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Dear TOJDE Readers

Welcome to Volume 23 Number 4 of TOJDE

There are 15 articles in October 2022 issue. 29 authors write the articles from 11 different countries. Austria, China, Indonesia, Malaysia, Mexico, Saudi Arabia, South Africa, South Korea, Turkiye, Ukraine and USA are the contries.

The author of the 1st article is Serkan DUZGUN. The title of the article is EXPLORING TEACHERS' VIEWS ON EMOTION TRANSFER IN VIRTUAL CLASSROOMS DURING EMERGENCY REMOTE TEACHING. This study explores emotion transfer-related views of teachers holding online classes in emergency remote teaching during the COVID-19 pandemic. The results highlight that female teachers find virtual classroom applications more effective than their male counterparts, the preschool teachers and classroom teachers find virtual classroom applications more effective in receiving emotions than the high school teachers and middle school teachers, and emotion transfer in virtual classrooms are efficient.

The title of the 2nd article is ATOMIC PHYSICS TEACHING MATERIALS IN BLENDED LEARNING TO IMPROVE SELF-DIRECTED LEARNING SKILLS IN DISTANCE EDUCATION. Nia ERLINA, PRAYEKTI and Iwan WICAKSONO are the authors. The study aims at analyzing the practicality and effectiveness of atomic physics teaching materials in blended learning to improve students' self-directed learning skills in the open and distance education system. The results show the atomic physics teaching materials are proven to be effective in increasing students' self-directed learning. There is no significant difference from all test classes so that atomic physics teaching materials are effective for application to students who have low, medium, and high abilities.

SOUTH KOREAN UNIVERSITY STUDENTS' VIEWS OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC is the title of the 3rd article. This article is written by Andrea Rakushin LEE, Daniel Ryan BAILEY and Norah ALMUSHARRAF. This case study indicates South Korean university students' satisfaction with online learning during the pandemic. As a result, university educators and administrators can better optimize online learning during the COVID-19 pandemic and after the crisis has dissipated.

The 4th article is written by Ricardo-Adan SALAS-RUEDA. The title is USE OF FLIPPED CLASSROOM IN THE TEACHING-LEARNING PROCESS ON DESCRIPTIVE STATISTICS. There is a quantitative research in this article. The implications of this research are the transformation of the educational context through the use of flipped classroom and incorporation of technological tools before, during and after the face-to-face classes.

The title of the 5th article is DISTANCE EDUCATION IN TURKIYE DURING THE COVID-19 PANDEMIC: WHAT DO STAKEHOLDERS THINK?, written by Erhan YAYLAK. This research attempts to assess the status of distance education implemented in Turkiye during the COVID-19 pandemic based on stakeholders' (students, parents, pre-service teachers, teachers, and academics) opinions and is completed in the phenomenological study framework. According to study, though there sre negative opinions about the continuation of distance education in the transition to formal education after the COVID-19 pandemic precautions end, findings reveal that it may continue simultaneously with formal education and may provide compensatory or supportive education.

ONLINE LEARNING: THE EFFECTS OF USING E-MODULES ON SELF-EFFICACY, MOTIVATION AND LEARNING OUTCOMES is the title of the 6th article. Fitra DELITA, Nurmala BERUTU and NEFRION are the authors. This research uses a quasi-experimental research design with three pretest-posttest groups. The findings show that the application of e-module in online learning resulted in significant increases in self-efficacy, motivation, and learning outcomes. The e-modules with the collaborative learning option is the most effective.

Matlala V. MAKOKOTLELA is the author of the 7th article. The title of this article is STUDENT TEACHERS' EXPERIENCES IN USING OPEN EDUCATION RESOURCE IN THE OPEN DISTANCE LEARNING CONTEXT. Based on the title, findings show that environmental education student-teachers know about open education resource informally and some students want to use this resource.

UNDERGRADUATES' ATTITUDES TOWARDS DISTANCE EDUCATION AND PERCEPTIONS OF READINESS FOR E-LEARNING DURING THE COVID-19 PANDEMIC is the 8th article, and the author are M. Esad KULOGLU and Sevilay YILDIZ. This research aims to examine the attitudes of undergraduates towards distance education, their perceptions of readiness for e-learning, and the relationship between these two variables during the COVID-19 pandemic, the effects of which are also felt in higher education. The findings of the study provide useful information about the distance education carried out during the COVID-19 pandemic.

The 9th article is written by Siti Haslina Md HARIZAN. The title of the article is DISTANCE EDUCATION EFFECTIVENESS AND BARRIERS IN DEVELOPING A POSITIVE ATTITUDE TOWARDS SUSTAINABILITY: MEDIATION OF INNOVATIVENESS. The objectives of this study are to investigate the effectiveness of distance education in fostering a positive attitude towards sustainability, examine the effects of barriers to sustainability in distance education in terms of the attitude towards sustainability and investigate the mediating effect of innovativeness in the aforesaid relationship. The study attests that distance education is effective in nurturing a positive attitude towards sustainability through the mediation of innovation. Although the barriers related to distance education seemed to pose an inverse effect on the attitude towards sustainability, it did not seem to have any significant effect on innovativeness.

The 10th article is titled DISTANCE LEARNING AND FACE-TO-FACE LEARNING: STUDENT PERCEPTION OF QUALITY ASSURANCE AND PROSPECTS FOR IMPROVEMENT IN EDUCATION MANAGEMENT TECHNOLOGIES, by the authors Volodymyr MOROZ and Svitlana MOROZ. The article offers a classification of distance education instruments and proposes recommendations concerning their application in the training process.

Yilmaz SARIER and Sengul UYSAL are the authors of the 11th article and the title is EMERGENCY REMOTE TEACHING DURING COVID-19 PANDEMIC: CHALLENGES, OPPORTUNITIES AND FUTURE SUGGESTIONS. This article explores the perceptions of high school students of emergency remote teaching in Turkiye. Research results reveal that views of the participants on the challenges of emergency remote teaching are developed into 8 themes: Digital pedagogy, technical infrastructure and accessibility, digital competences, compatibility, assessment and evaluation, heavy workload, and lack of learning motivation while their opinions on opportunities of distance education include 5 themes: lifelong learning opportunities, flexibility, experiencing emergency remote teaching or hybrid education, digital transformation in education, and an alternative to student mobility. Also, there are suggetions based on the results.

The 12th article is written by Azkia Muharom ALBANTANI, Ahmad MADKUR and Imam Fitri RAHMADI. The title is AGENCY IN ONLINE FOREIGN LANGUAGE LEARNING AMIDST THE COVID-19 OUTBREAK. The study aims at investigating the agency of first-year university students in online learning of Arabic as a foreign language. Results of the study reveal that first-year university students have a relatively high intention, motivation, self-regulation and self-efficacy in Arabic online learning.

COVID-19 PANDEMIC AND EMERGENCY DISTANCE TURKISH TEACHING is the title of the 13th article. Emrah BOYLU, Pinar ISIK and Omer Faruk ISIK are the authors. The aim of this study is to determine the teachers' views on emergency distance Turkish teaching as a foreign language after Covid-19 pandemic. According to the findings of the research, teachers face with many technological and pedagogical problems.

SCHOOL TEACHERS' BEHAVIOR IN REMOTE LEARNING DURING COVID-19 PANDEMIC: INDONESIA PERSPECTIVE is the 14th article, and the aothors are Shine Pintor Siolemba PATIRO and Hety BUDIYANTI. This study aims to uncover the extension of the Technology Acceptance Model in understanding, explaining, and predicting elementary school teachers' behavior in Indonesia to use online learning technology during the covid-19 pandemic. The model in this study is extended by accounting for four additional variables, which are subjective norms, and job relevance as a predictor of perceived usefulness, also, computer self-efficacy and computer anxiety to predict perceived ease of use.

The 15th article is A SNAPSHOT OF FLIPPED INSTRUCTION IN ENGLISH LANGUAGE TEACHING IN TURKIYE: A SYSTEMATIC REVIEW. Hasan Serif BALTACI is the author. The study aims to explore the trends and the perceived benefits and challenges of flipped language instruction regarding student achievement and attitudes in Turkiye. In the light of the findings, implications for practice and recommendations for future research are provided in the article.

Hope to meet you in the next issue of TOJDE.

Cordially,

Dr. T. Volkan YUZER

Editor in Chief

EXPLORING TEACHERS' VIEWS ON EMOTION TRANSFER IN VIRTUAL CLASSROOMS DURING EMERGENCY REMOTE TEACHING

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ABSTRACT

The present study explored emotion transfer-related views of teachers holding online classes in emergency remote teaching during the COVID-19 pandemic. We carried out the study with 630 teachers, the majority of whom were primary school teachers, serving at public and private K-12 schools. This was a descriptive survey study as it described the teachers' views as they were. The data were collected using the "Emotional Presence in Online Learning Scale" (EPOLS) and analyzed using descriptive statistics, independent sample t-test, and one-way analysis of variance (ANOVA). The findings revealed that the majority of teachers used the EBA Virtual Classroom application in emergency remote teaching while a small number of them utilized other virtual classroom applications. In addition, the teachers reported using messaging applications effectively, but it was not the case for social media. The private school teachers found virtual classroom applications efficient in transferring (conveying and receiving) emotions compared to public school teachers. The scores on the EPOLS and receiving emotions subscale pointed out that the female teachers found virtual classroom applications more effective than their male counterparts. Moreover, it was found that the preschool teachers and classroom teachers found virtual classroom applications more effective in receiving emotions than the high school teachers and middle school teachers, respectively. Finally, those with undergraduate and postgraduate education recognized emotion transfer in virtual classrooms more efficient than the teachers with an associate degree.

Keywords: Virtual classroom, emotion transfer, distance education, emergency remote teaching, COVID-19.

INTRODUCTION

Virtual classrooms are synchronous learning environments to which students attend online from different places, which allow for mutual communication and visual transfer of information and offer interaction opportunities in various ways, and where sessions can be recorded for later viewing (Clark & Kwinn, 2007). Time and place-oriented flexibility and freedom, thanks to such breakthrough features, may be considered among the most prominent advantages of virtual classrooms (Raes et al., 2020; Teo et al., 2020). Christopher (2014) indicated that features such as content and screen sharing and tools for chatting, drawing, pointing, voting, instant feedback, and dividing the groups into smaller units are standard features of virtual classrooms.

It is deemed critical to encourage interaction, participation, and cooperation while designing and implementing practical online classes (Ward, Peters, & Shelley, 2010). In this sense, the use of tools specified above may boost interaction, participation, and collaboration (Kear et al., 2012). Moreover, such features of virtual classrooms contribute to social presence and improve the sense of belonging to the community upon eliminating the transactional distance caused by psychological and communication gaps between teachers and students (Giesbers et al., 2009; Loch & Reushle, 2008; Moore, 1993; McDaniels et al., 2016). Wegerif (1998) highlighted that the social dimension of online learning is a seminal predictor of the success of distance learners and concluded that building a sense of community is the very first step for creating a collaborative learning environment. Otherwise, students are likely to be reluctant to take risks involved in learning. Online faculty members are also

considered indispensable mediators of a strong sense of community through their teaching styles and attitudes of caring for their students (Palmer, 1998). Teaching in learning environments personalized by learning styles brings substantial impacts on student achievement (Eryilmaz & Jaballa, 2019; Duzgun, 2018).

Thanks to numerous tools and relevant approaches, synchronous virtual classes ultimately aim to offer a similar learning experience as in face-to-face classes in traditional classrooms (Elkins & Pinder, 2015). In this regard, virtual classrooms have gained fame in emergency remote teaching in the pandemic. Emergency remote teaching is different from distance education. Distance education is interdisciplinary and expressed by the distance in time and/or space between the learners and the educational content. While remote teaching refers to spatial distance, distance education brings diverse perspectives to "distance" and attempts to explain it with operational distance. In this sense, online distance education and emergency remote teaching are all different concepts (Bozkurt & Sharma, 2020). Thus, education carried out in the COVID-19 pandemic may be considered emergency remote teaching (Hodges et al., 2020) since it has appeared as a temporary solution to an urgent issue (Golden, 2020). Emergency remote teaching aims to provide learners with fast and reliable temporary access to learning in contrast to distance education that allows for building systematic models for the planning and design of instruction.

The unprecedented spread of COVID-19 (NCov–Novel Coronavirus), having emerged in China in December 2019, across the world (Chen et al., 2020; Hui et al., 2020), led the World Health Organization (WHO) to declare a pandemic in March 2020 (WHO, 2021). In Turkiye, the Ministry of National Education (MoNE) decided to close schools at all levels as of March 23, 2020 to alleviate the spread of the pandemic (MoNE, 2020-a). Immediately after the closure of schools, the MoNE introduced various applications to manage distance education. Accordingly, the Education Information Network (EBA), an integral part of the Movement to Increase Opportunities and Improve Technology (FATIH) Project initiated in Turkiye in 2010 to support formal education, was improved to serve as a distance education platform in the pandemic (MoNE, 2021-d). Hence, the "EBA Virtual Classroom" application was integrated into EBA to satisfy the need for virtual classrooms in emergency remote teaching. Although the practices of private schools differed, the MoNE introduced "EBA Virtual Classroom" on April 15, 2020 for 8th-graders, high school preparatory students, and 12th-graders. In addition, provided taking necessary safety and confidentiality measures, the MoNE allowed teachers to use free versions of some virtual classroom applications (e.g., Zoom, Microsoft Teams, Google Meet, Skype) for other grade levels (MoNE, 2020-b). Approximately 12.5 million students and 1 million teachers actively used EBA between September 21, 2020 (beginning of the first semester) - January 22, 2021 (end of the first semester). In addition, more than 40 million EBA Virtual Classroom applications were used on EBA, and a total of 155 million online classes were held until January 23, 2021.

Although offering many opportunities for interaction and participation, virtual classrooms bear more limitations regarding conveying visual cues (e.g., facial expressions) and interactions than traditional classrooms (Kear et al., 2012). It is well-documented the limitations in perceiving body language and gestures in virtual classrooms may make it difficult to elicit verbal responses from students, to identify those with difficulties in understanding the topic, and to get their feedback (Cornelius, 2014; Kear et al., 2012; Wang & Hsu, 2008). However, frequent eye contact between the teacher and students contributes to student achievement (Duzgun & Selcuk, 2018).

Despite long distances, it is called "Virtual Eye Contact" to interact and communicate by creating a synchronized copy of eye contact between teachers and students through live video in virtual classrooms (Yuzer, 2007). In crowded classrooms, it may be difficult for all students to make eye contact with the teacher, even if all the cameras are turned on. In this case, although the teacher does not see the students, eye contact can be copied for each student through specific techniques to reveal their eye contact behavior. Therefore, independent of place, students may look at their teacher's virtual eyes simultaneously. Overall, the literature hosts many studies scrutinizing the effects of distance education and online learning on student achievement and exploring students' attitudes toward online classes. What is commonly emphasized by these studies is that distance education and virtual classrooms are all effective in increasing student achievement, improving their motivation and self-confidence, and contributing to their communication skills with peers and teachers (Miltiadou & Savenye, 2003; Ozgur, 2015; Wang & Newlin, 2001). At this point, another prominent subject needing to be explored is emotion transfer in distance education.

PURPOSE

The previous research reported robust correlations between emotions and cognition and behavior (Burleson & Planalp, 2000; Mayer, Salovey, & Caruso, 2002); therefore, emotions may be seminal for understanding social interaction (Andersen & Guerrero, 1998). It is well-known that emotions affect students' learning, school behavior, social relationships, and academic achievement, even teachers' teaching behavior in school settings (Brackett, Mayer, & Warner, 2004; Pekrun, Frenzel, Goetz, & Perry, 2007). In this sense, regarding cognitive learning and instructional behavior, it is also needed to explore how emotion transfer occurs in virtual environments. Yet, one may have certain barriers to expressing their emotions or recognizing others' emotions in virtual learning environments (Wang & Reeves, 2007). During text-based communication, the transfer of emotional messages may be challenged when emotions need to be conveyed in writing without non-verbal emotional cues. Han and Johnson (2012) emphasized that the lack of non-verbal emotional cues in virtual environments may restrict students' online interactions and their ability to perceive emotions. Nevertheless, McBrien, Cheng, and Jones (2009) reported that a synchronized online learning environment may facilitate student engagement and a positive online learning experience. In synchronized virtual classroom sessions, increasing the capacity to perceive emotions with non-verbal cues may also contribute to online students' sense of social presence, which is strongly associated with learning satisfaction and online learning achievement (Homer, Plass, & Blake, 2008; Richardson & Swan, 2003). Hence, the real-time interaction in virtual classrooms can facilitate the perception of verbal and non-verbal emotional cues. In this way, students feel less social distance when engaging in meaningful interaction with their teachers and peers (Moore, 1993). Non-verbal emotional cues, such as gestures and facial expressions, can also contribute to one's sense of being with others. Biocca (1997) aired that concretization, covering sensory interaction, motor interaction, and sensorimotor coordination in virtual environments, can affect one's sense of togetherness.

Many countries shifted to distance education due to the COVID-19 pandemic (WHO, 2021). In this emergency situation, schools deployed distance education using virtual classroom applications with diverse methods and tools to ensure the continuation of educational activities. In this period, the literature shifted its focus on teachers' views on distance education in virtual classrooms, particularly on the difficulty of using non-verbal communication in distance education (Wang & Reeves, 2007) regarding emotion transfer (Biocca, 1997). Therefore, the present study aimed to explore emotion transfer-related views of teachers holding online classes in emergency remote teaching during the pandemic. The relevant literature hosts studies on the nature of emergency remote teaching activities (Ferri, Grifoni, & Guzzo, 2020; Gillis & Krull, 2020; Jeffery & Bauer, 2020), the difficulties experienced by teachers in virtual classrooms (Khlaif, Salha, & Kouraichi, 2021; Zamora-Antuñano et al., 2021), and emotion transfer in distance education in the pandemic (Abel Jr, 2020; Aydin & Yuzer, 2006; Han, 2013; M. Amin & Sundari, 2020; Murphy, Eduljee, & Croteau, 2020; Sepulveda-Escobar & Morrison, 2020; Yuzer, 2007). Ultimately, the answers were sought for the following research questions:

1. How did the teachers use distance education tools during the pandemic?
2. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school type?
3. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' gender?
4. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school level?
5. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' educational attainment?
6. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by teachers' subject matter areas?
7. Do the teachers' views on emotion transfer in virtual classroom applications significantly differ by school location?

METHOD

The present research employed a survey design as it described the teachers' views as they were. A survey design is an approach of descriptive research where phenomena and events are explored and described through the opinions and attitudes of larger samples (Karakaya, 2012). It is utilized to describe the structure of objects, communities, organizations, as well as the mechanism of phenomena (Cohen et al., 2007). The phenomenon, individual, or object that is the subject of research is described in its own conditions (Karasar, 2012). Survey research is often concerned with how opinions and characteristics are distributed within the sample rather than why they originate (Fraenkel & Wallen, 2006). Therefore, the present study explored the participating teachers' views on emotion transfer in virtual classroom applications by school type, level, and location and teachers' gender, educational attainment, and subject matter areas.

Sample

The sample consisted of conveniently selected 630 teachers in Turkiye. While 521 (83%) served in public schools, 109 (17%) were employed in private schools. The majority of the teachers lived in Ankara (n = 548; 87%), and the remaining 82 teachers (13%) were residents of 27 different cities. The research was carried out in the second semester of the 2019-2020 academic year with the teachers, the majority of whom were primary school teachers (n = 252, 40%), having held online classes at K-12 schools (preschool (n = 33; 5%), primary school (n = 309; 49%), middle school (n = 268; 43%), and high school (n = 20; 3%). While the participants were aged 23-64 years (M = 39, SD = 8.23), they had professional seniority of 1-41 years (M = 14.73, SD = 7.80). In the study, the researcher did not obtain the participants' personal information, except for their informed consent, and informed the participants that they might quit at any stage of the study.

Data Collection Procedure and Analysis

The sample was selected among those having practiced emergency remote teaching through virtual classroom applications during the COVID-19 pandemic. The research sample was determined by adopting a maximum variation sampling technique, which is denoted as selecting diverse situations bearing similarities within themselves and working on these situations regarding the problem in the universe (Buyukozturk, Kilic Cakmak, Erkan Akgun, Karadeniz, & Demirel, 2018).

Although the relevant literature offers some instruments to measure emotion transfer in learning settings (Cleveland-Innes & Campbell, 2012; Kang, Kim, Choi, & Park, 2007; Ning, Young, Wilhite, & Marczyk, 2010; Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011), the Emotional Presence in Online Learning Scale (EPOLS) (Sarsar & Kisla, 2016) was used as the data collection tool since being validated for measuring emotion transfer in virtual classrooms in the Turkish language. In addition, the researcher, a distance education specialist, generated a demographic information form and a form to reveal the situation of teachers' participation in distance education. Then, the data collection tools were combined into a digital questionnaire booklet and sent to the participant online. The role of the researcher is limited only to collecting the data, which can be presented as numerically, by using measurement tools and explaining the findings through relevant statistical analyses on the data. All statistical analyses were performed on SPSS 26 and LISREL 8.80. The obtained data were first subjected to the Kolmogorov-Smirnov test to determine whether the data showed a normal distribution (Table 1).

Table 1. Normality of distribution

Factors	Statistics	n	*p*	*M*	Mode	Median	Skewness	Kurtosis
F1- Receiving Emotions	.143	630	.000	3.65	4.00	3.83	-.481	.000
F2- Giving Emotions	.087	630	.000	3.41	3.89	3.44	-.365	-.157
Total	.078	630	.000	3.53	3.89	3.61	-.401	-.081

*$p < .05$

As in Table 1, the skewness and kurtosis values between +1.5 and -1.5 (Tabachnick, Fidell, & Ullman, 2019), as well as the overlapping mean, mode, and median values, for the overall EPOLS and its subscales indicated the normality of distribution. Therefore, the data were analyzed using parametric analyses, namely independent samples t-test and one-way analysis of variance (ANOVA). In the case of a significant difference as a result of ANOVA, the source of the difference was sought through the Tukey HSD test.

Data Collection Tools

The research data were collected using a demographic information form and the EPOLS (Sarsar & Kisla, 2016). The demographic information form includes questions inquiring about school type, level, and location and teachers' gender, educational attainment, and subject matter areas. In addition, another form developed by the researcher covered questions about how the teachers carried out distance education practices during the pandemic. The EPOLS is a 5-point Likert-type scale and consists of 21 items within two subscales: receiving emotions and giving emotions. In the original study, the researchers calculated Cronbach's alpha coefficients to be 0.88 for the total score, 0.79 for the receiving emotions subscale, and 0.86 for the giving emotions subscale (Sarsar & Kisla, 2016). In this study, internal reliability coefficients were found as 0.92 for the total score, 0.91 for the receiving emotions subscale, and 0.82 for the giving emotions subscale.

Confirmatory Factor Analysis (CFA) was performed to validate the construct validity of the EPOLS. Accordingly, while x^2 (424), x^2/df (2.26), NNFI (0.92), PNFI (0.79), CFI (0.93), IFI (0.93), ECVI (4.76 < 42.12), AIC (510.25 < 4085.76), and CAIC (664.40 < 41610.04) indices showed acceptable model-data fit, RMSEA (0.11), GFI (0.71), and AGFI (0.64) yielded values outside the cut-off values for an acceptable model-data fit. Overall, the model tested in the research showed an acceptable fit to the data (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999; Mulaik et al., 1989; Schermelleh-Engel, Moosbrugger, & Muller, 2003; Steiger, 2007; Wheaton, Muthen, Alwin, & Summers, 1977).

Ethical Considerations

The responsible authors of the EPOLS provided relevant permission for the use of the scale via e-mail. Moreover, the Ethics Committee of Ankara Yildirim Beyazit University granted the ethical approval to the present study (No: 84892257-604.01.02-E.18220 dated 06.19.2020). The participants reading the pre-approval form and providing their voluntary consent were included in the study. No confidential information was collected from the participants who were free to quit at any stage of the study.

FINDINGS

Table 2 presents what type of distance education tools the teachers used in the pandemic.

Table 2. Distance education tools preferred by the teachers during the pandemic

		F	%
I have used the EBA Virtual Classroom.	Yes	408	64.8
	No	222	35.2
I have used other virtual classroom apps.	Yes	235	37.3
	No	395	62.7
I have used social media.	Yes	126	20.0
	No	504	80.0
I have used messaging apps.	Yes	475	75.4
	No	155	24.6

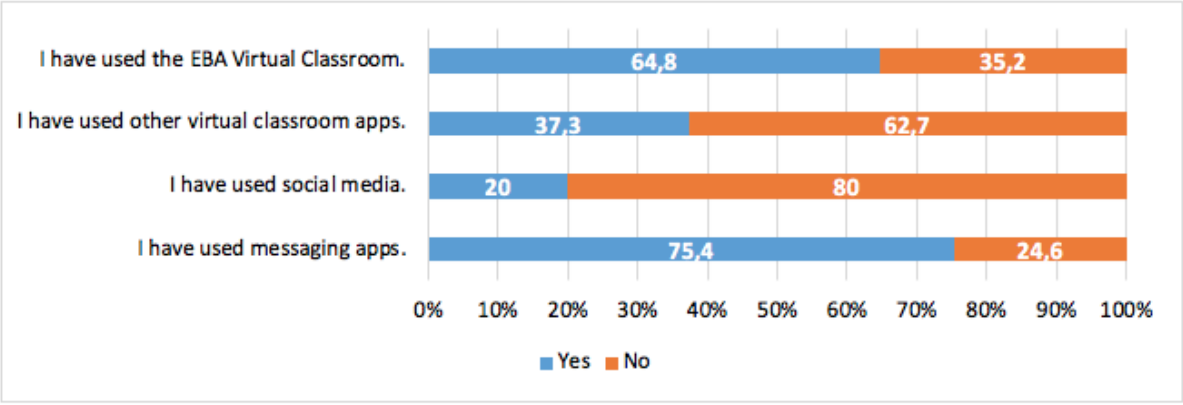

Figure 1. Distance education tools preferred by the teachers during the pandemic (percentages)

It was found that the majority of the teachers (64%) utilized the EBA Virtual Classroom in emergency remote teaching during the pandemic. While 235 teachers (37.3%) used other virtual classroom applications, 126 (20%) employed social media applications. The rate of those using messaging applications was found to be 75.4% (Table 2, Figure 1).

Most of the teachers served at public schools (82.7%), while the others were employed in private schools (17.3%). Table 3 presents the comparison of the teachers' views on emotion transfer in virtual classrooms by school type.

Table 3. Teachers' views on emotion transfer in virtual classrooms by school type

	School type	N	*M*	*SD*	*df*	*t*	*p*
F1- Receiving Emotions	Public school	521	3.61	.62	628	3.57	.000*
	Private school	109	3.84	.57			
	Total	630					
F2- Giving Emotions	Public school	521	3.39	.65	628	2.36	.019*
	Private school	109	3.55	.64			
	Total	630					
Total EPOLS	Public school	521	73.75	12.50	628	3.24	.001*
	Private school	109	77.96	11.60			
	Total	630					

Note. $*p < .05$

The teachers' scores on the EPOLS were compared through the independent samples t-test. As in Table 3, the teachers' giving emotions (p =.001), receiving emotions (p = .019), and total EPOLS scores (p = .000) significantly differed by school type, indicating that their views on emotion transfer in virtual classrooms significantly differed by school type. The teachers employed in private schools got significantly higher scores on the overall EPOLS (M = 77.96 vs. 73.75), receiving emotions subscale (M = 3.84 vs. 3.61), and the giving emotions subscale (M = 3.55 vs. 3.39) than the public school teachers (Table 3).

While 505 (80%) of the participating teachers were females, 125 (20%) were males. Table 4 presents the results of the t-test to compare the teachers' views on emwotion transfer in virtual classrooms by gender.

Table 4. Teachers' views on emotion transfer in virtual classrooms by gender

	Gender	N	*M*	*SD*	*df*	*t*	*p*
F1- Receiving Emotions	Female	505	3,67	,60467	628	2,131	,044*
	Male	125	3,54	,65511			
	Total	630					
F2- Giving Emotions	Female	505	3,44	,65450	628	1,700	,090
	Male	125	3,33	,63628			
	Total	630					
Total	Female	505	74,99	12,32939	628	2,070	,039
	Male	125	72,42	12,72872			
	Total	630					

Note. $*p < .05$

The findings showed that there were significant differences between the participants' scores on the overall EPOLS (p = .039) and the receiving emotions subscale (p = .044) by their gender. Yet, it was not the case on the giving emotions subscale (p = .090). Accordingly, the female teachers scored significantly higher on the overall EPOLS (M = 74.99 vs. 72.42) and the receiving emotions subscale (M = 3.67 vs. 3.54) than their male counterparts (Table 4).

Thirty-three (5.2%) of the teachers worked at preschools, 309 (49%) at primary schools, 268 (42.5%) at middle schools, and 20 (3.2%) at high schools. Table 5 demonstrates the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by school level.

Table 5. Teachers' views on emotion transfer in virtual classrooms by school level

		SS	*df*	MS	*F*	*p*	Difference (Tukey)
F1- Receiving Emotions	Between groups	6.047	3	2.016	5.412	.001*	Preschool - High school Primary school - Middle School
	Within groups	233.164	626	.372			
	Total	239.211	629				
F2- Giving Emotions	Between groups	.407	3	.136	.318	.812	-
	Within groups	266.920	626	.426			
	Total	267.327	629				
Total EPOLS	Between groups	1190.073	3	396.691	2.582	.053	-
	Within groups	96175.198	626	153.635			
	Total	97365.271	629				

Note. $*p < .05$

The teachers' scores on the overall EPOLS and the giving emotions subscale did not significantly differ by school level. Nevertheless, the findings revealed a significant difference between the scores on the receiving emotions subscale (p = .001). A Tukey test was performed to uncover the source of the significant difference, and it was found that the preschool (M = 3.83) and high school teachers (M = 3.37) scored significantly higher on the receiving emotions subscale than the primary school (M = 3.72) and middle school teachers (M = 3.56), respectively (Table 5).

Twenty-four (3.8%) of the teachers graduated from an associate degree program, 540 (85.7%) from an undergraduate program, and 66 (10.5%) from a graduate program. Table 6 presents the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by their educational attainment.

Table 6. Teachers' views on emotion transfer in virtual classrooms by their educational attainment

		SS	*df*	MS	*F*	*p*	Difference (Tukey)
F1- Receiving Emotions	Between groups	2.608	2	1.304	3.456	.032*	Associate degree-Undergraduate degree
	Within groups	236.603	627	.377			
	Total	239.211	629				Associate degree-Graduate degree
F2- Giving Emotions	Between groups	7.440	2	3.720	8.975	.000*	Associate degree-Undergraduate degree
	Within groups	259.887	627	.414			
	Total	267.327	629				Associate degree-Graduate degree
							Undergraduate degree-Graduate degree
Total EPOLS	Between groups	1853.485	2	926.743	6.084	.002*	Associate degree-Undergraduate degree
	Within groups	95511.786	627	152.331			
	Total	97365.271	629				Associate degree-Graduate degree

Note. $*p < .05$

It was found that there were significant differences between the teachers' scores on the overall EPOLS (p = .002), the receiving emotions subscale (p = .032), and the giving emotions subscale (p = .000) by their educational attainment. According to the results of the Tukey test, those who graduated from an undergraduate program (M = 3.35) and a graduate program (M = 3.71) scored significantly higher on the receiving emotions subscale than those with an associate degree (M = 3.33) and an undergraduate degree (M = 3.65), respectively. On the giving emotions subscale, there were significant differences between the teachers with an associate degree and an undergraduate degree (M = 2.98 vs. 3.41), between those with an associate degree and a graduate degree (M = 2.98 vs. 3.62), and between those having graduated from an undergraduate program and a graduate program (M = 3.41 vs. 3.62). Finally, those with an undergraduate degree (M = 3.65) and graduate degree (M =3.71) had significantly higher scores on the overall EPOLS than the teachers with an associate degree (M = 3.33) and an undergraduate degree (M = 3.65), respectively (Table 6). Figure 2 illustrates the distribution of the teachers by their subject matter areas

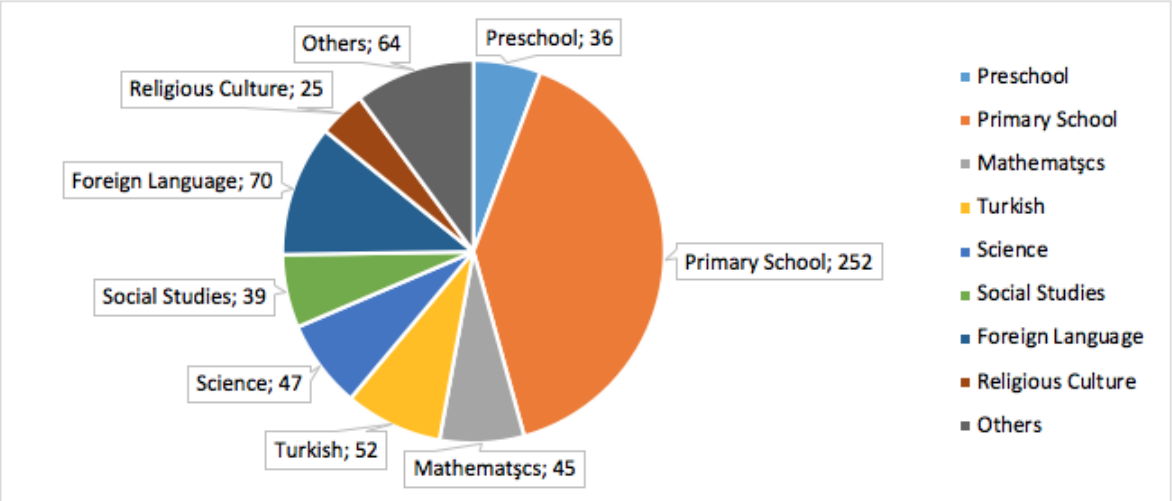

Figure 2. Distribution of the teachers by their subject matter areas

The majority of the teachers (40%) were classroom teachers, followed by Turkish (11.1%), science (8.3%), mathematics (7.5%), social studies (6.2%), preschool (5.7%), and religious culture teachers (4%). In addition, 6.2% of the teachers were with different subject matter areas. Table 7 presents the results of ANOVA to compare the teachers' views on emotion transfer in virtual classrooms by their subject matter areas.

Table 7. Teachers' views on emotion transfer in virtual classrooms by their subject matter areas

		SS	*df*	MS	*F*	*p*	Difference
F1- Receiving Emotions	Between groups	6.616	11	.601	1.598	.095	-
	Within groups	232.595	618	.376			
	Total	239.211	629				
F2- Giving Emotions	Between groups	3.340	11	.304	.711	.729	-
	Within groups	263.987	618	.427			
	Total	267.327	629				
Total EPOLS	Between groups	1694.800	11	154.073	.995	.449	-
	Within groups	95670.471	618	154.807			
	Total	97365.271	629				

Note. $^{*}p < .05$

The results of the ANOVA revealed no significant differences between the teachers' scores on the EPOLS by their subject matter areas (Table 7).

Most of the teachers (69%) worked in schools located in a city center, while 27.1% in a district, and 22 (3.5%) in a village/town. The comparison of the teachers' views on emotion transfer in virtual classrooms by school location is demonstrated in Table 8.

Table 8. Teachers' views on emotion transfer in virtual classrooms by school location

		SS	*df*	MS	*F*	*p*	Difference
F1- Receiving Emotions	Between groups	.914	2	.457	1,201	.302	-
	Within groups	238.286	626	.381			
	Total	239.200	628				
F2- Giving Emotions	Between groups	.434	2	.217	.510	.601	-
	Within groups	266.856	626	.426			
	Total	267.290	628				
Total	Between groups	279.085	2	139.542	.900	.407	-
	Within groups	97085.955	626	155.089			
	Total	97365.040	628				

Note. $^{*}p < .05$

The findings suggested no significant difference between the teachers' scores on the EPOLS by school location (Table 8).

DISCUSSION AND CONCLUSION

As a result of the study, it was found that the majority of the teachers used the EBA Virtual Classroom application for emergency remote teaching in the COVID-19 pandemic, while an insignificant number of teachers used other virtual classroom applications and social media. It may be asserted that the teachers

consistently utilized virtual classrooms as they offered a unique solution to enable teachers to reach and support their students in a short time during emergency remote teaching (M. Amin & Sundari, 2020). It is also well-documented that effective communication between teacher and student in virtual classrooms contributes to student motivation (Yaslica, 2020; Yilmazsoy, **Ozdinc**, & Kahraman, 2018). **Unal** and Bulunuz (2020) reported that distance education gained efficiency thanks to the launch of the EBA Virtual Classroom application. However, despite MoNE's official correspondence that allowed teachers to use other virtual classroom applications other than the EBA Virtual Classroom application provided certain restrictions (MoNE, 2020-c), the teachers may have preferred other virtual classroom applications and social media less to avoid the desired restrictions. Palloff and Pratt (2013) stated that possible security and privacy concerns in social networks may reduce the use of these technologies. Therefore, the privacy concerns of teachers and students may have also influenced teachers' preferences of virtual classroom applications and social media as emergency remote teaching tools. According to Finkelstein (2013), although the camera view in virtual classrooms promotes a sense of closeness, the fact that students do not desire others to see their living spaces (Neuwirth et al., 2020) intensifies the privacy concerns in virtual classrooms.

The teachers used messaging applications effectively during emergency remote teaching, which may be because the teachers wanted to keep in contact with their students. Similarly, the previous research reported that messaging applications were prevalently preferred in emergency remote teaching (Demir & **Ozdas**, 2020; Goren, Gok, Yalcin, Goregen, & **Caliskan**, 2020; M. Amin & Sundari, 2020). In addition, messaging applications used to organize virtual classrooms and students' extracurricular assignments became prominent in this process (Demir & **Ozdas**, 2020). Duban and **Sen** (2020) are of the opinion that teachers should follow up their students and provide relevant academic and psychological support through live classes and texting on the phone or via WhatsApp. WhatsApp has the potential to provide a natural and unstructured learning environment; thus, it is recommended to support the use of WhatsApp and similar ones for educational purposes, considering their pros and cons (**Cetinkaya**, 2017).

Considering the teachers' opinions on emotion transfer in virtual classrooms by school type, it was found that the private school teachers often found virtual classroom applications more effective in receiving and conveying emotions compared to the public school teachers. Kurnaz, Kaynar, **Senturk** Barisik, and Dogrukok (2020) also concluded that private school teachers adopt more positive attitudes toward distance education. In addition, while there are studies suggesting that private school students have positive perceptions of distance education (Kaynar, Kurnaz, Dogrukok, & Barisik, 2020), some other studies concluded that public school students' perceptions of distance education are more positive (Barisik, Kurnaz, Kaynar, & Dogrukok, 2020). On the other hand, Agir (2007) asserted that school type does not make a significant difference regarding students' attitudes toward distance education. In-service training and guidance in private schools may enable private school teachers to gain effective communication skills. Besides, the number of students in classrooms often does not exceed 20 in private schools, although it may become 30 or more in public schools. Thus, a smaller classroom size may enhance emotion transfer of private school teachers in virtual classrooms. The above-mentioned finding may be explained by the willingness and determination of private school teachers and school administrators to use cameras in distance education. Yet, MoNE did not leave public schools flexible about the use of cameras in virtual classrooms and even recommended online classes without cameras unless necessary (MoNE, 2020-c).

Furthermore, the findings revealed that the preschool and primary school teachers found themselves better at receiving emotions than the high school and middle school teachers, respectively. Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020) documented that middle school teachers have a more positive view of the future of distance education. In addition, while it is often reported that middle school students show the highest participation in virtual classrooms, it is not the case for high school students Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020). Yilmaz and Guner (2020) stated that while primary school and high school students participated in distance education mainly through virtual classrooms and TV, respectively, during the pandemic, middle school students used both TV and virtual classrooms. On the other hand, Agir (2007) concluded that school level is an insignificant variable to create significant differences regarding students' attitudes toward distance education. Besides, younger students are tought to have an increased desire to communicate and interact with their teachers. Therefore, it can be deduced that preschools and primary schools encourage the use of virtual classrooms more, which may enhance emotion transfer in these schools than in others.

It was discovered that the teachers with an undergraduate degree and a graduate degree adopted a more positive approach to emotion transfer in virtual classrooms compared to their counterparts with an associate degree. Yet, Can and Gunduz (2021) stated that the educational attainment of teachers is not a significant factor predicting virtual classroom management competence. It will not be surprising that teachers with rich pre-service education are equipped with better classroom management and communication skills. Communication skills may be considered an important determinant of emotion transfer during teaching. It is thought that the readiness of the teachers with advanced education to use technology may have yielded the finding above.

By gender, the female teachers reported more positive views on receiving and conveying emotions in virtual classrooms than their male colleagues, which may be because women are more receptive than men in interpersonal relationships. Women are also better at perceiving nonverbal communication than men (Barletta, 2003). Non-verbal communication is a critical factor affecting emotion transfer in virtual classrooms. While there are overlapping findings in the literature (Can & Gunduz, 2021; Abu Aqel, 2012; Trotter, 2007; Al-Shammari, 2007), some studies reported a significant difference in favor of males (Atasoy, **Ozden**, & Kara, 2020; Er Turkuresin, 2020; Goren, Gok, Yalcin, Goregen, & **Caliskan**, 2020). On the other hand, some other studies revealed that participation in virtual learning does not differ by gender (Alakharas, 2018; **Cakir** & Arslan, 2020; Duzgun & Sulak, 2020).

On the other hand, the teachers did not significantly differ in their views on emotion transfer in virtual classrooms by their subject matter areas. There are controversial findings in the literature. Bayburtlu (2020) concluded that the participating pre-service Turkish teachers did not show the desired interest in online classes. Agir (2007) stated that the computer technology teachers adopted more positive attitudes toward distance education compared to their colleagues with other subject matter areas. Bawaneh (2020) noted that science students moderately utilized virtual classroom applications and did not significantly differ in satisfaction with distance education by science branches (physics, chemistry, biology). Duzgun and Sulak (2020) could not find any significant differences between pre-service primary school teachers and pre-service mathematics teachers by their views on distance education.

