Xinhua News Agency's attention to China's development, which is presented as lauded by the rest of the world, is evident through their selection of pro-China commentary.

TABLE 3

专访：中国找到了正确的发展方向——访土耳其汉学家吉来	<i>Exclusive Interview: China has found the right direction for development—an interview with Turkish sinologist Giray Fidan</i>
专访：“不少国家都因能向中国大量出口而获益良多”——访土耳其学者阿尔泰·阿特勒	<i>Exclusive Interview: Many countries benefit from exporting to China—an interview with a Turkish scholar Altay Atli</i>
再次参加进博会旨在发掘中国大市场——访土耳其家电巨头倍科电器大中华区总裁	<i>We are participating in the CIIE again to open up the big Chinese market—interview with the Greater China CEO of Beko</i>

During the early phases of the pandemic, Xinhua's focus shifted to Turkey's domestic situation, with 56 reports on Coronavirus. Meanwhile, the reports on Sino-Turkish relations decreased to six from 3/11/2020 to 5/10/2020 and just two from 9/11/2020 to 11/10/2020. Until recently, Xinhua News Agency's coverage of Sino-Turkish relations increased to include fourteen articles, focusing on both governmental communications and civil affairs. As a result, Xinhua's coverage on the Covid-19 pandemic has decreased, with seven reports from 9/11/2020 to 11/10/2020 and five reports from 5/30/2021 to 7/29/2021. With the pandemic continuing, it is estimated that Covid-related coverage will remain at this level.

Based on the above summary of Xinhua's coverage on Sino-Turkish relations, it is clear that Turkey is portrayed as a supporter and partner of China. While pro-China scholars mostly support the narrative, any anti-China groups and political activities in Turkey are dismissed. Communication scholars have long agreed that the media's role in China is significantly different from that of the West. David Shambaugh pointed out that the Chinese media remains an essential instrument in the party-state's toolbox of control. At the same time, the system is being impacted by the Chinese public. This mechanism is evident in how Xinhua News reports emphasize the role of Turkey as China's partner and supporter.

The Covid-19 pandemic has brought another opportunity for Xinhua News Agency to enhance this framework. During the pandemic, Xinhua continues to stress that China, despite having its own challenges and difficulties, is helping Turkey fight the virus. For example, several reports during the early stage of Covid-19 highlighted talks between the two governments, indicating China's commitment to assisting Turkey with pharmaceutical supplies. Recently, a report introduced the clinical trial of China's Covid-19 vaccine in Turkey.

A central part of Turkey's role in Chinese media relies on the country's unique position on the international stage. As early as 2017, when the Turkish constitutional referendum was held, some scholars pointed out that Turkey, despite being a member of NATO, wanted to build leverage to force concessions from the US and Europe. The

"directionless and friendless" approach has resulted in relations tightening between China and Turkey. As Turkey's image in Chinese media is depicted as a strong regional power favoring China's increasing influences, conflicts of interest between the two countries are often not within the news framework.

(2) Turkey as a key geographical player

In 2019, Turkey launched a military offensive in Syria, inciting criticism from major global powers. Although Beijing joined the global condemnation of attacks launched by Ankara, Xinhua's coverage, which typically reflects China's call on Turkey to halt the military incursion, is generally neutral. Out of 144 reports from 9/11/2019 to 11/10/2019, 89 focus on Turkey's military actions. Notably, among these reports, many news sources relied upon Syrian media instead of Turkish media. These citations were crucial in forming an impression of Turkey's military actions. Compared to the reports on Sino-Turkey relations, Turkey is often depicted as an aggressive invader who brought tragedy to the Syrian people.

TABLE 4

叙媒：土耳其军队对叙东北部“叙利亚民主军”目标发动袭击	<i>Syrian media: Turkish army launches attacks on targets of "Syrian Democratic Army" in northeastern Syria</i>
叙媒：土耳其袭击“叙民主军”	<i>Syrian media: Turkey attacks "Syrian Democratic Army"</i>
叙利亚强烈谴责土耳其在叙北部展开军事行动	<i>Syria strongly condemns Turkey's military operations in northern Syria</i>
叙利亚谴责土耳其在军事行动中致平民死伤	<i>Syria condemns Turkey's military operations that caused civilian deaths and injuries</i>
叙外交部：土耳其在叙军事行动使土丧失阿斯塔纳担保国地位	<i>Syrian Ministry of Foreign Affairs: Turkey's military operations in Syria deprived Turkey of its status as a guarantor of Astana</i>
叙媒称土耳其占领叙北部边境重镇拉斯艾因	<i>Syrian media claim that Turkey occupied Ras al-Ain, an important town on the northern border of Syria</i>
叙利亚要求美国和土耳其立刻从叙撤军	<i>Syria demands that the U.S. and Turkey immediately withdraw their troops from Syria</i>

This coverage supports the framework of China's official position in the Turkish involvement in Syria. As a newcomer to the region, scholars believe that the Chinese government strives not to make the classic superpower mistake of being dragged into an interminable war in West Asia. As Xinhua News Agency directly mirrors the government's focus on the regional issue, the coverage reflects China's caution.

(3) Turkey as a regional influencer

An additional theme that connects Turkey and Chinese viewers is the attention to Turkey's soft powers, including culture, technology, and sports. Of all the selected time frames, there have been ten reports on culture and technology, and 24 on sports. Although the coverage on these topics is not as frequent as politics, military, and immigration, Xinhua News provides an incredible range of reports, such as the Turkish city that reads the most, 3D printing masks, and the successful test of Turkey's first "flying car."

For a long time, scholars of Turkish studies have seen explicit links between Turkey and its cultural influence in the Middle Eastern World. The term "Soft power" refers to piquing interest, capturing the imagination, and gaining admiration. In history, the role of soft power was discovered by Turkey's intelligentsia at an early point. The earliest

generation of writers used the allure of consent and the might of persuasion to promote establishing a nation-state of the Turkification of language.

In modern times, Turkey seeks to promote its soft power, specifically in the Middle East and Central Asia. However, due to its involvement in international politics and military actions, the Turkish national image has been complex and sometimes biased in these areas. Some Turkish Scholars believe that Turkey's soft power strategy should be purely engaged in country branding. Such strategies should be based on Turkey's self-recognition and to what extent others view Turkey's complicated position. In addition, several scholars point out that Turkey should be cognizant of its potential and be capable of operationalizing and projecting its soft power to increase regional and global influences.

With the development of technology, the spread of culture, and the influence of sports, Turkey has extended its influences beyond the Middle Eastern and Central Asia. Its achievements in these areas have led to more exposure on media of other regions, including China's Xinhua News. As a Chinese state-run media, Xinhua's coverage of culture, technology, and sports traditionally focuses on major global powers and several neighboring countries of China which have closer ties to Chinese viewers. Consequently, Turkey's increasing exposure will enhance the recognition of Turkey's national image among Chinese viewers.

Conclusion

Xinhua News Agency has adopted a unique approach in reporting on Turkey. Positive reports involve Turkey's advocacy for China to take on more responsibilities in global affairs. Conversely, negative rhetoric gets applied to Turkey's military actions in Syria. The coverage of Turkey is mainly dependent on the way China perceives its own national interests. Moreover, media coverage plays an essential role in forming Turkey's complex image in the eyes of the Chinese public.

Xinhua News Agency often discloses their selections of news sources; however, the interest-based editorial preference is evident. The media sources aim to indicate the discourse about China's perspectives on the news. The news coverage reflects and reinforces the government's and public's mixture of interest in relations with Turkey. The only exception is in soft power: culture, technology, and sports.

As the Sino-Turkish relationship evolves, the news coverage of China on Turkish media also needs to be further investigated. It is necessary that the comparison be observed and analyzed. In addition, analysis of Turkey-related content on the emerging Chinese media will offer a new perspective to this research.

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The Effectiveness of Blended Learning on Students Achievement at SQU

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Abstract

This study aimed to investigate the effectiveness of using Blended Learning (BL) in developing students' Achievement. The research methodology was based on a pre-post control group experimental research design. The sample consisted of 31 students in the control group and 30 in the experimental group, who were enrolled in an introductory educational technology course (TECH3007) at Sultan Qaboos University (SQU). The data collection instrument was an achievement test. The results revealed that there are a statistically significant difference at the level of 0.05 between the mean scores of the experimental group students in the post application of the achievement test in favor of the post application. In light of these results, a set of recommendations were presented, such as: paying attention to spreading BL among both students and faculty members at SQU, preparing the infrastructure, and spreading awareness towards the using of BL in all university courses.