Similarly, the teachers did not significantly differ in their views on emotion transfer in virtual classrooms by school location. It would be appropriate to address this finding considering the conditions of emergency remote teaching. The restrictions due to the COVID-19 pandemic hindered students and teachers from leaving their homes. In that sense, the pandemic literally equalized big cities and villages. Goren, Gok, Yalcin, Goregen, & **Caliskan**, (2020) emphasized that participation in virtual classrooms did not differ by the locations of districts. However, he interestingly highlighted that those living in districts wanted to continue their distance education after the pandemic more than those living in city centers.

Overall, the findings in the present study may imply the following recommendations:

A substantial body of research uncovered that students and teachers suffered from insufficient technical infrastructure (e.g., computer, tablet, or Internet connection) during emergency remote teaching in the pandemic (Abel Jr, 2020; Ferri, Grifoni, & Guzzo, 2020; Yolcu, 2020). In addition, problems in sound and video equipment (microphone, headset, speaker, or camera) and poor internet infrastructure affected the participation of students in virtual classrooms and the teaching flow of teachers (Abel Jr, 2020; **Ozgul**, Ceran, & Yildiz., 2020). Hence, technology-related problems may be settled to improve the efficiency and use of virtual classrooms (Gillis & Krull, 2020; Biyikli & **Ozgur**, 2021). In this regard, the greatest share of the responsibilities falls upon governments. Governments need to support students and teachers financially for hardware spending and online subscriptions, provide disadvantaged students with free tablets and internet, and invest more in the telecommunication infrastructure.

Unlike physical classrooms, external noise may create significant problems in virtual classrooms (Sepulveda-Escobar & Morrison, 2020; Mohan et al., 2020; Yilmaz et al., 2020) since many participants from different places may turn a virtual classroom into a polyphonic environment although the virtual teaching seems to be conducted in a single shared environment. However, both teachers and students are expected to create suitable environments for themselves during their online classes (Johnson, 2020; Lynch, 2004). Therefore, participation in virtual classrooms in suitable settings (no distractors, noises, bright light, etc.) is deemed essential for the authenticity of the lessons (Shim & Lee, 2020; Christopher, 2014; Johnson, 2020). In other

words, the participants should be comfortable in terms of the physical environment and technical stuff.

A considerable number of studies previously touched upon communication barriers arising from the limited reception of visual cues (e.g., facial expression, body language) in virtual classrooms (Cornelius, 2014; Kear et al., 2012; Phelps & Vlachopoulos, 2020). Moreover, remaining silent and turning off cameras in virtual classrooms may bring other undesirable consequences as well (Cornelius, 2014; Neuwirth et al., 2020). In addition, it is highlighted that students' motivation for and interest and participation in classes were hit during the pandemic (Ferri, Grifoni, & Guzzo, 2020; Jeffery & Bauer, 2020; Mohan et al., 2020; Yilmaz et al., 2020). Demir and Kale (2020) reported that the lack of eye contact and adequate communication or interactions and the inaccessibility of all students, as well as the poor motivation of the students due to the pandemic, adversely affect education in virtual classrooms. Besides, if it is expected to perform effective teaching in an online environment, then it may not be sufficient only to transform the course content utilized in traditional face-to-face classrooms into digital format (Ko & Rossen, 2017). Thus, the lessons in virtual classrooms should be planned, presented, and evaluated in a way that encourages participation, interaction, and cooperation in line with the possibilities and limitations of these classrooms (Christopher, 2014; Clark & Kwinn, 2007). Furthermore, to support in-class communication and student engagement, teachers should enrich online classes with features of virtual classrooms for chatting, raising hands, voting, small group activities, whiteboard, as well as camera footage and screen sharing (Arslan & Sumuer, 2020; Peper, Wilson, Martin, Rosegard, & Harvey, 2021; Simon, 2022). The previous research that documented a positive relationship between interactive teaching materials and achievement consistently recommended developing interactive materials for virtual classroom environments (Moller, 1998; Karaman et al., 2013; Yaslica, 2020). It is also well-known that a number of fundamental technical and interactive aspects of teaching, such as teacher interaction in learning, course content, and assessment, affect learning-teaching and student satisfaction (Genc & Gumrukcuoglu, 2020; Horn, 1994).

It was previously determined that the trainer training program for distance education had a significant impact on the self-efficacy and benefit perceptions of the faculty members toward distance education (Ak, Gokdas, **Oksuz** & Torun, 2021). Such a finding may imply that teachers and pre-service teachers may be recruited to a series of training covering classroom management strategies specific to the virtual classroom settings, as well as traditional strategies (Can, 2020; Phelps & Vlachopoulos, 2020). In addition, time management plays an important role in the success of online learning (Caplan & Graham, 2008). The previous research indicated that satisfactory time management is an indispensable part of complex and demanding virtual classrooms (Cornelius, 2014; Phelps & Vlachopoulos, 2020; Tulaskar & Turunen, 2022). Upon watching the class recordings, teachers and pre-service teachers should be encouraged to make self-assessments and receive peer assessments about their time management and verbal and nonverbal behavior in virtual classrooms. In this way, feedback on verbal and nonverbal communication behavior in virtual classrooms will contribute to their professional development. In particular, pre-service teachers' awareness of their emotional reactions becomes much more important in raising their awareness of learning and teaching (Aydin & Yuzer, 2006).

The use and recording of the personal information of teachers and students in virtual classrooms often raise security and privacy issues (Khlaif, Salha, & Kouraichi, 2021). Today, personal data can easily be accessed even through a photograph, which may create concerns about the misuse of information. However, such concerns can be settled thanks to certain rules and procedures to be set by relevant authorities. Teachers, students, and parents should be regularly informed and guided about the security and privacy issues in virtual classrooms (Arslan & Sumuer, 2020).

One cannot deny the substantial impact of emotion transfer on distance education since proper identification of students' emotions inevitably contributes to an effective learning experience. Transforming negative affect into positive feelings mediates students' motivation, engagement, self-regulated learning skills, and academic achievement. To do so, teachers need to adopt educational leadership through new perspectives to learning, which may demand emotional awareness. Educational leadership is needed even greater in contemporary education, particularly in distance education. Revealing emotion transfer situations between teachers and students and, thus, attempting to create an emotional awareness of teachers may be considered the practical output of the research.

The present study employed a survey design to uncover an existing phenomenon with quantitative data. Overall, further research is recommended

- adopting a narrow or in-depth qualitative approach to investigate the underlying causes of emotion transfer-related issues in distance education,
- exploring the impacts of emotion transfer in distance education through an emotion transfer-specific experimental model,
- exploring the effects of emotion transfer in distance education through eye-tracking devices, EEG devices, FMRI devices, etc.,
- replicating the present study with students at different school levels.

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ATOMIC PHYSICS TEACHING MATERIALS IN BLENDED LEARNING TO IMPROVE SELF-DIRECTED LEARNING SKILLS IN DISTANCE EDUCATION

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ABSTRACT

Atomic physics teaching materials support student motivation to learn independently, guide, and direct students to master material with abstract characteristics. The teaching materials in blended learning can improve the tutorial system's interaction process in distance education with special characteristics. Universitas Terbuka students have various ages, professions, geographic location, social environment, and prior knowledge. This study aimed at analyzing the practicality and effectiveness of atomic physics teaching materials in blended learning to improve students' self-directed learning skills in the open and distance education system. This research involving 121 students spread across 12 regional offices in Indonesia. Analysis of the impact and consistency of students' self-directed learning skills used inferential statistics, then for data analysis, the improvement used N-gain. The results of the study showed the average tutorial feasibility using atomic physics teaching materials is the most dominant in explaining the teaching material thoroughly and is easy to understand. The average percentage of student activity results get the highest score on the activity of conducting discussions. The effectiveness analysis results showed the atomic physics teaching materials are proven to be effective in increasing students' self-directed learning. ANOVA obtained no significant difference from all test classes so that atomic physics teaching materials are effective for application to students who have low, medium, and high abilities. The process of practicality and effectiveness has implications for developing teaching materials for distance education systems that must pay attention to the tutorial process, learning management system, and several other components.

Keywords: Atomic physics, blended learning, distance education, self-directed learning skills.

INTRODUCTION

The distance education system has been widely used to expand access for people to obtain an education. The distance education system is an alternative institution for people to participate in educational programs due to scarcity of resources and the high cost of taking part in regular education programs (Kaye & Rumble,

2018). The Universitas Terbuka (UT) provides distance education system services to community groups who cannot attend face-to-face or regular education in various forms, modes, and coverage supported by learning facilities and services as well as an assessment system that ensures the quality of graduates is following the national standards of Indonesian education (Budïastra, Wïcaksono, & Erlina, 2020). Teaching materials and information technology used in the form of a distance education system make it possible to conduct lectures remotely without being tied to distance, wherever and whenever they can access this learning (Richter & McPherson, 2012). The distance education system requires students to study independently using a variety of teaching materials and learning assistance services. Self-directed learning in the context of this system impacts the use of information and communication technology, meaning that various media can be used as teaching materials (Wicaksono et al., 2017). In this distance education, the teaching materials used must be more varied when compared to face-to-face education.

Teaching materials are an important requirement in the lecture process, especially to achieve the set instructional goals. One of the challenges faced by the distance education system is how students can achieve maximum competence (Butcher, 2015). It is because students are physically separated from lecturers and other students, learning material plays an important role in replacing an instructor's presence in the learning process. Good distance teaching materials need to pay attention to the learning process itself, namely how the teaching material can provide clear and communicative instructions, considering that students are not directly accompanied by tutors in the learning process (Perraton, 2012). In fact, there are still many weaknesses in the tutorial process, especially in atomic physics material. The teaching materials presented use symbols that are difficult for students to understand. The questions in atomic physics teaching materials still do not encourage high-level thinking and it is not facilitate students to achieve instructional goals (Maftei & Popescu, 2012). Students often experience difficulties in understanding the meaning of the reading material presented because atomic physics characteristics are abstract and students cannot directly observe atoms. This fact makes it difficult for students to understand the concept of atomic physics as a whole. Atomic physics teaching materials provide less feedback for the questions it asks, especially questions that have many answers or require complex and deep answers (Endres et al., 2016).

The availability of varied and high-quality teaching materials is essential to be considered, especially to independently help students in the learning process. Independence is related to systematic and complete teaching materials, which can be studied independently to benefit the student lecture process in the distance education system (Berg, 2020). Teaching material needs are descriptions and important components such as clearly stating instructional objectives, examples, exercises, summaries, formative tests, feedback, and learning instructions (Kaye & Rumble, 2018). The development of atomic physics teaching materials encourages the presentation of learning material appropriately even though physically they are not in the same place. The teaching materials provide space for applying distance education techniques in the teaching materials easily accepted by students. Atomic physics teaching materials motivate students to study independently, guide and direct them to master the material and provide clear concepts through various independent exercises. Besides, atomic physics teaching materials are integrated with audio-visual media, which is very suitable for explaining abstract atomic physics material for students. Illustration in audio-visual media is designed so that it is easy to accept, attractive, and not boring for students (Zazkis et al., 2009).

Learning independence demands a great deal of responsibility on students, so that it requires effort to carry out various activities to achieve instructional goals. Independence is students' behavior in realizing their wishes or desires in a real way without depending on others. In this case, the student can do learning on their own, determine effective learning methods, carry out learning tasks well, and carry out learning activities (Perraton, 2012). Self-directed learning, in many ways, is determined by the ability to learn effectively. Self-directed learning indicators that students must have include: initiation and persistence in learning, responsibility, discipline and great curiosity, confidence and a strong desire to learn, and organizing learning time and speed (Broad, 2006). Learning ability depends on reading speed and the ability to understand the content of the reading. Self-directed learning becomes effective when UT students must have self-discipline, initiative, and strong learning motivation (Wechsler et al., 2018). Students are also required to manage their time efficiently so that they can study regularly based on their own study schedule.

Self-directed learning skills are abilities that are formed from an effective distance education process (Budiastra, et al., 2020). Indonesian government regulation, Permenristekdikti No. 51/2018 states that

distance education is a teaching and learning process carried out remotely through the use of various communication media. Learning that supports various learning media is blended learning. Blended learning refers to a mixture of instructor-led and technology-based learning that is flexible. Blended learning describes an opportunity that integrates technological innovation and advantages in online learning with the interaction and participation of face-to-face learning benefits (Clark & Post, 2021). The basic concept of blended learning also optimizes oral communication in face-to-face learning with written communication in online learning. This learning can provide motivation and better learning outcomes than other methods, especially indirect learning methods (Agaoglu & Demïr, 2020).

Previous research shows that blended learning is used to properly combine Synchronous and Asynchronous learning settings (Li et al. 2020). This research was conducted at UT with an online learning system that is robust and effectively supports the Asynchronous learning setting. The distance education system requires students to be independent in learning to achieve goals. However, students' ability to study independently in the distance education system is generally still weak, so it requires a proper learning model (Pandiangan et al., 2017). Distance education is prone to controlling the learning process, so it is necessary to strengthen the interaction process between students, tutors, and technology (Budïastra et al., 2020). The interaction process needs to be raised through media and teaching materials to bring students to abstract thinking skills (Erlina et al., 2018). Students can use atomic physics teaching materials flexibly in terms of time and place. Furthermore, seen from its function as material supporting material integrated with printed teaching materials, it provides a meaningful learning experience. The development of a new generation of atomic physics teaching materials and appropriate technology for tutors and students in communicating is important (Butcher, 2015). Interaction is said to be effective if students are active in self-directed learning, and the tutor provides feedback to evaluate the lecture process that has been carried out. Evaluations designed in atomic physics teaching materials are complemented by the feedback that appears when students give inappropriate answers (Atenas & Havemann, 2013). Therefore, in addition to material selection, the use of teaching materials, the proper evaluation process will affect student success in achieving instructional goals.

STATEMENT OF THE PROBLEM AND QUESTION OF RESEARCH

The student's need for flexible learning continues to increase, especially for those constrained by time and place (Evans et al. 2020). The Universitas Terbuka (UT) engagement of blended learning tools in a management course includes a combination of e-learning, distance learning, and face to face learning. Blended learning is relevant for improving students who study while working, are in remote areas, and cannot directly learn fully face-to-face. UT students still need further study of student self-directed learning skills, so they need clear physics instruction (Pandiangan et al., 2017). Conventional university teaching of physics has shown little improvement in teaching physics principles. The domain of atomic physics is considered a difficult field to study because it deals with abstract and difficult to understand concepts (Maftei & Popescu, 2012). Thus the media and teaching materials for learning atomic physics are still challenging to develop. Further research shows that video-based learning can support learning interactions and a flexible learning system (Budiastra et al., 2019). This study aims to analyze how the practicality and effectiveness of atomic physics teaching materials improve students' self-directed learning skills in the distance education system. The research was conducted to answer the following questions: (1) what is the practicality which includes implementation in lectures, student activities, and the constraints that arise with atomic physics teaching materials to improve students' self-directed learning skills in the distance education system ?; and (2) what the effectiveness which includes increasing student self-directed learning skills and student responses to atomic physics teaching materials in blended learning to improve students' self-directed learning skills is?

METHOD

This research is Research and Development (R&D) namely Educational Research (Gall et al., 2003). The development carried out is in the form of new learning and supporting tools. This development procedure consists of two objectives, namely developing and testing atomic physics teaching material products through blended learning in achieving the goal of improving students' self-directed learning skills. Educational

development research steps carried out for product design meet eligibility standards include: (1) research and information colletion, namely needs analysis, literature study; (2) planning, formulating research problems; (3) develop preliminary form of product, development of learning materials, learning process and evaluation instruments; (4) preliminary field testing, initial field testing of the design of teaching materials products; (5) main product revision, improvement of teaching materials based on limited field testing; (6) playing field testing, testing the practicality and effectiveness of teaching materials; (7) operational product revision, improvement of teaching materials based on input and main field test results; (8) operational field testing, practicality and effectiveness of teaching materials for prospective users; (9) final product revision, improvement of the feasibility of teaching materials; and (10) dissemination and implementation, reporting teaching material products in journals and implementing distance education systems. This type of research is a Quasi-Experimental Design. The replication of the research design used was one group pretest-posttest design, namely Opre-test X treatment Opost-test (Krippendorff, 2018).

Participants

This study involved 121 students taking atomic physics courses and spread across 12 regional offices in Indonesia, namely Jakarta, Serang, Bogor, Bandung, Semarang, Yogyakarta, Surabaya, Malang, Jember, Pangkal Pinang, Medan, and Pontianak. The sample is based on non-probability sampling using a purposive sampling technique. UT students have an admission process without minimum academic criteria and are not limited by age and profession. The chosen regional office criteria are based on students' smooth access to the internet, the number of students, the area's size, and the quality of management. Each regional office sample was 5-15 students with cumulative achievement index in the high, medium, and low category when taking physics courses in the previous year. Atomic physics teaching materials include the development of atomic theory, the spectrum of the hydrogen atom, quantum numbers. This research was conducted in the odd semester of the 2018/2019 academic year using a new generation of atomic physics teaching materials. The UT in all Indonesian regional offices can be seen in Figure 1.

Figure 1. Universitas Terbuka in Indonesia

Data Collection and Analysis

The learning process used learning tools in the form of a Indonesian National Qualifications Framework based curriculum, tutorial activity design, tutorial program units, learning resources, learning media, tutorial assignment design, student worksheets, and self-directed learning tests. Students got a pretest before learning and a posttest after the learning process. The instruments used to collect practical data include a checklist of aspects of learning implementation, a checklist of student activities' frequency every 5 minutes, and a lecture constraint sheet accompanied by alternative solutions. The instrument of effectiveness data includes: self-directed learning results tests and student response sheets consisting of statements and answer choices have been provided. Self-directed learning skill are based on indicators of initiation and persistence in learning, responsibility, discipline and great curiosity, confidence and a strong desire to learn,

and able to organize time and set the pace of learning (Broad, 2006; Pandiangan et al., 2017). The research implementation was carried out an online tutorial based on blended learning between tutors and students for 8 meetings and structured assignments 3 times during the tutorial period, which was done in learning management system (LMS).

Table 1. Tutorial Implementation Procedure

1	2	3	4	5	6	7	8
Media: LMS Printed E-book **Tutorial Process:** Online	**Media:** LMS Printed E-book **Tutorial Process:** Online	**Media:** LMS Printed E-book Video Assignment: Structured 1 **Tutorial Process:** Online & Face to face	**Media:** LMS Printed E-book **Tutorial Process:** Online	**Media:** LMS Printed E-book Video Assignment: Structured 2 **Tutorial Process:** Online & Face to face	**Media:** LMS Printed E-book **Tutorial Process:** Online	**Media:** LMS Printed E-book Video Assignment: Structured 3 **Tutorial Process:** Online & Face to face	**Media:** LMS Printed E-book **Tutorial Process:** Online

Data analysis of the practicality of atomic physics teaching materials through the observation of 3 observers who assessed the number of aspects that were carried out so that the average category 3.6 ≤ very good <4.0, 2.6 ≤ good <3.5, 1.6 ≤ not good <2.5, 1.0 ≤ very bad <1.5 (Aryadoust & Raquel, 2019). Student activities during the lecture process are analyzed based on the frequency of activities that appear over a period of 5 minutes so that they can determine the average relevant student activity to reach a minimum percentage of 60% while using atomic physics teaching materials (Swarat et al., 2012). Constraints during the lecture process are analyzed based on alternative solutions that support students' self-directed learning skills. Analysis of the effectiveness data was further analyzed using inferential statistics with IBM SPSS 22 software. Analysis of the impact of students' self-directed learning skills from the pre-test, post-test, and N-gain scores using Paired Sample T-test if the data met normality or non-parametric using or Wilcoxon Signed Ranks-test. While the consistency of the impact of students' self-directed learning skills uses variance (ANOVA) if the data meets normality or is non-parametric using the Kruskall Wallis Test. The improvement of students' self-directed learning skills can be analyzed using the calculation of the average n-gain = (post-test score - pre-test score) / (maximum score - pre-test score), with categories including: (1) high if N-gain ≥ .70; (2) moderate if .70> N-gain ≥ .30; and (3) low if N-gain <.30 (Hake, 1999). Student responses to atomic physics teaching materials were analyzed using the Likert scale with the percentage category 19.99% ≤ strongly disagree <0%, 39.99% ≤ disagree <20%, 59.99% ≤ doubt <40%, 79, 99% ≤ agree <60%, 80% ≤ strongly agree <100% (Sax et al., 2008).

The UT applies dual pattern learning that is a face-to-face tutorial and online tutorial teaching. Blended learning is applied to online tutorial patterns in this research. The conceptualization of this research is supported by several components of the distance education system as follows.

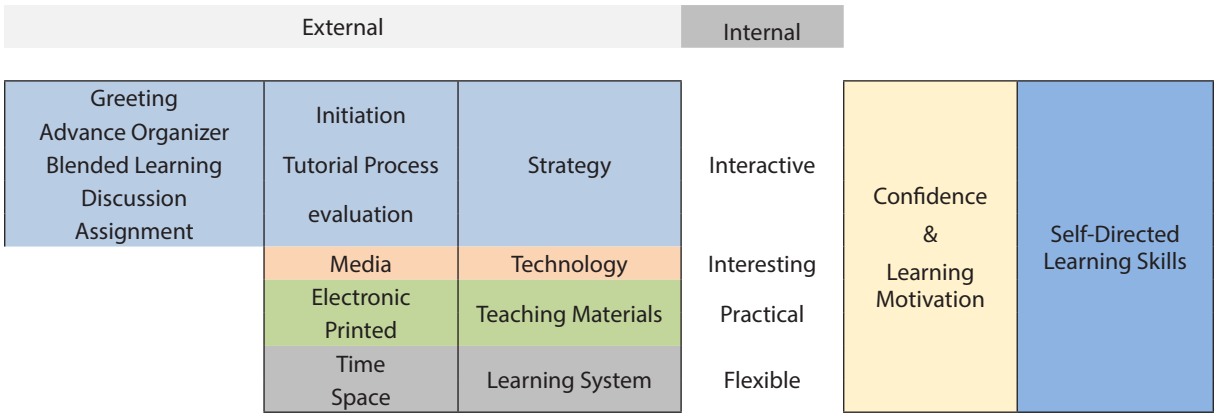

Figure 2. Conceptualization of the tutorial as a support for self-directed learning in a distance education

This study uses a open and distance education system that is supported by comprehensive components. The final goal in this tutorial process is student learning independence. Learning independence will be achieved if confidence and learning motivation are fulfilled. Internal and external factors play an important role in supporting self-directed learning. The learning environment can build internal factors for student learning that are interactive, interesting, practical, and flexible. External factors include strategies, technology, teaching materials, and learning systems. Blended learning in research is a supporting component of the tutorial process to build interactive learning strategies in the distance education system. Technology-based media in this research also supports interest in learning. This research also provides practical teaching materials in electronic form in the form of a virtual reading room (https://www.pustaka.ut.ac.id/lib/ruangbaca/) and print, distributed directly to students. The learning system in research is carried out flexibly. This learning system can optimize UT students who are scattered in various parts nationally and internationally. Also, the learning system used is not strictly timed. Students with various professions can listen to the initiation, tutorial process, and evaluation according to their available time to participate through the following LMS.

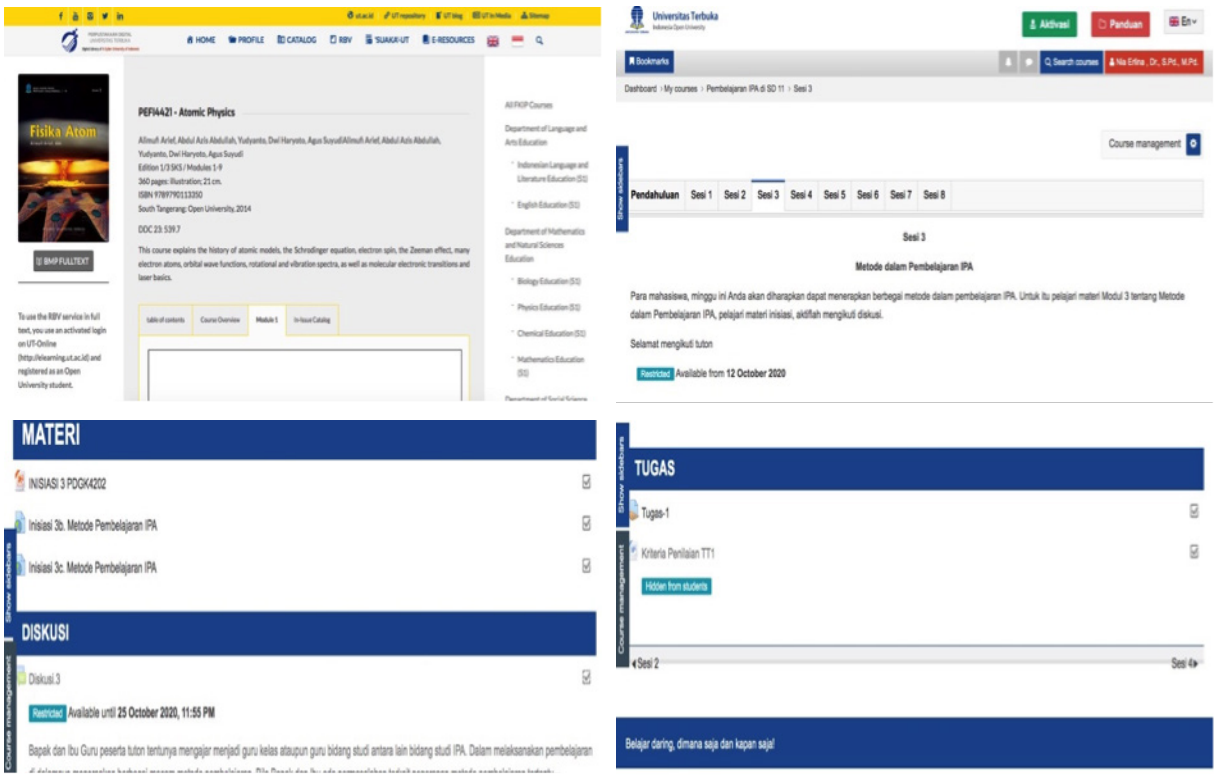

Figure 3. The LMS

Validity and Reliability

Learning tools were validated by learning experts and physics tutors before they were used for teaching. The validator determines the suitability of 26 statements against the learning device, including the content and construct's suitability. Validation test using Pearson product-moment correlation for validity and Cronbach-Alpha for Reliability. Table 3 provides information about the validity and reliability of learning devices. Table 3 shows the validation process with valid and reliable results. Pearson Correlation (r) on each validator indicates valid criteria. The validity test uses 26 statements of items with a significance of 5%. Cronbach's Alpha value .534> .39, then the decision making in the reliability test by four validators was concluded to be reliable. There is a significant correlation between variables. Each validator fulfills the aspects of content, language, presentation, and graphic feasibility assessment. The material expert stated that the material presented showed the concept of atomic physics according to competence using effective language and a clear sequence of presentation. Media experts state that teaching materials can support motivation, attractiveness, and interaction of stimulus and response based on display designs and illustrations. Besides, the tutor also stated that the blended learning used could support complete information in distance tutorials. The language presented is following the stage of student development with the aim of equitable education.

Table 2. Validity and Reliability Statistics

Validator	N of Items	Validity (Sig. (2-tailed))	Reliability Cronbach's Alpha
Content	26	.000 < .05	.534 > .39
Media		.000 < .05	
Tutor		.000 < .05	

FINDINGS

The results of this study present the supporting data on the practicality and effectiveness of atomic physics teaching materials in blended learning to improve self-directed learning skills in distance education systems as a whole as follows: (1) Implementation of tutorials; (2) student activities; (3) Constraints and solutions; (4) self-directed learning skills on each indicator; (5) Pretest and Posttest Self-directed learning skills; (6) N-gain of students' self-directed learning skills; (7) statistical analysis of the students' learning process; and (8) students' response to the application of atomic physics teaching materials in blended learning.

Implementing atomic physics teaching materials observed in the tutorial allows students to interact with tutors through additional explanations, information, discussions, and work on assignments. The average number of aspects performed per tutorial for all groups can be shown in Table 3.

Table 3. The feasibility of atomic physics teaching materials in face-to-face tutorials

No	Aspect	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	Average
1	Inform the students of the tutorial objectives.	3.2	3.1	3.2	3.1	3.3	3.2	3.2	3.2	3.3	2.9	3.2	3.1	3.2
2	Explain teaching materials thoroughly and easily understood	3.7	3.8	3.7	3.6	3.5	3.8	3.5	3.5	3.6	3.6	3.7	3.6	3.6
3	Asking questions to students	3.4	3.2	3.5	3.3	3.2	3.3	3.5	3.5	3.4	3.4	3.5	3.3	3.4
4	Guide students in completing tutorial assignments	3.3	3.3	3.4	3.2	3.1	3.3	3.1	3.1	3.2	3.1	3.4	3.2	3.2
5	Summing up the material and feedback	3.1	3.3	3.3	3.2	3.1	3.0	3.2	3.2	3.1	3.2	3.3	3.2	3.2

*C : Testing Classes

The active role of students in the distance education system is a must. This shows that teaching designed by tutors must be oriented towards student activities. The average student activity during the tutorial process is observed for each group, and the meeting can be shown in Table 4.

Table 4. Average Percentage of Student Activities

No	Aspect	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	Average
1	Listen to the tutor's explanation	82	83	82	83	82	83	81	81	82	80	81	81	81.8
2	Asking question	78	79	78	79	77	79	76	76	78	76	78	76	77.5
3	Respond to the tutor's questions	75	76	75	76	74	76	73	73	75	73	74	75	74.6
4	Discussion	87	88	87	88	86	88	85	85	87	85	85	86	86.5
5	Doing exercises or assignments	85	86	85	86	84	86	85	85	85	86	84	83	85.0

If the tutorial atomic physics teaching materials' problems can be solved collectively, the tutorial goes well. The situation experienced by students that hinders the smooth use of atomic physics teaching materials in the tutorial process as a whole can be shown in Table 5.

Table 5. Constraints in implementing atomic physics teaching materials

No.	Types of Constraints	Alternative Solutions
1	Presentation of atomic physics material in teaching materials is not comprehensive.	Describe the explanation of the material in atomic physics in a structured manner.
2	Teaching materials do not encourage student learning activities independently.	Addition of assignments that encourage students to learn independently.
3	Teaching materials in several sections have legibility that is difficult for students to understand.	The use of communicative sentences in writing atomic physics material.
4	Lack of illustration abstract examples in atomic physics teaching materials.	Added sample illustrations to provide a deeper understanding of the abstract matter of atomic physics.

The percentage of students' self-directed learning skills for each indicator of self-directed learning skills for the 12 test classes is shown in Figure 4.

Figure 4. Percentage of students' self-directed learning skills on each indicator

The average pre-test and post-test scores of students for each self-directed learning indicator for the 12 test classes are shown in Figure 5.

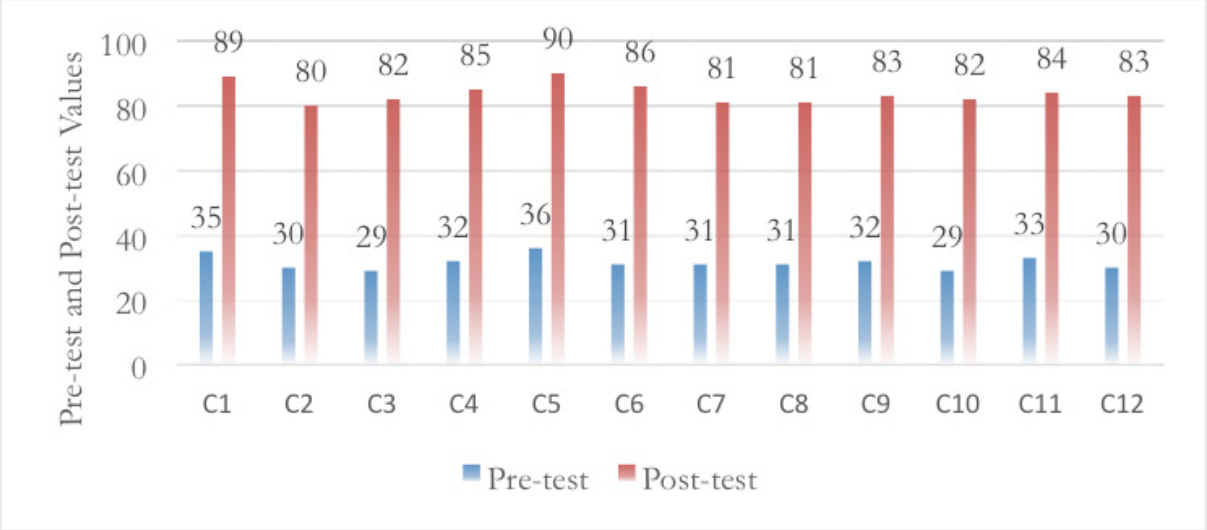

Figure 5. The average pre-test and post-test scores of students for each indicator of self-directed learning

Data from pre-test and post-test results are used in the N-gain analysis to improve self-directed learning after the tutorial using new generation atomic physics teaching materials. The average N-gain for the 12 test classes is shown in Figure 6.

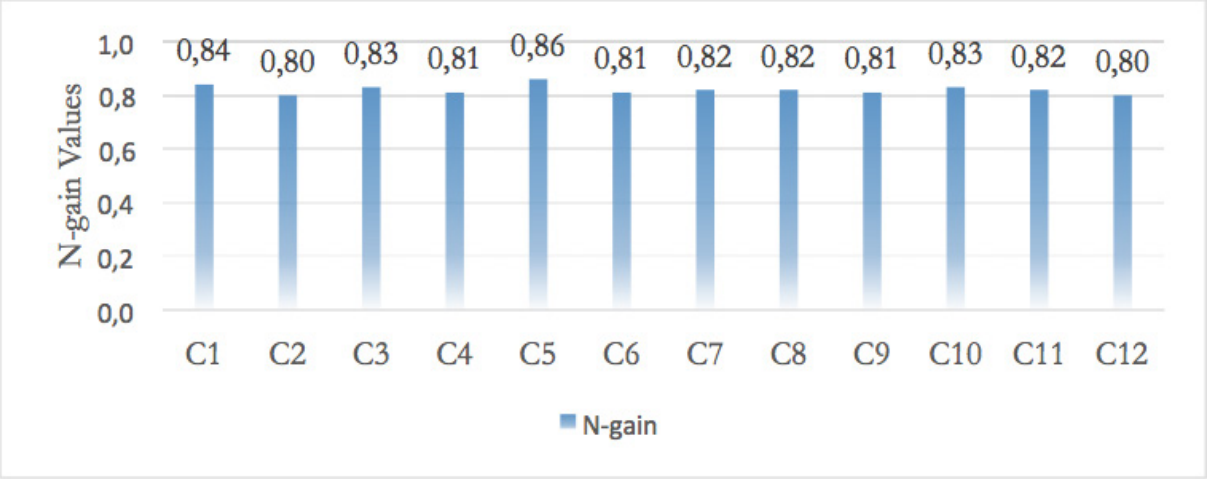

Figure 6. Average N-gain for the 12 test classes

Analysis of the impact of the application of atomic physics teaching materials based on the average pre-test and post-test values indicates that self-directed learning outcomes have increased. The results of the Paired Sample T-test statistical test based on normally distributed data can be shown in Table 6.

Table 6. The results of statistical testing paired sample t-test student self-directed learning

Kelas Uji	Paired Sample T-test (pre-test – post-test)	N	Mean	S	df	t	p
C1	Pair 1	9	57.42	8.50	8	36.96	p = < .0001
C2	Pair 2	6	57.91	8.72	5	33.17	p = < .0001
C3	Pair 3	15	57.85	8.04	14	35.23	p = < .0001
C4	Pair 4	12	57.76	8.31	11	37.40	p = < .0001
C5	Pair 5	8	57.43	8.27	7	37.99	p = < .0001
C6	Pair 6	9	57.06	9.02	8	28.96	p = < .0001
C7	Pair 7	13	57.64	8.82	12	33.30	p = < .0001
C8	Pair 8	9	57.64	8.82	8	33.30	p = < .0001
C9	Pair 9	10	56.27	9.10	9	32.12	p = < .0001
C10	Pair 10	11	57.85	8.04	10	35.23	p = < .0001
C11	Pair 11	12	58.22	7.84	11	37.82	p = < .0001
C12	Pair 12	7	57.13	8.37	6	31.28	p = < .0001

Consistency analysis of the impact of atomic physics teaching materials on the average N-gain value indicates that self-directed learning outcomes have increased consistently across all test classes. The ANOVA statistical test results based on data that are normally distributed can be shown in Table 7.

Table 7. The results of the ANOVA N-gain statistical test of the student's self-directed learning skills

N-gain	Sum of Squares	df	Mean Square	F	p
Between Groups	.186	11	.013	.832	.634
Within Groups	5.790	362	.016		
Total	5.977	376			

Student responses showed reactions or responses in the form of acceptance, rejection, or indifference. Student responses to students' relevance and reactions to attention, satisfaction, and self-confidence after using atomic physics teaching materials. The results of the Likert scale analysis with the average percentage can be shown in Table 8.

Table 8. The result of the percentage of student responses to atomic physics teaching materials

Criteria	Indicator	Response Rate (%)
Response	Relevance	92.3
Reaction	Attention	90.6
	Satisfaction	86.5
	Confidence	87.3

DISCUSSIONS AND CONCLUSION

Practicality

The use of appropriate teaching materials is needed in carrying out tutorial activities to improve student self-directed learning outcomes. Table 3 shows that the average tutorial feasibility using atomic physics teaching materials is the most dominant in explaining the teaching material thoroughly and **it is** easy to understand with an average value of 3.6. Teaching materials that have been developed make it easy for tutors to teach atomic physics material thoroughly. The teaching material symbols are given a description and a

brief explanation to understand atomic physics material more easily. Besides, this teaching material can direct students to study independently because it contains problems and steps in solving these problems. Judging from self-directed learning characteristics, atomic physics teaching materials can direct students to think critically, creatively, and innovatively in solving a problem (Wechsler et al., 2018). Teaching materials that lead to self-directed learning are important to be applied to students who take distance education because students with tutors cannot face to face so that the media used by students must be able to meet student needs in achieving their competency goals (Zhang et al., 2008).

Indicators of the feasibility of atomic physics teaching materials in the tutorial are inseparable from the aspects contained therein, which include: informing the purpose of the tutorial to students, explaining the teaching material thoroughly and easily understood, asking questions to students, guiding students to complete the tutorial assignments, and concluding the material and feedback (Downes, 2007). Informing the purpose of tutorials to students is a tutoring program provided by the UT in face-to-face tutorial between tutors and students in the classroom to foster the student's self-directed learning process. This activity also aims to discuss materials that must be mastered by students if they are constrained in understanding them. The results showed that the tutor needed to inform the purpose of this tutorial to overcome the learning problems and difficulties they experienced and master the subjects' competencies (Forsyth, 2014).

Explaining the teaching material thoroughly and easy to understand, the tutorial material occupies a significant position in the atomic physics teaching material's overall structure. It must be prepared so that the feasibility of the tutorial can achieve the goal. These targets must be according to the basic competencies and instructional goals that students must achieve. Atomic physics teaching materials that have been developed contain tutorial material, basic competencies, tutorial objectives, and ways of evaluating, which are designed systematically so that students can achieve the tutorial objectives. The components in explaining the teaching material thoroughly explain the basic competencies, indicators, and tutorial objectives of atomic physics material. Tutors need to explain how to use this teaching material to be easy to use and understand. The results showed that the delivery of the material in teaching materials needed to be thoroughly explained by the tutor so that students could understand atomic physics material and the tutorial's objectives that had been determined could be achieved (Glynn & Duit, 2012). Also, by thoroughly explaining, students can apply the knowledge gained in class and apply it in everyday life (Abd-El-Khalick, 2013).

The process of asking students questions is an expression of an individual's curiosity about a certain thing, which could be the information obtained that will be useful for him. The questions asked by the tutor can be constructive, which means that by asking these questions, students can think critically and creatively to answer these questions (Bennett, 2003). The tutor also needs to pay attention to several components in asking a question, including (1) asking questions briefly and clearly; (2) focus the questions so that the answers given by students do not have broad meaning; (3) after asking the question, the tutor needs to give the students time to think; (4) asking questions in turn from one student to another; and (5) the tutor provides answer guidance if the answer is not correct. The results showed that when the tutor wanted to ask the students, the tutor wanted to know the extent of the student's understanding of atomic physics material after explaining using atomic physics teaching materials (Fortus & Vedder-Weiss, 2014).

When guiding students to complete tutorial assignments through a continuous and systematic process of assisting individuals who support knowledge development, the supervisor acts as a facilitator of student development; when viewed from a content perspective, guiding can be done by conveying or transferring teaching materials in the form of science, technology, and art using strategies and methods that suit the differences of each student (Hwang et al., 2009). Based on the strategies and methods used, guiding is more in giving motivation and coaching. The results showed that guidance activities could help students complete tutorial assignments to resolve student difficulties (Pandiangan et al., 2017). Besides, with tutor guidance activities, students can find out students' cognitive level so that tutors can use variations in guidance for old students to understand something with students who quickly understand something.

The process of concluding material and feedback by encouraging the emergence of final opinions based on previous descriptions. When concluding the material, it means taking the essence or essence of atomic physics material to make it easier for students to learn it. Besides, students also need feedback through providing information about whether or not student answers to the questions given are accompanied by

additional information in the form of an explanation of the location of the error of the student's answer (Sadjati & Yuliana, 2017). Students' feedback during tutorial activities is, for example, asking questions so that feedback is obtained. Feedback is useful in encouraging student activity, assisting tutors in assessing and assisting in choosing evaluation forms. The results showed that through summarizing the material and feedback, a student could determine the extent of his understanding of atomic physics material (Verburg et al., 2019). Besides, this activity can be used to correct the learning development or learning progress of the students themselves. Feedback has three important components, including (1) recognition of the desired goal; (2) evidence about the present position; and (3) some understanding of a way to close the gap between the two (Nathenson & Henderson, 2018).

Based on Table 4, five student activities were observed when using atomic physics teaching materials, including listening to the tutor's explanation, asking questions, responding to the tutor's questions, conducting discussions, and doing exercises or assignments. The average percentage of student activity results get the highest score on the activity of conducting discussions by 86.5%, which is categorized as very active. Discussion activities lead students to exchange ideas with their group friends in solving a problem related to atomic physics. The results showed that through discussion activities, students could think actively and have the courage to express their opinions (Lin-Siegler et al., 2016). Also, discussion activities can foster a sense of responsibility and togetherness to find solutions to problems. Learning independence can be achieved if students are active in discussions. Judging from the characteristics of individuals who have the readiness to learn independently, students need to discuss with friends to foster curiosity about other opinions and foster a sense of responsibility to complete the assigned task (Broad, 2006). The discussion process can pave the way for students who have difficulty achieving the tutorial objectives. The activity of listening to the tutor's explanation is through listening and paying attention to the words spoken by others. Students need to listen to what is conveyed by the tutor so that the information obtained can be understood properly. The results showed that listening to tutors' explanations can be used as a means for the communication process to run well (Howard et al., 2016). Students, as good listeners after the listening process, can respond and conclude the results of the information that has been listened.

The activity of asking questions through an expression of student curiosity about a certain thing can be useful information. The activity of asking questions shows a dynamic interaction between tutors and students and between students and students. Asking activities will be more effective if the questions asked are sufficiently weighty, easy to understand, or relevant to the topic being discussed. The results showed that when students ask the tutor, it means that they have shown a high sense of curiosity and can train students to foster critical thinking skills (Laurillard, 2013). The tutor can assess the level of student understanding of the questions asked to take appropriate next steps applied in the tutorial. Activities to respond to the tutor's questions when students can respond to questions from the tutor properly, it can be assumed that the student has understood the material presented. The response to the question depends on the question's characteristics, which requires students to think critically and creatively, not just remembering or mentioning (Wen et al., 2015). The tutor provides questions that lead to open-ended questions, allows students to answer diverse questions, assesses students holistically, enables students to interpret atomic physics material from the answering process. The results showed that the ability to respond quickly to questions from the tutor arose from listening to material well-being so that students did not find it difficult to answer questions from the tutor.

Activities carry out discussions through scientific meetings so that students can exchange ideas in solving a problem. Discussions involve two or more students who interact verbally and face each other regarding the objectives or objectives of atomic physics material by exchanging information and maintaining or solving problems. When discussing, students can freely express their perceptions and opinions. The main purpose of the discussion activity is to find the best solution to a problem in applying atomic physics (Carpenter, 2006). With the discussion, students can exchange ideas with other students in solving atomic physics material problems. The results showed that discussion activities could foster critical thinking skills and train students' courage to express their public opinions (Wehmeyer et al., 2012). The activity of doing exercises or tasks must be done and becomes the responsibility of a person. Tutors give assignments to students to find out to what extent students understand the material being taught. The assignment aims to make students understand the new generation of atomic physics textbooks. Students carry out exercises while doing assignments so that students' experience in learning something becomes more integrated. The results showed that by giving

assignments, the tutor could find out the strengths and weaknesses of each student's mastery of concepts so that the tutor could take further actions that were suitable for learning (Perraton, 2012)

The use of atomic physics teaching materials is inseparable from the constraints or problems that arise during the tutorial process, as shown in Table 5. Constraints that appear in the presentation of atomic physics teaching materials in teaching materials are not comprehensive. The tutor describes an explanation of atomic physics in a structured manner. Atomic physics material is classified as abstract so that by describing the explanation of atomic physics in a structured manner, students can more easily understand the material (Giancoli, 2016). UT students must study independently so that teaching materials are needed, containing activities that lead students to study independently. Teaching materials like this can meet students' needs to think critically, creatively, and innovatively in solving a problem. Presentation of activities made contextually makes it easier for students to understand it because students can see firsthand the problems they face. Besides, it is necessary to add illustration examples to understand better students' abstract material (Butcher, 2015). The characteristics of atomic physics material are classified as abstract material and cannot be directly observed by students. Most students receive atomic theory learning like studying history or something that already exists, and they must accept it as it is (Feynman, 2018). Therefore, atomic physics teaching materials need to accommodate atomic physics material characteristics and make learning student-centered. Good teaching materials must contain content that can make students learn independently. This is so that students can explore their own thoughts to find answers to the problems given. Atomic physics teaching materials need to be added and illustration examples classified as abstract because the level of student thinking has entered the formal operational level, which requires students to think abstractly. Instructional objectives require students to understand abstract illustrations from atomic physics.

Effectiveness

Teaching materials can be said to be effective if they can increase students' self-directed learning skills. Based on Figure 4, there is an increase in the average value of the pre-test and post-test scores of the self-directed learning indicators when using new generation atomic physics teaching materials. This is indicated by the average pre-test score of 32, which then increases the average post-test score of 84.9. Learning independence demands a great deal of responsibility on students, so they try to carry out various activities to achieve learning goals (Glynn & Duit, 2012). In organizing and disciplining himself in developing learning abilities of his own accord. In addition to responsibility, students' high motivation is essential for self-directed learning (Howard et al., 2016). Students who use a thinking composition strategy or self-directed learning style produce a complete learning process and learning outcomes and qualitatively have better stories of experiences during the learning process written in themselves than students who do not receive self-regulation instruction (Blair & Raver, 2015). Figure 4 shows the increase in self-directed learning outcomes after using atomic physics teaching materials, as shown by the average N-gain value of .82 ($\alpha \geq .8$), categorized as high. These results indicate that atomic physics teaching materials can improve student learning independence. This increase is because in atomic physics teaching materials, there is a comprehensive explanation of the material to understand the material more easily. Besides, there are also abstract illustrations that can help students to achieve the goals of the tutorial. Students can learn independently if the content in the media used can make students think creatively and develop skills independently (Wiley et al., 2014). The tutorial that is applied also plays an important role in fostering self-directed learning for distance students. The tutorial activities carried out can trigger student self-directed learning activities so that students can observe, think, behave, and act in dealing with any problems that are the result of the learning process.

Based on Table 6, statistical analysis through paired sample t-test has results that H_0 is rejected, and H_1 is accepted, which means a significant difference between the pre-test and post-test scores of each test class. This proves that atomic physics teaching materials are proven to be effective in increasing students' self-directed learning skills. The results of the development of atomic physics teaching materials are carried out systematically starting from the design and development process, which can be in the form of developing their own activities to testing teaching materials (Plomp, 2013). Knowledge of the factors that affect the quality of results needs to be considered in teaching materials. Teaching materials explain the material thoroughly, and in it, there are abstract problems related to atomic physics. This teaching material makes

students interested in learning it is because of the innovations developed based on the needs analysis of the teaching materials commonly used. Table 7 shows the results of statistical tests through ANOVA obtained a significance value of .634> .05 so that H_0 is accepted and H_1 is rejected. Thus it can be concluded that there is no significant difference from all test classes so that atomic physics teaching materials are effective for application to students who have low, medium, and high abilities. This atomic physics teaching material is suitable for UT students because the teaching material has explained the material thoroughly and is equipped with illustration examples making it easier for students to understand atomic physics material, which is classified as abstract. For example, topics on electron configuration and quantum numbers, blended learning can support direct student interaction with tutors. Tutors can directly detect writing electron configurations that are often reversed, understanding quantum numbers (main quantum numbers, spin, azimuth, magnetic), which are still often wrong. The determination groups and periods are often wrong because students misunderstand the outer electrons. This interaction process can overcome the weaknesses of teaching materials when students learn independently. The variations and innovations that are raised compared to the teaching materials commonly used by UT students are also a separate supporting factor to help UT students improve their self-directed learning skills. The components in atomic physics teaching materials include learning instructions for students, competencies to be achieved, supporting information, practice questions, student worksheets, and evaluation (Pucciarelli & Kaplan, 2016).

Table 8 shows that the average result of student responses regarding the relevance of atomic physics teaching materials with atomic physics lecture material is 92.3, with a very high category. The average results of student reactions related to attention, satisfaction, and self-confidence were 90.6, 86.5, and 87.3, respectively, with very high categories. This result is relevant to Figure 3, showing that students positively responded from all indicators to the new generation of atomic physics teaching materials. confidence and a strong desire to learn shows the largest percentage. The teaching materials used can make it easier for students to understand atomic physics material, help students have discussions with a group of friends if students find it difficult, and foster student learning independence. For example, the atomic theory of Dalton, Thompson, Rutherford, Bohr, and quantum mechanics. This topic is presented audiovisually with an attractive color appearance. Each theory's strengths and weaknesses are presented based on animated experiments to support the wealth of e-books and printed books. Besides, students' interest in learning using atomic physics teaching materials can make it easier for tutors to deliver learning material (Kent et al., 2016). According to the Indonesian dictionary, it means the tendency of the heart to like something in terms of the meaning of interest. If students already like learning, their hearts and minds will be fully poured into the learning (Herman, 2017).

Based on Table 8, the analysis of student responses to atomic physics teaching materials shows responses in the form of relevance and reactions in attention, satisfaction, and self-confidence. Relevance is the relationship between two things that are interrelated when they are matched with one another. The results showed that atomic physics teaching materials were relevant to physics lecture material given by the tutor. The benefit of the relevance of the teaching material and the lecture material used is that it can meet the needs of students to understand atomic physics material. Besides, the illustration examples contained in the teaching materials can be used as a means to apply atomic physics in everyday life. Hydrogen is the element with the greatest abundance in the universe. For example, students can determine the hydrogen emission line spectrum wavelength in the visible area in the tutorial process. Teaching materials can explain Balmer's formula, $1/\lambda = R\ ((1/22)-(1/n2))$; n=3,4,5 …, based on the hydrogen atom's energy level through interactive videos. Attention is one of the psychological aspects a person has when he sees an object that he thinks is interesting (Erlina et al. 2018). Students will focus their attention if the tutorial used by the tutor is interesting or the media used makes it easier for students to understand the material. The results show that atomic physics teaching materials can focus students' attention on studying the material thoroughly. This is because in teaching materials, the material is explained thoroughly and the sentences used are easy to understand by students so that students feel that the teaching material can help them achieve their learning goals (Wechsler et al., 2018).

Besides, satisfaction is a feeling of pleasure or disappointment that a person has that appears after comparing the product's performance against the expected results. Students will feel satisfied if the tools or media they use in the tutorial can help them achieve competency goals. Student satisfaction because atomic physics teaching materials have illustrative examples that can help understand abstract material and assignments or

exercises that can encourage student self-directed learning activities. Combining illustration examples with the addition of assignments at the end of the tutorial makes students feel satisfied to use this teaching material in the tutorial. Using teaching materials that have been designed according to learning needs, students are directed to become active learners because they can read or study the material in teaching materials before participating in learning activities. Self-confidence is a positive attitude that an individual has to develop self-awareness, have independence, and have the ability to have everything he wants. Someone who already has a high sense of self-confidence can do something according to his mind. The results showed that the teaching materials are part of the tools that must be prepared by the tutor to teach the material to support the tutorial process (John, 2006). Natural physics teaching materials make students more confident in understanding atomic physics material and apply it in everyday life. This is because atomic physics teaching materials have been designed to meet the needs of UT students to improve their self-directed learning skills. Besides, this teaching material has also fulfilled one of the characteristics of the teaching material, namely adaptive, where the content in the teaching material is adjusted to the development of science and technology so that students who use the teaching material have high self-confidence to achieve their learning goals (Kent et al., 2016).

Based on the research results and discussion above, the study concludes about the practicality and effectiveness of atomic physics teaching materials to improve students' self-directed learning skills in the distance education system. The results of the practicality analysis, including student activity and feasibility, showed very good results. Constraints that arise in the presentation of the material are not comprehensive enough that the tutor explains the atomic physics in a structured manner. The analysis of the effectiveness, including the improvement of self-directed learning outcomes, showed that the average N-gain value was categorized as high. Besides, impact testing using the paired sample t-test 2-tailed showed a significant difference between each test class's pre-test and post-test scores. The consistency of the impact using the 2-tailed ANOVA showed no significant difference between all test classes. Student responses to atomic physics teaching materials showed the average results of responses and reactions were very agreeable.

LIMITATIONS AND RECOMMENDATIONS

This study has several limitations in implementing tutorials through blended learning before the covid 19 pandemics. Open and distance education students have distance learning activities based on heterogeneous characteristics of age, occupation, status, and place of residence without restrictions. Asynchronous activities provide opportunities for students to independently learn through the learning management system, printed, and e-book media. Some students still have difficulty understanding the objectives and concluding the tutorial material because asynchronous has a passive learning condition in social interaction. The face-to-face activity provides the advantage of actively supporting students' independent learning. These obstacles become recommendations on optimizing face-to-face activities to apply atomic physics teaching materials observed in the tutorials allowing students to interact with tutors through additional explanations, information, discussions, and doing assignments. Face-to-face activities in this study also support the weakness of student responses to the tutor's questions, initiation, and persistence. Nevertheless, technological assistance in online tutorials and face-to-face tutorials makes it easier for students to form their different abilities and understand students' characteristics and needs in online learning. This study provides recommendations for improving blended learning activities during the pandemic, namely applying andragogy models (conditions, interests, and past experiences) and online learning paths (learning, exploring, applying, connecting, evaluating).

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SOUTH KOREAN UNIVERSITY STUDENTS' VIEWS OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC

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ABSTRACT

The COVID-19 pandemic has created many formidable challenges for educational institutions around the world. This case study sought to gain insight into South Korean university students' satisfaction with online learning during the pandemic. It also obtained participant recommendations for improving online learning. Participants included 20 South Korean students studying at a university in central South Korea. Data included open-ended surveys, a focus group, and semi-structured interviews. Most students had mixed feelings in regard to satisfaction with online classes. A salient result is a need for more interaction in online classes. Students also provided a wide range of recommendations to improve online learning. Through these recommendations, university educators and administrators can better optimize online learning during the COVID-19 pandemic and after the crisis has dissipated.

Keywords: COVID-19, South Korean universities, student satisfaction, benefits of online learning, disadvantages of online learning.

INTRODUCTION

The COVID-19 pandemic has resulted in mass disruptions on a global scale and impacted many aspects of daily life, including educational systems. Nations around the world scrambled to quickly mitigate the impact that COVID-19 had on society and to reduce the number of infections and deaths. As a result of the crisis and apprehension about spreading the virus, many schools and universities around the world determined that online learning would be the best solution (UNESCO, 2020). The sudden spread of the coronavirus on a global scale left minimal time for administrators and educators to develop effective mitigation plans. Many universities were ill-prepared to deal with myriad challenges that arose during the transition to online learning platforms (Daniel, 2020).

At the beginning of the spring semester of 2020, which starts in early March for South Korean universities, administrators began determining the best course of action amidst the impending crisis (Bahk, 2020a). Many universities delayed the start of the semester, and some opted to have online classes for the entire spring term. Other universities took a more gradual approach by extending online learning for a limited period of time so that they could regularly assess the situation during the crisis. Public schools in South Korea also delayed the start of the semester and were instructed at the end of March to employ an online learning system for an indefinite period (Bahk, 2020a). As the semester progressed, some universities stayed online while others took on different approaches with a hybrid method being popular.

In South Korea, many university instructors struggled to utilize online learning platforms including learning management systems, video conferencing platforms, and instant messenger systems (Park, 2020). Moreover, some universities experienced technical challenges as programs ceased to work, servers crashed, and attendance tracking measures failed. University students also complained about the online lecturing systems, and some demanded at least partial tuition be reimbursed (Bahk, 2020c). The Association of Student Councils Network conducted a survey of 12,213 university students in late February, and 83.8% of participants stated that they should obtain a partial refund (as cited in Bahk, 2020c). Students indicated that they were not used to online learning systems and that more measures needed to be taken to assist students with disabilities (Bahk, 2020b). Additionally, students mentioned that certain practical and laboratory classes cannot be effectively offered online.

Regardless of any challenges that online learning presents, it is critical for universities to be proactive in reducing the spread of the novel coronavirus. Since the initial outbreaks, there have been new variants that have led to myriad obstacles (Bollinger & Ray, 2022). As of early 2022, the pandemic continues to present educational challenges and disruptions around the world (Khalil, Humayun, & Jhanjhi, 2021; Reimers, 2022). The future of the novel coronavirus is uncertain, and universities and other educational institutions must proactively implement measures to promote effective learning while protecting the general population. Moreover, online learning programs will likely continue to expand in the post-COVID-19 period. Data from this period can provide much-needed insight into online course development and modification.

PURPOSE OF THE STUDY

The first aim of this study was to gain insight into how South Korean university students describe their satisfaction with online learning during the COVID-19 pandemic and the second was to obtain input from South Korean university students to improve online classes. Although preliminary data has been released in the media (e.g. Bahk, 2020c) on students' opinions of university and governmental educational response to the COVID-19 pandemic, at the time of data collection, there was a dearth of scholarly research related to student satisfaction with online learning in the South Korean university context as a result of the pandemic. At the time of this writing, there are still limited publications, especially qualitative, that examine South Korean university students' satisfaction with online classes during the pandemic. Furthermore, technology and online learning platforms are constantly evolving, thus necessitating up-to-date research. Universities and individual instructors have also taken different approaches to online learning making it important to examine students' satisfaction with these diverse methods. The following research questions were used to guide the study:

1. How do South Korean university students describe their satisfaction with online learning in light of the COVID-19 pandemic?
2. What recommendations do South Korean university students have to improve online learning during the COVID-19 pandemic?

LITERATURE REVIEW

Student Satisfaction

Satisfaction is a feeling or sense of having needs or desires fulfilled (Saif, 2014). Universities often implement evaluative measures to ensure that student satisfaction is achieved (DeShields Jr. et al., 2005). At the

tertiary level, student satisfaction encompasses a wide range of dimensions. From an academic perspective, satisfaction can be achieved through positive university experiences and superior services and amenities (Weerasinghe et al., 2017). Appleton-Knapp and Krentler (2006) discuss the specific role of personal and institutional factors in promoting student satisfaction. Personal factors include demographics, employment background, preferred learning styles, and student grades. Institutional factors comprise instructional quality, perceptions of feedback, attaining academic goals and objectives, and suitable teaching styles. Wilkins and Balakrishnan (2013) provide a thorough list of criteria that influence student satisfaction including the quality of educators, university facilities, technology integration in the classroom, feedback quality, learning resource availability, library services and resources, and student-instructor relationships. Numerous other factors also influence student satisfaction including having ample opportunities for student development, the climate of the campus, teaching methodology, and having flexible academic programs and courses that meet the needs of diverse students (Douglas et al., 2006).

Online Learning Challenges

Although online learning has played a major role in many universities around the world over the last few decades, many were not adequately prepared to deal with the challenges of online learning that arose as a result of the COVID-19 pandemic (Bahk, 2020b). Even in the best of circumstances, online learning can present myriad challenges, but having to quickly implement an online learning system during the pandemic was especially problematic for many universities. Prior to the pandemic, there were numerous studies (e.g. Halim & Hashim 2019; Varshneya, 2017) conducted on the challenges and limitations of online learning. These barriers may likely have been exacerbated during the pandemic since some instructors had no experience or limited experience teaching online, and many students were also unfamiliar with online learning platforms and expectations.

Research has highlighted primary deficits of online learning, which makes it imperative for educators and administrators to examine the literature already available to reduce problems that are likely to occur. Online activities can result in students becoming distracted, resulting in less interest or focus on the class lesson (Melor et al., 2012). Technical issues can be particularly cumbersome in online learning environments (Halim & Hashim, 2019). Furthermore, students have different learning styles and needs, which can also create a dilemma in online learning since many activities and lessons use a one size fits all approach (Gillett-Swan, 2017). In addition, Gillett-Swan (2017) stresses that there may be an increased workload for instructors, especially for those who are not accustomed to online teaching. In the nascent stages of online learning, many students and faculty members were not familiar with the online learning platforms, which aligns with pre-COVID-19 research that discusses a wide array of technical issues that obstruct online learning (e. g. Varshneya, 2017). There are certainly other factors that impact the success of online learning, and student satisfaction can be hampered if course objectives and goals are not met. A significant shortfall of online learning is the elimination of authentic face-to-face interaction, which is present in traditional classrooms (Akkoyunlu & Soylu, 2006). Some universities may have had fewer challenges in implementing an online learning system since they already had online, blended/hybrid, or flipped learning classes in place.

Benefits of Online Learning

There are various studies (e.g. Daniel et al., 2016; Roach & Lemasters, 2006; Strong et al., 2012) that have reported the benefits of online learning. Online learning is certainly not without its challenges, but research also clearly highlights numerous benefits including more diverse communication options, allowing learners to work at their own pace, and providing access to online tools and resources to aid in academic achievement (Lu & Chiou, 2010). Additionally, it provides opportunities for group work and can be a more flexible way of studying, particularly for people with substantial family or work responsibilities. The wide range of benefits includes potential improvements in pedagogy, instruction, and curriculum design (Wang & Vasquez, 2012). Online learning also affords more versatility in allowing students and faculty the ability to learn at any time and location (Varshneya, 2017). Moreover, students can have greater opportunities to communicate and engage with classmates and build self-confidence (Halim & Hashim, 2019). Implementing a wide range

of activities that use various forms of multimedia can increase satisfaction and improve the overall learning experience online (Pazilah et al., 2019). Online learning programs can also be cost-effective for universities; nevertheless, educators and administrators must ensure that the courses are rigorous and fulfill academic objectives and goals.

Through online teaching, instructors can also more carefully foster a learning environment that meets the specific needs of diverse learners (Pourhossein Gilakjani, 2014). The younger generation is known for being more technologically proficient, and online learning can provide several benefits for academic development (Melor et al., 2012). Online learning presents opportunities for faculty and students alike. Certainly, many challenges need to be addressed, and technology is not without faults. However, online learning affords many educational benefits, and during a major local, national, or international crisis, universities may need to turn to online learning to ensure that students are fulfilling their academic goals. In addition, during a crisis, students may need to take on additional family or work-related responsibilities that they may not normally have. Asynchronous learning activities in particular can be beneficial for learners to complete at their own pace without having to worry about time restrictions.

Online Learning Satisfaction

In pre-COVID 19 studies in South Korea, students reported benefits of online learning in terms of cost, saving time, and improved learning benefits (Hwang et al., 2010). A study by Han et al. (2013) found that South Korean university students' satisfaction with online learning was average but not high. However, more recent, nationwide data is critical for assessing the overall state of online learning, especially during the pandemic since online learning was the norm in most South Korean universities. Early data obtained in March and April of 2020 (e.g. Bahk, 2020b; Bahk, 2020c) indicate difficulty with ensuring adequate student satisfaction for many South Korean universities since complaints were continuously mounting early in the spring semester. Universities had to quickly develop online learning programs, make adaptations as needed, and obtain faculty and student feedback to promote a quality learning environment for the entire duration of the semester.

Studies have been conducted on online learning satisfaction during the COVID-19 pandemic. Lederman (2020) found that the number of students (n=1000) highly satisfied with online learning decreased significantly from 51% prior to COVID to 19% during the pandemic. Additionally, three-fifths of teachers reported having challenges with student interaction in online courses during the pandemic. Early pandemic research has indicated that the success and effectiveness of online learning depend heavily on course content and design as well as engagement between students and instructors (Demuyakor, 2020). Furthermore, although many students are supportive of online learning, some have had technical difficulties that inhibited successful learning. Another major problem that has emerged is that many instructors do not have online teaching experience (Author citation; Bao, 2020). Instructors play a significant role in ensuring student satisfaction and quality learning through active discussions with students, focusing on the needs of learners, and creating effective assignments (Bao, 2020). A study at an Indian university found that online learning was viewed unfavorably in comparison to face-to-face classes, especially when examining interaction, presence, quality, and general satisfaction (Nambiar, 2020). In a large-scale study conducted with 30,383 students in 62 studies, results indicate that students are most satisfied with instructor support and universities' public relations (Aristovnik et al., 2020). However, there are issues that negatively impact satisfaction including students' professional and academic plans as well as "boredom, anxiety, and frustration" (Aristovnik et al., 2020, p. 1). Examining factors pertaining to student satisfaction in online courses during the COVID-19 pandemic is essential for ensuring students' academic needs are met.

In South Korea, studies have emerged during the COVID-19 pandemic that examine student satisfaction in online classes. Choi, Kim, and Robb (2020) found that in online classes focused on tourism and hospitality, satisfaction was improved through better relationships between students and instructors. Additionally, having more diversity in course activities and lessons is crucial for student satisfaction. Babar (2020) examined satisfaction among South Korean undergraduate students and found that most students had taken online classes for the first time and that student satisfaction was largely determined by interaction,

student motivation, the structure of the course, and instructor assistance and knowledge. A study by Lee (2020) found that higher interaction, including both student and instructor presence, in online classes led to increased student satisfaction in online classes for dental hygiene students. A study conducted in late 2020 found that South Korean university students (n=313) who are satisfied with online learning and find it to be useful also report a stronger acceptance of technology (Han & Sa, 2021). Another South Korean study conducted in May and June of 2021 reported that professor rapport and having sufficient support in place improves students' (n=207) satisfaction in online classes. A study by Jung and Shin (2021) found that the platform quality, course content quality, and delivery quality had a positive impact on students' (n=182) satisfaction in online classes in South Korea. Results provide much-needed insight into deficits and strengths that should be considered when developing online learning courses. These studies will also be beneficial in the post-pandemic period when educators and administrators determine how to implement or modify online or blended learning courses.

METHOD

This case study was conducted at a mid-sized university in central South Korea during the spring semester of 2020 when the COVID-19 was starting to spread rapidly. A case study is a qualitative approach that seeks to address a problem in a single setting (Creswell, 2007). Case studies comprise varying forms of data including interviews, focus groups, observations, and records (Yin, 2003). Participants in this study included 20 South Korean university students who were majoring in English language and literature. Participants were obtained through convenience and purposive sampling. Prior to the pandemic, the university offered online classes that students could take as electives, but these classes were not considered the norm. Face-to-face classes had been the dominant form of education in the pre-COVID period. During the spring semester of 2020, most of the courses at the university were conducted through WebEx, since it was available for free. Some instructors used the Zoom teleconferencing program to conduct classes but paid for the subscription. At the beginning of the semester, instructors were authorized to upload video lessons, but as the semester progressed, live classes were required. The researchers have expertise in educational technology and have been researching this field prior to the pandemic. They also have extensive experience teaching at the university level.

Due to the need for social distancing, the data were collected online and over the telephone. First, 20 students (11 males and 9 females) completed an open-ended survey (See Appendix A) through the university learning management system. These questions pertained to students' satisfaction with online learning. The questions also sought to obtain recommendations to improve online learning. A focus group was conducted with participants to further expand on these responses and gain more insight into the participants' views. The focus group was conducted through the Zoom teleconferencing program and lasted about 25 minutes. The session was longer, but part of the time was spent asking questions that were not directly related to the research. There were six participants (4 males and 2 females) who were obtained through purposive and convenience sampling. Zoom has been evaluated as a tool for conducting qualitative and mixed-method research studies. Archibald et al. (2019) found that Zoom research study participants were highly satisfied with their interview experience, and only a few had technical problems. Semi-structured interviews were conducted over the telephone with nine students (7 males and 2 females). Interviews averaged between 10 and 15 minutes. These interviews expanded on responses in the open-ended survey. Participants were assigned pseudonyms to protect their identities.

Case studies provide "description, analysis, and naturalistic summaries" of primary themes that emerged from the case (McMillan & Schumacher, 2006, p. 382). The researchers examined common themes that surfaced from the open-ended survey, focus group, and semi-structured telephone interviews. They sought to gain a more holistic view of the case by examining patterns, categorizing major topics, statements, and quotations that were extrapolated from the data. Finally, the researchers developed specific codes based on the dominant themes. Codes were checked for duplication, and member checking was conducted with three (Mirae, Jihee, and Kangmin) of the more vocal participants.

FINDINGS

Examining Satisfaction: Students' Views of Online Learning

Balanced Views

In terms of satisfaction, students had balanced views of online education, reporting moderate satisfaction toward online learning. Most students (n=16) provided mixed responses regarding their satisfaction with online learning. They discussed their frustrations with online classes but also understand the need for and benefits of online classes. None of the participants were completely satisfied with online learning. Various examples are provided, which highlight some of the benefits and disadvantages of online learning. Furthermore, in the open-ended survey, students indicated that they had a moderate amount of satisfaction toward online learning. Students provided detailed responses regarding their mixed feelings toward online learning. Jiyoo stated, *"I'm worried because I'm not used to online classes, but I think this is the best way to do it right now."* Siwoo had varying views and used the words *"ashamed," "nervous," and "excited"* to describe his feelings about online learning. He felt a little worried about interacting with people online but was excited about this new experience. Seoyun said, *"Although online classes are convenient because I commute to school, online classes feel completely different from learning in person."* Another example discussed by Hajoon is,

> *There are obvious merits of online learning. We don't have to go to class, and we can take a class anytime. Nonetheless, I prefer offline classes. We are not familiar with online classes. Only some professors are familiar with it, which makes it hard to enjoy it.*

Chulsu provided a more detailed response on the pros and cons of online learning. He stated that he feels very uncomfortable with online learning, but there are certain advantages, too. He expanded on this:

> *It requires much more focus to listen to the professors' lectures. But there are some comfort points. Because I don't have to prepare to go to school, and I just have to turn on my laptop in the morning. This is convenient, but online lectures are more inconvenient for me overall. I'm kind of tired from being at home all day too. It is a little depressing.*

Other problems mentioned include the embarrassment of showing faces on webcams (n=4), feeling awkward studying online (n=3), requiring synchronous lessons (n=3), and having various technical issues with the learning management system and video conferencing programs (n=6). Benefits of online learning discussed include saving time (n=6), general convenience (n=10), and reducing the spread of the coronavirus (n=8). In terms of satisfaction with online learning, there were mixed results, which centered on both pros and cons of the online learning experience.

Inferior Education

Three students discussed the inferiority of online education, which negatively impacted their satisfaction with online learning. Seunghyeon expressed disappointment about online education. He said, *"Because I really love having a real class, I felt really disappointed when I got a message from the university."* He also stated that there is plenty of information that he can learn online for free. *"I am attending university to experience reality. If I want to get a piece of information online, I can just watch YouTube videos."* Mirae understands the need for online classes but says that there should be some type of quality control, especially if tuition is not reduced. She emphasized that *"Korean students and professors are not very familiar with the system and the fact that the system hasn't been tested and proven yet, might cause lower quality of class with less productivity."* Sooah reiterated this by stating that online lectures are a good idea as long as assignments and assessments are consistent with face-to-face classes, but she was worried about the quality. Although this was not a dominant theme, several students (n=3) felt that online learning was lacking in terms of quality; furthermore, students (n=2) stated that there were major gaps in terms of preparation and quality in their online classes with some classes being more engaging and effective than others.

Communication Barriers

Five students discussed communication barriers in the online classroom, leading to a reduction in their satisfaction in the online classroom setting. Kangmin said it is very difficult to have communication in

online classes, but he understands the necessity of online learning. Deoksu also discussed his disinterest in online classes because of a lack of face-to-face communication. He mentioned that he cannot concentrate well in class. These thoughts were also shared by Jaeseop who wants to have real communication since he is majoring in English, and using a webcam is not practical. Some students' perceptions were more negative. For example, Jinho emphasized that he is incredibly bored because he just sits in front of the computer all day and does not communicate with people in real life. Jihoon expressed similar views by discussing the benefits of having better communication on campus, but he likes the convenience of studying at home. These students missed the real-life interactions that they were accustomed to in face-to-face classes. Furthermore, as English majors they expected more chances to engage in authentic conversations and activities with their peers and instructors.

Negative Views

Four respondents (Deoksu, Jaeseop, Jinho, and Seunghyeon) only discussed negative views and were not satisfied with online learning citing various reasons including boredom, communication issues, lack of realistic learning, reduced quality, and having less focus in online lectures. For example, Deoksu stated,

> *I feel so bored being at home all day and logging into my lectures. I really miss being on campus and interacting with professors and students face to face. I feel like I am wasting my money. Some professors' classes are much better than others, especially with live classes. Just making videos is not real teaching though.*

Jinho stated that online classes are not very interactive and he can easily learn from free online videos. He was disappointed that some professors seemed to do a minimal amount of work and did not take the time to get input from students. Jaeseop and Seunghyeon provided similar examples about the frustrations that they had with online learning. Although the majority of participants had mixed views of online learning, four were not pleased with the online learning environment and only discussed negative points about the experience.

Improving Online Learning

Students provided several recommendations for improving online classes during the COVID-19 pandemic. An emphasis was placed on the importance of live learning as well as interaction and ensuring that professors and universities are fully prepared. Sooah stated that universities should *"proceed with online lectures in real-time through remote learning programs."* She expanded on this by saying, *"Online classes are a burden to both professors and students. Professors should spend more time preparing the class. The students can't feel the heat of the real classes, so students can feel bored."*

Other examples reiterated the need for real-time lectures. Mirae stated,

> *I think some professors are working really hard to improve classes, but some are still doing the same things that are frustrating to students. Having real-time lectures using Zoom is more beneficial than Webex lectures. In Zoom, we can have breakout room discussions. Most professors are not using Zoom though.*

Jihee said that simply lecturing is not an effective way to learn. She emphasized that:

> *In regular classes on campus, students get bored by listening to long lectures. These long lectures are also boring online. When students watch pre-recorded lectures, they often just let the video play to show that they watched the lecture. Most students are not even really listening to the lectures. Having some type of authentic real-time interaction is important.*

Other examples were discussed by students. Kangmin mentioned that some students feel like professors are giving too many assignments to compensate for the lack of face-to-face instruction, which is particularly burdensome. He also mentioned spending more time on online class assignments in comparison to face-to-face classes. Areum stated, *"I think we should always be prepared for this situation (a crisis). Our university is not used to online lectures because this happened for the first time. I think it is a good way to prepare for this opportunity."* It is vital for universities to have effective mitigation plans in place to deal with potential crises and to implement more effective online learning programs in future semesters if needed. Students provided

a wide range of practical methods for improving online instruction including requiring real-time classes (n=9), using Zoom instead of WebEx since breakout rooms could be used (n=3), having more virtual office hours for problems (n=2), and improving technical support (n=4). The most salient result was the need for real-time lectures that foster a sense of community and engagement. However, three students stated that synchronous lessons were a burden.

DISCUSSION

Online learning programs were quickly implemented at many universities around the world as a result of the COVID-19 pandemic. Unfortunately, some universities were not adequately prepared for the challenges that quickly surfaced. Research question one aimed to examine how South Korean university students describe their views of online learning as a result of the COVID-19 pandemic. Most students (n=16) had balanced views about online classes, expressing a moderate amount of satisfaction with online classes. There was a wide range of balanced views that highlighted both pros and cons of online learning. The responses included some of the same concepts that were addressed in the literature on the benefits and disadvantages of online learning. These mixed responses largely align with recent COVID-19 era studies, which have reported both positive and negative factors that impact student satisfaction in online classes.

Some of the negative points about online learning included having to use webcams, feeling awkward, requiring synchronous lessons, and having technical problems. Students also discussed the inferiority of online learning and communication barriers. Four students only mentioned negative points and highlighted boredom, communication problems, a lack of realistic learning, reduced quality, and having problems focusing during class. Some of these problems have been addressed in germane studies on the challenges of online learning. Melor et al. (2012) found that online activities can result in student distraction. Varshneya (2017) examined the barriers of technological problems in online education. In a COVID-19 era study, Demuyakor (2020) discussed technical issues that impacted student learning. These problems may have been a more significant problem earlier in the semester, especially for students who were not familiar with online learning. Since this study was conducted early in the semester, and many of the students may not have been familiar with online learning, students may have reported more negative views. In the early stages of the COVID-19 educational response, many challenges and barriers were expected (Lederman, 2020). Nevertheless, it is vital for universities to prepare for a better outcome and try to proactively address potential problems early on.

Positive aspects discussed by the students (n=16) with balanced views include saving time, convenience, and reducing the spread of coronavirus. With the exception of the latter point, these benefits have been thoroughly documented in research (e.g. Lu & Chiou, 2010; Varshneya, 2017). The flexibility of online learning gives students the opportunity to study in various locations and at their own time, especially with asynchronous activities. Daniel (2020) states that having asynchronous activities gives students and instructors more flexibility. At the beginning of the semester, the university did not require live classes, but this policy changed. This can be viewed as a pro or con depending on individual perspectives. Having live classes provided some benefits and may have made the classroom environment seem more authentic; however, it may have been burdensome for both students and teachers who would prefer more flexibility. Prior to the COVID-19 pandemic, some online classes only consisted of asynchronous activities and did not require live interaction. There are a wide array of other benefits addressed in the literature that were not discussed by the students including diversity in pedagogy, curriculum, and activities, access to a greater range of resources, having a greater focus on diverse learning styles, and providing a greater range of communication tools (e.g. Daniel et al., 2016; Halim & Hashim 2019; Lu & Chiou, 2010). Examining the students' perceptions as the semester progresses or at the end of the semester may result in additional responses; conversely, students may identify additional weaknesses after having more exposure to online learning.

Akkoyunlu and Soylu (2006) discussed the lack of face-to-face interaction in online learning that can inhibit student satisfaction. A dominant theme in COVID-19 studies that examined student satisfaction is the importance of interaction and presence (e.g. Aristovnik et al., 2020; Bao, 2020; Demuyakor, 2020). Studies (e.g. Babar, 2020; Choi et al., 2020; Lee, 2020) in the South Korean context also highlighted the need for interaction for improving student satisfaction. This was a major limitation of online learning mentioned by

students in the study who wanted more authentic communication opportunities. There was also concern about being able to focus. This is documented in Melor et al.'s (2012) research, which found that students lose interest in online classes and may have difficulties following online lessons. Another South Korean study conducted in May and June of 2021 reported that professor rapport and having sufficient support in place improves students' (n=207) satisfaction in online classes. Although this study did not specifically examine rapport nor did this emerge directly in the results, students did highlight the importance of interaction in the online setting. Shin (2021) found that learning platform, course content quality, and delivery quality all played a critical role in students' satisfaction. In this study, students provided insight into their experiences with online learning, which includes examples related to delivery, content, and involvement.

Aristovnik et al's (2020) study during the COVID-19 era indicated that boredom and frustration can lead to problems with student satisfaction. Some of these experiences and concerns relate to the preliminary data released in the media that highlighted varying issues that impacted student satisfaction (Bahk, 2020c), but initial data tended to highlight technical problems whereas participants in this study emphasized a larger range of problems. Examples of boredom and frustration were discussed including having to watch videos instead of participating in live lectures and not having enough interaction. This could be attributed to having already experienced several weeks of online learning and that most of the technical issues or glitches had already been resolved. The future is unknown and the pandemic will likely continue to impact education systems across the world. Educators should aim to implement best practices in online education to foster a supportive and engaging learning environment that is centered on student needs.

Students reported mixed views in terms of satisfaction with online learning. To improve the deficits, it is critical for educators and administrators to regularly seek input from students to ensure academic achievement and student satisfaction. According to Daniel (2020), universities will continuously learn from this period and should determine which aspects of e-learning have been most beneficial. Educators need to provide quality feedback, ample learning resources, and strive to improve relationships with students (Wilkins & Balakrishnan, 2013). Educators and administrators should focus on an effective holistic approach to online learning that promotes student satisfaction through quality content, delivery, and interaction.

CONCLUSION

As a result of the COVID-19 crisis, many universities scrambled to put together an online learning plan in a short period of time. Students had a moderate level of satisfaction in terms of online learning. Ideally, in future classes that are conducted online, instructors and administrators will examine the deficits of previous semesters that need to be addressed to ensure student satisfaction and that learning objectives are being met. Furthermore, students provided several practical recommendations for improving online learning that can be implemented in future classes during the pandemic and even during normal circumstances. It is critical that institutions proactively implement measures to prepare for potential crises that may occur (de Geus, 1988). According to Rieley (1997), "We need to change our mental models of what is and what is not; we need to learn how to better plan for the future; we need to understand what our futures might be" (p. 1). There are various scenarios that universities need to prepare for, and traditional forms of education may not be effective in future crises. Even prior to the pandemic, online learning was becoming more normalized in many parts of the world. Universities can use the research from this period to strengthen post-COVID-19 online and hybrid learning courses.

There are a wide range of practical implications that educators and administrators can consider when designing and adapting online courses. The future of COVID-19 impact is unpredictable, and it is likely that many universities will continue with online or hybrid classes in the future. It is critical for educational institutions to examine the scholarly literature available to determine the best course of action for future classes. Student satisfaction is paramount in designing and delivering online courses. This study provides insight into South Korean students' perceptions of online learning during the COVID-19 pandemic and includes practical recommendations for improvements that can easily be made without significant adjustments. A dominant factor emphasized by students is the need for adequate interaction in online classes. Examining effective ways to improve online interaction is critical, especially in classes that focus heavily on communication.

Prior to the pandemic, online learning was gaining traction, but through the pandemic and the forced transition to online learning, myriad studies have been published on online learning. Educators, administrators, and stakeholders should begin to synthesize this recent data and best determine how to use the information gleaned to make more informed data-driven decisions to positively impact technology integration in schools. In analyzing the data, it is critical to examine the timing of data collection, setting, context, the background of students and instructors, course content, and other significant factors when making important decisions related to technology use in the classroom.

This study was limited to one university in South Korea. It would have been beneficial to examine students' perceptions at other universities. However, due to the timely nature of this study, it was essential to gather data quickly. This study was also limited to students majoring in the English language. Although they took classes outside of the department, their experiences and perceptions may be limited to mostly English department classes. Additionally, students may have been inclined to discuss what they deemed as socially acceptable answers, which may not have aligned with their actual views. It would have also been beneficial to gather data from other classes at the university or other universities in South Korea. Future research can examine more specific components of online learning. This study was conducted in the early stages of the pandemic, and gaining more insight into specific aspects of remote learning would be beneficial. A dominant theme in this study was the importance of interaction. Future studies can examine interaction at the student-student level and student-faculty level using various online learning management systems and videoconferencing platforms.

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APPENDIX A

Open-Ended Survey Questions

Note: These questions were expanded on during the focus group and semi-structured telephone interviews.