Keywords: Blended learning, Achievement, SQU, Oman

Introduction

It becomes obvious that the nature of the present time is knowledge expansion and technological development and their increasing impact on education systems. Depending on the traditional single-source model of teaching and learning has become unacceptable for its inadequacy. There is a need to use modern and sophisticated instructional strategies supported by innovative technologies especially e-learning resources and forms. Indeed, most educational institutions have realized the importance of e-learning courses delivery and their effective provision through the Internet (Azmi, 2014). However, Blended Learning (BL) is a common denominator between different e-learning styles. It is based on integrating learning methods and strategies with e-learning tools (Abu Mousa et al, 2014). Usually combining technologies in the instructional process improves its quality and enables the teacher to generate new learning environments (Al-Azawi & Shakkah, 2018).

Al-Mukhaini (2017) defines BL as "an educational method related to the integration of both the the traditional and technology-based environment in various forms" (p. 31). Pachler & Daly (2011) indicate that BL means the combination of different technologies based on the Internet, and different teaching approaches (p. 24). Al-Sharman (2015) believes that it is "a type of education that combines the traditional method of teaching with e-learning through the Internet" (p. 30). Richey (2013) defines it as "an educational design formula that combines face-to-face and e-learning, so that they are organized together as an educational method that benefits learning in different ways" (p. 23). Littlejohn & Pegler (2007) define BL as "a model for learning focuses on student learning through the provision of e-learning along with specific elements within the traditional course (p. 22). Milheim (2006) defines it as "a learning style that combines traditional classroom education and online learning features in an integrated model taking advantage of the possibilities available to each of them the instructional process (p.44). Therefore, it could be said that all the previous definitions agreed that the main feature of BL is the combination of traditional teaching methods and Internet based methods. The current research looks at BL as a type of learning in which e-learning where its elements and features are integrated with the elements and features of traditional f2f education using Internet tools of Moodle® platform to achieve learning activities for lectures, practical lessons, and training sessions in both traditional and virtual classrooms.

BL has distinctive characteristics (Abdel-Aty, 2016, pp. 22-23; Kaur, 2013, p. 615) as follows:

1. Integrated learning style where traditional education and e-learning are merged together in the design of educational situations using traditional AV aids and online learning.
2. Communication based learning style where a combination of synchronous and asynchronous communication exists between teacher and student.
3. Functional learning style as it employs technology and selects appropriate educational means to solve classroom's problems in terms of management and activities.
4. Balanced meaningful learning style as it combines and focuses, at the same time, on the appropriate application of educational technology, and the improvement the of objectives' and learners' achievement.
5. Systematic learning style by following the systems approach in teaching and learning and having different inputs, outputs and processes.

In addition, the use of the BL style in the field of education and training achieves multiple educational benefits which were identified in the literature (Al-Sharman, 2015, pp. 39-48; Kuteit, 2015, p. 159; Hew & Cheung, 2014, p. 9-10; Kaur, 2013, p. 614-615). It was found that BL saves time, effort and cost compared to traditional education alone or electronic education alone. It raises motivation, improves the students' academic achievement and takes into account the individual differences among them. The literature shows that BL eases forms of delivery and application in various places and environments and links learning inside and outside the classroom. It also enables the teacher to follow up on the students' performance by keeping opportunities available for them to meet each other.

In this study, the experimental treatment of BL may contribute to achieve a set of advantages by easing the communication with students, providing a continuous feedback and interactive environment that maintains the students' motivation, overcoming both traditional and e-learning styles' shortcomings and enabling the students to freely express their ideas and participate within their pace and ability to learn. Further, the blended learning environment of the current research is described as a teaching and learning style that is:

1. Meaningful that combines traditional and e-learning education in order to develop the students' achievement at the College of Education, SQU.
2. Integrated that combines traditional education using a computer lab, and e-learning through the university's Moodle® platform prepared for this purpose.
3. Asynchronous that provides e-learning content anywhere, at any time, and on any device connected to the Internet.
4. Interactive that allows f2f interaction with the teacher during traditional teaching and learning time.
5. Individualized that presents teaching and learning depending on the student's ability to learn the content according to his/her pace, attention and achievement.

Study Problem

At SQU, the introduction to educational technologies (TECH3007) course is the basic service courses to prepare the College of Education undergraduates in the field of technology. It aims to provide students with an understanding of innovative and latest technological applications with a special focus on studying theory and practice related to Internet applications so they acquire the basic skills in integrating these applications in teaching their various disciplines (SQU, 2021). Despite this well stated objective, the course implementation experiences many difficulties as evinced through the analysis of the course surveys conducted by the students at the end of each semester. A significant number of students expressed their dissatisfaction with the course pointing out the shortage in practical skills due to the short time of the practical sessions which does not commensurate with the required skills' training. They went on to attribute this difficulty to the different self-paced learning time required by students, insufficient time necessary to interact with their teachers in addition to the multiplicity of skills within each unit. The teachers, on the other side, complained that they do not have the privilege of enough time to individualize their students' learning and to train them separately because of the lack of time, and the large number of students. To further investigate the causes of the problem, the two researchers interviewed a sample of (31) students and the results showed low skills to integrate computer software and Internet technologies in their discipline, the gap between the learned skills and the those which are required for their field teaching practice, in addition to the predominance of the theoretical side over the practical. The students repeated the same previously-mentioned reasons as the main causes for these difficulties. Based on this pilot study, the researchers sought the results of specialized studies to find an appropriate educational strategy that have proven to be effective in developing technological skills and academic achievement; a strategy that may be useful in treating the aforementioned research problem.

The researchers found that BL has unique features which makes it the best strategy to investigate for its effectiveness to provide solutions for some of the pre-mentioned difficulties. First, it merges traditional teaching with e-learning according to the educational situation requirements without a limit for blending options of e-learning tools and traditional methods (Al-Mukhaini, 2017). Second, BL is also characterized by a balanced focus between the appropriate application of educational technology, and the achievement of educational goals (Yalcinkaya, 2015). Third, it saves time, efforts and cost, stimulates motivation and prevents boredom (Al-Sharman, 2015). Kuteit (2015) adds that BL is easy to apply in various places and environments as it can be adapted to the learners' individual differences and special needs to their academic achievement. Many studies such as; Al Musawi & Ammar (2021); Issa (2020); Adli, (2020); Al-Hiyari (2019); Ansiu (2018); Al-Sayed (2016); Hamid (2016); Khalifa (2015); Al-Hinnawi (21014); Marin & Nieto (2012); Poon (2012) have proven the effectiveness of using blended learning in developing many skills and improving achievement of undergraduate students. They have recommended the adoption of BL model for university education. It was also recommended for adoption at higher education level by conferences such as the 1st international conference of the Omani Society for Educational Technologies (OSET, 2010) and the 3rd World Conference (AWERC, 2012).

Study importance

The study is important in terms of raising the students' performance, professional competence and technological skills in faculties of education by showing the extent to which BL is effective on their academic achievement. The results of the research may contribute to direct attention of the universities and MOE in Oman and elsewhere to the importance of using blended learning in education and training.

Study objective, question and hypothesis

The current study aims to find out the effectiveness of BL on students' achievement at the College of Education of SQU. In particular, it seeks to answer the following question: "how effective is using blended learning in developing the achievement of students of the College of Education at SQU?". The current research seeks to verify the following hypothesis: "There are statistically significant differences at the 0.05 level between the mean scores of the experimental group students and the mean scores of the control group students in the post application of the academic achievement test in favor of the experimental group."

Methodology

Method

The study applied quasi-experimental method of an experimental/control group with pre and post measurement.

Study design

The research experiment was conducted according to the steps shown in Table 1.

Table 1. Study design

Item	Pre-application	Treatment	Post-application
Arrangements	Sunday 20/2/2019	3 Weeks 4 hrs./week, divided over two days 1 researcher taught both groups	Wednesday 6/3/2019
Experimental group	Achievement test	BL method using Moodle® platform	Achievement test
Control group		Traditional teaching method in a computer lab	

Study Community and Sample

The study population is all the College of Education, SQU the students who were registered to study in TECH3007 course during the Spring semester 2019; and numbered at 143 students, divided into four sections. Two sections (10 and 20) students were selected as a research sample. Their number was 61 students. Section 10 was the experimental with 30 students, and section 20 was the control group with 31 students.

Research tool

The academic achievement test was the research tool used in this study and prepared by the researchers as described in the following procedures:

1. The preliminary form of the test was first prepared consisting of (25) multiple choice items with four alternatives for each item. The number of items was chosen by determining the relative weight of the course skills. The grade assigned to each question was one.
2. The test was then applied to an exploratory sample of the research, with the aim of verifying the validity and reliability of the test.
3. The validity of the test was calculated in two ways:
 - a. Logical validity: the test was presented to five reviewers specializing in educational technology from faculty members at the College of Education, SQU to survey their views on the extent to which the test vocabulary is appropriate for its objectives, the course content, clarity and accuracy of its instructions. The percentage of the concordance coefficient between the reviewers' responses was calculated, and it resulted in 80% of the reviewers agreeing to delete five items due to the similarity between them and other items. After making the proposed modifications in the wording of some test items; the final test form became (20) item.
 - b. Internal consistency validity: after the test application to the exploratory sample, the researchers calculated the degree of correlation of each item with the total test score. The results showed that all the values of the calculated correlation coefficients are statistically significant at the 0.05 level. This confirmed the validity of the test.