1. How do you feel about your online learning experience?
2. How satisfied are you with online learning?
3. How satisfied are you with course interaction in your online classes?
4. How satisfied are you with course content in your online classes?
5. How satisfied are you with course delivery in your online classes?
6. How satisfied are you with your overall learning experiences in online classes?
7. Based on your experiences, what have been some benefits of online learning?
8. Based on your experiences, what have been some disadvantages of online learning?
9. What recommendations do you have to improve online learning?
10. Do you have any other thoughts you want to share related to your online learning experience?

USE OF FLIPPED CLASSROOM IN THE TEACHING-LEARNING PROCESS ON DESCRIPTIVE STATISTICS

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ABSTRACT

Educational institutions seek to transform the teaching-learning conditions through the use of new pedagogical and technological models. The aim of this quantitative research is to analyze the use of flipped classroom in the teaching-learning process on descriptive statistics through data science. The participants are 49 students who took the Basic Statistics course during the 2017 school year. This study used a single group quasi-experiment to examine the research hypotheses about Flipped classroom. In the Basic Statistics course, the students have difficulties to assimilate the knowledge about mean, mode, median, range and quartiles. Therefore, this research proposes the consultation of YouTube videos before the class, use of the Mathportal application collaboratively during the class and use of the Mathportal application individually after the class. The Mathportal application is a web tool that allows checking the results of the exercises on the mean, mode, median, range and quartiles at any time. The results of machine learning (linear regression) indicate that flipped classroom positively influences the teaching-learning process on descriptive statistics. On the other hand, data science allows the identification of 3 predictive models about the consultation of the YouTube videos and use of the Mathportal application through the decision tree technique. This research recommends the use of the Mathportal application for the teaching-learning process on statistics. Even, this web application can be used in the courses of differential calculus, geometry, algebra and financial mathematics. The implications of this research are the transformation of the educational context through the use of flipped classroom and incorporation of technological tools before, during and after the face-to-face classes. Finally, flipped classroom is a pedagogical model that is transforming the organization and implementation of school activities through the use of technology inside and outside the classroom.

Keywords: Flipped classroom, higher education, data science, machine learning.

INTRODUCTION

Today, technological advances are causing that educational institutions organize and implement new pedagogical models during the planning and implementation of school activities (Colomo-Magana et al., 2021; Li, 2018; Wenming & Erwen, 2018). In particular, the use of flipped classroom is growing at all educational levels (Adam et al., 2017; Awidi & Paynter, 2019; Yang, Sun & Liu, 2017).

Flipped classroom modifies the functions, behaviors and roles of students during the teaching-learning process and facilitates the organization of new school activities inside and outside the classroom (Cabero-Almenara et al., 2021; Goedhart et al., 2019; Jeong, Kim, & Kang, 2018). Before the class, students review digital resources such as audiovisual content, digital readings, presentations and online exams (Awidi & Paynter, 2019; Ozer, Kanbul, & Ozdamli, 2018). In the face-to-face sessions, students acquire a main role in the learning process through the realization of collaborative activities and discussion forums (Liu, 2019; Wittich et al., 2018).

Audiovisual content, educational platforms, web applications and technological tools are used during the implementation of flipped classroom in order to improve the teaching-learning conditions (Bonnes et al., 2017;

Chokshi et al., 2017; Ji & Han, 2019). In fact, this pedagogical model improved the academic performance of students in the courses of chemistry, humanities, medicine and health (Yang, Sun, & Liu, 2017).

Flipped classroom allows that teachers innovate the school activities through the incorporation of Information and Communication Technologies (ICTs) in the activities before, during and after the face-to-face sessions (Akcayir & Akcayir, 2018; Villalba, Castilla, & Redondo, 2018; Zhu & Xie, 2018).

In mathematics and statistics courses, teachers look for new pedagogical and technological models that improve the learning process because students have difficulties to assimilate the knowledge, understand the topics, and develop their skills. For this reason, this quantitative research proposes the use of flipped classroom in the teaching-learning process on descriptive statistics through the consultation of YouTube videos before the class, use of the Mathportal application collaboratively during the class and use of the Mathportal application individually after the class. The research questions are:

- What is the perception of the students about the consultation of the YouTube videos before the face-to-face sessions and use of the Mathportal application during and after the classes about descriptive statistics?
- What are the predictive models about the use of flipped classroom in the teaching-learning process about descriptive statistics?

FLIPPED CLASSROOM

Flipped classroom is a pedagogical model that uses technology to modify the organization and performance of school activities before, during and after the face-to-face sessions (Bonnes et al., 2017; Chokshi et al., 2017; Hughes, 2019). For example, students consult videos and digital readings at home and use technological tools inside and outside the classroom (Cabero-Almenara et al., 2021; Tokmak, Yakin, & Dogusoy, 2019; Tiejun, 2017).

The benefits of flipped classroom are the active role of students, construction of new educational spaces and realization of creative activities during the teaching-learning process through ICTs (He, Holton, & Farkas, 2018; Villalba, Castilla, & Redondo, 2018). In particular, this pedagogical model facilitates the interaction and communication between teachers and students through educational web platforms (Liu, 2019; Wenming & Erwen, 2018). Even, the use of flipped classroom in the educational field improves the academic performance, develops the skills and increases the motivation of students (Akcayir & Akcayir, 2018; Santikarn & Wichadee, 2018; Yu, 2019).

Various authors (e.g., Liu, 2019; Santikarn & Wichadee, 2018; Tiejun, 2017; Wenming & Erwen, 2018) used flipped classroom in order to improve the teaching-learning process and build new educational spaces. In fact, this pedagogical model facilitated the active participation of students in the courses of English Language (Santikarn & Wichadee, 2018; Wenming & Erwen, 2018), History of Modern Design (Tiejun, 2017) and House Architectural Design (Liu, 2019).

In the English Language course, Wenming and Erwen (2018) propose the use of audiovisual content and digital readings before the face-to-face sessions, incorporation of discussion forums in the classroom and realization of activities in the educational platform after the class. Similarly, Santikarn and Wichadee (2018) implemented flipped classroom in the English Language course to improve the academic performance of the students by consulting the videos before the class and holding the discussion forums in the classroom.

Technological advances such as Learning Management System (LMS) allow the performance of the school activities at any time (Annamalai et al., 2021; Bonnes et al., 2017; Tiejun, 2017). In the History of Modern Design course, the Edmodo web platform facilitated the participation of the students before, during and after the face-to-face sessions (Tiejun, 2017). Also, the results of flipped classroom are the increase of the academic performance and active role of students during the learning process (Tiejun, 2017).

Flipped classroom allows that teachers organize new student-centered activities (Adam et al., 2017; Chokshi et al., 2017; Liu, 2019). In the House Architectural Design course, the students acquired an active role by consulting the videos, taking the online questionnaires and using the technological tools inside and outside the classroom (Liu, 2019).

Finally, flipped classroom increases the interaction between the teacher and students, facilitates the understanding of the topics and encourages the critical thinking during the learning process (Adam et al., 2017; Bonnes et al., 2017; Shaykina & Minin, 2018). In fact, this pedagogical model allows improving the educational quality through the incorporation of ICTs in the school activities (Liu, 2019; Lo & Hwang, 2018).

METHOD

The particular aims of this quantitative research are (1) analyze the impact of the YouTube videos before the class about descriptive statistics (2) analyze the impact of the Mathportal application during the class about descriptive statistics (3) analyze the impact of the Mathportal application after the class about descriptive statistics and (4) identify the predictive models about the use of flipped classroom through the decision tree technique.

The Mathportal application is a web tool that allows checking the results of the exercises on the mean, mode, median, range and quartiles at any time. This web application is free and available at: https://www.mathportal.org/calculators/statistics-calculator/descriptive-statistics-calculator.php

Participants

The participants are 49 students (27 men and 22 women) that took the Basic Statistics course during the 2017 school year. The average age of these participants is 20.12 years old. This study used a single group quasi-experiment to examine the research hypotheses about Flipped classroom.

Procedure

The procedure began with the analysis of the educational context (See Table 1). In the Basic Statistics course, the students have difficulties to assimilate the knowledge about mean, mode, median, range and quartiles. Therefore, this research proposes the consultation of YouTube videos before the class, use of the Mathportal application collaboratively during the class and use of the Mathportal application individually after the class.

Table 1. Educational context.

No.	Stage	Aspect	Description
1	Analysis	Problem	The students of the Basic Statistics course have difficulties to assimilate the knowledge, understand the topics, and develop their skills
		Characteristics of students	The participants studied the careers of Administration, Commerce and Marketing during the 2017 school year
		Course	Basic Statistics (second semester)
2	Design	Learning objectives	Remember, explain, understand and use of the mean
			Remember, explain, understand and use of the mode
			Remember, explain, understand and use of the median
			Remember, explain, understand and use of the range
			Remember, explain, understand and use of the quartiles
		Incorporation of technology	The YouTube videos about descriptive statistics and Mathportal application
3	Development	Flipped classroom	Before the class, the students consulted the YouTube videos about descriptive statistics
			During the class, the students used the Mathportal application collaboratively
			After the class, the students used the Mathportal application individually
4	Implementation	Unit	Descriptive Statistical (3 face-to-face sessions)
		Duration	Each face-to-face session lasted 90 minutes

The use of flipped classroom in the Basic Statistics course transformed the functions of the students before, during and after the face-to-face sessions (See Table 2).

Table 2. Activities of flipped classroom.

No.	Objective	Before the class	During the class	After the class
1	Remember, explain, understand and use the topics about the media and mode	Individually, the student consulted the videos about the media and mode	Collaboratively, the students solved the exercises about the mean and mode. Later, the students used the Mathportal application to check the results	Individually, the student solved the exercises about the mean and mode. Subsequently, the student used the Mathportal application to check the results
2	Remember, explain, understand and use the topics about the median and range	Individually, the student consulted the videos about the median and range	Collaboratively, the students solved the exercises about the median and range. Later, the students used the Mathportal application to check the results	Individually, the student solved the exercises about the median and range. Subsequently, the student used the Mathportal application to check the results
3	Remember, explain, understand and use the topics about the quartiles	Individually, the student consulted the videos about the quartiles	Collaboratively, the students solved the exercises about the quartiles. Later, the students used the Mathportal application to check the results	Individually, the student solved the exercises about the quartiles. Subsequently, the student used the Mathportal application to check the results

Flipped classroom proposes the use of technology at home in order to acquire the knowledge (Bonnes et al., 2017; Chokshi et al., 2017; Wittich et al., 2018). Therefore, the hypothesis about the use of flipped classroom before the face-to-face sessions is:

- Hypothesis 1 (H1): The consultation of the YouTube videos before the class positively influences the teaching-learning process on descriptive statistics

Teachers use flipped classroom in the classroom to build new learning spaces (Liu, 2019; Lockman, Haines, & McPherson, 2017; Santikarn & Wichadee, 2018). Therefore, the hypothesis about the use of flipped classroom during the face-to-face sessions is:

- Hypothesis 2 (H2): The use of the Mathportal application collaboratively during the class positively influences the teaching-learning process on descriptive statistics

Flipped classroom allows transforming the functions of students outside the classroom (Adam et al., 2017; Bonnes et al., 2017; Lockman, Haines, & McPherson, 2017). Therefore, the hypothesis about the use of flipped classroom after the face-to-face sessions is:

- Hypothesis 3 (H3): The use of the Mathportal application individually after the class positively influences the teaching-learning process on descriptive statistics

Likewise, the predictive models about the use of flipped classroom in the field of statistics are:

- Predictive Model 1 (PM1) about the consultation of the YouTube videos before the class and teaching-learning process on descriptive statistics
- Predictive Model 2 (PM2) about the use of the Mathportal application collaboratively during the class and teaching-learning process on descriptive statistics
- Predictive Model 3 (PM3) about the use of the Mathportal application individually after the class and teaching-learning process on descriptive statistics

Data Analysis

Various authors (e.g., Salas-Rueda, 2021; Salas-Rueda et al., 2022) have used data science to understand the use of technological tools in the educational field. For example, the RapidMiner tool allowed calculating the linear regressions (machine learning) to evaluate the research hypotheses through the training section (70%, 80% and 90% of the sample). The evaluation section (30%, 20% and 10% of the sample) allowed identifying the accuracy of these linear regressions through error squared. Likewise, this tool allowed the construction of predictive models about the use of flipped classroom in the teaching-learning process by means of the decision tree technique.

Data Collection

Table 3 shows the questionnaire used in a Mexican university for the data collection during the 2017 school year. The variables of this research instrument are Profile of the students (3 questions: Career, Sex and Age) and Flipped classroom (4 questions: Before the class, During the class, After the class and Teaching-learning process).

Table 3. Questionnaire about flipped classroom.

No.	Variable	Dimension	Question	Answer	n	%
1	Profile of the students	Career	1. Indicate your career	Administration	20	40.82%
				Commerce	19	38.78%
				Marketing	10	20.41%
		Sex	2. Indicate your sex	Man	27	55.10%
				Woman	22	44.90%
		Age	3. Indicate your age	18 years	0	0.00%
				19 years	15	30.61%
				20 years	23	46.94%
				21 years	5	10.20%
				> 21 years	6	12.24%
2	Flipped classroom	Before the class	4. The consultation of the YouTube videos facilitates the active role of the student	Very much (1)	27	55.10%
				Much (2)	20	40.82%
				Little (3)	2	4.08%
				Very little (4)	0	0.00%
		During the class	5. The use of the Mathportal application collaboratively facilitates the active role of the student	Very much (1)	25	51.02%
				Much (2)	22	44.90%
				Little (3)	1	2.04%
				Very little (4)	1	2.04%
		After the class	6. The use of the Mathportal application individually facilitates the active role of the student	Very much (1)	31	63.27%
				Much (2)	13	26.53%
				Little (3)	5	10.20%
				Very little (4)	0	0.00%
		Teaching-learning process	7. Flipped classroom (activities before, during and after the class) facilitates the teaching-learning process on statistics	Very much (1)	30	61.22%
				Much (2)	13	26.53%
				Little (3)	6	12.24%
				Very little (4)	0	0.00%

The values of Load Factor (> 0.680), Cronbach's Alpha (> 0.750) and Composite Reliability (> 0.840) allow validating the questionnaire about the use of flipped classroom (See Table 4).

Table 4. Validation of the questionnaire about the use of flipped classroom.

Variable	Dimension	Load Factor	Cronbach's Alpha	Average Variance Extracted	Composite Reliability
Flipped classroom	Before the class	0.781	0.755	0.582	0.847
	During the class	0.762			
	After the class	0.821			
	Teaching-learning process	0.682			

FINDINGS

Flipped classroom facilitates very much (n = 30, 61.22%), much (n = 13, 26.53%) and little (n = 6, 12.24%) the teaching-learning process on statistics (See Table 3). The results of machine learning indicate that the consultation of the YouTube videos before the class, use of the Mathportal application collaboratively during the class and use of the Mathportal application individually after the class positively influence the teaching-learning process on descriptive statistics (See Table 5).

Table 5. Results of machine learning.

Hypothesis	Training	Linear regression	Result	Value-t	Value-p	Error squared
H1: Consultation of the YouTube videos → teaching-learning process	70%	y = 0.282x + 1.059	Accepted: 0.282	1.428	0.162	0.184
	80%	y = 0.348x + 0.951	Accepted: 0.348	1.954	0.058	0.210
	90%	y = 0.333x + 0.954	Accepted: 0.333	2.014	0.050	0.192
H2: Use of the Mathportal application collaboratively → teaching-learning process	70%	y = 0.271x + 1.097	Accepted: 0.271	1.490	0.145	0.302
	80%	y = 0.298x + 1.038	Accepted: 0.298	1.777	0.083	0.354
	90%	y = 0.293x + 1.024	Accepted: 0.293	1.878	0.067	0.487
H3: Use of the Mathportal application individually → teaching-learning process	70%	y = 0.629x + 0.621	Accepted: 0.629	3.782	0.001	0.243
	80%	y = 0.570x + 0.664	Accepted: 0.570	4.221	0.000	0.301
	90%	y = 0.585x + 0.608	Accepted: 0.585	4.507	0.000	0.314

Table 6 shows the correlations about the use of flipped classroom in the teaching-learning process.

Table 6. Correlations about the use of flipped classroom.

	Before the class	During the class	After the class	Teaching-learning
Before the class	1	-	-	-
During the class	0.596	1	-	-
After the class	0.513	0.394	1	-
Teaching-learning	0.240	0.327	0.572	1

Before the Class

The consultation of the YouTube videos facilitates very much (n = 27, 55.10%), much (n = 20, 40.82%) and little (n = 2, 4.08%) the active role of the student (See Table 3). The results of machine learning (linear regression) with 70% (0.282, value-t = 1.428, value-p = 0.162), 80% (0.348, value-t = 1.954, value-p = 0.058) and 90% (0.333, value-t = 2.014, value-p = 0.050) of training indicate that H1 is accepted (See Table 5). Therefore, the consultation of the YouTube videos before the class positively influences the teaching-learning process on descriptive statistics.

Table 7 presents 16 predictive conditions of the PM1 about the use of flipped classroom with the accuracy of 83.67%. For example, if the student considers that the consultation of the YouTube videos facilitates very much the active role, takes the career of Commerce and is a man then Flipped classroom facilitates much the teaching-learning process on statistics.

Table 7. Conditions of the PM1.

No.	YouTube videos → active role	Career	Sex	Age	Flipped classroom → teaching-learning
1	Very much	Administration	-	-	Very much
2	Very much	Commerce	Man	-	Much
3	Very much	Commerce	Woman	> 20.5 years	Very much
4	Very much	Commerce	Woman	≤ 20.5 years	Little
5	Very much	Marketing	Man	-	Much
6	Very much	Marketing	Woman	-	Very much
7	Much	-	Man	> 19.5 years	Very much
8	Much	Administration	Woman	> 19.5 years	Very much
9	Much	Commerce	Woman	> 19.5 years	Little
10	Much	Marketing	Woman	> 19.5 years	Little
11	Much	Marketing	-	≤ 19.5 years	Much
12	Much	Administration	Man	≤ 19.5 years	Much
13	Much	Administration	Woman	≤ 19.5 years	Very much
14	Much	Commerce	-	≤ 19.5 years	Very much
15	Little	Commerce	-	-	Much
16	Little	Administration	-	-	Little

During the Class

The use of the Mathportal application collaboratively facilitates very much (n = 25, 51.02%), much (n = 22, 44.90%), little (n = 1, 2.04%) and very little (n = 1, 2.04%) the active role of the student (See Table 3). The results of machine learning with 70% (0.271, value-t = 1.490, value-p = 0.145), 80% (0.298, value-t = 1.777, value-p = 0.083) and 90% (0.293, value-t = 1.878, value-p = 0.067) indicate that H2 is accepted (See Table 5). Therefore, the use of the Mathportal application collaboratively during the class positively influences the teaching-learning process on descriptive statistics.

Table 8 shows 12 predictive conditions of the PM2 about the use of flipped classroom with the accuracy of 75.51%. For example, if the student thinks that the use of the Mathportal application collaboratively facilitates very much the active role of the student, takes the career of Commerce and has an age ≤ 19.5 years then flipped classroom facilitates very much the teaching-learning process on statistics.

Table 8. Conditions of the PM2.

No.	Mathportal application collaboratively → active role	Career	Sex	Age	Flipped classroom → teaching-learning
1	Very much	Administration	-	-	Very much
2	Very much	Commerce	-	> 20.5 years	Very much
3	Very much	Commerce	-	≤ 20.5 & > 19.5 years	Much
4	Very much	Commerce	-	≤ 19.5 years	Very much
5	Very much	Marketing	-	-	Very much
6	Much	-	-	> 22.5 years	Much
7	Much	-	-	≤ 22.5 & > 21.5 years	Very much
8	Much	Administration	-	≤ 21.5 years	Very much
9	Much	Commerce	-	≤ 21.5 years	Much
10	Much	Marketing	-	≤ 21.5 years	Much
11	Little	-	-	-	Much
12	Very little	-	-	-	Much

After the Class

The use of the Mathportal application individually facilitates very much (n = 31, 63.27%), much (n = 13, 26.53%) and little (n = 5, 10.20%) the active role of the student (See Table 3). The results of machine learning with 70% (0.629, value-t = 3.782, value-p = 0.001), 80% (0.570, value-t = 4.221, value-p = 0.000) and 90% (0.585, value-t = 4.507, value-p = 0.000) of training indicate that H3 is accepted (See Table 5). Therefore, the use of the Mathportal application individually after the class positively influences the teaching-learning process on descriptive statistics.

Table 9 shows 15 predictive conditions of the PM3 about the use of flipped classroom with the accuracy of 87.76%. For example, if the student considers that the use of the Mathportal application individually facilitates very much the active role of the student and takes the career of Administration then flipped classroom facilitates very much the teaching-learning process on statistics.

Table 9. Conditions of the PM3.

No.	Use of the Mathportal application individually → active role	Career	Sex	Age	Flipped classroom → teaching-learning
1	Very much	Administration	-	-	Very much
2	Very much	Commerce	Man	> 22.5 years	Much
3	Very much	Commerce	Man	≤ 22.5 years	Very much
4	Very much	Commerce	Woman	-	Very much
5	Very much	Marketing	-	-	Very much
6	Much	Commerce	Man	-	Much
7	Much	Commerce	Woman	-	Little
8	Much	Administration	-	-	Very much
9	Much	Marketing	Man	> 20.5 years	Much
10	Much	Marketing	Man	≤ 20.5 years	Very much
11	Much	Marketing	Woman	-	Much
12	Little	Commerce	-	-	Much
13	Little	Administration	-	> 19.5 years	Little
14	Little	Administration	-	≤ 19.5 years	Much
15	Little	Marketing	-	-	Little

DISCUSSIONS AND CONCLUSION

Flipped classroom is modifying the teaching-learning process through the use of tools, platforms and technological applications (Tiejun, 2017; Wenming & Erwen, 2018; Wittich et al., 2018). In particular, this research proposes the consultation of the YouTube videos before the class, use of the Mathportal application collaboratively during the class and use of the Mathportal application individually after the class. Analysis showed that flipped classroom facilitates very much (n = 30, 61.22%) the teaching-learning process on statistics. Also, flipped classroom facilitates much (n = 13, 26.53%) the teaching-learning process on statistics. Therefore, the majority of students (87.75%) have a favorable opinion about this pedagogical model.

Before the Class

Various authors (e.g., Bonnes et al., 2017; Chokshi et al., 2017; Wittich et al., 2018) mention that flipped classroom favors the active participation of students before the face-to-face sessions. In particular, 55.10% of the students (n = 27) thinks that the consultation of the YouTube videos facilitates very much the active role. Also, the consultation of the YouTube videos facilitates much (n = 20, 40.82%) the active role. Therefore, the majority of students (95.92%) have a favorable opinion about this aspect.

Similar to Wenming and Erwen (2018), the students reviewed the multimedia resources to acquire the knowledge at home. The results of machine learning about H1 are higher than 0.280, therefore, the consultation of the YouTube videos before the class positively influences the teaching-learning process on descriptive statistics.

Data science identifies 16 conditions of the PM1 with an accuracy greater than 83.60%. In this model, the age, career and sex of the student determine how the consultation of the YouTube videos influences the teaching-learning process on statistics. For example, the decision tree technique establishes 7 conditions where Flipped classroom facilitates very much the teaching-learning process on statistics.

During the Class

Various authors (e.g., Liu, 2019; Lockman, Haines, & McPherson, 2017; Santikarn & Wichadee, 2018) mention that flipped classroom is a pedagogical model that improves the teaching-learning conditions through technology. For example, the Mathportal application is a support tool that allows checking the results of the exercises about the mean, mode, median, range and quartiles at any time. In particular, 51.02% of the students (n = 25) thinks that the use of the Mathportal application collaboratively facilitates very much the active role. Also, the use of the Mathportal application collaboratively facilitates much (n = 22, 44.90%) the active role. Therefore, the majority of students (95.92%) have a favorable opinion about this aspect.

The incorporation of flipped classroom in the educational field favors the collaborative work during the face-to-face sessions (Cabero-Almenara et al., 2021; Tokmak, Yakin, & Dogusoy, 2019; Tiejun, 2017). The results of machine learning on H2 are higher than 0.270, therefore, the use of the Mathportal application collaboratively during the class positively influences the teaching-learning process on descriptive statistics.

Data science identifies 12 conditions of the PM2 with an accuracy greater than 75.50%. In this model, the age and career of the student determine how the use of the Mathportal application collaboratively influences the teaching-learning process on statistics. For example, the decision tree technique establishes 6 conditions where Flipped classroom facilitates very much the teaching-learning process on statistics.

After the Class

Flipped classroom allows the realization of creative activities outside the classroom (Adam et al., 2017; Bonnes et al., 2017; Lockman, Haines, & McPherson, 2017). In particular, 63.27% of the students (n = 31) thinks that the use of the Mathportal application individually facilitates very much the active role. Also, the use of the Mathportal application individually facilitates much (n = 13, 26.53%) the active role.

Flipped classroom allows that teachers organize and carry out creative activities outside the classroom where students have the main role during the learning process (Cabero-Almenara et al., 2021; Tokmak, Yakin, & Dogusoy, 2019; Tiejun, 2017). The results of machine learning about H3 are higher than 0.560, therefore, the use of the Mathportal application individually after the class positively influences the teaching-learning process on descriptive statistics.

Data science identifies 15 conditions of the PM3 with an accuracy greater than 87.70%. In this model, the age, sex and career of the student determine how the use of the Mathportal application individually influences the teaching-learning process on statistics. For example, the decision tree technique establishes 6 conditions where Flipped classroom facilitates very much the teaching-learning process on statistics.

Finally, flipped classroom is a pedagogical model that transforms the functions, roles and activities of teachers and students during the teaching-learning process (He, Holton, & Farkas, 2018; Villalba, Castilla, & Redondo, 2018; Yang, Sun, & Liu, 2017).

CONCLUSION

Universities together with teachers can improve the learning conditions through flipped classroom. In particular, the results of machine learning indicate that the activities of flipped classroom positively influence the educational process on descriptive statistics. On the other hand, data science allows the identification of 3 predictive models about the consultation of YouTube videos and use of the Mathportal application through the decision tree technique.

The limitations of this quantitative research are the sample size, consultation of the YouTube videos and use of the Mathportal application. Therefore, future research may analyze the impact of digital games, social media, technological tools, educational software, 3D applications and online questionnaires during the implementation of flipped classroom. In particular, educators can organize creative activities before the face-to-face sessions through readings, digital presentations and discussion on social media. During the classes, students can use mobile devices to access educational tools and consult the information on the Internet. Finally, teachers can plan, organize and conduct discussion forums on web platforms such as Moodle and Google Classroom.

This research recommends the use of the Mathportal application for the teaching-learning process on statistics. Even, this web application can be used in the courses of differential calculus, geometry, algebra and financial mathematics. The implications of this research are the transformation of the educational context through the use of flipped classroom and incorporation of technological tools inside and outside the classroom.

Finally, flipped classroom is a pedagogical model that allows the planning, organization and implementation of innovative and creative school activities before, during and after the face-to-face sessions through the use of ICTs such as the Mathportal application and YouTube videos.

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DISTANCE EDUCATION IN TURKIYE DURING THE COVID-19 PANDEMIC: WHAT DO STAKEHOLDERS THINK?

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ABSTRACT

This research attempted to assess the status of distance education implemented in Turkiye during the COVID-19 pandemic based on stakeholders' (students, parents, pre-service teachers, teachers, and academics) opinions and was completed in the phenomenological study framework. With this aim, stakeholders' views within the study's purview were collected during April 2021 with an online semi-structured interview form with pandemic precautions. The data were examined with content analysis using the MAXQDA 2020 qualitative data analysis program. The interview questions principally focused on four themes, namely readiness for distance learning, benefits, adequacy, and continuation. It can be deduced from stakeholder's opinions that though Turkiye was unprepared for distance education, the adaptation eventuated in a short time. There were differences in educational organizations' readiness levels, and the views on infrastructure's inadequacy explained this situation. They found distance education to be positive from psychological, situational, educational, and economic aspects. They deemed it indispensable for education to continue and for the use of technology in education. However, the lack of interaction in distance education, digital impossibilities, and other factors were the negative aspects. The stakeholders participating in this research emphasized that rather than being adequate, distance education was inadequate due to interaction- and infrastructure-related issues. Though there were negative opinions about the continuation of distance education in the transition to formal education after the COVID-19 pandemic precautions ended, findings revealed that it may continue simultaneously with formal education and may provide compensatory or supportive education. Additionally, further research is needed regarding the generalizability and educational outcomes of distance education implemented during the COVID-19 pandemic.

Keywords: COVID-19, pandemic, distance education, stakeholders' views, Turkiye.

INTRODUCTION

Distance education was introduced as an alternative to formal education. Just as an individual chooses, distance education may be implemented in situations like being disabled, being incarcerated, transport, settlement, opportunities, and extraordinary conditions like various natural or human disasters. An example of such exceptional situations from recent times is the COVID-19 pandemic. Coronavirus is a virus group categorized as alphacoronavirus and betacoronavirus, that frequently causes cold or other mild upper respiratory tract infections in the human body (Law et al., 2020). The 2019 novel coronavirus (SARS-CoV-2) was identified in a patient's throat in Wuhan, Hubei province in China on January 7, 2020 by the Chinese Disease Control and Prevention Center (Huang et al., 2020; The World Health Organization [WHO], 2020). Though initiated in China, it rapidly spread to other southeast Asian countries and subsequently to 185 countries. The spread of a virus around the world is generally referred to as a pandemic (WHO, 2010). Due to the COVID-19 pandemic, countries were forced to close their borders and enter quarantine and shape a new education system worldwide (Gilani, 2020). Countries, where COVID-19 was widespread, had to take a multitude of precautions led by the professionals in the fields of health and economics, education, military, and social services.

According to UNESCO (The United Nations Educational, Scientific and Cultural Organization), many countries suspended formal education in educational institutions with this pandemic's spread. However, 20 countries including Turkmenistan, Belarus, and Singapore chose to continue with their formal education. The formal break in education during a pandemic is not a unique implementation. During the Ebola epidemic (2014–2016), various West African countries disrupted formal education for durations ranging from five to nine months (Ciavarella et al., 2016). In the fall of 2009, 67% of H1N1 emergency plans replaced face-to-face classes with online classes (Allen, & Seaman, 2013). Other forms of natural disasters are also covered by COVID-19 comparators. Hurricane Katrina, which made landfall in August 2005, physically damaged 27 colleges in the Gulf region and others in Texas, leaving courses on campus impossible (Meyer, & Wilson, 2011). Studies have stated that closing educational organizations for specific periods lowered the spread of epidemics such as influenza and H1N1 (Ferguson et al., 2006). However, this is the first time that formal education has been disrupted worldwide. Children in both developed and developing economies cannot go to school. However, this does not mean that education has come to a halt (Korlu, 2020).

MEASURES FOR SUSTAINING LEARNING

In this crisis, which has never been encountered in education systems, and for which they were unprepared, many countries took a variety of precautions to mitigate learning losses. They began to implement distance education applications (Cetinkaya Aydin, 2020). However, online learning has not only been implemented in response to the crisis. The development of the internet and networking technology has enabled learners to study regardless of their location. Online learning has thus been proposed as a plausible and effectual alternative to face-to-face learning (Stacey et al., 2004).

Due to the COVID-19 pandemic, all educational facilities in 124 countries, including Turkiye, ceased formal education, with schools in certain regions closed in 11 other countries. The first COVID-19 case was identified in Turkiye on March 11, 2020. The Ministry of National Education (MoNE) adopted a range of precautions in the area of education to intervene against COVID-19. After identifying the first case, MoNE announced schools would remain closed for two weeks from March 16 to March 30. This announcement brought the one-week mid-term break planned for April forward and stated that distance education activities would begin from March 23 (MoNE, 2020a). A new announcement on March 25 noted that schools would remain closed until April 30 and distance education would continue during this process (Calik Gocumlu, & Guven, 2020). On the scientific council's advice, an announcement on April 30 by Minister of National Education of Turkiye, Ziya Selcuk, stated that schools might open on June 1, 2020 (Milliyet, 2020, 29 April). However, on May 18, 2020, the President announced after a cabinet meeting that the new academic year would commence in September. Ziya Selcuk announced via Twitter that distance education would continue until June 19 (Selcuk, 2020a). Schools in Turkiye opened on September 1, 2020, and started the winter break on January 22, 2021. Then, as of February 15, 2021, the decision was made by the government to gradually transition to face-to-face training. On March 1, 2021, the "controlled normalization" of Turkiye within the scope of the decisions taken by all the pre-school educational institutions in general, in elementary school, 8th and 12th grades was passed face-to-face training (Tedmem, 2021). Moreover, face-to-face training was initiated at all levels in low- and medium-risk settlements. Distance education activities in Turkiye during the COVID-19 pandemic were completed using the Education Information Network (EIN) existing content, new contents, and on television channels with a broadcast of programs with lesson contents prepared in accordance with the class levels.

EMERGENCY DISTANCE EDUCATION

The existing literature highlights the impact of COVID-19 on education in many parts of the world, especially with respect to the challenges, constraints and challenges facing governments, institutions and stakeholders (Huber, & Helm, 2020; Judd et al., 2020; National Foundation for Educational Research [NFER], 2020; Zhang et al., 2020). Other publications emphasize experiences, innovations, and strategies to manage distance education (Ferdig et al., 2020) and descriptions of how institutions and stakeholders have adapted to the new scenario created by the COVID-19 pandemic (Bao, 2020; Moorhouse, 2020; Zhang et al., 2020).

The new normal created by the COVID-19 pandemic has accelerated the transition to online teaching. The current scenario entails a rapid pedagogical change from conventional to online training, from personal to virtual training, and from seminars to webinars (Mishra et al., 2020). While technology provided schools and colleges with the ability to transition to online teaching during the Spring 2020 semester, for the remainder of the semester emergency distance education was provided and not online learning (Bozkurt, & Sharma, 2020; Marinoni et al., 2020; Schlesselman, 2020). While this transition process is smooth for certain educational institutions, it still poses an intractable challenge for some educational institutions. In this sense, online distance education and emergency distance education are not the same. In emergency distance education, what is currently being done should be considered only a temporary solution to an immediate problem (Golden, 2020; Hodges et al., 2020).

The transition to online teaching owing to COVID-19 brought a multitude of challenges for both the teachers and the students. These challenges were associated with the distance between teachers and their students instead of the conventional classroom teaching (Moore, 2014) and/or lack of online teaching experience (Johnson et al., 2020). In online learning, the teacher-student relationship was weak compared to conventional education. On the one hand, the teachers cannot see the students' faces and only hear their voices. On the other hand, students have problems transferring their learning experiences in face-to-face learning environments to online learning environments. Teachers had to change to online teaching, requiring them to use various digital tools and resources to resolve different issues and implement new teaching and learning approaches (Eickelmann, & Gerick, 2020). Other problems have been pointed out with regard to teachers' difficulties in applying information communication techniques, interaction with pupils, organization of online learning materials, and lack of adequate facilities for students (Verma et al., 2020).

Challenges related to a sudden shift to online delivery in response to the pandemic; lack of online instructional experience, limited time to complete the transition, technical barriers, and poor learning environments for students working remotely (Bao, 2020). Therefore, the current situation poses a problem in which, on the one hand, teachers must use and explore online education opportunities. Besides, some teachers lack knowledge and expertise in delivering online education, and there is a high level of stress for students. There is concern that poor delivery of online teaching may have negative long-term implications for online teaching as a method of teaching (Moor, 2020). Teacher narratives sometimes reveal low participation in online courses due to lack of parental supervision, inadequate Internet access, and teacher resources and expertise (McKenzie, 2020). However, it was noted that students used multiple methods to access their curriculum-television, telephones, and other devices (COVID-19 update media briefing, June 9, 2020; George, 2020). In these circumstances, questions about the ongoing motivation of online learners to relieve their stress and anxiety are of critical importance. It should be prioritized by educators while implementing such a method of emergency distance learning (Adedoyin, & Soykan, 2020; Bozkurt, & Sharma, 2020).

Compared to face-to-face teaching, teachers reported spending more time getting used to the online teaching environment. They were required to design innovative methods to engage with students and gauge the comprehension of the content being taught of each student (Scull et al., 2020). Beyond the pedagogical objectives, teachers had to communicate with their students to account for the social integration of their learning groups (Konig et al., 2020). Students familiar with face-to-face interactions had to adapt rapidly to distance education and the online environment. The multifaceted changes and restrictions concomitant to COVID-19 and the resulting psychosocial stressors confronting the learners and the educators exacerbated the challenges concerned with the rapid transition to distance learning (Marshall, & Wolanskyj-Spinner, 2020; Saddik et al., 2020). Before, during, and after their online interactions, educators and learners needed to increase networking, promote humanity and empathy in their connections, and improve their communicative effectiveness (Carlson, 2020). This experience influenced how they create meaning and reflect upon learning and teaching (Li, & Bailey, 2020).

A number of emergency distance education studies have been conducted. During this period, the field of applied education especially faced difficulties. Their countries have experienced the transition to emergency distance. Although some countries are prepared for this situation, they are likely to be overwhelmed with such unprecedented transitions. States and non-governmental organizations have published various policies and reports (Di Pietro et al., 2020; Economic Commission for Latin America and the Caribbean [ECLAC] and UNESCO, 2020; Emma, & Holie, 2020; United Nations International Children's Emergency Fund

[UNICEF], 2020; United Nations [UN], 2020) to prepare for distance education during the pandemic. In addition to research on responses to emergency distance education (Appolloni et al., 2021; Bozkurt, & Sharma, 2020; Crowford et al., 2020; Lindner et al., 2020; Murphy, 2020) and health education (Al-Balas et al., 2020; Daroedono et al., 2020; Pather et al., 2020; Sindiani et al., 2020) numerous investigations have been conducted. The use of technology in emergency distance education (Chick et al., 2020), the impact of social networks on education (Nadeak, 2020), home learning (Putri et al., 2020; Suryaman et al., 2020), and other related issues have been examined. Other studies have attempted to identify new strategies for understanding different subjects (Capahay, 2020; Pace et al., 2020; Toquero, 2020), present different preparedness measures for emergency distance education (Churiyah et al., 2020), and to gain a global perspective (Bozkurt et al., 2020).

There have been a number of studies on students, teachers, education administrators, teacher education, and higher education and related themes such as the views on emergency distance education of students (Daroedono et al., 2020; Durak, & Cankaya, 2020; Mulyanti et al., 2020; Wangadinata et al., 2020), teachers (Balaman, & Hanbay Tiryaki, 2021; Fauzi, & Sastra Khusuma, 2020; Giovannella, Passarelli, & Persico, 2020; Karakaya et al., 2020; Korkmaz, & Toraman, 2020), both students and teachers (Hebebci et al., 2020), education administrators (Johnson et al., 2020), and the parents with children (Garbe et al., 2020).

During the pandemic, there have been studies on online and urgent distance education at a higher education level (Ali, 2020), students' acceptance of distance education (Rizun, & Strzelecki, 2020; Yilmaz Ince et al., 2020;), and post-pandemic higher education (Pham, & Ho, 2020). Finally, when the research on the challenges and opportunities of emergency distance education are examined, it can be deduced that it presents intractable challenges. The studies were conducted with one (student, teacher, etc.) or several (teacher-student, teacher-school, etc.) pillars of education. It can be said that there are very few studies in the literature that reflect different perspectives on emergency distance education. Therefore, this study can be deemed imperative to examine the standpoint of stakeholders (students, parents, pre-service teachers, teachers, and academics) on emergency distance education implemented during the COVID-19 pandemic.

PURPOSE OF THE STUDY

The transition to emergency distance education due to the COVID-19 shutdown has also markedly changed the way students and teachers interact and learn. This urgent distance education was a process that required adaptation by all stakeholders. This situation made it essential for the stakeholders to interact, communicate, work, and cooperate in an unprecedented manner. Although the closure of educational institutions during the transition to emergency distance education causes some difficulties and disruptions, it may generate diverse learning opportunities. Most of previously conducted studies have focused on the differences in students' performance, attitudes, and the effect of online learning on academic success. Data in this research, gathered in Turkiye during COVID-19, were obtained from stakeholders regarding the emergency distance education process. These data are associated with the themes determined by the researcher, namely the readiness for distance education, usefulness of distance education, adequacy of distance education, and continuity of distance education. These themes were analyzed and explained with sample expressions. The visual for this frame is illustrated in Figure 1.

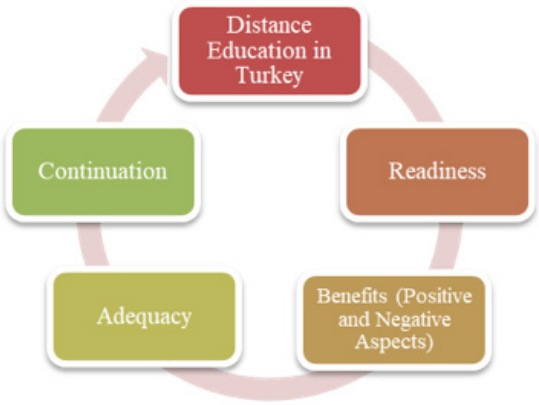

Figure 1. Research themes of the COVID-19 emergency distance education process

MoNE in Turkiye, due to the COVID-19 pandemic, has allowed emergency distance education. With this decision, the government adopted measures to reduce the learning loss of students. In this process, the technological opportunities of millions of students from different socio-economic levels were not questioned. Emergency distance education did not just affect students. Working parents, in particular, found it difficult to manage their children having distance education. Children were exposed to digital screens in an unusual manner. This screen addiction may have caused severe problems. The technological possibilities of teachers for emergency distance education were not questioned either. Distance education mode was adopted under the assumption that everyone had technological accessibility. Teachers whom themselves had school-age children had problems like other working parents. It is possible to express the same problems regarding the training of pre-service teachers. Teachers and academicians with low perception and motivation for using technology encountered problems in the emergency distance education process. Pre-service teachers returned to their native place during the emergency distance education process. As they lived in rural areas, they were confronted with various technical and technological issues. It is worth noting that stakeholders of education had diversified positive or negative experiences in the distance education process. In this context, together with the institutions and stakeholders with Turkiye, applied emergency readiness to distance education, aimed to uncover the positive and negative aspects of distance education emergency. It is imperative to question the adequacy of emergency distance education to minimize the loss of learning and achieve learning goals. Furthermore, it is worthwhile to investigate the extent to which emergency distance education should continue and its effect on formal education after the COVID-19 pandemic. Besides, based on the findings of this study, a number of meaningful suggestions are made for the sustainability of learning during the COVID-19 pandemic. Within the scope of this study, participant stakeholders were asked the following questions:

1. Do you think the educational organizations in Turkiye were ready for distance education during the COVID-19 pandemic?
2. According to stakeholders, what are the positive aspects of distance education implemented during the COVID-19 pandemic?
3. According to stakeholders, what are the negative aspects of distance education implemented during the COVID-19 pandemic?
4. Do stakeholders find distance education implemented during the COVID-19 pandemic adequate (satisfactory)?
5. Do stakeholders want distance education to partly or wholly continue after the end of disruptions that occurred due to the COVID-19 pandemic?