- The reliability of the achievement test was calculated using the Kuder–Richardson formula (KR-21) after applying it to the exploratory sample. Table 2 shows the statistical data of the test.

Table 2. Reliability statistical data of the achievement test

No. of responses	Means	SD	Variance	KR ₂₁ Coefficient
20	15.3	4.51	20.3401	0.9148

Table 2 shows that the test reliability coefficient value equals (0.9148), which is a large value that can be trusted. It is also possible to be assured of the results that will be obtained after applying the experimental treatment to the research sample.

- To calculate the duration of the test time, the response time of each student was recorded. Then, the highest and lowest quartiles were separated for these times, and the average performance time was calculated for each of the two quartiles. The value of the two averages was (46), (26) minutes respectively. Then, the average performance time was calculated for each of the two quartiles and the result indicated that the test performance time value is (36) minutes. This time was raised to (40) minutes to be the approved test time.
- To calculate the ease and difficulty coefficients, the correct answers and the wrong answers were calculated for each test item. The values of the corrected ease coefficients were then calculated using correction-for-guessing formula. The values of the calculated ease coefficients ranged between the two values (0.41), (0.72) which are acceptable average values for the ease and difficulty coefficients.
- To calculate the discriminatory coefficients, the UL (upper vs. lower 27% technique) Index was applied where the scores of the students were arranged in descending order and (27%) of the scores of the sample students were separated to the highest quartile, and (27%) of the scores of the sample students were separated to the lowest quartile. It was found that the values of the discriminatory coefficients ranged between (0.42), (0.71), which indicates that the test items has a discriminatory degree that can be trusted.
- The final form of the test was prepared based on the opinions of the reviewers and the modifications made to it. It included the name/data of the student, date/time of the test and the overall test score. Then the test items were 20 items.

BL environment design and development

The researchers relied on the model Huang & Zhou (2005, p. 303,) to design and produce the blended learning environment for this experiment as shown in Fig. 1.

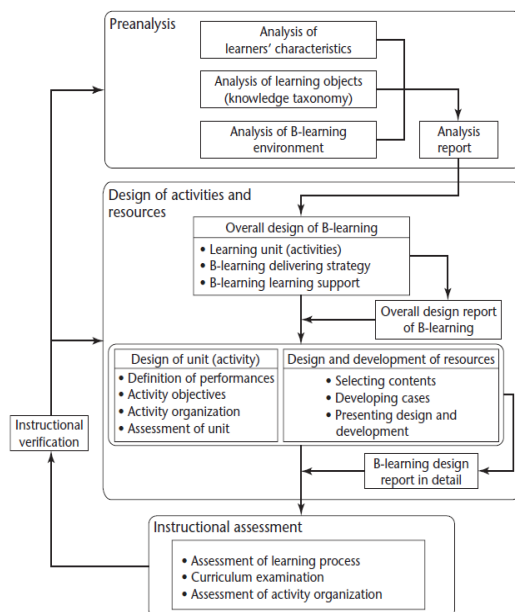


Fig. 1. Huang & Zhou model (2005) used to design and develop BL environment of the current research

Research variables

- The independent variable: BL.
- The dependent variable: achievement.

Research limitations

This research was limited to the following:

1. Students of the College of Education at SQU who are registered in sections (10) and (20) to study (TECH3007) Course in the Spring semester of the academic year 2018/2019.
2. Use of Moodle® as a platform to present the e-learning resources used in teaching students.

Results and discussion

To answer the main research question and test the validity of the research hypothesis, the achievement test was applied to the students of both the experimental and control groups. The mean scores were then calculated as well as the standard deviations. Table 3 presents the descriptive statistics, and the "t" value for the scores of the students of the two groups in the post application of the achievement test

Table 3. Descriptive statistics, and the t-test of the post application of the achievement test

Group	N	Mean	SD	t-value	df	Sig.	Effect size (di)
Experimental	30	17.1	1.37339	9.153	12.057	0.00	1.7
Control	31	10.7667	2.52823				

Table 3 findings indicate that the difference between the mean scores of the students of the experimental and control groups in the post application of the achievement test is statistically significant at the 0.05 level, in favor of the students of the experimental group. Thus, the validity of the main hypothesis of the research is verified and accepted. The effect size (di) was also calculated and the results shown in Table 3 indicate that the value of di equals to (1.7) which means that the performance mean of the experimental group exceeds the performance mean of the control group by (1.7) of standard deviation units; and the effect size is large. The researchers attribute this result to a number of reasons, including:

1. Diversity of e-learning resources provided in the BL environment and used by the students of the experimental group were not available to the students of the control group. This allowed the experimental group students to have multiple alternatives, allowing them to select according to what suits them.
2. Availability of resources to the students of the experimental group on the Moodle® platform at anytime and anywhere which wasn't the case for the students of the control group. This setting has facilitated and helped the students of the experimental group in accessing information, re-explaining the topics, and repeating the explanation and presentation more than once according to their abilities and pace of learning; this contributed significantly to the increase in their academic achievement.
3. Classroom meeting time in the experimental group was more focused on discussion, dialogue, and implementation of skills, as a large part of their basic learning was conducted through Moodle® whereas it included basic explanation of ideas, discussions and activities. This in turn needs more time to clarify in order to complete their achievement of the learning objectives and skills acquisition.
4. Individual differences among students in the experimental group were better met as they learned in a BL environment that was suitable for their learning characteristics. This may have contributed positively to the improved achievement by these students as compared to their colleagues of the control group.

This result is consistent with the findings of Al Musawi, & Ammar (2021) study regarding the effectiveness of BL at its various blending ratios in developing the academic achievement of students of the College of Education at SQU. It also substantiates the results of Adli (2020), Al-Hiyari (2019) and Ansiu (2018) studies which have proved the effectiveness of BL in developing the cognitive achievement of female students and English language and geography learners. (), which confirmed its results. This result also confirms Hamid (2016) study findings in that statistically significant differences exist between the mean scores of the BL class group and the traditional class group in the post application of the achievement test for students of the College of Education in favor of the BL class group

Conclusion, recommendations and suggestions

The current study aims to find out the effectiveness of BL on students' achievement at the College of Education of SQU. It was thought that BL can solve some existing problems as it combines the traditional teaching with e-learning tools strengths while maintaining the students' motivation and improving their achievement. The study found that this is evident by conducting a field experiment and supports many previous studies findings on both global and regional levels. Therefore, it seems it is in the interest of the policymakers at the Omani universities and educational institutions to spread, plan and implement BL among both students and faculty members. This becomes obvious specifically in the education and other programs characterized by theoretical and practical knowledge that requires more time to elaborate on discussion and inquiries.

We recommend that these educational institutions should focus on the technological infrastructure but more importantly they need to emphasize the awareness and change acceptance towards the recognition of BL in university courses. It is needless to say that these institutions should assess the training needs of their academic communities and design programs based on the BL environment using the Huang and Zhou (2005) model explained in this study. Learning programs based on the BL environment should be designed using active and self-learning theories. Colleges of Education are in need to update and develop their students' skills to use and interact with BL techniques.

Taking in consideration the study limitations, we suggest that researchers investigate the effectiveness of BL in developing students' skills and attitudes in various courses and specializations, in addition to studying the features and techniques of e-learning in activating BL strategies. We also suggest to expand the use of the BL environment to develop various research variables related to the academic courses of the university.

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The Evaluation of Hong Kong Students' Perception of Online Teaching Practice in Higher Education

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ABSTRACT

During the coronavirus pandemic, online learning practice has been adopted by universities in Hong Kong. It becomes the major teaching and learning method throughout these years. At the beginning of the epidemic, all stakeholders such as colleges, students, professors are not familiar with the online learning platform. The teaching quality and learning experience are being doubted, which would affect the public confidence in higher education. Therefore, universities have started to develop online learning practice in a systematic way. It is aimed at helping students to overcome the challenges, which could help to improve the learning experience. During the online learning and teaching period, online lectures or tutorial with live streaming through ZOOM or other online learning platforms such as Microsoft Teams, Blackboard Collaborate, and Panopto have been implemented. It may probably become a practice to replace face-to-face classes in the future. As the students' needs should always be the first priority of a university, the learning outcomes to students should be maximized. So, students' perceptions on the Online Teaching Practice should be considered.

The students' perceptions on the Online Teaching Practice could be influenced by different factors. In this project, the factors that have an impact on students' perceptions on the online teaching practice would be surveyed and discussed to investigate the effectiveness of online learning. By using different methods to analyze the survey data, the main factors that affected students' perceptions of online teaching practice could be shown. The findings of this project would provide valuable insight to academic units of universities in providing effective distance education.

INTRODUCTION

In recent years, especially after the outbreak of COVID-19, the usage of online teaching practice grows rapidly. In this social distancing era, online activities including online education are rapidly evolving (Arch Pathol Lab Med, 2020). Traditional teaching activities occur in classrooms or lecture halls. However, it is changing under the pandemic. The development of online teaching becomes a highlighted topic in universities. Most of the classes in higher education of Hong Kong have been changed from face-to-face to online distance classes. The way of teaching practice has been changed significantly. In this new generation of higher education, we will apply different technologies in our regular learning. For examples, live streaming software, online meeting software, recordings platforms. These learning tools are parts of higher education and provide effective learning environment to students. In this paper, some dimensions are based on the technology acceptance model and Information System Success Model developed by Davis in 1989 and DeLone & McLean in 1992, respectively. These dimensions are used for investigating students' perception of online teaching practice in higher education. The result could help the public and universities to understand university students' attitudes toward online teaching practice and provide some factors that have consequential impacts on students' perception on the teaching mode.

Three sub research questions are formulated in response to the research question:

- 1) Do student's personal backgrounds such as gender, age, GPA performance, way of learning online and prior online learning experience affect students' perception of online teaching practice in higher education?
- 2) What are the relationships between the factors in the technology acceptance model (TAM) and students' perception on online teaching practice?
- 3) How is the attitude of students toward online teaching practice?

THE STUDY

Technology Acceptance Model (or TAM)

TAM is developed by David (1986). TAM could be used to explain or predict people's acceptance on technology.

It is a model that has been used by many researchers to study the people's perception toward different technologies or system.

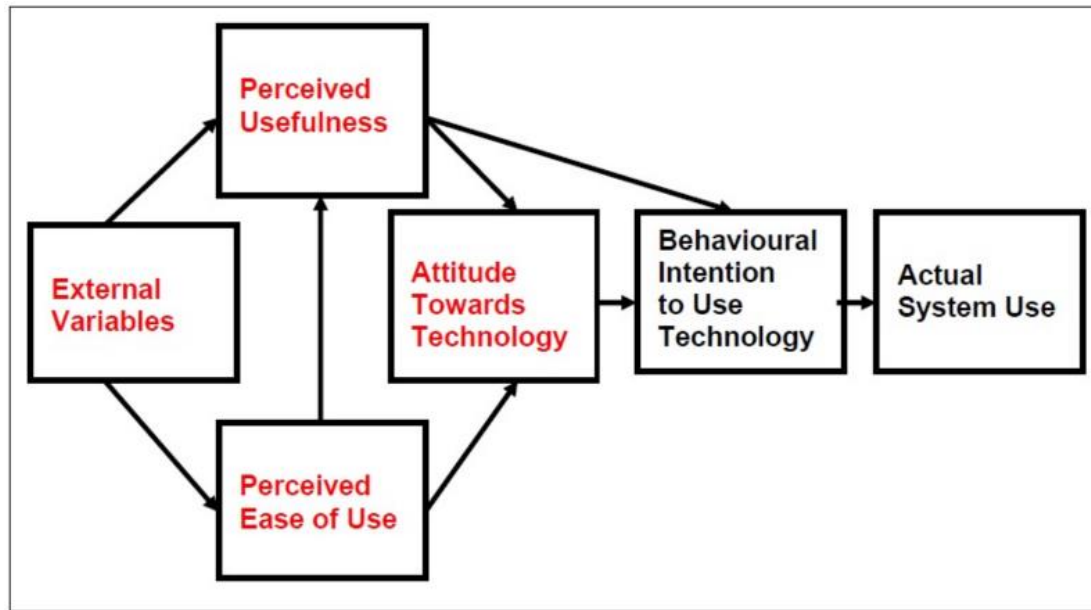


Figure 1.1 The Technology Acceptance Model (Davis 1989)

Information System Success Model

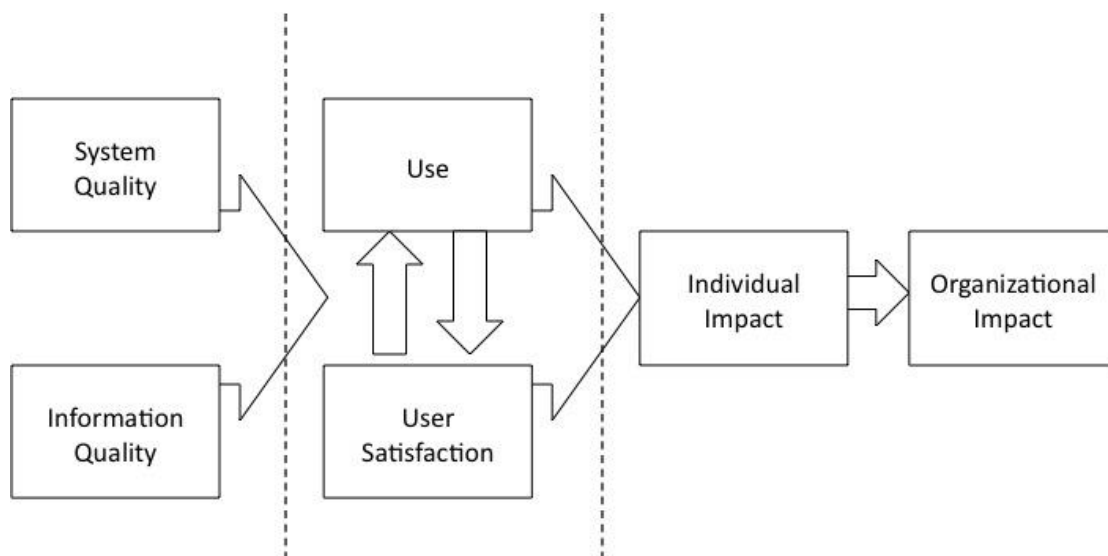


Figure 1.2 Information Systems Success Model (DeLone & McLean 1992)

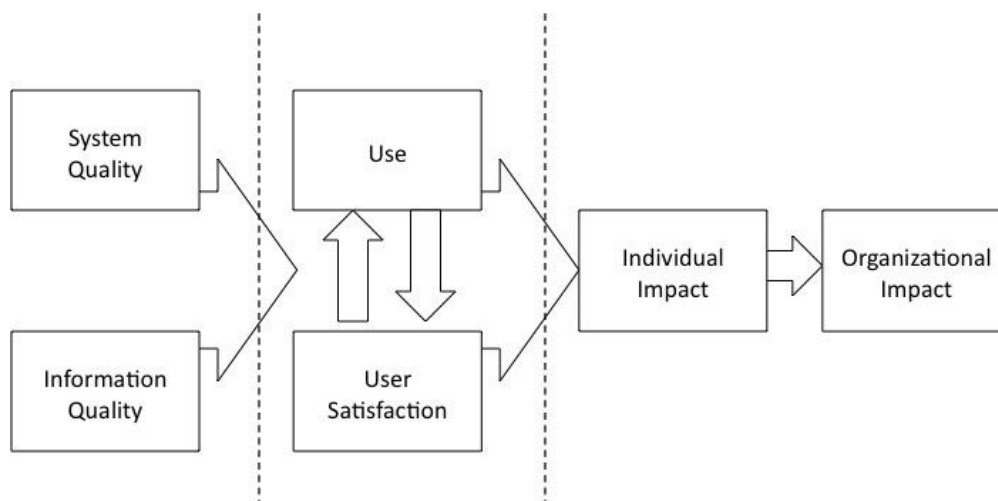


Figure 1.3 Information Systems Success Model (DeLone & McLean 2002, 2003)

According to the updated model proposed by (DeLone & McLean) in 2002 and 2003, there are 6 items: information, system and service quality, intention to use, user satisfaction, and net benefits. The 6 items affect each other as shown as above. A system consists of information, system quality and service. They could affect the intension of using the system. Finally, users would decide the system is good or not by seeing the benefits.