METHOD

This research was designed with the qualitative research method. Qualitative research attempts to extract pertinent information from participants' viewpoints, and uses explanatory and inductive methods (Miles, & Huberman, 2016). To determine the opinions of stakeholders (students, parents, pre-service teachers, teachers, and academics) regarding distance education implementation in Turkiye during the COVID-19 pandemic, phenomenology's qualitative research pattern was chosen. Christensen et al. (2015) defined phenomenology as a qualitative research method wherein one or more participants try to explain how they experience a phenomenon. The closure of formal education and emergency distance education due to the COVID-19 pandemic has been identified as the principal research phenomenon in this study.

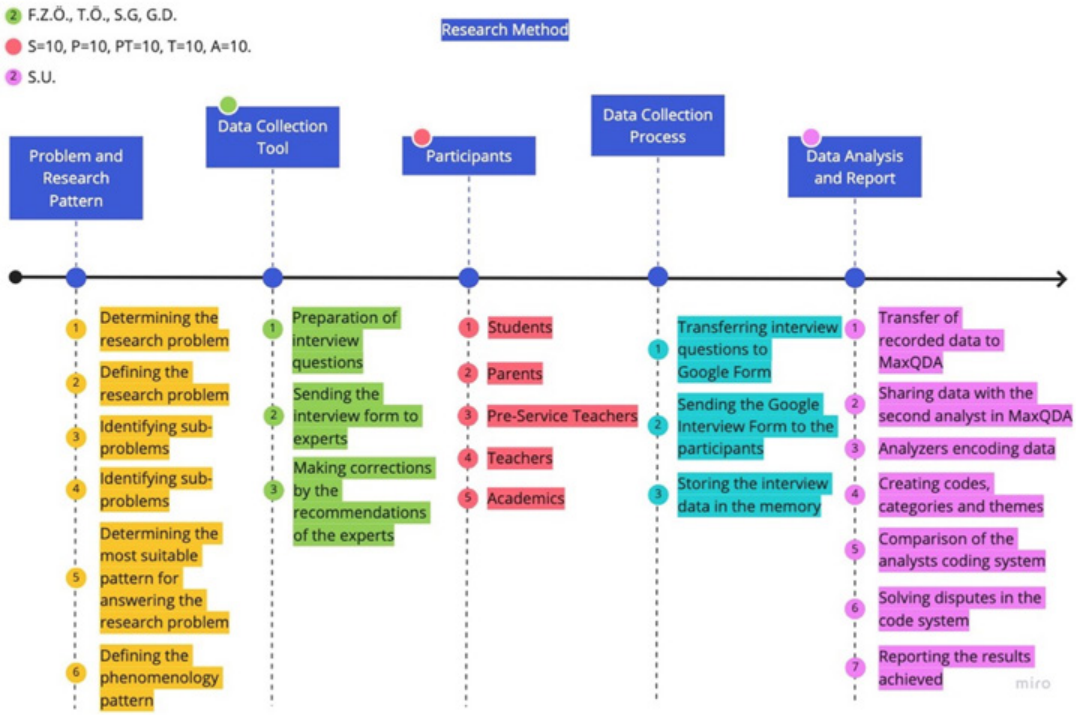

Figure 2. Research Method

Participants

More than one sampling method was used to determine the study group for the research. These were the non-random criteria, snowball (chain), and maximum diversity sampling methods. When choosing the study group:

1. Criteria were that stakeholders were students and pre-service teachers receiving distance education, teachers and academics who provided distance education, and parents who had children receiving distance education.
2. After approaching stakeholders who abided by these criteria, we approached more volunteer participants with these criteria.
3. The participation rates of stakeholders (students, parents, pre-service teachers, teachers, and academics) were close.

Table 1. Demographic Characteristics of Participants

Student			Parent			Pre-service Teacher*			Teacher**			Academician***		
ID	G	A	ID	G	A	ID	G	A	ID	G	A	ID	G	A
S1	F	20	P1	F	35	PT1	F	20	T1	M	38	A1	M	35
S2	M	22	P2	F	39	PT2	F	21	T2	F	35	A2	M	35
S3	F	19	P3	F	40	PT3	F	19	T3	F	36	A3	M	32
S4	F	14	P4	M	43	PT4	M	21	T4	F	30	A4	F	36
S5	F	18	P5	F	38	PT5	M	21	T5	M	29	A5	F	36
S6	M	24	P6	M	40	PT6	F	22	T6	M	48	A6	M	38
S7	M	14	P7	M	46	PT7	F	22	T7	F	33	A7	M	34
S8	F	13	P8	F	37	PT8	F	23	T8	F	37	A8	M	39
S9	M	10	P9	F	41	PT9	M	23	T9	F	27	A9	F	36
S10	F	11	P10	F	47	PT10	F	25	T10	M	43	A10	M	38

* Pre-service teachers who receive teacher education in Education Faculties.

** Teachers working in schools affiliated with the Ministry of National Education (MoNE).

*** Faculty members working at universities affiliated with the Turkish Higher Education Council (HEC).

This research included a total of 50 stakeholders with 10 students (six female and four male) at different educational levels, 10 parents (seven female and three male), 10 pre-service teachers (seven female and three male), 10 teachers (six female and four male), and 10 academicians (four female and six male). During data analysis, stakeholders were coded based on variables such as gender and class level, with students S1, S2, and S3; parents P1, P2, and P3; pre-service teachers PT1, PT2, and PT3; teachers T1, T2, and T3; and academics A1, A2, and A3.

Data Collection and Analysis

The research used a semi-structured interview form. Questions in this form were revised after receiving opinions from two academics (FZO, TO) and two teachers (SG, GD) to arrive at the final form. Due to a number of precautions during the COVID-19 pandemic, data were acquired through Google Forms by the research's texture. An informed, voluntary consent form was given to the stakeholders participating in this study. This consent form included information about this research's objectives and procedure, the confidentiality of the interviews, storage and analysis of the data, publication of the results, methods of using personal information, and researcher's role. The data collected online were classified and saved directly in an external hard disk.

Research data were analyzed using content analysis. Creswell (2014) remarked that the principal procedural steps for content analysis in qualitative research are preparation and organization of data, data coding, associating codes to reduce themes, presenting, and interpreting findings. The interview forms collected from stakeholders were saved in an external disk. Afterward, the transcripts were coded into terms, patterns, and codes using the MAXQDA software continuously until no further information was obtained. Coding was accomplished by classifying and naming elements based on suitability and having the same theme group features. Finally, a thorough analysis was performed after combining and eliminating the codes. A qualitative research code is mostly a word or short phrase communicating an extract and/or stimulating attribute that is notable and summarizes a portion of the language-based or visual data (Saldana, 2016). In this context, the resultant themes, categories, and codes attained by analyzing the data obtained were visualized and presented in MAXMaps according to their repetition frequency (f). The visuals and explanations developed by Zayimoglu Ozturk et al. (2020) to better read the figures presented in the research findings are illustrated in Figure 3.

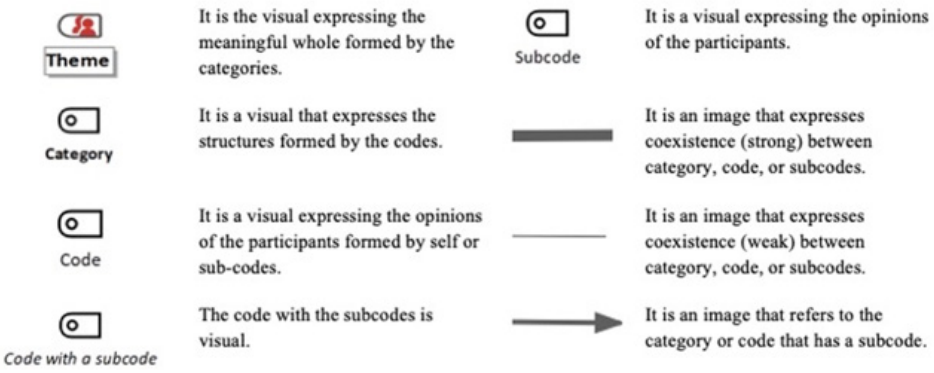

Figure 3. Expressions Used in Data Visualization

The multiple analyst triangulation method was used to confirm the validity and reliability of the themes and codes reached during the research. This method involves an independent analysis of the same qualitative data by two or more people and comparing the findings (Patton, 2014). As a result, all data were independently coded by an expert in class education, and then the researcher and expert compared coding systems. As a result of this comparison, the formula with values above 70% indicating an acceptable reliability of comparisons recommended by Miles and Huberman (2016) (reliability = agreement number/agreement + disagreement number X 100) was applied and the reliability value was calculated as 89%. The validity of qualitative research may be provided by diversifying data, explaining study group features, reporting data in detail, and quoting data in studies (Creswell, 2014; Johnson, & Christiensen, 2014). As a result, codes were visualized and presented based on which stakeholder made the statement, code network and code matrix, the frequency (f) of code statements. In addition to this work, by declaring the codes openly and clearly and supporting them with direct quotes, it was attempted to increase the study's validity and reliability. Data collection and analysis procedures were clearly explained about the researcher's role and competency.

FINDINGS

The research results start with a brief overview of the participants' experiences in distance education implemented in the COVID-19 process. The aim is to reveal the state of readiness, opportunities, difficulties, competence, and continuity for distance education applied in this process.

Readiness for Distance Education

The code concept map about responses of stakeholders to questions about the readiness for distance education in Turkiye during the COVID-19 pandemic is given in Figure 4.

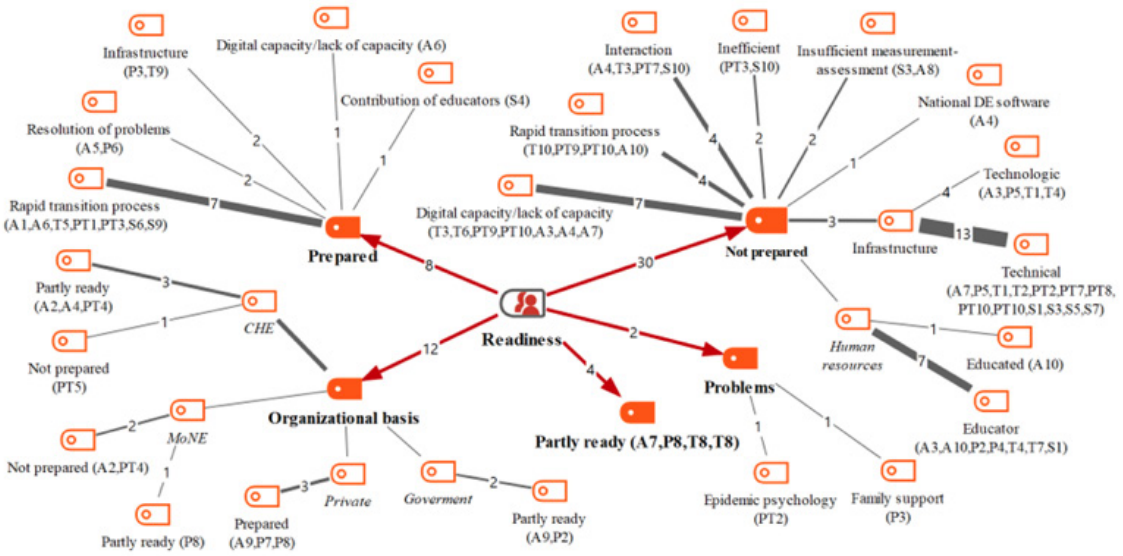

Figure 4. Readiness for Distance Education According to Stakeholders during the COVID-19 Pandemic in Turkiye.

Stakeholders gave the responses to the question, "Do you think educational organizations in Turkiye were prepared for distance education? Please explain." in the readiness category comprised categories of no (f:8), not prepared (f:30), partly ready (f:4), on an organizational basis (f:12) and problems (f:2). Each category contained a variety of codes. With the prepared category, codes were determined as rapid transition process (f:7), infrastructure problems (f:2), resolution of problems (f:2), digital capacity/lack of capacity (f:1), and contribution of educators (f:1). Sample statements by stakeholders in the prepared category for distance education in educational organizations are "My thoughts are supported by the universities beginning interactive distance education systems in lessons in a short time." (A1) about the rapid transition process; "Yes, I think they were ready; however, I think we struggled most with the system not being suitable for distance education." (P3) about deficient infrastructure; and "It will be better in time. The preparations within a short time are promising." (P6) for the resolution of problems code.

The codes in the not prepared category of the readiness theme which included infrastructure (f:20), human resources (f:8), digital capacity/lack of capacity (f:1), rapid transition process (f:4), interaction (f:4), inefficient lessons (f:2), insufficient measurement-assessment (f:2) and national distance education (DE) software (f:1). Additionally, within the infrastructure code, there were subcodes of technologic (f:4) and technical (f:13), while the human resources code comprised two subcodes of educator (f:7) and educated (f:1). Example statements include "Distance education began because of COVID-19 on education. This transition had to be rapid, so I think we were caught unprepared for distance education." (PT10) for the rapid transition code in the not prepared category; "The lack of interaction means that poor students couldn't ask questions." (A4) about the interaction code; "Additionally, there is still no clarity about the assessment of students with distance education." (S3) for the insufficient measurement-assessment code; "We weren't ready due to lack of necessary infrastructure (lack of computer, telephone, internet, etc. due to reasons like poor material status of families)." (T1) about the technologic subcode; and "Turkiye's education organizations don't have the infrastructure, the available website couldn't respond to the need; in fact, we saw even the internet network supporting this wasn't adequate." (P5) for the technical subcode in the infrastructure code.

Benefits of Distance Education

The code concept map about responses of stakeholders to questions about the benefits of distance education during the COVID-19 pandemic is given in Figure 5.

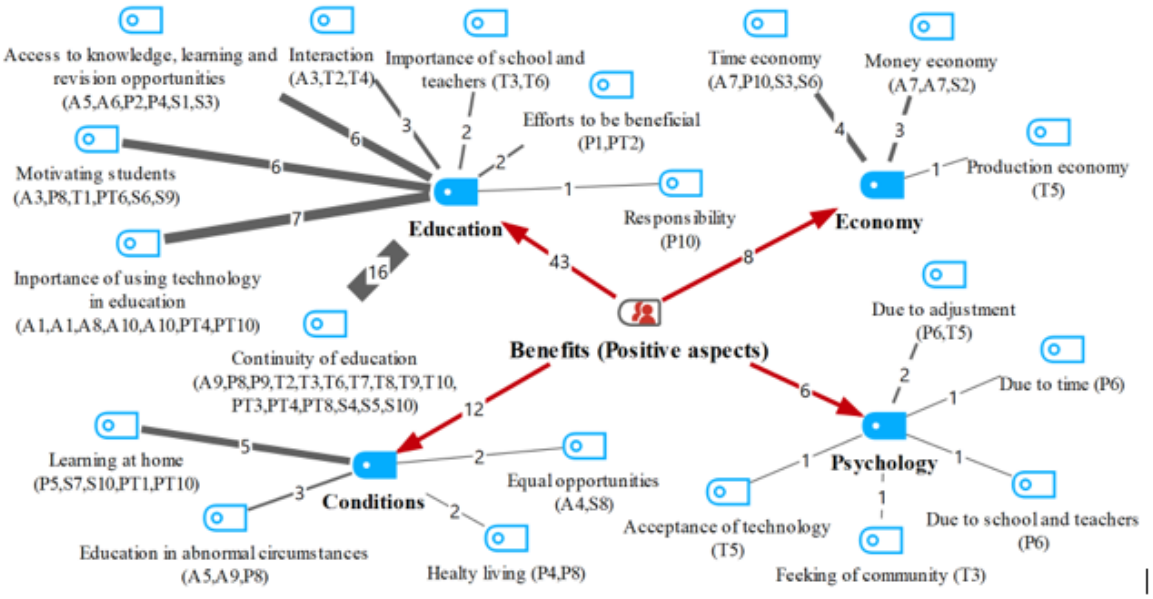

Figure 5. Positive Aspects of the Benefits of Distance Learning Theme According to Stakeholders during the COVID-19 Pandemic in Turkiye.

To the stakeholders, "Explain what are the negative aspects of the applied distance education according to you?" the question was asked. According to stakeholder statements, the positive aspects category was shaped around four main codes of positive aspects in terms of psychology, economy, education, and conditions. The psychological terms code included the subcodes of acceptance of technology (f:1), feeling of community (f:1), due to adjustment (f:2), due to school and teachers (f:1), and due to time (f:1). Example statements for the acceptance of technology and due to adjustment subcodes are "While we don't include technology in our lives much, we understood the need to catch up by adjusting to technology and including it in our lives when we need to." (T5); and in relation to the feeling of community code "I think live lessons on the internet will be more effective as students can see each other and see they are in the same situation which will be good psychologically." (T3).

In terms of conditions, the subcodes were learning at home (f:5), healthy living (f:2), equal opportunities (f:2), and education in abnormal circumstances (f:3). Example statements for the learning at home code include "I think children will have higher perception in an environment where they will feel comfortable, at ease and confident." (P5); and in relation to the healthy living subcode "Knowing they can access education at most hours of the day, children will sleep more regularly, additionally, they have the opportunity to eat healthily at home which they don't have at school." (P4).

The economy code included the subcodes of time economy (f:4), money economy (f:3), and production economy (f:1). Sample statements include "Time is very valuable for humanity. More gains were provided in terms of using time." (P10) for the time economy subcode and "The only positive aspect is in terms of material. We don't spend anything. We are at home with family." (S2) for the money economy subcode.

The education category comprised the codes continuity of education (f:18), the importance of using technology in education (f:7), access to knowledge, learning and revision opportunities (f:6), motivating students (f:6), interaction (f:3), efforts to be beneficial (f:2), importance of school and teachers (f:2) and responsibility (f:1). The digital competence (f:5) subcode was within the importance of technology in education code. Sample statements include "In extraordinary circumstance when we can't go to school it ensures the education system is not delayed and continues. It contributes to not breaking communication between educators and students, prevents students from being distant from lessons and forgetting information. It plays a big role in reducing the losses that will be experienced this year." (P9) in relation to the continuity of education subcode; "More important, lessons are recorded and can be watched again. I think that's the greatest advantage of distance education." (S3) for the access to knowledge, learning and revision opportunities subcode; and "We

don't get confused as we listen to lessons individually. If we were in class, I think we would be distracted more quickly." (S6) for the motivating students" subcode. The code concept map related to the benefits of distance education during the COVID-19 pandemic based on responses of stakeholders is given in Figure 6.

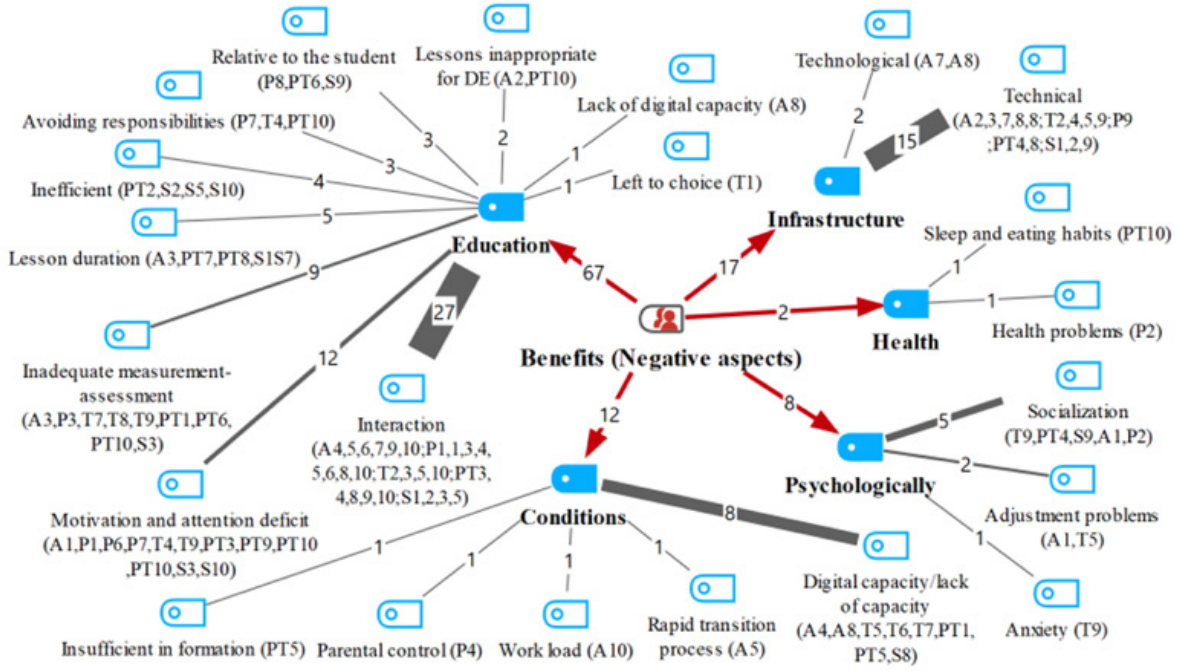

Figure 6. Negative Aspects of the Benefits of Distance Learning Theme According to Stakeholders during the COVID-19 Pandemic in Turkiye.

Stakeholders' responses to the question "According to you, what are the negative aspects of the implemented distance education? Please explain." in the negative aspects category comprised the codes relating to in terms of education (f:67), infrastructure (f:17), conditions (f:12), psychologically (f:8), and health (f:2). In terms of education, the code comprised the subcodes of interaction (f:27), motivation and attention deficit (f:12), inadequate measurement-assessment (f:9), lesson duration (f:5), inefficient (f:4), relative to the student (f:3), avoiding responsibilities (f:3), lessons inappropriate for DE (f:2), lack of digital capacity (f:1), and left to choice (f:1). Sample statements are "Distance education with the TV may be boring because there is no interaction." (T1) about interaction; "Definitely there are problems with discipline and students focus on the lessons." (P7) about motivation and attention deficit code; "Lesson hours are short, system problems, the lack of interactive assessment possibilities and the lack of sufficient tools in terms of measurement and assessment." (A3) for the insufficient measurement-assessment and lesson duration subcodes; "It's not efficient. The teacher goes over the slides, and it is a pity that we do the same thing when we talk about how correct this is or is not in lessons." (A2) about the inefficient subcode; and "It may be hard to stay in front of a screen for a long time, especially for students in the young age group." (P8) for the relative to the student subcode.

The infrastructure code comprised the subcodes of technical (f:15) and technological (f:2). An example statement for the technical and technological subcodes is "Additionally another notable significant problem is the inadequacy of technical and technological equipment." (A7). The conditions code comprises the subcodes of digital capacity/lack of capacity (f:8), parental control (f:1), workload (f:1), rapid transition process (f:1) and insufficient information (f:1). Example statements include, "To be honest, it's ridiculous for children living in villages without the internet and television in the east and children growing up on the internet in the west to receive education in the same way." (S8) about the digital capacity/lack of capacity subcode; and "Additionally, children with mothers and fathers who work means it is difficult to check this education is done at home, while it can't fully be followed." (P4).

In terms of psychology, the code comprises the subcodes of socialization (f:5), adjustment problems (f:2), and anxiety (f:1). Statements related to the socialization subcode are "The inability to spend time with their peers negatively affects socialization." (T9); related to the adjustment subcode are "Some students and parents find the internet or program setup strange." (T5), while about the anxiety subcode "Students worry about the topic of measurement-assessment." (T9). The subcodes are sleep and eating habits (f:1) and health problems (f:1) the health code. Example statements are "Education in front of a screen negatively affects sleep and eating patterns." (PT10) about the sleep and eating habits; and "Long durations spent in front of a screen can cause additional health problems (negative effects on vision and muscle system)." (P2) for the health problem subcode.

Adequacy of Distance Education

The code concept map in relation to responses of stakeholders about the adequacy of distance education during the COVID-19 pandemic is given in Figure 7.

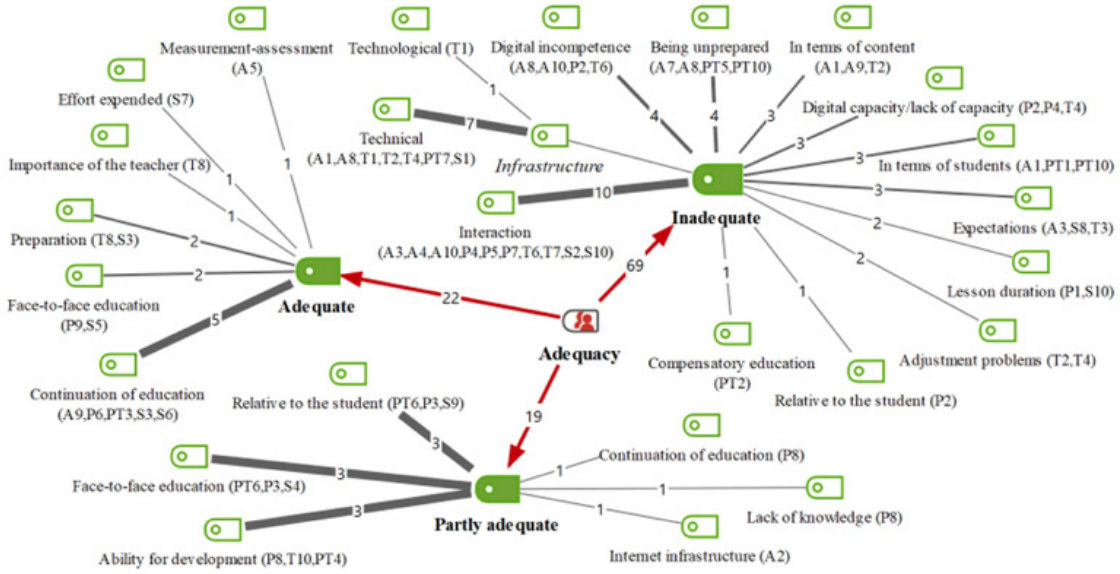

Figure 7. Adequacy of Distance Learning According to Stakeholders during the COVID-19 Pandemic in Turkiye.

Responses to the question "Do you find the distance education implemented during the COVID-19 pandemic adequate (satisfactory)? Please explain." comprised the categories of adequate (f:69), inadequate (f:22), and partly adequate (f:19). The inadequate category comprised the codes interaction (f:10), infrastructure (f:8), digital incompetence (f:4), being unprepared (f:4), expectations (f:3), digital capacity/lack of capacity (f:3), in terms of students (f:3), in terms of content (f:3), lesson duration (f:2), adjustment problems (f:2), compensatory education (f:1) and relative to the student (f:1). Statements include, "There's no answer to the question. Additionally, I don't think all families have sufficient equipment for this education system. Children should be able to perform the operation with the teacher, rather than listen, especially in numerical lessons." (P4) about interaction and digital capacity/lack of capacity codes; "The most important reason distance education is inadequate is the sudden transition due to not predicting this process; the infrastructure problems really lowered satisfaction." (A8) for infrastructure, digital incompetence, and being unprepared codes; and "I think we don't have sufficient economic and social competence for distance education in the country." (T3) about the expectations code.

The adequate category comprised the codes continuation of education (f:5), face-to-face education (f:2), preparation (f:2), importance of the teacher (f:1), effort expended (f:1) and measurement-assessment (f:1). Examples of statements for the continuation of education are, "I think many organizations adapted easily

and tried to make the process more effective/increase quality. In this period when face-to-face education can't happen, the first stage of the distance education process was sufficient to motivate students and educators in the beginning and for easy adaptation." (A9); about the face-to-face education code "For me, lessons are actually satisfactory. I don't find it difficult to understand the topics and teacher, but it is, unfortunately, challenging to reach the efficiency of face-to-face education." (S5); and about the preparation code, "Because the transition was so quick in a short time and considering this duration, an excellent system was created." (S3).

In the partly adequate category, the codes were relative to the student (f:3), ability for development (f:3), face-to-face education (f:3), continuation of education (f:1), lack of knowledge (f:1) and internet infrastructure (f:1). Statements include, "Studies are not flawed but are as they should be. However, I don't think giving education from a distance is suitable in terms of information teaching. Communication should be founded based on active eye contact between teacher-student. The distance education duration implemented in the country is 20 min which is a marker that attention was paid to the students' traits. At the same time, I assess it as being suitable for teacher traits, with exercises and activity content being good and efficient." (PT6) for the relative to the student, lack of knowledge, and face-to-face education codes.

Continuation of Distance Education

The code concept map based on responses of stakeholders about the continuation of distance education in Turkiye after the COVID-19 pandemic are given in Figure 8.

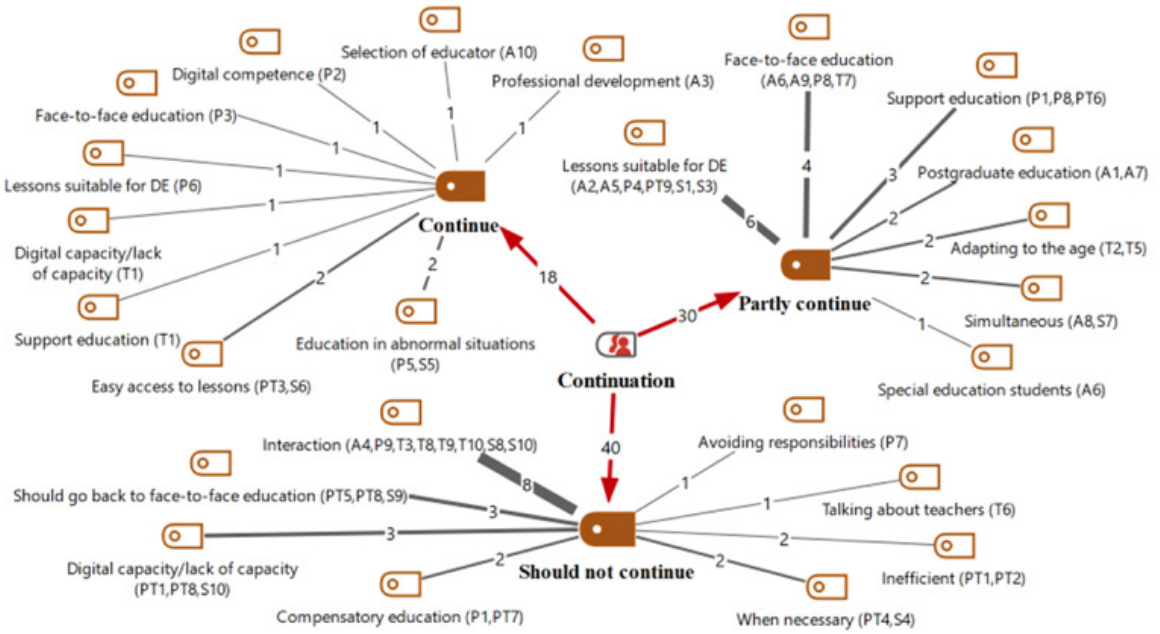

Figure 8. Continuation of Distance Learning after the COVID-19 Pandemic in Turkiye According to Stakeholders.

The responses of stakeholders to the question "Do you want distance education to partly or fully continue after the COVID-19 intervention process has ended? Please explain" comprised the categories should not continue (f:40), partly continue (f:30) and continue (f:18). They should not continue category includes the code"s interaction (f:8), digital capacity/lack of capacity (f:3), should go back to face-to-face education (f:3), when necessary (f:2), compensatory education (f:2), inefficient (f:2), talking about teachers (f:1) and avoiding responsibilities (f:1). Example statements for the interaction and digital capacity/lack of capacity codes are "It should not continue because people don't listen to lessons, we can't ask the teacher questions we don't understand, and not everyone has electronic devices." (S10); and about the should go back to face-to-face education are "I would choose for schools to open. I missed my friends and my teacher a lot. I can access the information I want at any time, but it was awful not to be able to see my friends." (S9).

In the partly continue category, the codes were lessons suitable for DE (f:6), face-to-face education (f:4), support education (f:3), adapting to the age (f:2), simultaneous (f:2), postgraduate education (f:2) and special education students (f:1). Examples of statements about lessons suitable for DE are "I think it will be more efficient to have partial implementation considering the lesson content and quality of education about distance education after the viral pandemic ends." (A2); for the face-to-face education and special education students' codes "I want it to partly continue, it may continue especially for special education students. But I think face-to-face education will be better." (A6); and about the support education code "It shouldn't be full. But it may be partly implemented with supporting qualities for students. In this way, it will prevent class teachers undertaking a large load." (PT6).

In the continue category, the codes were easy access to lessons (f:2), education in abnormal situations (f:2), digital capacity/lack of capacity (f:1), lessons suitable for DE (f:1), support education (f:1), face-to-face education (f:1), digital competence (f:1), selection of educator (f:1) and professional development (f:1). Example statements are "I want it to continue a lot. As I said, I am finding it more efficient distance education. I think everyone being able to receive education in their own home with their families will be more efficient." (S6) for the easy access to lessons code; "Yes, it should be done. Nobody knows if the events occurring today will repeat, and as a result, this system should continue to be improved further." (P5) about education in abnormal situations code; and "Yes, maybe depending on the students' situations. It may be a good tool for those with the opportunity. I think it's a good resource for revision and exercises. I think it's good compared to other resources." (T1) about digital capacity/lack of capacity and support education codes.

DISCUSSIONS AND CONCLUSION

The aim of this research was to investigate and reveal the opinions regarding distance education of students, parents, teachers, pre-service teachers, and academics employed in education faculties mostly affected by the transition to distance education in educational organizations in Turkiye during the COVID-19 pandemic and to make recommendations based on the findings. Findings acquired in the study have been discussed comprehensively. The responses of stakeholders in the research were analyzed in the framework of four main themes namely the readiness for distance education, benefits of distance education, adequacy of distance education, and continuation of distance education. A few stakeholders who participated in this research remarked that Turkiye was unprepared for distance education. Stakeholders noted that private organizations were prepared for distance education on an organizational basis, while state organizations, MoNE and The Turkish Higher Education Council (HEC) were only partly ready.

The positive aspects of distance education in psychology, economy, conditions, and most education were emphasized. In terms of psychology, positive aspects such as acceptance of technology, adjustment, sense of community due to time and schools and teachers were at the forefront. Just as stakeholders used technology, some had to accept technology or adapt to it due to the distance education activities implemented during the pandemic. Students felt the need to experience a sense of community in online environments because they did not have the opportunity to socialize as they were not in school. Whiteman (2002) stated that many educators attempted to develop a sense of community encompassing security, commonality, and interaction between students in distance education. The formation of a sense of community among students can help students continue with distance education (Rovai, 2002) and feel satisfied and motivated (McCraken, 2005). To examine the positive aspects of distance education, various conditions were assessed within the framework of learning at home, healthy living, equal opportunities, and education in unusual situations.

Positive aspects in terms of distance education conditions were stated to be viewing the desired lesson at the desired time without any limitation and being in a comfortable, peaceful, and secure environment. Reimers and Schleicher (2020) reported that it is of critical importance to ensure continuity of academic learning for students in distance education during the pandemic. Continuation of education during the pandemic was stated to be a factor that increased students' success and motivation. Wei and Chou (2020) remarked that perceptions about distance education positively affected readiness for distance education. It is worth mentioning that the more positive a student's perceptions are, the more prepared they are for distance education. Pre-service teachers affirmed that the connection between education and technology would continue to increase in future years and distance and virtual learning environments will be used more often (Yaylak, 2019).

The use of television in distance education can provide equality of opportunity in education. The Minister of National Education of Turkiye, Ziya Selcuk, stated that weight was given to distance education on television channels due to the higher access to television in Turkiye than access to the internet (Selcuk, 2020b). However, higher-level distance education teaching was conducted through the internet. Stakeholders stated that not everyone has access to information technologies or the internet, which leads to unequal opportunities. Aktas Salman (2020a) asserted that students' success was affected by the educational level of parents and socioeconomic power and said: In Turkiye, where there is a large gap in household budgets allocated to education, there is an inequality which was felt more during the distance education process; the digital gap. In other words, the inequality felt by individuals in different socioeconomic conditions in terms of access to information communication technologies (ICT) and their use.

This situation may be termed as the lack of digital capacity. Though the Ministry made agreements with GSM operators to ensure every student had the opportunity for a certain amount of internet access, it appears problems were experienced both regarding devices and access to the internet. An 88.3% increase in household internet access in Turkiye in 2019 (Turkish Statistical Institute [TUIK], 2019) does not mean that all students have equal opportunities. Young people living in low-income households are said to have a high probability of not having a computer at home. Such conditions prevent a markedly large number of children from participating in distance education. Numerous studies have concluded that emergency distance education increases opportunity inequality among students (Bergamini, 2020; Blundel et al., 2020; Govindarajan, & Srivastava, 2020; Iwuoha, & Jude-Iwuoha, 2020; Qunaibi, 2020; Williamson et al., 2020).

Most stakeholders who participated in the research were optimistic about the continuation of education in this form during the pandemic. Teachers have indispensable roles in the continuation of this process. Teachers are considered to have expended more effort in the distance education process than informal education while hoping their value will finally be understood by society. While maintaining efforts at distance education during this process and with significant responsibilities at the point of compensating for learning losses after the pandemic, teachers and education workers ought to be supported with continued work security in this crisis period to prevent income losses and meet professional needs (International Task Force on Teachers for Education 2030, 2020). However, access to information, learning, and revision opportunities increased with technology in the distance education process. This situation is a marker of how crucial the use of technology in education is. Though the use of technology is regarded as the most important in the distance education process, stakeholders underlined the need for distance education interaction. Interaction due to the structure of distance education lessons (Dunn et al., 2014; Greene, & Azevedo, 2007), motivation, and support were essential determinants for successful lesson processes (Lim, 2004; Liu et al., 2012). Positive aspects with regard to the economy were that technology is essential for distance education, production of technology needs to increase in our country, and it should not stretch the budget in terms of materials (access, food, stationery, etc.), and a more effective use of time (access, lesson preparation, etc.).

Likewise, the positive opinions about the distance education mode implemented in Turkiye during the COVID-19 pandemic, there were negative opinions. These were observed to be diversified with regard to psychology, health, conditions, education, and infrastructure. Negative situations such as students not spending time with their peer group or classmates (socialization), uncertainty about measurement and assessment (anxiety), and inability to adjust to the use of technology by students and parents (adjustment) were revealed. The interaction came to the forefront among negative aspects of distance education. Stakeholders remarked the weakness of mutual interaction in distance education and the importance of face-to-face education from this aspect. This situation was concluded to cause a lack of motivation and attention among students, according to stakeholders. Phirangee and Malec (2017) revealed that students experienced isolation and lack of community due to disrupted communication with peers and teachers, which negatively affected their learning experiences. Experts experiencing the Chinese situation (Distance education practiced in China) indicated that forming live connections is more efficient, even occasionally, of students with their teachers and classmates (Arik, 2020). Data revealed that only 3% of students communicated with their teachers and implied the importance of the school and teachers' role in supporting students socially and emotionally in times of crisis and need (Turkish Educational Volunteers Foundation [TEGV], 2020). This situation can be inferred to be valid for teachers and academics. A recent study (Aguilera-Hermida, 2020) indicated that university students still prefer face-to-face learning due to their unpleasant experiences of a sudden transition to online learning, such as lack of supporting resources from institutions, teachers, or peers.

The duration spent in front of a screen was stated to cause adverse effects such as disrupting students' sleeping and eating patterns, degeneration of vision and muscle system, and other general health problems. In this situation, parents must control screen use by students. According to research results by the TEGV, appetite changes and sleep disorders were observed mostly with continuously watching television, playing computer games, and using a telephone (TEGV, 2020). Nonetheless, students with working parents may be out of control or not receive the requisite support from teachers. As support cannot be provided simultaneously in distance education lessons, it requires relative responsibility and self-control (Artino, & Stephens, 2009; Dabbagh, & Kitsantas, 2004; Hartley, & Bendixen, 2001). This situation may impact the students positively or negatively basis on their class level and ability to undertake responsibility. Research has stated a positive correlation between self-control and academic success in distance education environments (King et al., 2000; Whipp, & Chiarelli, 2004). About this situation, Camera (2020) stated that low-income households generally have parents who cannot stay at home to help children, implying that even with technological access to distance education, it may be less effective for such students. Some children must work during the age of getting educated. Children who leave school early in places with intense seasonal work may be further removed from schooling during the pandemic with distance education implemented. It may not be easy to monitor children who are removed from education and regain them for society. For example, some children did not return to school after the Ebola epidemic in Africa, while others remained behind in learning and development. Additionally, there was an increase in sexual abuse and violence rates toward children after schools in West Africa closed (Jenkins, 2020). To avoid these types of outcomes, every child should access school return action plans prepared by authorities.