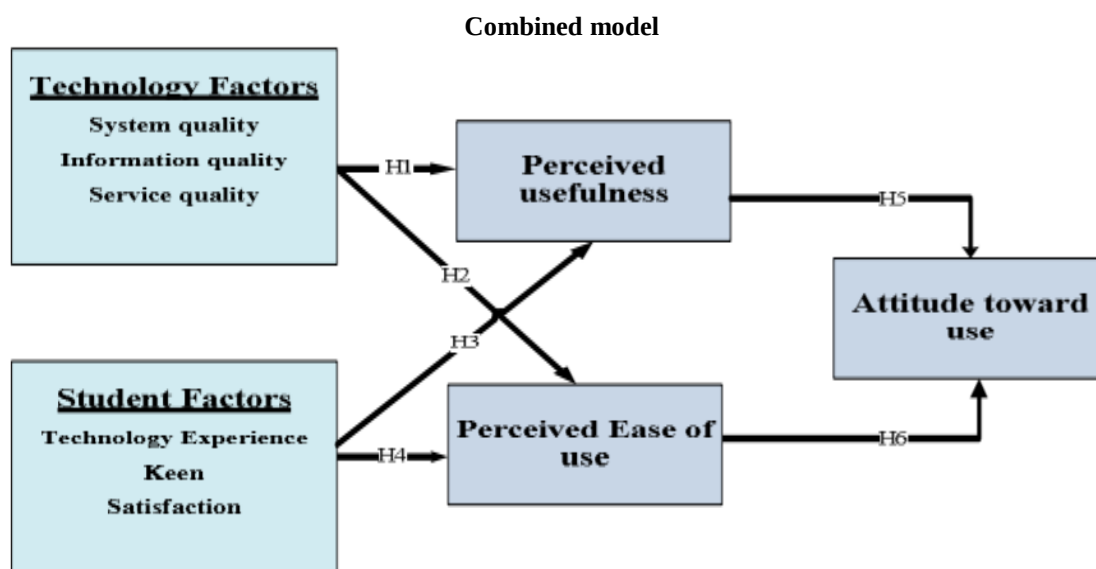


Figure 1.4 Combined Research Model (Al-Momani, 2014)

From the figure 1.4, the external factors include Technology Factor and Student Factor. Technology factor could explain as quality of the technology. In this project, the quality of the software used in online teaching practice would be treated as technology factor. TF and SF will influence the PU and PEU and then influence the ATT. In this study, this model will be a reference for further analysis.

Development of Hypothesis

Different factors may affect the student's perception toward online teaching practice. Also, there may contain some relationship among each factor. Al-Momani provided some hypothesis in 2014 that the perception could be affect by multiple external factors. I am going to make some hypothesis below which are for the analysis in this study. The details would be discussed in Chapter 5 after analysis.

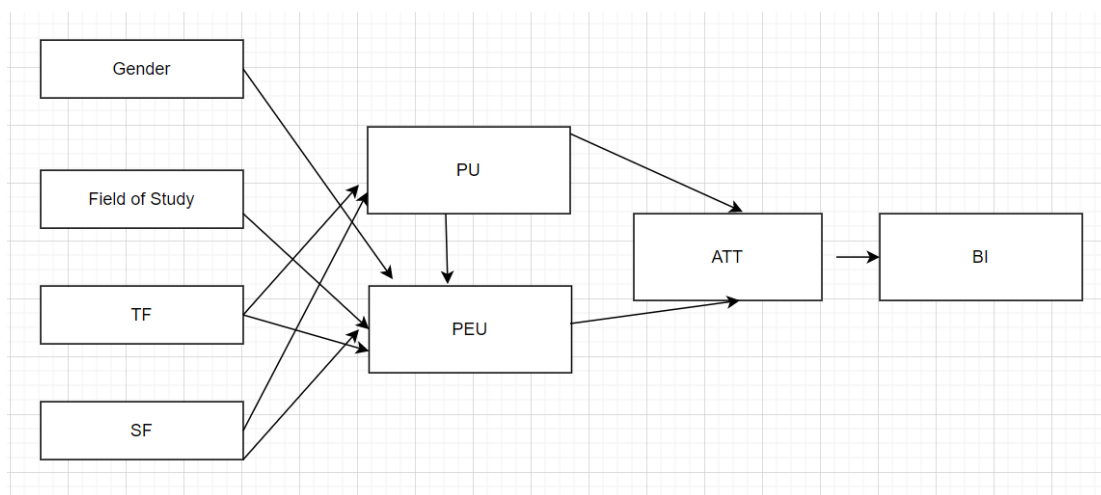


Figure 1.5 Research model in this study

Gender:

H1: Male students rate higher in PEU of online teaching practice

Field of Study:

H2: Science/Engineering Students rate higher in PEU of online teaching practice

Technology Factor:

H3: Technology Factors (TF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice

H4: Technology Factors (TF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice

Student Factor:

H5: Student Factors (SF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice

H6: Student Factors (SF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice

PU and PEU:

H7: There is a positive relationship between Perceived Ease of Use (PEU) and Perceived Usefulness (PU) in online teaching practice

ATT:

H8: There is a positive relationship between Perceived Usefulness (PU) and Attitude (ATT) toward online teaching practice

H9: There is a positive relationship between Perceived Ease of Use (PEU) and Attitude (ATT) toward online teaching practice

BI:

H10: There is a positive relationship between ATT and BI

FINDINGS

The concept of the questionnaire used in this study is based on a model which has been used to investigate the factors that affect the acceptance of information technologies. The model is known as technology acceptance model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). Students' perceived ease of use, usefulness and their attitude toward a particular technology would be measured in the questionnaire. Also, the questionnaire also examines two groups of factors which are technology factors and student factors.

Population and Sample

Since the questionnaires are distributed and collected digitally, the target of this study is to collect 200 completed questionnaires. The questionnaires which are invalid would not be used to analyzed.

Personal background data of respondents

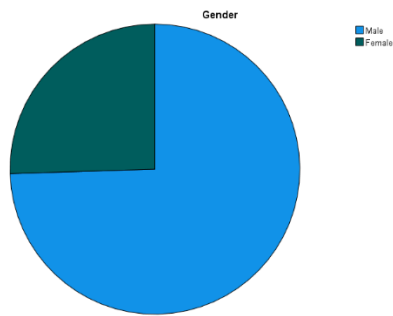


Figure 2.1 Pie Chart of Gender

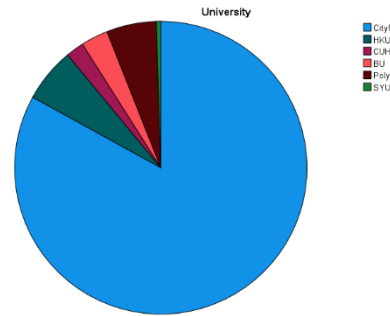


Figure 2.2 Pie Chart of Respondent's University

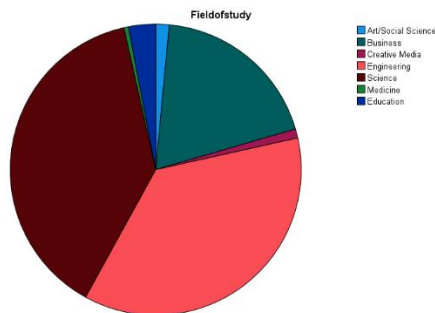


Figure 2.3 Pie Chart of Field of Study

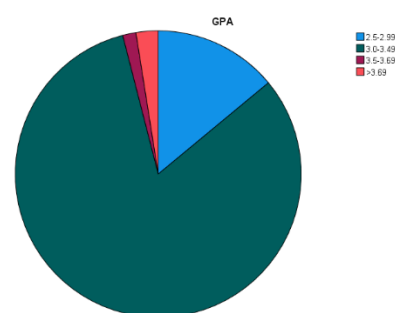


Figure 2.4 Pie Chart of Respondent's GPA

ANALYSIS OF RESULT

1. Relationship between Gender and PEU

Independent Samples Test									
Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
PEU								Lower	Upper
Equal variances assumed	41.681	<.001	7.390	198	<.001	2.27083	.30729	1.66484	2.87681
Equal variances not assumed			5.251	56.984	<.001	2.27083	.43245	1.40485	3.13680

Table 3.1: T-Test for Gender on PEU

From table 4.17, the significance value under Levene's Test is less than 0.05. It means that the variances between two groups are assumed not equal. Then, the value of significance under is less than 0.01 which less than 0.05. Therefore, there are a significant difference between the male and female from the data of this study, which means males and females have different perceptions on the ease of use toward online teaching. Also, from table 4.16, the mean of male is higher than the mean of female.

Therefore, the hypothesis *H1: Male students rate higher in PEU of online teaching practice* is supported/accepted.

2. Relationship between Field of Study and PEU

ANOVA

PEU

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	304.576	6	50.763	16.281	.000
Within Groups	601.744	193	3.118		
Total	906.320	199			

Table 3.2: one way ANOVA for Field of Study on PEU

Firstly, according to Table 4.19, the value of significance is smaller 0.05. It means the field of study group has a significant different on PEU. Secondly, according to table 4.18, Engineering and Science students get the highest mean on PEU.

Therefore, *H2: Science/Engineering Students rate higher in PEU of online teaching practice* is supported/accepted.

3. Relationship between TF and PU

According to Table 4.1, Pearson correlation coefficient is + 0.485 with p-value smaller than 0.01. It shows that the relationship between TF and PU is positive and significant. Therefore, *H3: Technology Factors (TF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice*, is accepted/supported.

4. Relationship between TF and PEU

According to Table 4.1, Pearson correlation coefficient is + 0.882 which is larger than 0.5 with p-value smaller than 0.01. It shows that the relationship between TF and PEU is strongly positive and significant. Therefore, *H4: Technology Factors (SF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice*, is accepted/supported.

5. Relationship between SF and PU

According to Table 4.1, Pearson correlation coefficient is -0.254. It shows that the relationship between SF and PU is negative. Also, the value of the coefficient is relatively low. Therefore, *H5: Student Factors (SF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice* is rejected.

6. Relationship between SF and PEU

According to Table 4.1, Pearson correlation coefficient is 0.228. It shows that the relationship between SF and PEU is weakly positive. However, the value of the coefficient is relatively low which is lower than 0.3. Therefore, *H6: Student Factors (SF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice* is rejected.

7. Relationship between PU and PEU

According to Table 4.1, Pearson correlation coefficient is + 0.632 which is larger than 0.5 with p-value smaller than 0.01. It shows that the relationship between PU and PEU is strongly positive and significant. Therefore, *H7: There is a positive relationship between Perceived Ease of Use (PEU) and Perceived Usefulness (PU) in online teaching practice*, is accepted/supported.

8. Relationship between ATT and PU

According to Table 4.1, Pearson correlation coefficient is + 0.935 which is larger than 0.5 with p-value smaller than 0.01. It shows that the relationship between PU and ATT is strongly positive and significant. Therefore, *H8: There is a positive relationship between Perceived Usefulness (PU) and Attitude (ATT) toward online teaching practice*, is accepted/supported.

9. Relationship between ATT and PEU

According to Table 4.1, Pearson correlation coefficient is + 0.643 which is larger than 0.5 with p-value smaller than 0.01. It shows that the relationship between PEU and ATT is strongly positive and significant. Therefore, *H9: There is a positive relationship between Perceived Ease of Use (PEU) and Attitude (ATT) toward online teaching practice* is accepted/supported.

		Correlations				
		Technology_Factor	Student_Factor	PU	PEU	ATT
Technology_Factor	Pearson Correlation	1	.308**	.485**	.882**	.492**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001
	N	200	200	200	200	200
Student_Factor	Pearson Correlation	.308**	1	-.254**	.228**	-.258**
	Sig. (2-tailed)	<.001		<.001	.001	<.001
	N	200	200	200	200	200
PU	Pearson Correlation	.485**	-.254**	1	.632**	.935**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001
	N	200	200	200	200	200
PEU	Pearson Correlation	.882**	.228**	.632**	1	.643**
	Sig. (2-tailed)	<.001	.001	<.001		<.001
	N	200	200	200	200	200
ATT	Pearson Correlation	.492**	-.258**	.935**	.643**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	
	N	200	200	200	200	200

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4.1 Result of Pearson Correlation

Result model of the correlation among variables

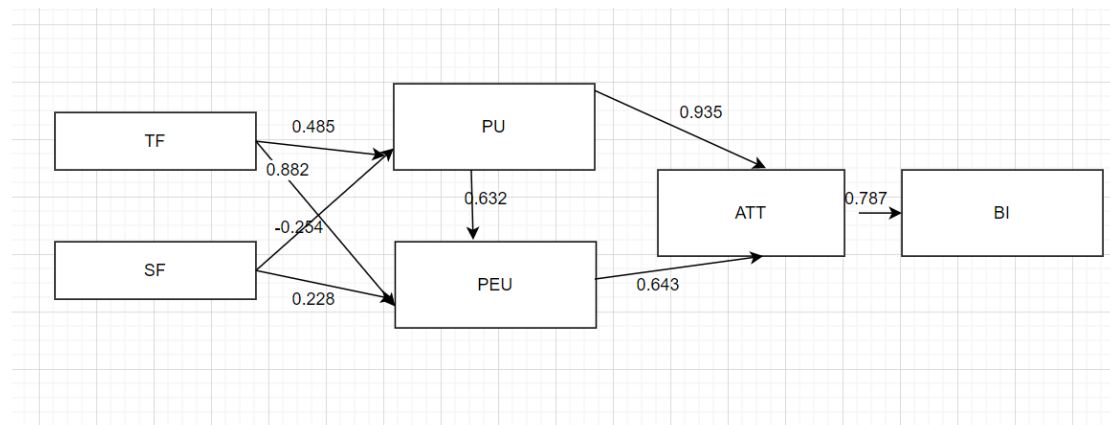


Figure 4.2 Result model of the correlation among variables

DISCUSSION AND CONCLUSION

1 Discussion on Gender Difference

From the result in this study, the hypothesis H1 is supported. It is found that male may probably tend to think that the online teaching software is user-friendly and easy to use. From the study written by Shaouf & Altaqqi (2018), they claimed that there are differences on attitude, and satisfaction toward technology-related and internet-related activities with different gender. In fact, there are research showing that biological and characteristic differences exist between different gender (Kadijevich, 2000; Li & Kirkup, 2007). Why females tend to think that the technologies in online teaching practice is not easy to use?

Females are probably less interested to technology. In school, the number of female students in a technology course is relatively lower than the number of males. It is found that females are less enjoyable to learn the usage of internet or computer than males (Kaino, 2008). It would be the reason of why the H1 is supported. Females would be less interested in the software used in online teaching practice. Even if there are some new functions in Zoom which could make the learning more effective or fun, they might not be interested and feel hard to use. Therefore, students' perceived ease of use of online teaching would be different between gender.

2 Discussion on Field of Study

From the result, we could find that Science and Engineering students are more positive on the ease of use of online teaching software. It could be explained by the nature of their major. For the students who studying in Science and

Engineering, they gain more exposure in innovative and technological things in their daily life. For example, a Computer Science student is required to learn new programming or innovation in order to create a product. Technology is an important part of their academic life. They are probably more interested in technology (Arya College, 2019). And they are more knowledgeable in technology. When they start learning through an online teaching software, they could easily adapt to it. However, for other students such as Social Science students, they use less technology in their academic life. Also, they are more focusing on face-to-face discussion in the lectures. They are not required to be knowledgeable in technology or internet (Katrina, 2007). Therefore, they would tend to think the software is not easy to use. This study is not indicating the students who are not studying Science/Engineering find many difficulties in online teaching practice as the item with lowest mean in PEU which is Creative Media still gets '3'. It means that they think the ease of using online teaching software is neutral.

3 Discussion on Technology Factor

It is found that Technology Factor has strong relationship with PEU and PU. It is also similar to the result of the study written by DeLone & McLean (1992) and Al-Momani (2014). Technology factor group is indicating the quality of the software used in online teaching practice. The quality of the software would affect students' PEU and PU. It is because if the interface is well-designed, the ease of use would be increased. Also, if the software's functions are suitable and helpful for learning, the PU would be increased. Therefore, it is concluded that the Technology Factor do has positive relationship with Perceived Ease of Use (PEU) and Perceived Usefulness (PU).

4 Discussion on Student Factor

In this study, it is found that the Student Factor does not have strong positive relationship with PU and PEU. It is not matched with the findings from Al-Momani in 2014. After investigation on the descriptive data in Student Factor group, the question SF8 which gets a highest standard deviation could be the reason. SF8 is 'I have a fun interacting with educational technology rather than non-education technology'. The result of SF8 shows that not all students think that the educational technology is fun. Although they may think the software is useful for learning, they might feel bored when using the software. Since the software is for learning and academic purposes, it is acceptable to say the software is not fun. Therefore, we could not find a strong relationship between Student Factor and Perceived Ease of Use (PEU) and Perceived Usefulness (PU).

5 Discussion on Relationships between PEU and PU

From the result 4.6.5, It is found that there is a strong positive correlation between PEU and PU. This finding is matched the findings from the study of Venkatesh & Morris & Davis in 2000. After the analysis, we could conclude that students' perceived ease of use of the technology used in online teaching practice has a strong positive relationship with the ease of use of the technology used in online teaching practice. Therefore, the hypotheses H7 is accepted.

6 Discussion on Attitude

It is found that PEU and PU have strong positive relationship with Attitude. It is because student's attitude toward online teaching practice is affected by the PU and PEU. It is suggested that students would probably feel better toward the technology used in the learning activity when they think the technology is useful and easy to use. For example, there is an item in PU group, 'Easy to review my previous lectures in E-learning software.'. Students would have positive attitude toward the online teaching if they could review the lectures easily. They would think the online teaching is favorable to their learning and study. It is supported that PU and PEU have positive relationship with ATT. Therefore, H8 and H9 is accepted.