Another topic that formed a common point was measurement-assessment. Stakeholders had concerns related to the issue of measurement and assessment during the distance education process. During a pandemic, educational organizations should prepare measurement and assessment methods that can be completed over e-mail or web-based environments (Saravara, 2007). It can be stated that educational organizations in Turkiye were deficient in the topic of measurement-assessment in education-teaching activities implemented during the pandemic. After parents and teachers gained awareness about the program's critical aspects, teachers needed to ensure student-centered learning. The International Society for Technology in Education (ISTE) deems it imperative to create the conditions required to support learning in this type of technological learning (ISTE, 2019). In this educational approach, roles change from passive information to active participation in a process that emphasizes discovery (Morgan, 2020). For instance, instead of teachers using technology to present information to students, they should ensure students' opportunity to work with peers for various projects, use digital tools to collect information and create presentations to share ideas (Chen, 2010). Instead of exams taken alone in video lessons or home education environments, methods such as group projects and live forums preserving communication between students with teachers and peers are experienced more productively in terms of pedagogy (Ergenc, 2020). The Chair of HEC, Sarac, (2020) stated: "Examinations in our universities will be implemented with alternative methods like 'digital opportunities' or 'homework, projects' with the condition of being transparent and auditable." After this announcement, universities attempted to perform measurement-assessment in the form of online exams or homework. Educational facilities linked to MoNE did not hold exams but plan to transfer students to the class above based on first semester grades. Regarding this issue, the need to establish impartial and fair assessment-evaluation systems against the risk of future interruption of education has emerged (Adedoyin, & Soykan, 2020; Feldman, nd).

The study participants had different opinions about the short duration of distance education and the inefficiency of lessons. Additionally, studies were considered standardized rather than based on the principle of being relative to the student. Students with a natural development benefited from this system. Further, some participants stated that some lessons may be suitable for distance education, while some were not, and the requisite efficiency was not obtained through these lessons. Lesson duration may cause positive or negative outcomes for students at different class levels. There may be students who cannot learn, who do not want to learn, or are bored. Just as there are students not displaying a natural development, refugee students come from different cultures who are not well-versed in Turkish. Stakeholders deemed it essential to provide distance education to students with special education needs. The effect of COVID-19 is probably worse for people in low socioeconomic groups, and the risk of disabled children remaining behind is greater (Nhlapo, 2020). Due to the lack of parsed data and information, it is uncertain how many disabled students received

inadequate educational support due to the COVID-19 pandemic (UNESCO Bangkok, 2020). Just as provincial and county national education directorates attempted to identify students without the necessary digital opportunities for distance education, the determination of students requiring special education is essential in inclusiveness and equal education opportunities. Several studies have been conducted with disadvantaged students. For example, the Promoting Integration of Syrian Kids into the Turkish Education System (PIKTES) announced that they would begin distance education from March 30, 2020, in adaptation classes that took a mandatory break. The "Adjustment for Turkish" lessons can be followed on the Turkiye Radio and Television Corporation - Education Information Network (TRT-EBA) and PIKTES YouTube channel (piktes.gov.tr). While trying to solve the problem of integration education of refugee students, providing these students with urgent distance education can rather increase the problems.

Students who lack interest or self-control and have working parents may not benefit sufficiently from distance education. The digital gap is not just in terms of access to information communication technologies (ICT). It is, however, present for students who cannot benefit sufficiently from the distance education process even with ICT access. Students' digital literacy skills and parental support affect the distance education process (Aktas Salman, 2020b). Research assessing distance education in the first week stated that teachers had a key role in distance education as informal education. Teachers' digital literacy levels were essential, and distance education inclusiveness was not just based on internet access (Ergen, 2020). Teachers may have difficulties accessing students whose families have to work, refugees whose primary language is not Turkish, and students who require special education. This negatively affects the inclusiveness of distance education.

There were opinions related to the adequacy of the distance education implemented in educational organizations during the COVID-19 pandemic as adequate, partly adequate, and inadequate. According to these opinions, most stakeholders consider distance education to be insufficient. Most who found it satisfactory thought it was essential to continue education, be prepared quickly, that teachers were necessary, and would choose formal education. Stakeholders who found it partly adequate again thought it was needed in terms of continuing of education. Contrary to those emphasizing negative aspects, they stated that lesson durations were according to the students, they preferred formal education, and develop distance education. Participants who saw distance education as inadequate emphasized that interaction was insufficient. For distance learning to be effective, the information, tools, and platforms where the precondition of the "interaction" element can occur were understood to be still very new and unknown in society (TEGV, 2020). Another critical topic appeared to be infrastructure, with technological and technical infrastructure found to be inadequate. Stakeholders found distance education inefficient and stated that the content was not student-centered and educational organizations were unprepared for distance education. The lack of digital capacity was accentuated here. The inadequacy of distance education was thought to be triggered by inequality of opportunity due to every student and every family not having the requisite technology and infrastructure.

The roles of educators changed with distance education implemented by educational organizations in the pandemic. Some of those participating in this research did not think educators had sufficient skills for distance education. This situation may have occurred due to the rapid and unprepared transition to distance education. Teachers require support; many teachers providing distance education during the pandemic were giving fully online lessons for the first time. For example, according to the US National Center for Education Statistics data, only 21.1% of state schools had at least one fully online lesson in 2015–2016 (Riser-Kositsky, 2019). It is known that there are remarkable differences between teachers in terms of access to digital devices and the ability to use these devices in Turkiye and many other countries. It can be remarked that this difference is rather lower in Turkiye. Students receiving distance education during the COVID-19 pandemic can use technology much better. Prensky (2001) defined this generation as "digital natives." One of these students' parents stated that as children know this system, the person providing the education needs training. In contrast, the other parent noted that distance education appeared to be a preliminary study and the same topics need to be repeated in informal education. Aktas Salman (2020b) displayed parallel opinions to these stakeholder opinions by stating, "while teachers with higher digital literacy adapted to the process more easily, teachers lacking about this topic had difficulty."

The proportion of stakeholders who wanted distance education to continue when the pandemic precautions ended, and normal life returned were lower compared to those stating that it should partly continue or

totally discontinue. When the opinions of stakeholders who wanted distance education to continue were investigated, no definite reason came to light. They asserted that students could easily access lessons, while other stakeholders indicated that it could support students' education. Some stakeholders noted that distance education should continue to be used and developed in abnormal situations such as COVID-19 and natural disasters. Stakeholders who believed that distance education should partly continue reported opinions that lessons suitable for distance education should continue, while unsuitable lessons should be given with formal education. They stated that while formal education should continue, simultaneous distance education can also be provided, and distance education can be used for postgraduate education. Gelisli (2015) stated that separate applications for theoretical and applied lessons can increase success despite some problems with distance education. Opinions that distance education should not continue due to the lack of interaction were reported, emphasizing the need to return to formal education. Additionally, they stated that digital impossibilities may plausibly increase the inequality of opportunities in education. They noted that distance education lessons were inefficient and if they are to be given, it is necessary to use distance education for complementary aims.

Suggestions for the Continuation of Learning During and After COVID-19

In summary, the findings of this research ensured ideas were obtained about the distance education process implemented by MoNE and HEC based on the opinions of students, teachers, pre-service teachers, parents, and academics during the COVID-19 pandemic. This may form the basis or inspiration for action plans to be prepared for the transition to formal education by organizations responsible for education and teaching. For clearer and more profound conclusions and educational implications, however, future research is needed. Based on the findings of this study, recommendations for future research are as follows.

Priority and support can be given to research, projects, and studies that will improve teachers' digital literacy levels. Many generation X teachers feel inadequate in their use of ICT. While generation Z students use technology well, opportunities should be created for teachers to improve themselves, especially in teacher education programs, information-technology literacy, etc. It can be suggested that the contents be concentrated.

As all courses are in online training, computer servers may not accommodate such large-scale new users. Online training platforms can often shut down due to overload. To solve any unexpected problems on time, the educators need to prepare different plans before the lessons begin and inform students about these plans. Local administrations, central government, and non-governmental organizations have numerous responsibilities in meeting the students' technological needs and teachers who have problems accessing distance education. For emergency distance education, it is necessary to prepare a broadband internet infrastructure that allows synchronous and asynchronous education, video conferencing, uploading, and downloading digital materials (video, presentation, homework documents, etc.) without any problems.

During the emergency distance education process, teachers and students mostly had problems conducting the assessment and evaluation. Since multiple-choice exams are usually held in formal education, they lost their reliability in the new normal process. Many educational institutions had to take different measures for exams. It can be suggested as a better solution for teachers to use formative assessment by using learning management systems to evaluate their students. Even so, studies should be conducted regarding fairer and more objective evaluation systems. Teachers can use learning management systems with a more robust infrastructure to make formative assessments in the emergency distance education process.

E-content, i.e., digital-based instructional content that supports the course, can be produced to make students active in distance education. During the distance education process, children were constantly exposed to digital screens. Lessons generally continued teacher centered. According to the results of the study, the importance of mutual interaction in distance education has emerged. Based on this result, the course contents should be planned in which the lessons are more interactive, student-centered, and especially with the voice, and gestures felt more clearly. Active use of learning management systems will enable students improve their self-learning skills. Teaching contents can be segregated into smaller units to help students focus and learn self-directed. Moreover, students should not be exposed to classes for 6–8 hours during the day. Teachers and parents should direct children to extracurricular activities that will keep children active.

During the pandemic, the responsible institutions should devise action plans for returning to school for many children absent from school for different reasons (technological need, need to work, etc.). It is valuable to strive to prevent children from losing their educational opportunities. Complementary and supportive education programs may be created for child laborers and seasonal child workers. The number of refugees that do not have Turkish as the primary language cannot be underestimated in Turkiye, so distance education platforms and programs should include these children. Planning of the make-up education, its scope, and making it clear to the public that it will ensure the completion of the students' learning deficiencies in the transition to the next class is essential in many aspects. Students who need special education may be the ones who experience the maximum loss of education in the emergency distance education process. Therefore, a different education platform and program can be created for students who need special education and for their parents.

With COVID-19, education was restructured all over the world, and emergency distance education was introduced. A lot of research has been done, and experience has been gained during this process. Undoubtedly, with technology development, distance education applications will increasingly continue after the end of this pandemic. In this case, education policymakers and governments should do the necessary and relevant work and adopt various measures required to improve the restructured education.

Limitations

There are certain limitations to this study. This study was conducted with a total of 50 stakeholders who lived in several cities in Turkiye. For this reason, there are limitations regarding the generalizability of the findings of this research at national and international levels. Accordingly, it can be suggested that similar studies should be conducted on a larger scale nationally or internationally. As this study was conducted within the qualitative research method, further studies can be conducted with quantitative or mixed research methods to examine the effects of distance education on stakeholders during the COVID-19 pandemic in further depth. Besides, research can be conducted with stakeholders living in many different cities and regions.

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ONLINE LEARNING: THE EFFECTS OF USING E-MODULES ON SELF-EFFICACY, MOTIVATION AND LEARNING OUTCOMES

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ABSTRACT

Teachers' mastery of learning technologies is highly necessary for the digital era. Among such skills is the ability of teachers to package learning materials using various software. One form of presenting learning materials with technology is an e-module. E-modules serve as the main teaching material in online learning and can also be used in face-to-face learning. The purpose of this study was to analyze the effects of using e-modules on self-efficacy, motivation, and learning outcomes in an online learning environment. This research used a quasi-experimental research design with three pretest-posttest groups. The students involved in this study consisted of the control group without e-modules (Group A), the experimental group using emodules independently (Group B), and the experimental group using e-modules collaboratively (Group C). 30 students per group participated in the Geography Learning Planning course. Data was collected through questionnaires and a 10-item essay test and were exposed to descriptive and inferential statistical analyses. The findings showed that the application of e-module in online learning resulted in significant increases in self-efficacy, motivation, and learning outcomes. The e-modules with the collaborative learning option was the most effective.

Teachers' mastery of learning technologies is highly necessary for the digital era. Among such skills is the ability of teachers to package learning materials using various software. One form of presenting learning materials with technology is an e-module. E-modules serve as the main teaching material in online learning and can also be used in face-to-face learning. The purpose of this study was to analyze the effects of using e-modules on self-efficacy, motivation, and learning outcomes in an online learning environment. This research used a quasi-experimental research design with three pretest-posttest groups. The students involved in this study consisted of the control group without e-modules (Group A), the experimental group using emodules independently (Group B), and the experimental group using e-modules collaboratively (Group C). 30 students per group participated in the Geography Learning Planning course. Data was collected through questionnaires and a 10-item essay test and were exposed to descriptive and inferential statistical analyses. The findings showed that the application of e-module in online learning resulted in significant increases in self-efficacy, motivation, and learning outcomes. The e-modules with the collaborative learning option was the most effective.

Keywords: e-Modules, self-efficacy, motivation, learning oucomes, online learning.

INTRODUCTION

21st century learning demands the mastery of technology among educators and students alike. The use of media and technology-based learning resources affects the quality of the process and learning outcomes. This is especially true in the Covid-19 pandemic situation which promotes the shift from face-to-face learning in class to virtual class with an e-learning system. E-learning is an electronic learning method supported by the internet, the use of digital platforms and devices such as computers, laptops, tablets or smartphones (Muller & Faltin, 2011; Nussbaumer, Dahn, Kroop, Mikroyannidis & Albert, 2015). Electronic learning is thus also supported by electronic learning resources (Berutu, Delita, Astuti, Novira, & Wirda, 2019)-one such resource being e-module.

E-modules are teaching materials or learning media that are presented electronically to support active learning. E-modules would make it easier for teachers to convey material to their students as well as make learning more interesting for being in accordance with present-day technological developments. Presentation of material in e-modules is not only done textually, but can also vary through multimedia in the form of video, audio, short films and others (Herawati, 2017; Kismiati, 2018). The development of electronic-based teaching materials is similar to that of e-books. E-modules are often required to be self-instructional, self-contained, stand-alone, adaptive, and user friendly (Ministry of Education and Culture of the Republic of Indonesia, 2017). Thus, e-modules can serve as the main learning resource for students, if developed according to student profile and designed in an interesting way to avoid boredom while studying (Asrial, Syahrial, Maison, Kurniawan & Piyana, 2020).

E-modules are part of learning tools that contain learning outcomes or competencies in each learning activity, material, summary, and systematic evaluation. The current e-module developed for purposes of this study facilitates student learning, independently, in groups or conventionally. E-modules are presented with self-study instructions so that students can learn at their own pace. E-modules promote learning effectiveness, learning independence (Syahroni, Dewi & Kasmui, 2016), (Aprilia & Suryadarma, 2020), self-efficacy, motivation, learning performance and learning outcomes (Jeske, Backhaus & Roßnagel, 2014; Herawati, 2017; Kismiati, 2018; Hapsari 2016). When learning or studying content independently, students self-efficacy and motivation can increase, and learning outcomes may improve. The ability of teachers to develop technology-based teaching materials must be a concern, since learning resources in the form of e-modules are required in education today, especially in the face of the current situation as online learning policies are adopted worldwide. With online learning, teachers' and students' physical interactions are limited, and e-modules can help students learn more independently, thereby minimizing teacher guidance and allowing learners' independent tracking and evaluations of their own learning (Syahroni, Dewi & Kasmui, 2016; Ministry of Education and Culture of the Republic of Indonesia, 2017). This certainly affects the extent of learning that takes place and the subsequent learning outcomes.

However, there are still few teachers who developed learning resources independently and are more likely to use teaching materials that have been developed by others. This includes materials that are downloaded from internet or attained from other teachers who experiment with similar subject. Teaching materials need to be prepared with a consideration of the needs and characteristics of the diverse learners they address (Delita, Arif, Rosni, Sitompul & Rohani, 2019). The current Geography Learning Planning course is set out to build on one specific topic: the development of learning tools oriented toward higher order thinking skills. One of the outputs of this course is the learning implementation plan. The initial survey using google forms distributed to 95 students showed that as many as 91.6% stated that it was difficult for them to design lesson plans independently, and they mostly preferred the lesson plans that are already available on the internet. This seemed to result in feelings of lower perceived competence in learning design in students' as prospective teachers. In addition, 96.8% of the students stated that they needed a series of e-learning modules to study and practice the Geography Learning Planning as part of the course. Based on these problems reported in survey, e-modules were developed as the main teaching materials in online classes.

Several studies on e-modules have been carried out by other researchers including: Tamrongkunanan, & Tanitteerapan (2020) who developed e-modules that can improve students' knowledge and skills; Sofyan, Anggereini & Saadiah (2019) who designed e-modules based on local wisdom; Aprilia & Suryadarma (2020) who used e-modules to enhance self regulated learning; Hill, Sharma, & Johnston (2015) who

conducted research to study the impact of online learning modules on conceptual understanding; Asrial, Syahrial, Maison, Kurniawan & Piyana (2020) developed ethnoconstructivism e-module to increase students motivation, interest and perception. The current research differs in the variables it investigates including self-efficacy, motivation and learning outcomes. Self-efficacy can influence motivation. Overall, self-efficacy and motivation can affect learning outcomes (Mukti & Tentama, 2020; Slameto, 2010). Another difference lies in the grouping procedure employed as there are three groups in this study one without e-modules, one using e-modules independently and a final group studying e-modules collaboratively.

PURPOSE OF THE STUDY

The study aims to analyze the effects of e-modules on students':

1. self-efficacy
2. motivation, and learning outcomes

in an online learning environment.

METHOD

This research used quasi-experimental method with three groups of pretest-posttest research design. The research was conducted through 6 meetings (2 x 50 minutes each) conducted online using Zoom Cloud Meeting, LMS SIPDA and WhatsApp. Learning in the control class was not carried out with e-modules, whereas the experimental classes used e-modules independently or in collaboration.

Participants

A total 90 students, 56 girls and 34 boys, in Geography Education Department, Social Sciences Faculty, Universitas Negeri Medan, participated in this study. There were 30 students in each class. They were selected based on the purposes of the research and registered in the same course namely Geography Learning Planning. The students involved in this research consisted of control class without e-modules (Group A), experimental class using e-modules independently (Group B) and experimental class using e-modules collaboratively (Group C).

Data Collection and Analysis

The researcher conducted this study in February 2021. The learning topic was the Development of HOTS-Based Learning Tools. Overall, the study consisting of 6 online meetings using Zoom, LMS and WhatsApp. The students participated in the pretest at the first Zoom Cloud Meeting with all groups. It lasted 50 minutes and measured their prior knowledge. They also took the self-efficacy and motivation surveys. During the treatment period from the second to the fifth meetings, Group A was taught the material without e-modules, and Group B used e-modules independently. Meanwhile, Group C used e-modules collaboratively in learning groups consisting of five students each. After the treatment, the students participated in a posttest that measured their learning outcomes and they also took self-efficacy and motivation surveys again. Self-efficacy contains three indicators: magnitude, strength and generality (adopted from Bandura, 1997). The data was obtained from a questionnaire consisting of 20 items. Data on student motivation was collected using a questionnaire in the ARCS format (attention, relevance, confidence, and satisfaction) developed by Keller (2006). This questionnaire consists of 20 items which contain all indicators. Learning outcomes data were collected through a pretest and a posttest. Questions were given in the form of an essay test consisting of 10 items. Subsequently, self-efficacy, motivation, and learning outcomes data were analyzed using SPSS version 24 software. Tests on normality and homogeneity of data were carried out using the Shapiro-Wilk and Levene tests. The statistical analysis was computed using the ANCOVA test at 5% significance level.

The Scales

In the self-efficacy and motivation surveys, a Likert scale was used with the response options of 1) strongly disagree; 2) disagree; 3) neutral agree; and 4) agree and 5) strongly agree. The qualitatively construct validation of the instruments was carried out by three field experts in team. Empiric validation per item was performed using Pearson product moment and the result showed that all the items in the three instruments were valid. The reliability of the self-efficacy, motivation and learning outcomes instrument was measured using Cronbach's alpha. The Cronbach's alpha value was .89 for self-efficacy; .89 for motivation) and .70 for learning outcomes, respectively. The results of the analysis indicate the instruments are declared valid and reliable.

FINDINGS

The Effect of Using E-Modules on Self-Efficacy

The data of self-efficacy were homogeneous in variances, and the result of the Levene's test was 0. 219. A one-way ANCOVA was conducted to test whether statistically significant differences existed among the three groups from the perspective of the students' self-efficacy. As shown in Table 1, statistically significant differences existed among the three groups on self-efficacy, specifically F (2.86) = 15.068, p <.001. The means were respectively 70.03 for Group A, 72.23 for Group B and 75.23 for Group C. The results of the pairwise comparisons also indicated that Group B (learning with e-modules independently) significantly outperformed Group A (learning without e-modules), while these interventions were both significantly less effective than the interventions implemented in Group C (learning with e-modules collaboratively) in terms of enhanching students' self-efficacy (see Table 2).

Table 1. Summary of ANCOVA on Self-Efficacy

Learning Method	N	M	SD	F
Learning without E-Modules	30	70.03	5.17	
Learning with E-Modules Independently	30	72.23	4.49	15.068
Learning with E-Modules Collaboratively	30	75.23	4.08	

Note: $^{***}p < .001$

Table 2. Results of the Pairwise Comparisons of the Groups for Self-Efficacy

(I) Learning Method	(J) Group	MD (I-J)	SE	Sig.
Learn without E-Modules	Group A	-4.214*	0.765	0.002
Learning with E-Modules	Group B	-1.855*	0.765	0.000
	Group C	2.359*	0.765	0.008

Note: *Adjustment for multiple comparisons: Bonferroni.*

$^{*}p < .05$.

The Effect of Using E-Modules on the Motivation

On the questionnaire data about the student motivation, a one way ANCOVA was conducted. Similarly, the data met all basic data assumptions. The results of the Levene's test of equality showed that the data were homogeneous in variances with a significance value 0.950.

As shown in Table 3, statistically significant differences existed among the three groups from the perspective of student motivation, specifically $F(2.86) = 5.051$, $p < .001$. The means were respectively 71.30 for Group A, 72.40 for Group B, and 74.00 for Group C. The results of the pairwise comparisons as shown in Table 4 indicated that the intervention implemented in Group C (learning with e-modules collaboratively) and Group B (learning with e-modules independently) were significantly more effective than that ini Group A (learning without e-modules).

Table 3. Summary of ANCOVA on Motivation

Learning Method	N	M	SD	F
Learning without E-Modules	30	71.30	4.647	
Learning with E-Modules Independently	30	72.40	4.598	5.051
Learning with E-Modules Collaboratively	30	74.00	4.934	

Note: ***$p < .001$

Table 4. Results of the Pairwise Comparisons of the Groups for Motivation

(I) Learning Method	(J) Group	MD (I-J)	SE	Sig.
Learning without E-Modules	Group A	-3.076*	0.970	0.001
Learning with E-Modules	Group B	-1.741*	0.970	0.006
	Group C	-1.335*	0.970	0.027

Note: *Adjustment for multiple comparisons: Bonferroni.*

**p < .05.*

The Effect of Using E-Modules on Learning Outcomes

Another one-way ANCOVA was conducted to test whether statistically significant differences existed among the three groups in terms of enhancing students' learning outcomes, after controlling for their pre-test scores. The data were analysed using one way ANCOVA meeting the basic data assumptions, including normal distribution, homogeneity of regression slopes and homogeneity of variance. Specifically, the results of the Levene's test of equality showed that the data were homogeneous in variances with a significance value of 0.227.

As shown in Table 5, statistically significant differences existed among the three groups in the terms of improving the students' learning outcomes (F (2.86) = 9.668, $p < .001$). The means were respectively 73.30 for Group A, 77.17 for Group B and 79.80 for Group C. The results of the pairwise comparisons as shown in Table 6 indicated that Group C (learning with e-modules collaboratively) and Group B (learning with e-modules independently) performed significantly better than Group A (learning without e-modules).

Table 5. Summary of ANCOVA on Learning Outcomes

Learning Method	N	M	SD	F
Learning without E-Modules	30	73.30	4.154	
Learning with E-Modules Independently	30	77.17	3.931	9.668
Learning with E-Modules Collaboratively	30	79.80	5.671	

Note: ***$p < .001$

Table 6. Results of the Pairwise Comparisons of the Groups for Learning Outcomes

(I) Learning Method	(J) Group	MD (I-J)	SE	Sig.
Learning without E-Modules	Group A	-3.394*	1.113	0.007
Learning with E-Modules	Group B	-4.845*	1.113	0.000
	Group C	-1,451*	1.113	0.006

Note: *Note Adjustment for multiple comparisons: Bonferroni.*

**p < .05.*

DISCUSSION AND CONCLUSION

The Effects of E-Module Use on Self-Efficacy, Motivation and Learning Outcomes

In the digital era, learning resources that can also be accessed in electronic or digital form are required in any learning situation. These electronic teaching materials can support online and offline learning processes and face-to-face learning in the classroom. One such electronic learning resource is the e-module. Electronic modules (e-modules) are similar to electronic books in that they are arranged such that students can study them independently, either with or without teacher guidance. E-modules as learning programs can be studied by students only with minimal supervision from the teacher because they are designed as complete packages (Hill, Sharma & Johnston, 2015; Nisa, Ismet & Andriani, 2020). This component includes competencies and learning outcomes, instructions for use, tools and materials needed, material descriptions, material summaries, exercises and assignments, discussion forums, and disclosed answers that allow for independent assessment.

Learning resources in the form of e-modules can be developed using software and presented in various formats. Software that can be used in the development of e-modules includes Sigil, Canva, Book Creator, Flip Book Maker, and various other software that can be used for free either by download/installation or online (Ministry of Education and Culture of the Republic of Indonesia, 2017). The e-module in this study was developed using Sigil software in epub (electronic publication) format. The advantages of this epub, among others, are: it can be used in various software and accessed on various devices; it is easy to transform to other formats and allows video-embedding (Boyd, 2019; Ministry of Education and Culture, 2017). Thus the use of e-modules becomes more practical, effective and efficient. The development of e-modules can be aimed at facilitating learning independently and strengthening the mastery of a competency. E-modules can also be aimed at increasing learning independence and improving learning outcomes (Syahroni, Dewi & Kasmui, 2016), knowledge and skills (Tamrongkunanan & Tanitteerapan, 2020), self regulation (Aprilia & Suryadarma, 2020), perception, interest and motivation (Asrial, Syahrial, Maison, Kurniawan & Piyana, 2020). In this study, e-modules were developed and implemented to investigate their impact on students' self-efficacy, motivation and learning outcomes in the Geography Learning Planning course, especially with respect of the topic of HOTS Oriented Learning Device Development. A detailed discussion on each variable is presented in the following.

The Effects of the Use of E-Module on Self-Efficacy

Self efficacy is the ability of students to independently and actively motivate themselves in order to achieve a specific goal (Zimmerman, 2000), and an active and constructive process in students to guide and control their cognition, motivation and behavior (Senemoglu, 2005; Pintrich, 2005; 1990; Saks & Leijen, 2014). Self-efficacy can be improved through technology-based learning. This can be in the form of learning activities using ICT, digital media, managing learning with e-learning platforms such as LMS and presenting materials electronically. More learning materials that can be accessed with various hardware such as computers, laptops and smartphonescan be developed (Muller & Faltin, 2011; Nussbaumer, Dahn, Kroop, Mikroyannidis & Albert, 2015). One group of materials with such characteristics is e-modules.

The findings of this research revealed a statistically significant effect of using e-modules on student selfefficacy. With respect to this variable, the treatment of learning with e-modules collaboratively was the most effective, followed by the intervention of learning with e-modules independently; with the option of learning without e-modules returning the lowest effective. Regarding the students in collaborative method with emodules, they collaborated for task completion and mastery the material learning by discussion, and they reported to have felt confident while completing the whole learning package. Therefore, their selfefficacy had increased greatly as well. The students in the learning using e-modules independently also were confident that they had mastered the materials. On the other hand, the students in the learning without emodules appeared less certain about their full mastery of the courses materials and completion of the tasksrequired. With the currect study, it was confirmed that when provided with the ability to plan, control and reflect on their learning activities confidently, students can show higher mastery of learning content and perform better overall (Pintrich, 2005). Similar studies on e-module use also report an increase in students' self efficacy, self-regulation, and self-directed learning activities (Jeske, Backhaus & Roßnagel, 2014; Herawati, 2017; Kismiati, 2018; Hapsari 2016).

The Effect of E-Module Use on Motivation

The use of technology in learning will make the learning process more interesting and motivate students (Jeske, et al., 2014). The integration of technology in lectures, for example, is carried out in the presentation of course material. Materials presented electronically in the form of e-books, e-modules, videos, animations, graphics and images help clarify concepts, increase motivation and create a pleasant learning atmosphere (Herawati, 2017; Kismiati, 2018). In this study, the use of e-modules was proven to increase student motivation and promote student interest in the material studied in lectures. Based on the observations, it can be claimed that, in the experimental class, students were more motivated than those in the control class. The students were more enthusiastic and the learning activities were more appealing and varied. This could be seen in the frequency of student-initiated questions, arguments, concerns and expressed confidence in learning, as well as in the ability to complete assignments correctly and in a timely manner.

The results indicated a statistically significant effect of using e-modules on learning motivation. The collaborative method were significantly better than the independent study method and the option of learning without e-modules, in this respect. This seemed to be due to the fact that learning with e-modules collaboratively involved discussions, and enabled students to support each other. Similarly, the students in the independent study with e-modules group showed higher motivation as they also had the opportunity to discuss the learning material although they mostly relied on themselves while analyzing the content. However, the group without e-modules felt confused due to limited interaction during the learning process and being deprived of the enriched electronic content. Hence, it can be stated that there is a significant effect of using e-modules in increasing student learning motivation in Geography Learning Planning lectures. Similar findings were also found by Asrial, et al., (2020) where e-modules were able to increase students' perceptions, interests and motivations to take part in the learning process.

The Effects of E-Module Use on Learning Outcomes

Learning outcomes are the indicators of student achievement or performance as a result of their participation in any learning process. They include cognitive, affective and psychomotor aspects. Students' attainment of cognitive outcomes can be observed in their mastery of the material they have learned. Since cognitive outcomes are primarily delivered through the content of the teaching material, their attainment can be improved by the teacher preparing and packaging the material content. Developing it in a format that is more accessible, easy to understand and can be used flexibly by students certainly improves the mastery of the material. Presentation of material in electronic form with a consideration of student needs and conditions facilitates the learning process so that they can directly build their skills and knowledge (Sanghi, 2007).

In this study, the material was packaged in the form of an e-module. E-modules are developed following appropriate criteria such as self-containment and self-instruction, and students can improve their mastery of the material both independently and through collaboration. Students' mastery of the materials was tested using multiple choice questions as well as practical application tests that involved designing learning tools. The experimental class performed better on both these knowledge and skills tests because the learning activities in the module provided students with specific guidance, enriched their knowledge about learning tools and helped strengthen their skills. In the multiple choice test, students mostly had errors in questions related to learning models and higher order thinking skills, while in the practice test of designing lesson plans, their biggest challenge was planning core activities oriented to a scientific approach and planning authentic assessments that included attitudes, knowledge and skills. The results of this study are in line with research conducted by Tamrongkunanan & Tanitteerapan (2020), where the use of e-modules were shown to improve students' knowledge and skills significantly. Syahroni, Dewi & Kasmui (2016) also found that emodules increase learning independence and learning outcomes.

The use of e-modules in learning in this study was proven to increase students' self-efficacy, motivation and learning outcomes. Thus, teachers must improve their ability to master learning technology to produce teaching materials that are relevant and designed in accordance with the demands of 21 st century learning. The integration of e-modules in learning can improve the learning process and outcomes. E-modules are very useful as the main learning resource because they are designed based on the contextual characteristics of

students, the uniqueness of the material and the principles of active and interactive learning and technology integration. E-modules can help to clarify the concepts much more effectively because they are presented in various forms, with the inclusion of textual, and visual, audio or audiovisual content. The use of e-modules in learning in this study was proven to increase students' self-efficacy, motivation and learning outcomes.

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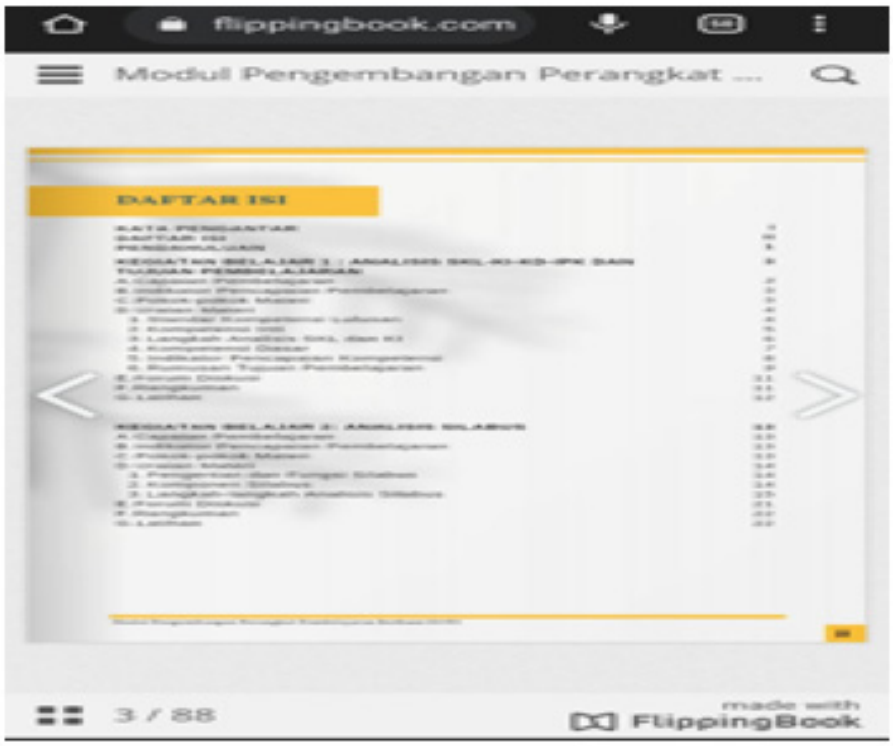
APENDIX 1.

Display and Content of E-Modules

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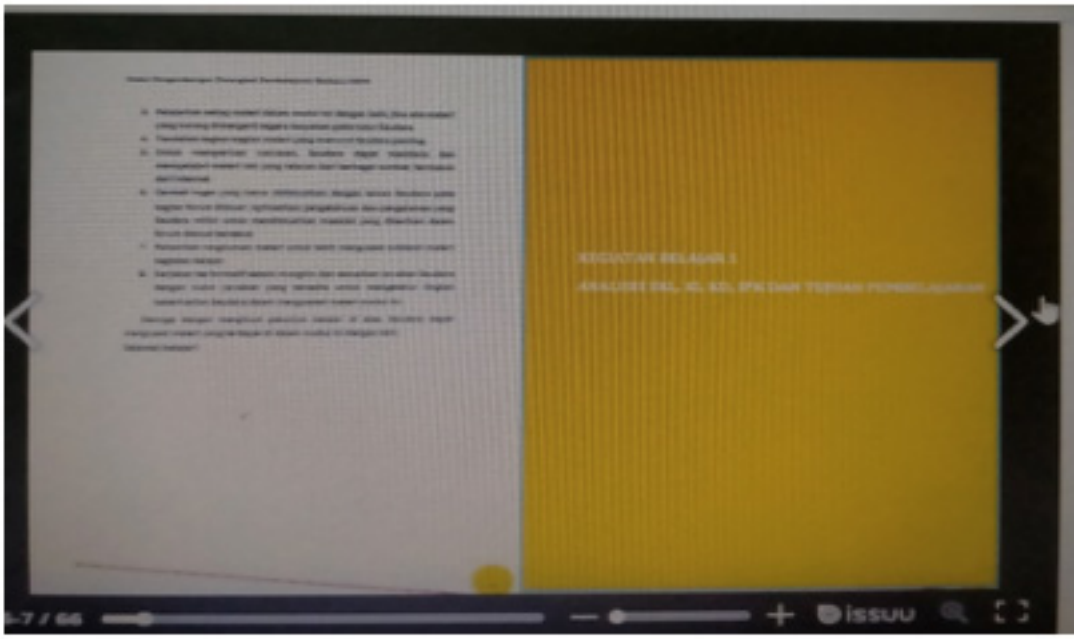
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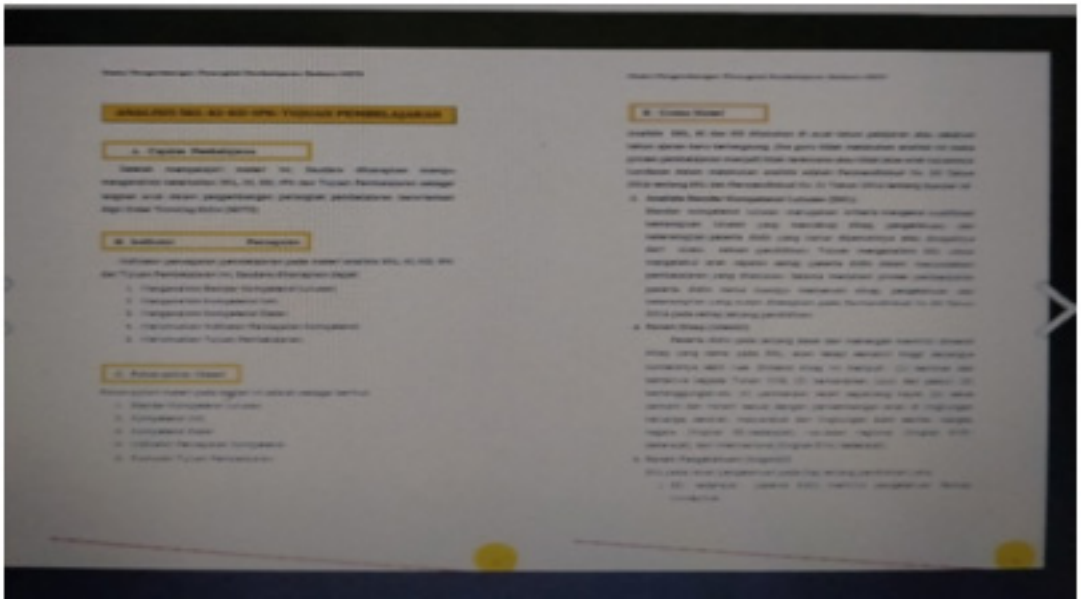

APENDIX 2.

Self-Efficacy Instrument

A Likert scale was used with the response options of 1) strongly disagree; 2) disagree; 3) neutral agree; and 4) agree and 5) strongly agree.

No	Statements	Response				
		SD	D	N	A	SA
	Magnitude (the level of difficulty in learning the material, questions, assignments and practice)					
1	I try to understand the lecture material even though the material is difficult.					
2	I try to work on difficult questions in class.					
3	I try to complete assignments with high difficulty in lectures.					
4	I will not be able to master the lecture material that has high difficulty.					
5	I easy to do tasks and questions.					
6	I will fail if I encounter high difficulties in my studies.					
	Strength (strong or weak students' belief in their abilities)					
7	I have a strong belief that I can manage myself to understand every lecture material.					
8	I have a strong belief that I can manage myself to solve problems correctly.					
9	I have a strong belief that I am able to complete tasks on time and correctly.					
10	I really believe that if I study diligently, I will get good results.					
11	I am only able to do lectures if the amount is small.					
12	I was not able to answer the exam questions correctly.					
	Generality (student belief in ability in various situations and conditions)					
13	I can master any material if I try hard.					
14	If I practice every day then I can master all the subject matter.					
15	If I've decided on something that's important to me, then I'll keep trying to achieve it even if it's harder than I thought.					
16	I believe that the amount of effort I put in can achieve better results.					
17	I can overcome any obstacles I encounter in this course.					
18	I can solve the questions given even though I have never studied it.					
19	I am able to do assignments even though I have to look for references from various sources.					
20	I will not succeed if I encounter material and questions that have not been discussed in lectures.					

APENDIX 3.

Motivation Instrument

A Likert scale was used with the response options of 1) strongly disagree; 2) disagree; 3) neutral agree; and 4) agree and 5) strongly agree.

No	Statements	Response				
		SD	D	N	A	SA
	Attention					
1	I am interested and read the material before it is discussed in the lecture.					
2	I pay attention to the lecturer's explanation when presenting the material.					
3	I took notes on the explanation of the material.					
4	I ask if there is any material that is not understood.					
5	I do other activities when the lecturer explains the material.					
	Relevance					
6	I do not know the purpose of learning the lecture material.					
7	I discussed with friends and I realized the importance of this course material more and more.					
8	I can relate lesson planning materials to current learning needs in the school.					
9	I can use the previous material to study advanced material.					
10	I do not know the benefits of the material studied.					
	Confidence					
11	I am sure that I will succeed in mastering this course material.					
12	I can solve exam questions independently.					
13	I can do all coursework well.					
14	I can always find a solution to the problems I encounter.					
15	I feel like I can't do this coursework.					
16	I have doubts about being able to do the exam questions.					
	Satisfaction					
17	I feel satisfied because I can understand every lecture material.					
18	The method used by the lecturer can help me understand the material.					
19	I gained useful new knowledge in this course.					
20	This course material is not important to study.					

APENDIX 4.

Learning Outcomes Instrument (Pretest and Posstest)

Answer the following questions:
1) What are the components in the Learning Implementation Plan?
2) What are the steps in preparing the Learning Implementation Plan?
3) How to formulate learning objectives in the Learning Implementation Plan?
4) What are the characteristics of higher order thinking-oriented learning?
5) Describe an innovative learning model that is appropriate for this century's learning?
6) Should teachers design lesson plans? Explain the reason
7) Should every teacher's lesson plan be the same? Explain the reason
8) Describe the assessment components in the Learning Implementation Plan
9) What media is most suitable for online learning? Explain the reason
10) Learning activities in the Learning Implementation Plan consist of initial activities, core activities and closing activities, explain

STUDENT TEACHERS' EXPERIENCES IN USING OPEN EDUCATION RESOURCE IN THE OPEN DISTANCE LEARNING CONTEXT

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ABSTRACT

Open education resource (OER) has become an increasingly important topic for consideration in the open distance learning (ODL) context. ODL students' education should be learner-centered based on intrinsic motivation and OER usage. The purpose of this study was to explore the student teachers' experiences in using open education resource in ODL. Even though many studies have been conducted on OER in ODL, there are insufficient empirical studies that have explored environmental education (EE) student teachers' experiences in using OER in the ODL environment. In exploring this topic, the qualitative research methodology, interpretive paradigm, and rhizomatic approach were used. Participants and documents were purposefully sampled. Data was ethically collected through documentation and semi-structured telephonic interviews. The data were thematically analysed and processed to find patterns, keywords were identified, coded, and clustered into categories, and themes emerged. Qualitative findings showed that EE student-teachers knew about OER informally and some students wanted to use OER. Hindrances to OER usage by student-teachers included little engagement with OER by lecturers and costs to access OER.