7 Discussion on BI

It is found that the ATT has positive relationship with BI. Students who have positive attitude toward online teaching would tend to support the development of online teaching.

It is because when students are enjoyable in online teaching and they think online teaching are beneficial to their learning, they would think developing online teaching is a right decision. They would prefer implementing online teaching practice in the future. Since the technology is favorable to their study, they would think the online teaching is worth to implement. Therefore, H10 is supported.

Summary

This study examines Hong Kong Students' Perception of Online Teaching Practice in Higher Education. The perceptions of students measured through this study has been presented. The perception is measured by a combined model using modified TAM (Technology Acceptance Model) and Information System Success Model.

In this report, it is found that the perception could be affected by different factor group. Also, some of the factor

groups affect each other. In this report, personal background including genders, field of study, have been investigated and analyzed. Also, the relationship among the factors in TAM have been compared. The result is shown this report.

The survey shows some of the factors have significant different. Also, the result of the survey has supported/rejected the hypotheses in this study. It shows that there are relationships among some of the factors. You may refer to below:

Gender:	
H1: Male students rate higher in PEU of online teaching practice	<u>Accepted</u>
Field of Study:	
H2: Science/Engineering Students rate higher in PEU of online teaching practice	<u>Accepted</u>
Technology Factor:	
H3: Technology Factors (TF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice	<u>Accepted</u>
H4: Technology Factors (TF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice	<u>Accepted</u>
Student Factor:	
H5: Student Factors (SF) have a positive effect on the Perceived Usefulness (PU) of online teaching practice	<u>Rejected</u>
H6: Student Factors (SF) have a positive effect on the Perceived Ease of Use (PEU) of online teaching practice	<u>Rejected</u>
PU and PEU:	
H7: There is a positive relationship between Perceived Ease of Use (PEU) and Perceived Usefulness (PU) in online teaching practice	<u>Accepted</u>
ATT:	
H8: There is a positive relationship between Perceived Usefulness (PU) and Attitude (ATT) toward online teaching practice	<u>Accepted</u>
H9: There is a positive relationship between Perceived Ease of Use (PEU) and Attitude (ATT) toward online teaching practice	<u>Accepted</u>
BI:	
H10: There is a positive relationship between ATT and BI	<u>Accepted</u>

Table 5.1 Results of the Hypotheses

Implication for Practice

This project has investigated the relationship between technology factor, student factor, perceived ease of use, usefulness, and other personal background factors. These factors could help to understand the perception of student toward online teaching practice. Therefore, students' intension and perception could be found though the factors mentioned in this study.

After the analysis in this study, we could understand that technology factor which represents the quality of the technology used in online teaching practice such as Zoom could be an essential factor to affect students' perception. Student's perception should always be the main concern in teaching arrangement as the student's requirement will affect the quality of teaching. Also, we could see that the technology factor and perceived usefulness is inseparable as the quality of technology could affect the usefulness of the software. It also affects the perception of students toward online teaching practice.

The factors and their relationship could be a reference for the academic unit of universities or course leader, to improve the online teaching practice. Or to decide whether the online teaching should be implement/developed in the future or not. The students' perception is important in the decision.

Limitation of Study

Firstly, the sample size is not large enough to provide a better result. Due to the distance learning, the questionnaire could not be distributed to more student. Also, most of the students are from City University of Hong Kong. Students from other universities could not be reached easily due to online teaching arrangement. If the sample size is larger, the result of this study would be more convincing to represent general students in Hong Kong.

Secondly, the major of respondents is uneven. Since the questionnaires are distributed mainly to my classmates, which are studying in Engineering/Science, the number of Engineering/Science students are much more than others. If I have more time, I will try to reach the students from other colleges to get more data.

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What He Would Say If ...

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ABSTRACT

What Vygotsky (also spelled Vygotskij) would say if he saw the world today ... Our paper was conceived as a possible/impossible interview with Lev S. Vygotsky (1896-1934), the founder and most significant representative of the cultural-historical school, an evergreen figure in the field of education for his studies on the dynamics involved in learning processes (collaboration and the sharing of knowledge between teacher and learner, the mediating role of the former for the latter's successful task completion, the use of tools), as well as on human cognitive abilities (mental processes in their development and the dialectical relationship between normality and pathology). A 360-degree panorama of questions and answers, giving Vygotsky the floor on today's world, from the topicality of the COVID-19 pandemic to the use of digital technologies, school, education and play, with forays into the psychology of art. The interview was carried out on the basis of knowledge drawn from primary and secondary sources, referring to Vygotsky's biography and his writings, and partly by imagining the form and content of his hypothetical reflections concerning certain aspects of our time, so distant from the 1930s in which he lived.

Keywords: Vygotsky/Vygotskij, education, mathematics education, digital technologies, distance/remote teaching and learning, COVID-19



Figure 1. L. S. Vygotskij
(Source: https://it.wikipedia.org/wiki/Lev_Semënovič_Vygotskij)

Let us begin our chat with a question that is unavoidable given the current situation: as founder of the cultural-historical school, what is your opinion on the COVID-19 pandemic? We are probably not mistaken in considering historical materialism and dialectical materialism as theoretical pillars of your reasoning.

Indeed, I am well aware of Friedrich Engels's argument that the human being also arises through differentiation. Not only individually, through differentiation from a single egg-cell to the most complicated organism that nature produces, but also historically. When, after thousands of years of effort, the differentiation of the hand from the foot and the upright position were finally acquired, then the human became distinctly different from the ape.

I could therefore hypothesise that COVID-19 also arose through differentiation and, with its numerous variants, again through differentiation, attempts to lay the foundations and premises for its survival, with all due respect for the vaccines invented by humans.

There is no doubt that viruses (including COVID-19) are also part of nature, but in nature, as Engels maintains, there is nothing that is eternal except matter, which is eternally in transformation, eternally in motion.

I think I can offer you some words of comfort: viruses, like human beings, are not eternal. So what? Let us differentiate our behaviour in such a way as to leave no room for the “differentiated” aggression of any kind of viral threat. Perhaps operational protocols grounded in a culture of respect could become behavioural and cultural-historical variables of a certain effectiveness in terms of an adequate quality of life, both for humans and for every other living being. Even viruses have the right to the freedom to be what they are, provided that this same freedom does not act against the freedom of other living beings, men and women in particular. An interactive game that should be played according to shared rules. But would COVID-19 respect them? And would we, more committed as we are than any other animal to harming nature and the environment in which we all live?

Thank you. In addition to this, we would be interested to know your opinion on digital technologies, what you think of computers, and everything that goes with them (software, programs and apps, platforms, social media, etc.), all of which have become irreplaceable in today’s life, even more so as a result of the pandemic, also in terms of their use for teaching purposes, if we think of distance learning, which has become fundamental in these difficult times. In this respect, the concepts of “stimulus-means” and “zone of proximal development” seem to be of particular interest.

First of all, let us see what we mean by “stimulus-means”. To illustrate the concept, I like to recall the case of Buridan’s ass: the hungry animal is faced with two stacks of hay, one on the right and the other on the left, and, unable to choose which to go to, dies of starvation. The two equivalent stimuli (the two stacks) produce two equal but opposite reactions and the animal’s behaviour is inhibited.

A human being, on the other hand, could toss a coin and choose between the two stimuli according to the result of the toss. A human thus creates, on his/her own initiative, a stimulus that he/she uses (so it is a means, a tool) to establish a new stimulus-response relationship and so allow his/her behaviour to unfold in a different direction. Hence, we see the dual function of stimuli-means/tools: on the one hand, externally oriented, they enable action and thus the solution of a practical problem; on the other hand, internally oriented, they control and direct this action.

In fact, the creation and use of tools is a peculiarity of the human species, and the presence of created stimuli alongside those given is the distinctive feature of human psychology, through which the dialectical (qualitative) leap is made, compared to animals, in the ways of interacting with the environment, in the relationship between stimulus and reaction, a leap which is represented at a neurophysiological level by a functional modification of the brain, specifically by the formation of new brain connections. An illustrative example in this sense is the knot on the handkerchief that serves to remind you that something must be done (a certain task, a certain action). When you see the knot in the handkerchief, it works as an external stimulus that acts on a trace deposited in the memory, in your brain, a trace connected to a trace relative to another stimulus (the delivery of the task to be performed).

Can you clarify the concept of “tool”?

Tools can be external (I am thinking of technical, i.e., material tools, used to solve practical problems, such as a shovel to cultivate a field or a branch to draw a sign in the sand to mark out a path) or internal, which may have been external previously, but have then been internalised (psychological, i.e., symbolic tools, that is, mental constructs, also called signs). Internalised tools are, in particular, those that are distinctive and characteristic of the human mind, products of human culture and an integral part of the social activity in which they operate. I am thinking of the “classic” example (valid in my time as well as in your current era) of the compass, a tool created at a certain moment in human history and used in geometry to draw circumferences. The operations of the compass can be carried out by holding it physically with one hand, but they can also be “visualised” internally.