Keywords: Heutagogy, self-directed learning, cost, access, intrinsic, study material.

INTRODUCTION

Because open distance learning (ODL) students are faced with the challenge of high costs of study material, Open Education Resource (OER) is critical in ODL to overcome the traditional barriers that cause disparity in education such as economic and geographical marginalisation (Johnstone, 2005). In Popkin's (2015) opinion, the cost of ODL has increased more than three times the rate of inflation since 1977 and widened the geographical marginalisation of students. Luo et al. (2020) found that, because of the costs, some students did not acquire study materials which hampered their academic progress. However, Grimaldi et al. (2019) declared that OER aimed to address the high costs of study material with prices determining whether a student would buy a textbook or not. OER is a way of ensuring that all students access all the required resources at minimal or no cost. Wiley (2014) stated that the aim of developing OER was to reduce costs of study material and to expand access. The cost of study material seems to be one of the impeding factors to student-teachers' access to study material.

This study was conducted in an ODL setting which is viewed by Gerber (2013) as an environment that provides learning for everyone; in other words, it breaks geographical and economic barriers. Greyling et al. (2020) highlighted that the fundamental purpose of ODL is to offer equal opportunities for tertiary-quality education for all, offering options to higher education for students who face socio-economic and demographic difficulties. As highlighted by Ossiannilsson (2012), the increasing use of OER is driven by factors such as internationalisation, the need for quality in education, widening participation, and digital development in society and is facilitated by technology enabling interaction, collaboration, and pedagogic practices. Thus, OER can support ODL students as cited by Gerber (2013). It can be mentioned that OER also cater for ODL student-teachers as they are part of the community. Because there is insufficient research in this area, this study aimed to explore EE student-teachers' experiences of using OER in the Mediation of Environmental Education (HBEDMEF) module in an ODL environment in an African university.

THEORETICAL FRAMEWORK

The approach through which the phenomenon of OER was examined was rhizomatic learning. Rhizomatic learning is viewed by Deleuze (1994) as a heutagogical method in which 'learners are highly autonomous and self-determined, and emphasis is placed on development of learner capacity and capability with the goal of producing learners who are well-prepared for the complexities of today's workplace' (Blaschke, 2012, p. 56). Rhizomatic learning recognises that learning is a complex process of sense-making to which each learner brings their own context and has their own needs (Cormier, 2020). Bozkurt (2019) highlighted that information and communication technologies play a role in the rhizomatic learning process. The students use digital networks to access OER because they learn from a distance, meaning that their learning is an intrinsic process and experience (Bozkurt et al., 2016).

This study explored the EE student-teachers' experiences in using OER in an ODL context in which rhizomatic learning is dominant. The EE student-teachers use networks that need data bundles and the internet to access this so-called free resource. However, OER is not free in the true sense of the word because data and the internet are needed to access i.e, both of which come at a cost.

In Chan et al.'s (2019) opinion, heutagogy encourages self-determined and nonlinear learning, suggesting that the heutagogical approach has overtaken the pedagogical approach, which is linear. Contrary to the pedagogical approach, heutagogy promotes inner motivation, self-encouragement and a willingness by the student-teachers to learn independently. The use of OER encourages independent learning, which could be improved by using social networks and collaborative learning (Silveira, 2016). This means that EE student-teachers should have self-motivation or an inner drive, self-direct their learning and use technology to access OER in an ODL context and learn independently.

The options provided by OER are learner-centred and lend themselves to cooperative studying. The heutagogical approach and pedagogical implications of using OER put the learner at the centre, in contrast to the traditional linear approach, which is teacher-centred as mentioned earlier. The use of OER in an ODL context aligns with the heutagogical approach (Deleuze, 1994) as it puts the student at the centre. Therefore, rhizomatic learning is assumed to be resilient (Cormier, 2015). OER is perceived as being free and so it should be freely accessed to help ODL EE student-teachers to be resilient and succeed with their studies, using a heutagogical approach.

LITERATURE REVIEW

Both OER and ODL endeavour to address barriers to higher education by providing equitable access to superior quality education for everyone. Greyling et al. (2020) highlighted that ODL primarily aims to give equal access to tertiary education for everyone, including students who have economic and geographic problems while Wiley (2014) mentions that OER aim to address hindrances to education, such as access and cost. Ossiannilsson and Creelman (2012) view OER as 'digital materials assumed to be offered freely and openly for use and re-use in teaching, learning and research usually under explicit terms of reuse, such as Creative Commons licences' (p. 1) agreeing with scholars such as Abramovich and McBride (2018) and Wiley (2014) who posited that OER is freely available. Abramovich et al. (2018) concurred that OER has few financial implications for students, agreeing with the William and Flora Hewlett Foundation (2015). This suggests that OER has the potential to assist EE student-teachers in an ODL context, who are facing access, geographical and financial challenges, because they are perceived as freely available to anyone, everywhere and at any time using the internet.

Significance of OER on Cost Saving

OER has the potential to save high costs in higher education. Grimaldi et al. (2019) stated that as per the leading OER producer, OpenStax, the adoption of OER textbooks has saved students an estimated $500 million dollars since 2012. Hilton et al. (2013) opined that OER users were pleased with the cost-savings benefits of OER. Hilton et al. (2013) were of the view that instructors should develop courses that use OER instead of traditional study materials, which are expensive, and avoid causing students to use cost as

a determining factor for choosing courses. Another advantage of OER, ostensibly, is the advancement of a learner-centred and decentralised approach to learning (Kanwar et al. 2010). This is in line with rhizomatic learning that Deleuze (1994) viewed as a heutagogical technique in which studying is basically an intrinsic process and experience and therefore key to ODL student-teachers' success since their learning is intrinsic. The author of this article defines intrinsic learning as self-directed learning.

Kanwar et al. (2010) posited that one of the potential benefits of OER for the global South or developing countries was that it assisted in saving money for study materials. Ossiannilsson and Creelman (2012) mentioned that OER is a digital material offered freely that should mitigate the cost associated with study materials in ODL. However, Luo et al. (2020) declared that 'despite vocal support among educators given the importance of reducing financial burdens on students, OER have yet to make the anticipated impact in higher education' (p. 141). Despite Kanwar et al. (2010) mentioning the potential benefit of OER as saving money, the author also acknowledges that, irrespective of its enormous potential, the OER promise has not been translated into concrete and tangible outcomes to date. It is safe to mention that OER has not fully attained its intended effect of ameliorating economic and geographical distance. Access to OER is key for ODL EE student-teachers because learning is student-centred which OER has the potential to provide. It should be mentioned that the outbreak of the coronavirus pandemic (Covid-19) made OER a pressing need in ODL because the African university had to rapidly abandon the blended mode of delivery and change to the fully online approach. Teaching and learning in ODL may, therefore, not be successful without the creation and use of OER.

Pedagogical Significance of OER

Scholars like Wolfenden et al. (2017) point to OER as a tool that has the potential to transform or enable changes in pedagogy, shifting from a lecturer-centred to a learner-centred pedagogic approach. Wiley (2017, p. 24) used the term "OER- enabled pedagogy" (p. 24) because the resource is assumed to remove copyright restrictions on the use of the materials and allow students to engage in the 5R activities, namely, "make and own a copy; re-use in a wide range of ways; revise-adapt, modify, and improve, combine two or more, redistribute-share with others" (p. 11). The author further highlights that OER is not a standing pedagogy as the 5R activities should be used as the convertors with real pedagogies to enable the use of a constructionist pedagogy that facilitates learning by doing and actively engages learners. This agrees with Deleuze (1994) who pointed out that the heutagogical method is student-centred which is important in ODL. Wiley (2017) concurred with Bozkurt (2019) on the use of information and communication technologies that play a role in the intrinsic learning process. This is in line with OER because it is accessed through technologies. Therefore, the pedagogical aspect of OER allows for intrinsic learning in ODL.

Challenges with OER Usage

Abramovich et al. (2018) stated that, despite economic benefits to OER usage, there are hindrances that prevent its extensive use while several scholars concur that access to OER requires expensive modern technological equipment, bandwidth, and connectivity (Asunka, 2008; Cox & Trotter, 2016; Letseka et al., 2018; Ossiannilsson & Creelman, 2012; Telukdarie & Munsamy, 2019; Wolfenden et al., 2017*).* This implies that there are indirect costs associated with the use of OER which depends on access to electricity or power, the internet and the availability of data and expensive new technologies. These factors create extra barriers which add to the traditional barriers of distance learning such as geographical distance.

The findings of a study conducted by Jhangiani et al. in (2016) in British Columbia revealed that faculties in teaching institutions were somewhat less likely to create and adopt OER compared to their peers in research-led institutions, a hesitancy that could limit pedagogic change. Wolfenden et al. (2017) highlighted that 'an absence of fast, consistent internet connectivity; and limited access to laptops and desktop computers were all reported to limit teacher educators' exploration of and familiarity with OER, most acutely [at a rural higher education institution] in Uganda'(p. 269). Cox and Trotter (2017) attested that the availability, stability, speed, cost and limitations of internet connectivity determined the level to which lecturers engaged digitally in terms of downloading and uploading OER in Sub-

Saharan Africa. Similarly, Asunka (2008) agreed that in Sub-Saharan Africa, learning through technology is problematic as it is reliant on communication technology infrastructure. Problems include unreliable internet connectivity and irregular power supply. Telukdarie and Munsamy (2019) concurred that higher education is faced with challenges of digitization technology which requires finances. The key issue is that these challenges impede access to OER and their widespread use and, therefore, fail to facilitate student-teachers' intrinsic learning in the ODL space.

Some Unisa lecturers maintain traditional teaching practices of using published textbooks and study material simply because adequate internet access is available only to lecturers while students from some provinces such as Limpopo and Eastern Cape, which are typically poor rural, have difficulties in accessing the internet, do not have reliable access to computers or the internet, resulting in a situation where all teaching materials have to be made available in hard-copy and delivered by post so that every student has equal learning opportunities. Thus, there is a need to make the use of OER optional or at least exclude it from assessments to maintain justice (Cox & Trotter, 2017). Furthermore, some lecturers cited a pedagogical challenge as one reason for not using OER, particularly because it is difficult to incorporate OER into a highly interactive teaching style.

Hoxby and Turner (2015) stated that for financial reasons, students registered for courses based on the cost of course materials, which could cause them to leave out some courses that could benefit their study objectives. In addition, Abramovich et al. (2018) highlighted that, even though the reason for the adoption of OER was that they were free, and therefore offset traditional barriers to course material, OER cannot be defined as completely free. Furthermore, based on their experience, Windle et al. (2010) attested, that even if there was no direct cost associated with OER, they were often linked to various associated services like workshops, development and consultancy that had financial implications.

Following the above discussion, this study argues that OER usage is associated with indirect costs such as access to internet, acquisition of new expensive technologies, data and the internet. It should not be assumed that all communities can easily access OER, which is referred to as free, because, as Letseka et al. (2018) and Asunka (2008) pointed out, marginalised communities such as those on the African continent still experience restricted internet access. The William and Flora Hewlett Foundation (2015) concurred by indicating that, in developing countries, the market for OER may be limited.

Thakrar et al.'s (2009) research findings on harnessing OER to the problems of instructor education in a sub-Saharan Africa consortium and the University of Fort Hare, South Africa, showed that a lack of access to new technology tools was a restriction to users of OER. Greyling et al. (2020) highlighted challenges with accessing the internet in South Africa, where some students who had old cell phones stated that new phones and data were very expensive. This means that the marginalised communities in Sub-Saharan Africa may not benefit from OER which aim to address the high cost of study materials, leaving student-teachers frustrated. It should be noted that Thakrar et al. (2009) and Greyling et al. (2020) conducted their studies almost ten years apart but little seems to have changed. In addition, the Greyling study was conducted in 2020, the year in which the education system was severely impacted by Covid-19. This is because most universities used face-to-face pedagogy, while ODL institutions used a blended approach. Action needs to be taken to address these challenges. However, insufficient exploratory work has been published on teacher agency in terms of pedagogic transformation in settings where OER usage has been initiated (Wolfenden et al., 2017). The paucity of discourse on OER as a tool to enable pedagogic transformation is another challenge. This study was, thus, conducted during the time when the need for pedagogic transformation driven by Covid-19 was critical. In addition, the Greyling study was conducted in 2020, the year in which the education system was severely impacted by Covid-19. This is because most universities used face-to-face pedagogy, while ODL institutions used a blended approach. Action needs to be taken to address these challenges. However, insufficient exploratory work has been published on teacher agency in terms of pedagogic transformation in settings where OER usage has been initiated (Wolfenden et al., 2017). The paucity of discourse on OER as a tool to enable pedagogic transformation is another challenge. This study was, thus, conducted during the time when the need for pedagogic transformation driven by Covid-19 was critical.

Students' Effort to Address Cost of Study Material

Financial constraints have been identified as one factor that has hindered people, and student-teachers, in particular, from accessing education, because the cost of course material seems to be unavoidable. One of the reasons for availing OER in education was to save costs as highlighted earlier. The use of OER is intended to mitigate the negative impact that financial constraints have on access to studies (Johnstone, 2005). However, OER usage has indirect costs as highlighted by Asunka (2008), Telukdarie and Munsamy (2019), Thakrar et al. (2009) and Windle et al. (2010) that pose a challenge to OER users.

To reduce the cost associated with acquiring course material, students often resort to purchasing used textbooks, "other versions" or "books by other authors on the same topic", rent books, share with classmates, use library reserve copies, photocopies and they would even use the internet while at the library or at regional offices to illegally download materials that could be of help to their studies (Jhangiani et al., 2016). The students' efforts are a clear indication that there are associated financial implications with OER usage, which could impede their widespread implementation. This study sought to answer the research questions below:

RQ1: What is your experience of using OER in ODL context?

RQ2: How did you reduce the indirect cost associated with accessing OER?

METHOD

Research Approach, Paradigm and Design

This study explored student-teachers' experiences of using OER in an ODL context. A qualitative research approach and interpretivist paradigm were used, since interpretivism is at the centre of qualitative research. The rhizomatic learning approach was the approach through which the phenomenon was studied. Student teachers shared their lived experiences in using OER by means of telephonic interviews (Marshall & Rossman, 2011).

Participants

This study targeted honours students who registered for HBEDMEF module offered in an African ODL. The ODL HBEDMEF students were targeted because they studied remotely using technologies that were also used to access OER thus enabling rhizomatic learning. Participants were purposefully selected to provide rich information based on their experience of using OER in ODL to answer the research questions and to enhance the credibility of the findings regarding the student-teachers' experiences in using OER (Palys, 2008).

Data Collection Instruments and Procedures

Data Collection Instruments

Two primary data collection instruments were used for this study namely, documentation and telephonic interviews. This study used documents because they are a valuable source of information (Marshall & Rossman, 2011) and to support interview data.

Interviews were used because interviewing participants is a fundamental strategy in the qualitative data collection process while it was also a safe strategy during Covid-19 to observe social distancing, particularly in 2020. Also, telephonic interviews were used because the sample was geographically dispersed. Furthermore, telephonic interviews were used as they reduced the time needed for gathering the data (Dakwa, 2015), therefore becoming instrumental in the context of this study which was conducted in an ODL environment.

Data Collection Procedures

Purposive sampling was employed to select EE documents dated 2018 to 2020. Selected documents included Tutorial Letter 101 and student support material that was downloaded from the Learning Management System (LMS) hosted by Sakai, particularly the additional resources tools.

Appointments were made telephonically with each participant prior to the interviews. The researcher developed and used a semi-structured interview form. Interviews lasted for about 45 minutes. Open-ended questions were asked to allow for deeper probing into the participants' responses (Babbie, 2010), and the researcher took notes. Interviews were conducted with each participant after 4 p.m. which was according to the participants' preferences as they were committed elsewhere from 8 a.m. until 4 p.m.

Ethics

The study was ethically conducted using a clearance certificate obtained from the College of Education at the university in which the study was conducted. Consent was sought from the participants prior to data collection, as suggested by Marshall and Rossman (2011) while the principles of confidentiality, privacy, anonymity and informed consent were considered (Marshall & Rossman, 2011). Pseudonyms were used for the student-teachers, namely, ST1 to ST8 to protect the participants' identity.

Data Analysis

Data were thematically analysed on a continuous basis. The informal analysis and processing of data began during the data collection process. Data from documents was analysed first followed by the analysis of the interview data.

Document analysis began during the selection of relevant documents. The documents were recurrently, meticulously and deeply read, and interpreted to gain an in-depth knowledge of how the student-teachers experienced OER usage. The data was processed and similar words were identified. Data was grouped according to words, phrases, and sentences with the same meaning and coded. Redundant data was omitted. The codes were clustered to form categories.

Preliminary analysis process was conducted after each interview session based on the notes that were taken. Data were transcribed, transcripts were coded and analysed using content analysis (McMillan & Shumacher, 2014). Codes were divided into sub-categories following identified similarities and differences. The interpretive paradigm enhanced the interpretation of the meaning of the data. Finally, concepts were identified leading to the emergence of themes (Rubin & Babbie, 2013) based on the research questions. The first theme was student-teachers' experience of using OER in ODL context, second was the intervention strategies adopted by students to reduce challenges associated with OER usage.

Documents were scrutinised to increase trustworthiness of the results. Also, triangulation strategy was used through data collected using literature review, interviews, and documents. Member checking was done with the participants to verify that their responses had been correctly captured and understood by the researcher. The use of purposive sampling enhanced credibility of the research's results in terms of student teachers' experiences of using OER in an ODL context. In this study, dependability was ensured by asking a colleague to co-code the data as an attempt to reduce personal bias and subjective interpretations. Confirmability was ensured through documenting procedures, checking and re-checking collected data obtained from the various instruments. The findings obtained from the interviews were provided through direct quotations to ensure the authenticity of the research. However, transferability might be restricted because the research was limited to one module of a qualification offered in an African ODL environment.

FINDINGS

This section presents the findings based on the document analysis and the interviews in terms of EE student-teachers' experiences of using OER in an ODL context. Second, it presents the interview findings relating to intervention strategies adopted by student-teachers to reduce challenges associated with the costs of OER usage.

Theme 1: Student-Teachers' Experiences of Using OER in an ODL Context

The findings from documents revealed that information about the module's study material was outlined in Tutorial Letter (TLs) 101 which had been distributed to student-teachers between 2018 to 2020. In all three

years, the lecturers did not refer the student-teachers to OER but based the course on a recommended book. The heading under which the study material information was provided clearly indicated 'recommended books' while they were also informed that they could use any source such as school textbooks that were relevant to the content of the module. OER were not mentioned in the TLs. Students received support material that was compiled by the lecturers in the form of notes and those that were based on feedback from assignments which were uploaded on the LMS, particularly the additional resources tool. OER was not part of the uploaded support material.

Findings from the interviews showed that student-teachers were not referred to OER and that they did not regard OER as important study material. When asked if they were informed about OER by their lecturers, ST1 has this to say:

> *Our lecturers did not inform us about OER because it is not indicated in TLs 101. We were referred to a recommended book. The title, author, place of publication and the publisher were indicated in case we wanted to buy the book. We were also referred to school textbooks but not OER.*

ST2 was asked about which study material was more important – the recommended book or the OER –and responded this way:

> *The recommended book is important than OER because it is mentioned in TL 101. OER was supposed to be mentioned in TL 101 if it was important. Some students talk about OER on the LMS chat tools like blog, discussions, and on group WhatsApp. I go with the information given by my lecturers.*

Asked about the type of support material uploaded on the additional resources tool on the LMS, ST3 said:

> *We receive study material uploaded on additional resources, but we never received OER material. The study material is notes compiled by the lecturers.*

When asked if the notes uploaded on the additional resources tool on the LMS was helpful in terms of preparing them for the examination, ST4 had this to say:

> *The notes were helpful. The examination questions were within the scope of the notes and the recommended book. I used this information when preparing for my examination and I pass*

The findings revealed that the module content focused on the theory that addressed environmental aspects. It did not include the theoretical or practical information on the use of educational technologies to train student-teachers on the use of technologies that are used to access OER. When ST5 was asked if the recommended book introduced them to theory or practical aspects of using educational technologies, the answer was:

> *No, we learn more about the aspect of EE content as it is integrated in our curriculum which are sustainability, indigenous knowledge system and sustainability, and assessment.*

Theme 2: Intervention Strategies Adopted by Students to Reduce Challenges Associated with OER Usage

It was revealed through interview data that there were student-teachers who knew about OER even though the lecturers did not introduce this resource to them. They attempted to download the resources but could not because their devices were slow therefore consuming too much bandwidth or they had problems with downloading the app. ST6 was asked about the challenges experienced when downloading OER, the answer was:

> *My computer took long to download. It was taking a lot of my data.*

ST7 was asked on what strategies they used to reduce challenges associated with downloading OER and answered this way:

> *I shared my challenge with other student teachers, and they told me that they buy used books from old students. Again, there are people who buy old books from old students and re-sell them with less prices, sometimes I buy from them. I am a teacher, so I also ask information from my colleagues, they give me the sources they use, and I use them if they are relevant. Sometimes books written by other authors have relevant information I use them. I borrowed books and made photocopies of reserved materials in the library to help me push my studies.*

Findings showed that student-teachers used WhatsApp group calls to discuss and share information related to the module. They also used their private emails to share study material that assisted them when writing assignments. When asked what strategies they used to address OER challenges, ST8 said:

> *The WhatsApp calls are useful because we can discuss and share ideas about the module. At the end, we share material through our private emails.*

DISCUSSIONS

This study explored the EE student-teachers' experiences of using OER in ODL context, by investigating HBEDMEF module. Two qualitative themes were determined based on the research questions: first, EE student-teachers' experiences of using OER in an ODL context; second, the intervention strategies adopted by EE student-teachers to reduce the indirect costs associated with accessing OER. Discussion of findings from documents and interviews was done in an integrated way under the first theme followed by the discussions of findings from the interviews under Theme 2.

The results from interviews and document analysis revealed that generally the students knew about OER informally. The lecturers did not introduce OER to the student-teachers. From document analysis the results showed that OER were not mentioned in Tutorial Letters 101 from 2018 to 2020, which are the documents that inform the student-teachers about the module's study material each year. In addition, the lecturers' notes did not include OER as they were based on assignment feedback, and the previous question papers as well as the recommended book, meaning the students did not benefit from OER. This contradicts the opinion of Kanwar et al. (2010) that one of the potential benefits of OER for the global South or developing countries is to reduce costs of course study materials. The lecturers' approach made the student-teachers regard OER as unimportant, and therefore, negatively affected their OER usage. This concurs with scholars such as Jhangiani et al. (2016) who mentioned a lack of engagement by lecturers in terms of the creation and adoption of OER in British Columbia and Cox and Trotter (2017) who pointed to technological challenges as one of the key factors in determining the degree to which lecturers downloaded and uploaded OER in Sub-Saharan Africa. This is in line with the stance taken by other lecturers at the University of South Africa citing technological and pedagogical challenges as the reasons for not engaging with OER (Cox & Trotter, 2017), further agreeing with Wolfenden et al. (2017) who highlighted the lack of exploratory research about pedagogical change in contexts where OER had been implemented. It is imperative that the lecturers' pedagogy changes because Covid-19 has pushed ODL institutions to fully online teaching and learning in which OER is key because students may not physically access libraries on the campuses of their universities. The lecturers' lack of engagement with the creation, adoption and provision of OER to student-teachers robs the ODL student-teachers of an opportunity to engage in rhizomatic learning (Deleuze, 1994; Bozkurt, 2019; Bozkurt et al., 2016).

Furthermore, results indicated that the module content did not include the theoretical or practical aspects of integrating educational technologies into the student-teachers' studies. This contradicted the findings of Ossiannilsson (2012) that OER were also used for different reasons such as digital development in society. In this study, student-teachers are a group that needs digital development as their work environment is becoming digital. Again, this shows the approach of lecturers towards OER creation, adoption and provision to student-teachers, confirming Wolfenden et al.'s (2017) opinion that there is no major exploratory work published in terms of pedagogic transformation in spaces where OER should be used. The lecturers' lack of engagement with OER hampers the resource's potential to transform pedagogy in shifting from a lecturer-centred to a learner-centred pedagogical approach. It does not, therefore, provide an opportunity to student-teachers for rhizomatic learning that is assumed to enhance their resilience as students (Cormier, 2015).

The lecturers' approach towards OER use calls for attention because the ODL student-teachers' learning experience should be self-directed, intrinsic and student-centred. The lecturers' pedagogy should be transformed to accommodate OER use to create a student-centred learning experience. It is important to mention that the onset of Covid-19 in 2020 was a wake-up call to ODL institutions to enhance the use of online study material such as OER. The document results revealed that the EE student-teachers' experiences of using OER in ODL was influenced by the lecturers' approach towards OER creation and usage as they mentioned that they used the information provided by the lecturers. Little engagement by lecturers defeats

the purpose of the heutagogical method which is to provide student-centred learning experiences (Deleuze, 1994; Kanwar et al. 2010). Student-centred learning is central in the ODL environment to address the geographical distance gap and expand access to higher education. Therefore, the lecturers should facilitate student-centredness by exposing student-teachers to the concept of OER by creating, adopting and providing OER information. The lecturers' disengagement with OER contradicts Grimaldi et al. (2019) and Hilton et al. (2013) who highlighted the positive results of students' engagement with OER and Wiley (2014) who mentioned that the distinctive planned aims of OER are to address hindrances to education that include access and costs.

Even though the lecturers did not refer students to OER, results from the interviews showed that some students talked about it on chats such as the university's online discussion platform and a WhatsApp group and tried to download it. This means generally, EE student-teachers knew about OER informally and were interested in using it. However, some student-teachers' technological devices were not compatible with the download apps while other devices were very slow. One student teacher used high bandwidth to download OER because his device was slow, and this discouraged him. The results therefore differed with what was stated by scholars who said that OER is freely available (Abramovich et al., 2018; Hilton III et al., 2013). This finding is key in the ODL environment as it informs the lecturers and the managers that it cannot be a general assumption that all student-teachers have gadgets that enable them to access higher education online. Generally, there is a perception that today every student teacher has a gadget that can perform all the functions, but the results of this study revealed that reality is not in line with perceptions. Access to technological tools that enable student-teachers to access OER and quality higher education is essential in the ODL context while it is not so crucial in the face-to-face setting. It is important for EE student-teachers to have a means of communication that enables them to engage in international environmental discourse on issues such as sustainability, climate change, and loss of biodiversity. The need for suitable gadgets to access OER was exacerbated by the outbreak of Covid-19 as the restrictions barred students from crowding the libraries, regional offices, and interacting face-to-face in international conferences. In addition, Covid-19 fast-tracked transformation of ODL to open distance e-learning (ODeL) requiring students to engage with OER.

The challenge with slow computers that require high bandwidth restricted student-teachers from using OER and learning intrinsically. Bozkurt's (2019) posited that information and communication technologies play a role in the intrinsic learning process especially in the ODL environment where the study was conducted. However, the indirect costs associated with accessing OER are a hindrance to OER-enabled pedagogy and rob students of opportunities to learn constructively and engage actively using technology. OER is touted as free electronic resource. This supposition suggests that OER's aim to reduce the high cost associated with purchasing traditional textbooks seems not to have been realised. This is because OER access is overshadowed by the indirect cost barrier and some lecturers who did not engage with OER as they felt it would be unfair to students who were faced with digital challenges (Cox & Trotter, 2017).

The fact that OER was not referred to in the HBEDMEF TL 101 concurs with scholars who pointed out that some South African students are faced with digital challenges (Greyling et al., 2020; Letseka et al., 2018; William Flora Hewlett Foundation, 2015). The results further confirmed the views of Luo et al. (2020) that 'despite vocal support among educators given the importance of reducing financial burdens on students, OER have yet to make the anticipated impact in higher education' (p. 141). This opposes Wiley's (2014) opinion that the distinctive aims of OER are to reduce the cost of study material and to expand access. That being said, this study argues that OER need to be freely accessed despite the associated technological costs, and there is a need for lecturers to change their pedagogical approach as a matter of urgency to create and adopt OER because ODL institutions have had to turn to a fully online pedagogical approach that requires rhizomatic learning. This has been occasioned by the Covid-19 pandemic.

Intervention Strategies Adopted by Students to Reduce Indirect Costs Associated with OER Usage

Interview results revealed that some student-teachers who informally knew about the OER attempted to download them. This shows that the student-teachers had interest in using OER even though their lecturers did not formally include it in the study materials. A challenging factor was the devices that were either

slow to download OER or not compatible with the downloading applications (apps). This confirms the findings of other scholars who highlighted challenges with downloading material caused by digital problems (Asunka, 2008; Telukdarie & Munsamy, 2019; Thakrar et al., 2009).

The results showed that the student-teachers used alternatives to access relevant material that assisted them in completing assignments and preparing for the examinations. The alternatives included buying books with relevant information from senior students who had previously enrolled the module or from private book sellers who bought books from senior students for resale. In addition, those who were teachers sought assistance from their colleagues and used the sources that could assist them to write assignments. Furthermore, they borrowed books and made photocopies from the library and shared the information amongst themselves. This concurs with Jhangiani et al. (2016) that students used various strategies to reduce the cost of acquiring traditional study materials. On the other hand, it defeats the objectives of the provision of OER which are to reduce the cost of the study materials and to promote a learner-centred, nonlinear and decentralised approach to learning (Kanwar et al., 2010).

Furthermore, results revealed that student-teachers used WhatsApp group calls to discuss issues related to the assignments and the examination. This enhanced their collaboration in terms of sharing ideas that assisted them in writing assignments. Students also emailed material to one another. The results concur with Silveira (2016) who opined that fundamentally, OER should motivate independent learning that may be enhanced through social networks to permit collaborative learning.

CONCLUSION

This study set out to explore the EE student-teachers' experiences of using OER in the ODL context in an African university. To achieve this, the study answered two research questions. RQ1: What is your experience of using OER in ODL context? RQ2: How did you reduce the indirect cost associated with accessing OER? Generally, student-teachers knew about the OER informally through LMS chats and some tried to download it but did not succeed. Collaboration through WhatsApp group discussions and the discussions tools on the university's online LMS introduced some student-teachers to OER. TL 101 referred them to the recommended books and any other textbook with relevant information.

To answer the questions, the student-teachers did not use OER as the lecturers did not mention them in TLs 101. The lecturers did not create OER and this led to student-teachers having a negative opinion about OER usage. In addition, the support material that was uploaded on additional resources did not include OER, therefore, sending a message that did not encourage the use of OER. The pedagogical barrier from the side of the lecturers influenced student-teachers' choice of study material as some indicated that they followed only what the lecturers said. This did not benefit them in terms of heutagogical, intrinsic learning, student-centredness, and an OER-enabled pedagogy. Generally, institutions of higher learning like the one at which this study was conducted are moving towards fully online learning meaning a change in pedagogy is needed. Using OER is key to the transformation of the pedagogical approach.

The student-teachers who wanted to download OER faced challenges in terms of their devices that were slow to download or were not compatible with downloading the apps. Slow computers consumed too much bandwidth causing the student-teachers to come up with alternative means of accessing information rather than using OER. Therefore, it may not be assumed that OER reduce study costs because even though the material is perceived to be freely available, it is not easily accessed by all as this study indicated. The student-teachers shared information on a WhatsApp group that helped them to write assignments. On the other hand, they still used old methods to access study material such as buying used hard-copy textbooks and sharing books.

This study contributed to practice in terms of the discourses around the use of OER in the HBEDMEF module as it led to recommendations that, if implemented, could address the challenges associated with the creation and use of OER by the EE module lecturers and, in turn, the students.

Based on the results from the literature, documentation and the interviews, the recommendations are as follows:

- Module lecturers should create OER and mention it in TLs 101. This would introduce the student-teachers to OER and make them understand the importance of their use.

- Uploaded material should include OER to show their significance and to encourage student-teachers to use them.
- The module content should comprise educational technological information, theory and application to enhance student-teachers' technological knowledge and skills that would enable them to create and adopt OER in their workplaces.

While the study has achieved its aim, limitations were observed. One student-teacher's phone cut off during the interview and efforts to reconnect the student were in vain. This might have robbed the study of some information that would have added value to it if the student had had a different experience. However, the aim of the study was achieved through the answers from those who answered all the questions. While this study was able to answer the research questions in terms of exploring the experiences of EE student-teachers with OER in the ODL environment, there are still some issues that need to be investigated. This study did not establish whether the lecturers were trained on how to create and use OER; therefore, the lecturers' views should be investigated. In addition, it did not cover how OER could be easily accessed by the student-teachers. Further research should be conducted to explore less expensive communication channels that could be used to provide OER to student-teachers.

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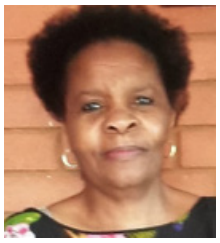

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UNDERGRADUATES' ATTITUDES TOWARDS DISTANCE EDUCATION AND PERCEPTIONS OF READINESS FOR E-LEARNING DURING THE COVID-19 PANDEMIC

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ABSTRACT

The COVID-19 pandemic, which suddenly took the whole world under its influence, also radically affected the educational environments. This research aimed to examine the attitudes of undergraduates towards distance education, their perceptions of readiness for e-learning, and the relationship between these two variables during the COVID-19 pandemic, the effects of which are also felt in higher education. Thus, quantitative research paradigm and correlational design were used in the study. Data were collected online in two weeks via the Attitude Scale towards Distance Learning (ASDL) and E-Learning Readiness Self-Assessment Instrument (ERSI). Using the convenient sampling method, 1422 undergraduate students enrolled in a summer school program at a state university in Turkiye were included in the sample. The findings of the research indicate that the participants' attitudes towards distance education are moderate, and their perceptions of readiness for e-learning are high-level during the COVID-19 pandemic. There is a moderate positive correlation between these two variables. There are also positive, moderate, or strong correlations between the ASDL and some subscales of the ERSI. The findings of the study provide useful information about the distance education carried out during the COVID-19 pandemic.

Keywords: Covid-19 pandemic, distance education, attitude, e-learning, readiness.

INTRODUCTION

Although not fully detected, the new type of coronavirus disease (COVID-19) which is thought to have emerged in the Wuhan city of China towards the end of 2019 affected the whole world in a short time, caused a global pandemic, and exposed the world to irreversible changes. (WHO, 2021). Education systems have also been inevitably affected by this change. Governments, school administrations, and educators have become concerned about potential learning losses due to the pandemic. Students and their families have been severely suffered by this period. The pandemic has greatly endangered the functioning of schools and learning in various ways. Different practices have been used to know and compensate for the extent of learning losses in students (Zhao, 2021). The sudden closure of schools in this period caused the usual teaching activities to be stopped immediately and all the education actors involved were plunged into an uncertain pedagogical disturbance in the following months (Nadeau, Siouiet & Fortier, 2020). In some countries, education has started to be carried out distantly, and in the others, the mixed education method has been preferred, which can also be called hybrid as it is a combination of distance and face-to-face education (United Nations, 2020).

After the first coronavirus case observed in Turkiye in March 2020, schools were completely closed. It has been tried to adapt to this new normal by adopting various models at different levels (TEDMEM, 2020). Although there were problems in the context of education in this period, the implemented models facilitated the transition to the new normal, brought new paradigms in education to the agenda, and led to new beginnings such as the sudden spread of distance education (El Maarouf, Belghazi & El Maarouf, 2020). On the other side, some researchers emphasize that the sudden and forced closure may lead to deterioration of content and assessments, cognitive overload (Charroud, Dessus & Osete, 2020), educational interruption, inconsistencies between goals, and difficulties in implementation (Detroz, Tessaro & Younes, 2020). However, these challenges can also be an opportunity for people to question and rediscover their practices (Alonso Vilches, Detroz, Hausman & Verpoorten, 2020). For example, distance education can help break the spiral of failure and mitigate the effects of the competitive classroom climate such as threatening glances from peers, upward social comparisons, shyness, etc.

Distance education is a method in which teachers and learners are not physically in the same environment, and learning can be carried out synchronously or asynchronously with educational technology tools (Alkan, 2011; Seferoglu, 2006). In the 21st century, electronic-based teaching methods carried out through radio, television, and the internet are most preferred in distance education. Learning through electronic-based tools is called e-learning. E-learning means transferring knowledge and skills to individuals through electronic devices and teaching activities carried out in electronic environments (Gulbahar, 2019). Although distance education and e-learning are thought to be vital parts of educational environments during the pandemic, the sudden exposure to this outbreak shows that Turkiye and other countries have been unprepared for the continuity of education (Bozkurt & Sharma, 2020). Obviously, students experience complex and intense emotions in their learning processes regarding the new normal due to pandemic psychology (Strong, 1990).

Learning is an action that has affective and psychological aspects as well as cognitive ones (Aydin, 2016). Cognitive skills, learning styles, affective characteristics such as attitude and motivation have important roles in learning (Tasgin, 2020). In e-learning, hardware requirements, technical knowledge and skills are also needed (Gulbahar, 2019). These mean readiness for e-learning as well (Kalelioglu & Baturay, 2014).

ICTs are key elements that guarantee pedagogical continuity and support new ways of living and working in this exceptional period. Digital technologies have never been more important in ensuring pedagogical continuity (Elmendilia & Saaidi, 2020). Various research results imply that students have serious learning losses in Turkiye and around the world (CREDO, 2020; TEDMEM, 2020). Therefore, millions of students can continue their education distantly in the post-pandemic period to compensate for their learning losses.

In Turkiye especially in higher education institutions, since the beginning of the pandemic, education has been mostly carried out distantly, except for certain programs (yok.gov.tr). After literature review, it can be clearly seen that the studies on distance education in Turkish higher education context during the COVID-19 pandemic focus on the following areas: undergraduates' views and satisfaction levels about distance education carried out during the pandemic period (Akdemir & Kilic, 2020; Gurler, Uslu & Dastan, 2020; Karadag & Yucel, 2020; Yildiz, 2020), their readiness for distance education and e-learning (Kuzu, 2020; Turkmen, Asci & Zor, 2020; Uyar & Karakuyu, 2020). However, a study dealing with the relationship between both variables was not found by the researchers. Thus, it is considered significant to investigate both the attitudes of students towards distance education and their perceptions of readiness for e-learning together for several reasons.

First, determining some characteristics of the undergraduates in the development of distance education curriculums, which have become a part of the new normal, may be effective in future action plans. Secondly, it may reveal the importance of studies on needs analysis in emergency distance education situations that may be experienced later. Thirdly, in the light of the variables discussed in this study, it is possible to determine the relationships between some features underlying digital competencies, which are among the 21st century skills. Besides, it is thought that the study will contribute to the field in terms of emphasizing the importance of the learners' affective characteristics in urgent digital transformations. Last but not least, this study will emphasize the importance of curriculum development studies to be carried out in global crises and may guide education policies in this direction. In this sense, this study aims to examine the relationship between undergraduates' attitudes towards distance education and their perceptions of readiness for e-learning during the COVID-19 pandemic. To achieve this aim, answers to the following research questions were sought:

1. What is the level of undergraduates' attitudes towards distance education during the pandemic?
2. What is the level of undergraduates' perceptions of readiness for e-learning during the pandemic?
3. Is there a significant relationship between undergraduates' attitudes towards distance education carried out during the pandemic and their perceptions of readiness for e-learning?

METHOD

Design and Procedure

Correlational design was used for the purpose of the research. The correlational design is a model that examines the relationship and connections between two or more variables to reach a conclusion beyond describing a situation or event. This model aims to analyze the correlation between the variables without manipulating them (Frankel, Wallen & Hyun, 2015). Correlational research are studies that lead to revealing the relationship between variables that interact, determining the degree and direction of existing relationships, and conducting other studies by considering the relationships between variables (Buyukozturk, Cakmak, Akgun, Karadeniz, & Demirel, 2013). In this regard, the relationship between undergraduates' attitudes towards distance education and their perceptions of readiness for e-learning during the pandemic was examined in this study.

The research procedure is as follows. Firstly, necessary permissions were obtained from the developers of the scales to be used in the research. Then, the approval was received from the Social and Human Sciences Research Ethics Committee of Karabuk University, numbered E-78977401-050.02.04-25363 and dated 2 July 2020. The data were collected through the "Attitude Scale towards Distance Learning (ASDL)" developed by Kisla (2016) and the "E-Learning Readiness Self-Assessment Instrument (ERSI)" developed by Watkins, Leigh & Triner (2004), and adapted into Turkish by Kalelioglu & Baturay (2014). The data were collected online in two weeks. A total of 1568 students studying online summer school program at Karabuk University filled out the scales online. After checking the scales completed by 1568 students, 146 of them were removed from the data file according to Mahalanobis Distance (MD), and the data obtained from 1422 students forming the sample were subjected to statistical analysis.

Participants

The universe of the study consists of 18.126 students who registered the summer school program at Karabuk University in the summer term of the 2019-2020 academic year. The sample consists of students who voluntarily participated in the study by clicking on the link in the e-mail sent to the whole universe and completed the study by answering all the items. Many multivariate extreme data were found in the data analysis, and accordingly, 146 out of 1568 students who voluntarily answered all the questions were not included in the sample (N=1422). Since the study was based on volunteerism, convenient sampling method was used for the sampling process. Some descriptive statistics of the sample are given in Table 1.

Table 1. Descriptive statistics of the sample

Feature	Variable	f	%
Gender	Female	580	40,8
	Male	842	59,2
Age	18-20	255	17,9
	21-23	734	51,6
	24+	433	30,8
University	Karabuk University	1050	73,8
	The others	372	26,2
Department	Social Sciences	328	23,1
	Econ.&Admn.Sc.	100	7
	Health Sciences	122	8,6

	Natural&Applied Sc.	872	61,3
Grade	Prep.	18	1,3
	1st	121	8,5
	2nd	292	20,5
	3rd	343	24,1
	4th	537	37,8
	5th	6	4,6
	6th	21	1,5
	Grad.	24	1,7
Total		1422	100

Data Collection Tools

The Attitude Scale towards Distance Learning (ASDL)

The Attitude Scale towards Distance Learning (ASDL) developed by Kisla (2016) includes 35 items. ASDL has a single factor that measures students' attitudes towards distance learning. The 5-likert type scale items are rated from strongly disagree (1) to strongly agree (5). Internal consistency coefficient of the scale was reported as α=.89. The scale explained 28% of total variance with a single factor.