Here then is the point: the human being possesses a specific and original potentiality that puts him/her in a position (only if he/she so wishes and desires) to modify reality to his/her own advantage when this same reality presents itself in such terms as to constitute an operational constraint. The computer, a “new” tool which characterises the daytime flow of your present life, can assume the characteristics of an effective stimulus-means on condition that its use is inserted in a strategic plan that has an applicative and existential sense whose ultimate aim is to improve the quality of life of its user. Incidentally, I have seen that you use the computer to do geometry, applying what is called “dynamic geometry software” (DGS) - also to draw circumferences, which we were talking about earlier.

Might there not be a risk that ancient and modern tools lead to a kind of personal “shirking of responsibility”?

Any tool (whether “ancient”, such as the compass, or “modern”, such as those offered by computer environments, like dynamic geometry software) can lead to the avoidance of responsibility, if it is used in an uncritical manner, thus inhibiting critical-constructive thinking and blocking any necessary creative pathway, which is normally indispensable for reaching a solution to the problem.

I am thinking of the school sector. It should be noted, in fact, that the presence of a tool does not in itself lead to an improvement in teaching performance. Changes in education are, in fact, the result of a more general change, so it is

necessary to completely rethink teaching practice so as to integrate the tool effectively. I would like to emphasise, in this context, the importance of the process of “internalising” the tools (which become psychological tools or signs, such as language, calculation systems, mnemonic techniques, algebraic symbol systems, writing, charts, diagrams, etc.) and the role that the teacher plays in this process as a “cultural mediator”, to the extent that the teacher not only demonstrates the concrete act of using a tool to carry out a task but, through his/her guidance, enables the generation (and evolution) of new meanings related to the actual use of the tool itself (a process that has been defined as “semiotic mediation”).

The use of a given tool - in relation to the notion of which one can then think of the proposed distinction between, on the one hand, the object itself, called an “artifact” (in general, a material object such as a compass, but also a software program), and, on the other hand, the different modes of use that a user can (and must) put in place to obtain a given effect through the object itself, so that, from this point of view, “tool” indicates the projection of the subject onto the artifact, that is, the unity of the artifact and the patterns of use elaborated by a given subject in relation to the artifact itself and to situations - certainly makes it possible to construct meanings linked to it and to the signs deriving from it (for example, the names of the commands in the case of the “modern” computer tool). The transition to disciplinary meanings (e.g., mathematical meanings - i.e., the educational objective) requires, however, a specific intervention on the part of the teacher, who uses the tool as a mediator of meanings according to his/her own educational aims.

Your reply came naturally to the world of schools and teaching.

I believe that the school performs a fundamental role in the psychic development of children (and adolescents) precisely because it represents the main place of cultural mediation in which the child (and adolescent) finds himself/herself in his/her own life, the main social context where, in general, the learner must be shown and taught the use of the tools necessary to make him/her autonomous in his/her own education (in my day, the book or the compass; in your current era, also the computer, the tablet, in general any digital technology, as a “new” tool that mediates thought and learning). After 1933, and especially in the context of the new collaborations begun at the Herzen Pedagogical Institute in Leningrad, I systematically addressed the problem of the relationship between education and psychic development.

First of all, I do not see the relationship between teacher and learner as a mechanical process of unidirectional transmission of information from the former to the latter, but rather as a circular process of teaching by the teacher and learning by the learner. I think that education should not be understood as a unidirectional teacher-learner relationship, in which the latter merely learns passively what is transmitted to him/her, but as a dynamic and fluid process, neither rigid nor predetermined, in which teacher and learner actively interact in the construction of knowledge. It is a process in which the teacher is responsible for mediating and assisting the student’s learning, supporting him/her through social interaction at the moment of cooperative construction of awareness, knowledge and competence; the mediation activity implemented by the teacher must be flexible, in response to the feedback he/she receives from the student in the moment of learning, and the amount of support he/she provides must be modulated appropriately, and may, depending on the conditions, also vary significantly (from explicit instructions to vague hints).

If we understand you correctly, the notion of “proximal development” seems to be of particular relevance here ...

Certainly. I would like to emphasise once again the interpersonal and social character of education. In the framework of my conception, the notion of “zone of proximal development” is therefore particularly relevant, that is to say, that area of mental activity that the child (or adolescent) can produce with the help of adults (in this context, especially teachers) or more able companions and which is added to the mental activity that he/she could produce alone. Let me be more precise: in general, the zone of proximal development is the area between the child’s spontaneous performance and the performance enhanced by the introduction of stimuli-means. Hence my criticism of the use of cognitive development assessment tools, in particular intelligence tests (and the same assessment questionnaires that you use a lot at the present time in your schools) limited to spontaneous performance, without an analysis of the potential (proximal development) that could be expressed with the help of an adult figure or a more able companion.

Here one could, in fact, open up a whole discussion on the actual applicability of my principles to what have been defined as “classroom realities” (that is, authentic classroom contexts), on the illustration of operational models, on examples of lesson structuring and dynamic assessment procedures (which should take place while students are engaged in the learning activity), as well as on strategies aimed at the inclusion of students at risk or from different socio-cultural-economic backgrounds and on the use of technological tools to foster not only the cognitive but also the social processes involved. These are all points that you who have come after me have explored in depth, but on which, in the specific context of this interview, I would not like to comment.

And what is your opinion on distance learning, which we have already mentioned in passing?

I could put the question in these terms: does distance learning - a didactic-pedagogic procedure that has characterised the era of the COVID-19 pandemic - adequately respond to the needs of the school population (students and teachers)? What I would like to say, in the context of our chat, is that distance learning is perhaps a particular stimulus-means as well, and here too everything depends on the use made of it by teachers, parents and adult reference figures. As a new

technology it can be regarded either as a positive and critical-constructive variable or, on the contrary, as a tool that interferes with the articulation of a correct two-way and multi-way communication process.

Considering that I am aware of the discussion you have had on the use of distance learning, on the criticalities it has shown in practice at a social and learning level, starting from the lack of physicality that distinguishes it, I would like to reiterate that it would be a good idea for the people involved (students, teachers, parents) to be fully conscious of the fact that they are the directors of the development of a (multi-way) relational process, the purpose of which can be summed up once again in the motto “let us act to improve the quality of life” of each actor who is called upon to play his/her role on the existential stage: student, teacher, parent.

Indeed, education can be conceived as an art form that uses specific and original tools. One of these tools (and perhaps the main one) is play, an activity that especially children are engaged in on a daily basis. What is your take on this?

The fact that a child plays should always be interpreted as the imaginative and illusory realisation of unrealisable desires. Imagination is a new phenomenon that is not present in the consciousness of very young children; it is completely absent in animals and is a form of specifically human conscious activity. Like every function of consciousness, it originates in action. The old saying that children’s play is imagination becoming action can be reversed: we can say that the imagination of children and adolescents who go to school is play without action.

Play without action, OK. But let us explore the concept of “play” as an educational tool available to parents and teachers. Education also means promoting respect for certain rules, which are essential for learning to become socially competent people. This respect is itself an element of active teaching, aimed at forming citizens who will be free and aware, even if they have learned to respect the basic rules of civil coexistence. But are there games without rules?

A game involving an imaginary situation is, in fact, based on rules. It seems to me that we could go further and posit the non-existence of a game without rules and without a particular attitude of the child towards these same rules. Let us explore this idea further. Take any form of game that involves an imaginary situation. The imaginary situation already entails rules of behaviour, even if we are not dealing with a game with rules which have already been formulated in advance. A girl imagines herself as a mother and the doll as her daughter. She must then follow the rules of maternal behaviour. In the game, then, the child is free. But it is an illusory freedom.

Earlier we were talking about education as a form of art. Given that you have dealt extensively with art, a question we would like to ask you in this connection concerns the reason why one work of art or another arouses our personal interest, our particular form of emotion. In a nutshell: either we like it or we don’t. Why?

We will never be able to say exactly why we like this or that work of art; it is almost impossible, in a few words, to express, even in part, what the essential and most important aspects of this experience are: and, as Plato already noted in the dialogue *Ion*, it is precisely poets who know least of all how they manage to create. It does not require particular psychological penetration to realise that the deepest causes of the artistic phenomenon are hidden in the unconscious.

In short, it is not what is beautiful that is beautiful, but what is liked is beautiful - we might say.

We would have had many more questions to ask our interlocutor, but ... *dum loquimur, fugerit invida aetas* ...

TO LEARN MORE

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