The E-Learning Readiness Self-Assessment Instrument (ERSI)

The E-Learning Readiness Self-Assessment Instrument (ERSI) was developed by Watkins, Leigh & Triner (2004) and adapted into Turkish by Kalelioglu & Baturay (2014). The original form of the ERSI includes 27 items and 6 factors. The item number was reduced to 25 in the adapted scale, and the 6-factor structure of the scale was preserved. The factors of the scale are importance of success (α=.80), online relationships (α=.78), technical skills (α=.80), technology access (α=.84), motivation (α=.75), and online skills (α=.64). The items of the 5-likert type scale are rated from strongly disagree (1) to strongly agree (5). The amount of variance explained by the scale, which was found to preserve its 6-factor structure as a result of the analyzes, was 61.54.

Data Analysis

Within the scope of this study, analyzes were carried out using Factor 10.10, Mplus 7, and SPSS programs. As a result of the analysis, many multivariate extreme data were found in the relevant scales, and some individuals were excluded from the data file according to Mahalanobis Distance (criterion having a value less than .001). Accordingly, 146 people were not included in the analysis and a new data file was created (N=1422). The structure of the data was found to be suitable for the polychoric correlation matrix. One of the most reliable confirmatory factor analysis (CFA) software with polychoric correlation matrix is Mplus. In the analyzes performed with Mplus by using polychoric correlation matrix and ULSMV factor subtraction method, non-working items were determined. The relevant experts (PCG, CEIT, and Measurement & Evaluation specialists) stated their opinions in terms of the removal of non-working items from the scales. Consequently, the fit indices showed appropriate results in the CFA performed with the remaining items (ASDL: TLI/NNFI=.942, CFI=.946, RMSEA=.098 %90 Confidence Interval [.096-.100]; and ERSI: TLI/NNFI=.984, CFI=.990, RMSEA=.041 %90 Confidence Interval [.096-.100]). Hence, it was determined that the items had sufficient factor loading and predicted the factors significantly. In addition, Standardized Alpha and McDonald's Omega coefficients were calculated for both scales in the reliability analysis (ASDL: α=.98, α=.92; ERSI: α=.91, α=.88).

The fact that the skewness and kurtosis coefficients in the literature are between ±1.5 shows that the scales and the subscales do not deviate too much from the normal distribution. So, it is sufficient that the values of skewness and kurtosis of the subscales are between -1.5 and +1.5 to accept the normal distribution of the data (George & Mallery, 2010). In this research, the skewness and kurtosis values were found between ±1.5.

Depending on these results, statistical analyzes based on the assumption of normal distribution were used. For the interpretation of the findings, "1.00-1.80: none", "1.81-2.61: low", "2.62-3.42: moderate", "3.43-4, 23: high" and "4.24-5.00: very high" values are used.

FINDINGS

In this section, the findings of the research are presented in comprehensible tables in a meaningful order according to the research questions.

Table 2. Attitudes of the participants towards distance education

Scale	N	$\bar{X}$	SD
ASDL	1422	3,07	1,114

Table 2 shows the descriptive statistics (arithmetic mean and standard deviation) of undergraduates' attitudes towards distance education. According to the table, the attitudes of undergraduates towards distance education are at the "moderate" level (Mean: 3,07; SD: 1,114).

Table 3. Attitudes of the participants towards distance education

Scale and Subscales	N	$\bar{X}$	SD
Technology Access	1422	3,56	1,372
Technical Skills	1422	4,59	,707
Online Relationships	1422	4,03	1,099
Motivation	1422	3,45	1,313
Online Skills	1422	3,77	1,269
Importance of Success	1422	4,29	,796
ERSI	1422	3,95	,839

Table 3 shows the descriptive statistics (arithmetic mean and standard deviation) of undergraduates' perceptions of readiness for e-learning. According to the table, undergraduates' perceptions of readiness for e-learning are at the "high" level (Mean: 3.95; SD=.839). Undergraduates' perceptions of "technology access" (Mean: 3,56; SD:1,372), "online relationships" (Mean: 4,03; SD:1,099), "motivation" (Mean: 3,45 SD: 1,313), and "online skills" (Mean: 3.77 SD: 1.269), which are the subscales of the ERSI, are also at a "high" level. In the subscales of ERSI, "technical skills" (Mean: 4.59; SD: .707), and "importance of success" (Mean: 4.29; SD: .796), student perceptions are at the "very high" level.

Table 4. Attitudes of the participants towards distance education

Scale and Subscales	1	2	3	4	5	6	7	8
Technology Access	1							
Technical Skills	,499**	1						
Online Relationships	,499**	,577**	1					
Motivation	,521**	,442**	,734**	1				
Online Skills	,523**	,485**	,709**	,818**	1			

Importance of Success	,188**	,358**	,286**	,200**	,241**	1		
ERSI	,749**	,697**	,851**	,863**	,869**	,435**	1	
ASDL	,438**	,319**	,556**	,743**	,718**	0,23	,664**	1

*Note. N=1422, Sig.(2-tailed):,000 *p<.05, **p<.01*

Table 4 shows the relationship between undergraduates' attitudes towards distance education and their perceptions of readiness for e-learning. According to the table, it is seen that there is a moderate positive correlation between undergraduate students' attitudes towards distance education and their readiness for e-learning (r: 0.664; p<0.01). According to the table, there are also significant relationships between ASDL and ERSI's subscales. Moderate positive correlation exists between the ASDL and the "technology access" (r: 0.438; p<0.01), "technical skills" (r: 0.319; p<0.01) and "online relationships" (r: 0.556; p<0.01), which are the subscales of the ERSI. There is also high-level positive correlation between ASDL and "motivation" (r= 0.743; p<0.01) and "online skills" (r= 0.718; p<0.01) subscales. There is no significant relationship between ASDL and the "importance of success" subscale of ERSI (r: 0.023; p<0.01).

DISCUSSIONS AND CONCLUSION

During the new type of coronavirus (Covid-19) pandemic, the attitudes of the undergraduates towards distance education were found to be "moderate". In a study carried out by Oz-Ceviz, Tektas, Basmaci & Tektas (2020), the reasons why undergraduates are satisfied with the distance education are as followings: having the opportunity to watch the content again, not going to school, having a bulletin and video for information about the course, no attendance obligation, and no loss of time. Likewise, in Buluk and Esitti's (2020) study, it was found that many tourism undergraduates (approximately 86%) could adapt to the learning management system implemented by the university in a short time. It has been stated that this is caused by online communication, especially the use of mobile technology devices has an important place in the lives of the youth. The same reasons could be effective for the participants of this research. Another study revealed that during the pandemic distance education made it easier for undergraduates to adapt to this period by increasing their technical skills and the students were satisfied with the distance education platforms offered by their institutions (Yilmaz- Altuntas, Basaran, Ozeke & Yilmaz, 2020). Contrary to these studies, there are also unparallel results in the literature. For example, the undergraduate students of the geography department who participated in the study of Saribas & Meydan (2020) have negative attitudes towards online learning. Similarly, the attitudes of associate degree students participating in Demir's (2020) study towards distance education courses in mathematics are negative. Likewise, Akdemir & Kilic's (2020) study shows that the participants also experienced unfavorable experiences regarding distance education carried out during the pandemic, and the education received in this period did not meet their academic expectations. Although the results of this study are not completely similar to the results of other studies, it may provide considerable information about the attitudes of the undergraduates towards distance education carried out during the pandemic. Nevertheless, the small number of studies and their samples make it necessary to repeat similar studies with larger samples at variable intervals.

In a study examining the satisfaction levels of students regarding distance education in higher education during the COVID-19 pandemic, participants' statements show that the Council of Higher Education of Turkiye "passed the class" thanks to its decisions and information policy whereas the universities "failed the classroom" due to lack of preparation. Moreover, the participant students think that the instructors are deprived of teaching skills for distance education (Karadag & Yucel, 2020). This study, on the other hand, is concerned with how ready the students are for this critical period. The results show that the participants' perceptions of readiness for e-learning are at a high level throughout the scale. In terms of subscales, their readiness perceptions are at a high level in the technology access, online relations, motivation, and online skills" and very high in the technical skills, and importance of success. Kuzu (2020) found out similar results in her study in examining the freshmen's readiness levels for distance education during the pandemic. In two other studies carried out on vocational school students, it was also concluded that the participants' readiness levels for e-learning were high (Turkmen, Asci & Zor, 2020; Uyar & Karakuyu, 2020). On the

other hand, students who participated in the study of Akdemir and Kilic (2020) felt lack of motivation in distance learning during the pandemic. Accordingly, the results of this study differ from the study of Akdemir and Kilic (2020) in terms of participants' motivation for e-learning. These results may have been affected by the data collected from different samples in different time periods. The course of the pandemic may also have had a direct impact on the results. Considered as a whole, the results of different studies show that students think that they are ready for e-learning. On the other hand, they consider that universities, faculty members, and lecturers are caught unprepared for the pandemic period. Hence, researchers can carry out comprehensive studies to examine the perceptions of readiness for e-teaching, and e-learning of all stakeholders during the pandemic. Besides, due to the different results in the literature, researchers can focus on learners' motivation in distance education.

The sudden and rapid transition to distance education due to the pandemic may cause inequalities in access to technology. Karadag & Yucel (2020), and Yildiz (2020) stated these inequalities among important problems in their studies. On the contrary, the results of this study show that the undergraduates have a high level of readiness perception in "technology access" during the pandemic. This may have been for the reason that the data of the study was collected online, and the sample consisted of students who had no problem in accessing the technology. Accordingly, researchers can consider this point in order to provide results with higher validity and reliability in further studies.

The results of the study show that there is a significant and positive relationship between undergraduates' attitudes towards distance education and their perceptions of readiness for e-learning through distance education. Even though distance education and e-learning are similar to classical education environments and learning, it is clear that there are some cognitive and affective differences for learners. Besides these two variables, e-learning can also be affected by different cognitive and affective features such as academic success, motivation, interest, expectation, excitement, etc. (Bicer, 2019; Etlioglu & Tekin, 2019; Gulbahar, 2019). Moreover, how the distance education carried out during the pandemic, combined with the psychology of the pandemic, affects e-learning remains a door that has not been fully opened yet. Given the relationship between the attitude towards distance education and the perception of readiness for e-learning, it is a necessity to reveal other variables that may relate to these variables and to deal with the psychology of pandemic in depth. It is vital to examine the relationships between these variables and different variables, which regulate or mediate these relationships, in terms of contributing to the literature and related researchers in understanding the pandemic psychology of students.

It can be considered as a limitation that the study group of the research consisted of 1422 students who attended the summer school at Karabuk University in the summer term of the 2019-2020 academic year. Due to this limitation, future studies can be carried out with much larger samples and universities to be selected from every region of the country. More comprehensive and in-depth data on the factors affecting their attitudes towards distance education and their perceptions of readiness for e-learning can be revealed by conducting one-to-one interviews with students. This can provide an overall questioning and discussion of the results. Lastly, the views of lecturers and university students on these subjects can be compared.

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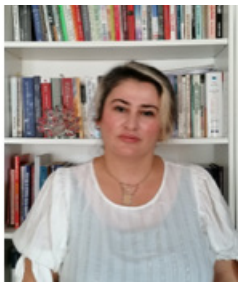

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DISTANCE EDUCATION EFFECTIVENESS AND BARRIERS IN DEVELOPING A POSITIVE ATTITUDE TOWARDS SUSTAINABILITY: MEDIATION OF INNOVATIVENESS

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ABSTRACT

The objectives of this study are to investigate the effectiveness of distance education in fostering a positive attitude towards sustainability, examine the effects of barriers to sustainability in distance education in terms of the attitude towards sustainability and investigate the mediating effect of innovativeness in the aforesaid relationship. Online survey questionnaires were used to collect data from 663 final-year students enrolled in courses offered through distance education mode at selected universities in Malaysia. The data analysis was based on the partial least squares structural equation modelling (PLS-SEM) approach. This study attests that distance education is effective in nurturing a positive attitude towards sustainability through the mediation of innovation. Although the barriers related to distance education seemed to pose an inverse effect on the attitude towards sustainability, it did not seem to have any significant effect on innovativeness. Future research may investigate the further applicability of this study's model in various contexts related to the role of distance education in achieving the goals of the sustainable development agenda.

Keywords: Attitude, barriers, distance education, innovativeness, online education, sustainability.

INTRODUCTION

The recent coronavirus disease 2019 (COVID-19) pandemic has drastically changed the higher education landscape and given rise to long-term impacts on institutions of higher education. The movement control order and the need to stay at home have necessitated holding classes online for distance learning students at institutions of higher education. Notably, there has been a surge in enrolments for online courses since March 2020 (Impey, 2020), where people aged 25 to 49 expressed greater enthusiasm for online-only options than people aged 18 to 24 or 50 or older (McKenzie, 2020). Together with the rising public participation in lifelong learning (Ministry of Higher Education Malaysia, 2011), the contribution of developing communication technologies and the increasing demand due to changing lifestyles have created an educational niche opportunity for distance education to be upgraded from being a supplementary aid to a distinctive solution. Universities that are successful in this transition period will be able to provide quality education that caters to the needs of future graduates. Since distance education seeks to equip this digital generation with learning that is necessary for their survival, its essence is in nurturing sustainability or a way of life that balances the immediate needs for commerce, living, habitation, food, transportation, energy and entertainment with the future needs for these resources.

Distance education has a history that spans almost two centuries; thus, it has experienced significant changes in the way learning occurs and is communicated (Moore et al., 2011). Modern distance education involves the employment of technology to aid and enhance learning (Al-Arimi, 2014). It has also been acknowledged as a mechanism through which sustainability can be achieved (Aleixo et al., 2018; Azeiteiro et al., 2015; Ramos et al., 2015). Since sustainability has not been well integrated into mainstream university operations and curricula (Larran Jorge et al., 2015; Waas et al., 2010), there is a crucial need to incorporate sustainability into university courses and programmes.

Although distance education has been acknowledged in previous studies as a mechanism through which sustainable development can be achieved (Aleixo et al., 2018; Ramos et al., 2015), learners' grasp of knowledge and practice regarding the concept of sustainability has been below expectations (Azeiteiro et al., 2015). This has made the assessment of the sustainability nurtured through distance education programmes/courses a complex issue (Md Harizan & Hilmi, 2019), particularly in achieving the intended outcome of the sustainability agenda among students. To date, only a few studies have addressed this topic (Bacelar-Nicolau et al., 2009; Azeiteiro et al., 2015). Meanwhile, Bacelar-Nicolau et al. (2009) evaluated the extent to which a master's programme with environmental and social science content would succeed in expanding students' awareness and knowledge through e-learning. Azeiteiro et al. (2015) conducted a descriptive analysis to assess the effectiveness of e-learning in delivering education related to sustainable development using a case study approach.

Attitude has been found to be an important determinant of most sustainable behaviours (Kim et al., 2020; Passafaro, 2019; Pouratashi & Zamani, 2021). Indeed, attitudinal change is a prerequisite to behavioural change (Arbuthnott, 2009). The significance of attitude in transforming the sustainability agenda in the context of higher education has also been acknowledged (Anderson, 2017; Chawla & Manhas, 2015). However, the method by which attitude towards sustainability is formed through the process of delivering lessons via the distance education mode has yet to be explored further. The importance of online and distance education in shaping the right attitude towards sustainability cannot be ignored since the graduates of these programmes are expected to be well equipped with learning that is of great economic significance and with strong social and environmental impacts.

To understand the notion of attitude towards sustainability derived from enrolment in online and distance education programmes, it is important to focus on the criteria that define the nature and effectiveness of online and distance education programmes in shaping learners' attitudes towards sustainability. This can be done by evaluating the key criteria that give rise to the sustainability behavioural outcome of learners. The evaluation of the effectiveness of distance education starts with the distance learning experience, which shows an extremely high level of student motivation and satisfaction with the distance education programmes (Martinho et al., 2010; Pinto de Moura et al., 2010). Student's motivation, satisfaction and quality issues have been found to be greatly linked with the effectiveness of distance education in delivering the sustainability message (Dimitrious, 2015; Harris & Martin, 2012; Markova et al., 2017). However, it has also been revealed that although the new virtual technologies are important, they are not sufficient because they do not encourage the development of key learning skills, attitudes and values towards environmental conservation and sustainable development on the same level as face-to-face fieldwork (de Oliveira, 2012; Oliveira et al., 2017). Therefore, further investigation is needed to explain the influence of the effectiveness of distance education in forming distance learners' attitudes towards sustainability.

Meanwhile, barriers are seen as obstacles to building a positive attitude towards sustainability in higher education settings (Aleixo et al., 2016, 2018; Bell et al., 2017; Berge, 2013; Lloyd et al., 2012; Markova et al., 2017). Studies have rarely investigated the impact of barriers within the context of online and distance education on attitude towards sustainability. Thus, it is important to understand the barriers hindering sustainability in distance education and their impact on the development of a positive attitude towards sustainability in an empirical manner.

In striving for sustainability in higher education, innovative teaching approaches and methodologies are essential (Laurie et al., 2016). As courses run via distance education mode are mainly facilitated by technology, innovativeness is pertinent in shaping an individual's attitude towards sustainability. Researchers have rarely conducted empirical studies examining the influence of innovativeness on the attitude towards sustainability of distance education. Hence, by applying the conceptual basis posited by Siti Hajar Mohd Roffeei et al. (2016), which underlies the notion, it can be stated that innovativeness will mediate the relationship between the effectiveness of distance education, barriers to sustainability in distance education and attitude towards sustainability in distance education. Therefore, the objectives of the study are as follows: 1) to investigate the effectiveness of distance education in fostering a positive attitude towards sustainability of learners; 2) to examine the effect of barriers to sustainability in distance education on the attitude towards sustainability of learners; and 3) to investigate the mediating effect of innovativeness in the relationship between the effectiveness of distance education, barriers to sustainability in distance education and attitude towards sustainability of learners.

LITERATURE REVIEW

Attitude Towards Sustainability

Attitude is a learned predisposition to behave in a consistently favourable or unfavourable way with respect to a given object' (Schiffman & Wisenblit, 2015) and is considered to result from individual beliefs regarding behaviours and their consequences (Fishbein & Ajzen, 1975). It is important to focus on attitude because one's personal attitude towards the norm has a clear impact on intentions to act in a certain manner (Ajzen, 1991). Having a favourable attitude towards an object, people or idea is almost always an essential prerequisite for future behaviour or behavioural intention (Pouratashi & Zamani, 2021). Studies have reported significant positive effects of pro-environmental attitude on sustainable consumption behaviour (Jung, Choi, & Oh, 2020; Sesini, Castiglioni, & Lozza, 2020), tourism behaviour (Fang et al., 2018; Passafaro, 2019; Verma, Chandra, & Kumar, 2019) and general pro-environmental behaviour (Ertz & Sarigollu, 2019; Tian, Zhang, & Li, 2020).

The formation of a sustainability-oriented attitude has also been found to be vital within the higher education context, for example, sustainable behaviour on campus (Ibiapina, Cunha, Paiva, & Romero, 2020), even though we know it is an important determinant of sustainable behaviours in various contexts (Kim et al., 2020; Passafaro, 2019; Pouratashi & Zamani, 2021). Many sustainability programmes in institutions of higher education are designed to change attitudes towards the natural environment, society and economic well-being. Thus, if attitude change is to translate into altered behaviour, the process of education must extend beyond attitudes to assisting people to act in such ways (Arbuthnott, 2009). Various pieces of evidence have been found to support this notion. Anderson (2017) found a strong correlation between taking related university courses and attitude towards engaging in environmentally sustainable behaviour and activities, while sustainability-related modules have deeply impacted students' attitudes towards the sustainability agenda (Chawla & Manhas, 2015). Nevertheless, studies have yet to discover the attitudinal outcome pertaining to sustainability as the result of enrolling in online and distance education programmes (Oliveira et al., 2018; Silas Marques de Oliveira, 2012). It is believed that the concept of attitude towards sustainability within the distance education context may be understood in the context of learners' beliefs when they have been impacted by their respective distance education programmes. Thus, it is important to focus on the criteria that define the nature and effectiveness of online and distance education in shaping learners' attitudes towards sustainability. Apart from focusing solely on the attitudinal outcome of sustainability-related courses among learners, it is also imperative to investigate the criteria that provide a holistic view of the essence of online and distance education towards sustainability. This can be done by evaluating the key criteria of distance education from which the sustainability behavioural outcome of learners emanates.

Effectiveness of Distance Education in Fostering Sustainability

Over the past decade, a large number of distance education programmes have met the needs of learners, maintained a competitive edge for providers and created various learning opportunities in conventional learning both locally and internationally. Distance education is important because it enables the attainment of environmental preservation and sustainability due to its fewer travel requirements; although some face-to-face lectures have to be attended, the use of resources is still minimised due to the shorter duration of student time on campus and the utilisation of a paperless environment as a result of online and electronic-based lessons (Campbell & Campbell, 2011; Din, Haron, & Ahmad, 2013; May, Cox, Kroder, & Franklin, 2010; Md Harizan, Hilmi, & Atan, 2015, 2016, 2017). The environmental dimension of sustainability aims to achieve environmental protection by conserving and enhancing the resource base and staying within the earth's environmental limits in the long term (Waas et al., 2011). Other dimensions of sustainability, such as economic and social areas, have rarely been investigated (Md Harizan & Hilmi, 2019). Without sufficient insights in understanding the essence of the triple bottom line model (Elkington, 1994) within the distance education context, it will be much harder for institutions to evaluate the sustainability attainment of their distance education courses and programmes.

Various approaches have been used to evaluate the effectiveness of distance education in achieving sustainability. Some of these approaches include pedagogical challenges, teaching techniques and curriculum orientation (Figueiro & Raufflet, 2015), student motivation, satisfaction and quality issues (Dimitrious,

2015; Harris & Martin, 2012; Markova et al., 2017). General expectations, learning quality, teaching resources, pedagogical tools and evaluation, sustainability competencies acquired, satisfaction, interactions and reasons to pursue a new enrolment in distance learning programmes are the other approaches (Azeiteiro et al., 2015). Each approach has been deemed significant in forming a distance learning experience with the sustainability outcome to be embraced by learners.

Successful distance education and learning consists of text-based learning materials, organisational and instructional support, intensive study schools and tutorials, learning event designs, assessment tasks and material development teams, among others (Joliffe, Ritter & Stevens, 2012). Salmon (2004) suggested a five-stage framework comprising activities such as access and motivation, information exchange, online socialisation and knowledge development for a successful distance education approach. Based on existing studies, several elements underlying the effectiveness of distance education in sustainability may be analysed, namely, expectations of students, motivations and reasons for pursuing distance education programmes or courses, the quality of learning, evaluation and assessment, sustainability competencies acquired and satisfaction of learners.

Expectations of Students

Expectations can be defined as the preliminary thoughts that set the standard or reference point while one is carrying out a performance evaluation of a product (Akinci, Yurcu & Kasalak, 2018). Understanding students' expectations is the prerequisite that underlies the effectiveness of distance education in ensuring sustainability awareness and practices to be nurtured among them. The embodied elements of learning experiences gained while enrolling in courses via distance education mode are important factors that signify the expectations of distance learners from the programme. Student expectations normally deal with the acquisition of knowledge, research skills, competency development, and professional improvement and validation (Azeiteiro et al., 2015) as results of enrolling in the programme for future application in their work or jobs. It has also been revealed that students' general expectations of online and distance education are similar to those of face-to-face education (Martinho et al., 2010; Pinto de Moura et al., 2010). The majority of learners expect sustained improvements in their enrolled programme, including their interactions with the instructor, course content, course structure, facilities and assessment (Harizan & Hilmi, 2019). Such factors can be taken into consideration in developing a positive attitude towards sustainability after enrolling in distance education programmes/courses.

Motivation and Reasons to Pursue Distance Education Programmes/Courses

Students are motivated to pursue distance education programmes for various reasons, which include the will to pursue knowledge and competencies in sustainability, aside from attaining professional advancement (Azeiteiro et al., 2015), knowledge improvement and recognition, job requirements and self-development. This encompasses the achievement of personal ambition and higher living status, the desire to experience campus life, family and peer pressure and external factors such as reputation in the university and its surroundings (Harizan & Hilmi, 2019). Students with high motivation for distance learning programmes would also have a reason to return for new training sessions provided by the same university (Azeiteiro et al., 2015). Martinho et al. (2010) and Pinto de Moura et al. (2010) found that an extremely high level of student motivation for online programmes changed their attitudes about the environmental domains, thereby contributing to others' changing attitudes and behaviours as well.

Quality of Learning

Research has revealed that the quality of teaching activity significantly improved the attitude towards energy saving and carbon reduction among students in Taiwan (Chou et al., 2015). Notably, the quality of online and distance learning programmes can be indicated by several components, namely, the materials, electronic/online activities, learning strategies and acquired skills, group or collaborative work, teachers or instructors and e-learning management systems/portals (Azeiteiro et al., 2015). Learners were reported to be very positive about the learning quality via distance education, although a few of them expressed

unfavourable opinions regarding course materials and collaborative work (Md Harizan & Hilmi, 2019). Learning quality is strongly linked to the well-rated teaching resources by students, such as bibliographic resources, supporting texts and Moodle (e-learning platform) lessons (Azeiteiro et al., 2015). Therefore, it is believed that the quality of learning in distance education may also nurture a positive attitude towards sustainability among learners.

Evaluation and Assessment

The emergence of new educational materials in implementing innovative teaching approaches and pedagogies has, in turn, broadened the range of the assessment methods for students' competencies and deeper knowledge (Laurie et al., 2016). Project-based learning is generally preferred as a method of exposing students to sustainability issues since it enables assessment through case studies, games, simulations or roleplays (Thurer et al., 2018). On the other hand, evaluations based on slideshows, Internet sites, videos and online exams via Moodle/Learning Management System were rated low by the students (Azeiteiro et al., 2015). Transmission, which is susceptible to the quality of Internet infrastructure, may affect the audio and visual quality of the materials, thus causing a certain level of distraction while students attempt to answer online quizzes (Md Harizan & Hilmi, 2019). This situation may affect the attitude towards sustainability in distance education. Besides, the assessment of sustainability's key competencies in higher education also requires further research (Rieckmann, 2012).

Sustainability Competencies Acquired

Competencies for sustainable development in higher education programmes are important to achieve sustainability in the higher education context (Lambrechts et al., 2013). Courses in education for sustainable development pedagogies promote the learning of skills, perspectives and values necessary to foster sustainable societies (Laurie et al., 2016). Findings on the competencies derived from curricula pertaining to sustainability indicate mixed reactions in studies conducted in the field. According to a survey by Byrne et al. (2013), none of the delegates agreed that sustainability knowledge and skills are thoroughly embedded within the curricula at their university. Science-based sustainability fundamental seminars also constitute a less effective intervention in producing favourable sustainable behaviour among practicing engineers in comparison to non-engineers (Wilson, 2014). Meanwhile, students in Irish higher education institutions possess inadequate knowledge and a narrow understanding of sustainable development and know extraordinarily little about social issues (Nicolaou & Conlon, 2012). According to Chawla and Manhas (2015), most students found that the term 'sustainability' is rather unclear, although they were somehow engaged in sustainability-related matters. The findings exemplify a lack of understanding of the complexity of the sustainability agenda, which is largely associated with environmental issues. It has been reported that students acquire important sustainable development competencies that are implicitly integrated into the programmes, such as personal involvement, action skills, emotional intelligence and interdisciplinary work. However, interpersonal competencies and competencies related to the application of knowledge to practical situations are not yet sufficiently developed (Azeiteiro et al., 2015). A strong correlation was reported between taking related university courses and attitudes towards engaging in environmentally sustainable behaviours and activities among students (Anderson, 2017), suggesting that the linkages have to be explained further.

Satisfaction

In the educational context, students' satisfaction can be understood as the level where their expectations are fulfilled in educational institutions (Akinci, Yurcu & Kasalak, 2018). Satisfaction in electronic and distance learning is stimulated by several related aspects, namely, content, user interface, learning community, customisation and learning performance (Wang, 2003). Students have also reported high satisfaction with electronic learning due to its flexible pedagogical model compared to equivalent classroom courses, with communication tools, instructor expertise or motivating skills, and learning electronic activities as the contributing factors (Azeiteiro et al., 2015). Material conditions and learning facilities, lecturers, instructional activities, learning environment and peer relationships have also been found to engender satisfaction among

students (Topala & Tomozii, 2014). Positive feedback on satisfaction with learning materials or resources, pedagogical tools and assessments are commonly reported among respondents who enrolled in distance education programmes (Md Harizan & Hilmi, 2019).

Satisfaction with the online programmes often changed the students' attitudes about environmental domains and contributed to others' changing attitudes and behaviours as well (Martinho et al., 2010; Pinto de Moura et al., 2010). Students with high levels of satisfaction with the distance learning programmes often have reasons to return for new training sessions at the same university (Azeiteiro et al., 2015). Thus, it is believed that satisfaction with distance education programmes/courses may lead to favourable attitudes towards sustainability among learners.

Barriers to Sustainability in Distance Education

The progress towards the goals established in Rio de Janeiro has been slower than what was hoped for, and the implementation in higher education institutions has had its ups and downs, as well as some barriers (Velazquez et al., 2006). Barriers are obstacles to promoting the effectiveness of e-learning as a sustainable education approach (Azeiteiro et al., 2015), as well as in building a positive attitude towards sustainability in higher education settings (Aleixo et al., 2016). Among the barriers to the implementation of sustainability in higher education institutions are ambiguity and complexity in understanding the actual concept of sustainability, lack of financial resources or funding and lack of commitments among students and faculty members (Aleixo et al., 2016). These barriers are also believed to hinder the attainment of sustainability in distance education programmes and courses. The barriers faced by distance learners are also associated with the lack of individual assistance, which impedes the socialisation of individuals. In addition, the lack of immediate feedback depends too much on access to facilities and communication technologies. Limitations have been associated with communication due to an excessive number of students, development of affectional and psychomotor behaviours and high costs attributed to the used technology (Tavukcu et al., 2011). Russian students have reportedly encountered learning challenges with regards to effective teaching practices and communication patterns (Markova et al., 2017). Lower awareness of local and global environmental issues and the lack of extrinsic motivation among faculty members, alumni and students, aside from the limited focus on staff training programmes, are also identified as barriers to sustainability in higher education (Thurer et al., 2018).

Among the identified barriers that may impact the effectiveness of distance education in nurturing sustainability among learners are lack of time to manage studies well, work and family commitments for part-timers, a lack of knowledge regarding sustainability, poor interaction between peers and instructors, financial problems in sustaining studies, programme structure, the quality of instructors and learning materials, and accessibility to the Internet (Md Harizan & Hilmi, 2019). Thus, it is important to highlight the adverse impact of barriers to sustainability in distance education and the way it jeopardises the shaping process of attitudes towards sustainability among learners.

Innovativeness

Education for sustainable development has necessitated the application of innovative teaching approaches and methodologies, which has also increased the use of information and communications technology (ICT) in teaching and learning activities (Laurie et al., 2016). As courses run via the distance education mode are mainly facilitated by technology, innovativeness is found to be pertinent in shaping an individual's attitude towards sustainability. Innovativeness is defined as the degree to which an individual is relatively 'more ready to adopt' an innovation than other members of the social system (Rogers & Shoemaker, 1971). Innovativeness is believed to affect the attitudes of individuals (Eastlick & Lotz, 1999) and has a significant positive effect on the receptiveness to new ideas (Crespo & del Bosque, 2008) and products (Mansori, Sambasivan, & Md Sidin, 2015) and on various innovative behaviours (Siti Hajar Mohd Roffeei et al., 2016, 2018).

The process of designing and developing any kind of in-class activities that contribute to innovativeness is important in identifying individuals who have high levels of such traits (Kilicer, Bardakci, & Arpaci, 2018). It is asserted that computer self-literacy has been significantly associated with personal innovativeness of

learners in the ICT domain in the e-learning environment (Kim & Park, 2018). Since the level of self-efficacy in computer applications among learners has much to do with the process of distance education in enhancing innovativeness among learners, it is believed that the effectiveness of distance education could significantly impose a positive effect on innovativeness. On the other hand, barriers seem to hinder the successful implementation of various aspects of distance education, including innovation (Williams, 2020). Based on this notion, it is believed that barriers could also impose a significant adverse effect on innovativeness.

It is believed that innovativeness could significantly mediate the relationship between internal/external organisational environment and innovative behaviour (Siti Hajar Mohd Roffeei et al., 2016). This suggests that innovativeness may also mediate the relationship between the effectiveness of distance education, barriers to sustainability in distance education and attitude towards sustainability in distance education.

HYPOTHESES

Several hypotheses have been formulated in this study:

- H1: The effectiveness of distance education has a significant positive impact on the attitude towards sustainability.
- H2: The barriers to sustainability in distance education have a significant negative impact on the attitude towards sustainability.
- H3: Innovativeness has a significant positive impact on the attitude towards sustainability.
- H4: The effectiveness of distance education has a significant positive impact on innovativeness.
- H5: The barriers to sustainability in distance education have a significant negative impact on innovativeness.
- H6: Innovativeness mediates the relationship between the effectiveness of distance education and the attitude towards sustainability.
- H7: Innovativeness mediates the relationship between the barriers to sustainability in distance education and the attitude towards sustainability.

THEORETICAL FRAMEWORK

The model of the study can be explained clearly as it is based on the notion of social modelling expounded in the Social Cognitive Theory for personal and social change (Bandura, 2004), whereby the determinants and psychosocial mechanisms through which symbolic communication promotes personal and social changes are analysed in an agentic conceptual framework. In this study, to be an agent for a better world is to influence the learner's own functioning and life circumstances. In this transactional view of learners and society, the graduates are both considered producers and products with respective attitudinal outcomes of their social environment, which, in this study, is the distance education environment milieu. By formulating their respective social environments through effective distance education programmes/courses, the learners are driven to get involved in the enhancement of their lives, which, in this study, is their ideal attitude towards sustainability. Impediments to personal and social change are expressed in the form of barriers to sustainability in distance education, inhibiting the development of a positive attitude towards sustainability. A sense of efficacy, expressed in the form of innovativeness, may be able to strengthen learners' ability to overcome the barriers while attenuating the impacts imposed by the effectiveness of distance education in yielding the ideal attitude towards sustainability. Specifically, the model can be explained through the Transformational Learning Theory (Mezirow, 1997), which asserts that changes in meaning evolve in two domains of learning. The first domain, which is instrumental learning, focuses on acquiring knowledge through task-oriented problem-solving and determining the cause-and-effect relationship, which, in this study, is created and developed through the course activities related to sustainability awareness and involvement. This process will enhance learners' sense of innovativeness and further empower them to grasp more opportunities and increase their capabilities to build the ideal attitude towards sustainability. The second domain is communicative learning, which is the knowledge acquisition involved in understanding

the meaning of others concerning values, ideals, feelings, moral decisions, freedom, justice, labour, love, autonomy, commitment and democracy (Haron et al., 2012), which are parts of the main essence of the sustainability agenda itself.

METHODOLOGY

The study employed the cross-sectional approach using online survey questionnaires as the main data collection method. The population of the study consisted of final-year students currently enrolled in management or social science courses through the distance education mode at selected universities in Malaysia. Prior to data collection, a letter of consent was sent to each participating university to obtain permission for undertaking the survey. A notice with a link to the online questionnaires via the SurveyMonkey online survey platform was requested to be posted on the e-learning portal of each institution prior to the actual date of the survey. Four main variables were investigated in this study: attitude towards sustainability (dependent variable), effectiveness of distance education (independent variable), barriers to sustainability in distance education (independent variable) and innovativeness (mediating variable). Measurement instruments were adapted from previous studies. Attitude towards sustainability was adapted from Gale et al. (2014) and Yatim et al. (2012), effectiveness of distance education was adapted from Harizan and Hilmi (2021), barriers to sustainability in distance education was adapted from Aleixo et al. (2016) and innovativeness was adapted from Herrero Crespo and Rodríguez del Bosque (2008). All items, except for the socio-demographic characteristics, were measured using a four-point Likert scale (1 = Strongly disagree to 4 = Strongly agree). All items were referred to field experts for face validation before conducting a pilot study (n=70).

RESULTS AND FINDINGS

A total of 663 responses were acquired. Most of the respondents were between 25 to 34 years of age (54.9%), female (60.5%), married (58.5%), with a personal monthly income between RM2,000.00 to RM2,999.00 (37.9%) and had previously obtained a diploma (55.5%). Most of the respondents were Muslims (87.5%) from the Malay ethnic group (85.4%), working in the government sector (57.0%) and pursuing management studies (58.4%). The data were analysed based on the partial least squares structural equation modelling (PLS-SEM) approach using SmartPLS 3 software. The analysis involved the assessment of the measurement model and the presentation of the structural model.

Reliability and Validity Measurement

The assessment of reflective measurement models comprises composite reliability to assess internal consistency, individual indicator reliability and average variance extracted (AVE) to evaluate the convergent validity and discriminant validity (Hair et al., 2017). The Fornell-Larcker criterion, cross-loadings and Heterotrait-Monotrait Ratio of Correlations-HTMT can be used to examine discriminant validity.

Internal Consistency Reliability and Convergent Validity

Table 1 demonstrates the reliability analysis through composite reliability (CR), whereby values greater than 0.7 indicate that this study's research instrument has a high internal consistency (Nunnally, 1978; Hair et al., 2014). This table also presents the AVE, whereby values above 0.5 indicate that the study's constructs have established convergent validity (Henseler, Ringle, & Sinkovics, 2009). The factor loadings reported a value of 0.7 or higher, which is an acceptable measure. Items with low loadings were removed.

Table 1. Measurement Model

Second order construct	AVE	CR	Construct	Items	Loadings	CR	AVE
Effectiveness of distance education	0.718	0.930	Acquired skills	acq_skill1	0.758		
				acq_skill2	0.835		
				acq_skill3	0.847		
				acq_skill4	0.893		
				acq_skill5	0.876	0.925	0.711
			Assessment	assessment1	0.903		
				assessment2	0.913		
				assessment3	0.852	0.919	0.791
			Expectation	exp1	0.872		
				exp2	0.893		
				exp3	0.872		
				exp4	0.916		
				exp5	0.816		
				exp6	0.913		
				exp7	0.907		
				exp8	0.894		
				exp9	0.868	0.97	0.781
			Group work	group1	0.87		
				group2	0.889		
				group3	0.9		
				group4	0.846	0.93	0.768
			Learning strategy	learning_strategy1	0.89		
				learning_strategy2	0.877		
				learning_strategy3	0.798		
				learning_strategy5	0.822	0.911	0.718
			Motivation	motif1	0.763		
				motif10	0.797		
				motif11	0.834		
				motif2	0.83		
				motif4	0.704		
				motif5	0.852		
				motif6	0.839		
				motif7	0.799		
				motif9	0.746	0.94	0.636
			Quality - eportal	eportal1	0.933		
				eportal2	0.92		
				eportal3	0.924	0.947	0.857
			Quality-Instructor	instructor1	0.907		
				instructor2	0.928		
				instructor3	0.922		
				instructor4	0.903		
				instructor5	0.888	0.96	0.827

Second order construct	AVE	CR	Construct	Items	Loadings	CR	AVE
			Quality-Materials	materials1	0.866		
				materials2	0.873		
				materials3	0.833		
				materials4	0.822		
				materials5	0.867	0.93	0.726
			Quality-Online	online1	0.821		
				online2	0.845		
				qonline3	0.877		
				online4	0.868		
				online5	0.839		
				online6	0.803	0.936	0.71
			Sustainability competencies acquired (SCA)	sustain6	0.848		
				sustain7	0.855		
				sustain8	0.741	0.891	0.671
			Satisfaction	satisfaction1	0.844		
				satisfaction2	0.83		
				satisfaction3	0.876		
				satisfaction4	0.794	0.903	0.7
			Barriers to sustainability	barrier1	0.723		
				barrier6	0.866	0.776	0.636
			Innovativeness	innova1	0.885		
				innova4	0.891	0.882	0.788
			Attitude towards sustainability	att1	0.751		
				att2	0.777		
				att4	0.777		
				att5	0.825		
				att6	0.86		
				att7	0.774		
				att8	0.868	0.928	0.649

Discriminant Validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards (Hair et al., 2017). The cross-loadings are the first approach to evaluate the discriminant validity of the indicators. Each indicator loads highest on the construct it is intended to measure (Chin, 1998). Thus, this model has good discriminant validity (see Table 2).

Table 2. Indicator Item Cross-Loadings

	Acquired skills	Assessment	Attitude	Barriers	Expecta - tion	Group work	Innova -tiveness	Learning strategy	Motiva - tion	Quality - eportal	Quality-instructor	Quality-materials	Quality-online	SCA	Satisfaction
acq_skill1	**0.75**														
acq_skill2	**0.83**														
acq_skill3	**0.84**														
acq_skill4	**0.89**														
acq_skill5	**0.87**														
assessment1		**0.90**													
assessment2		**0.91**													
assessment3		**0.85**													
att1			**0.75**												
att2			**0.77**												
att4			**0.77**												
att5			**0.82**												
att6			**0.86**												
att7			**0.77**												
att8			**0.86**												
barrier1				**0.72**											
barrier6				**0.86**											
exp1					**0.87**										
exp2					**0.89**										
exp3					**0.87**										
exp4					**0.91**										
exp5					**0.81**										
exp6					**0.91**										
exp7					**0.90**										
exp8					**0.89**										
exp9					**0.86**										

	Acquired skills	Assessment	Attitude	Barriers	Expecta - tion	Group work	Innova -tiveness	Learning strategy	Motiva - tion	Quality - eportal	Quality-instructor	Quality-materials	Quality-online	SCA	Satisfaction
group1						**0.87**									
group2						**0.88**									
group3						**0.9**									
group4						**0.84**									
innova1							**0.88**								
innova4							**0.89**								
instructor1											**0.90**				
instructor2											**0.92**				
instructor3											**0.92**				
instructor4											**0.90**				
instructor5											**0.88**				
learning_ strategy1								**0.89**							
learning_ strategy2								**0.87**							
learning_ strategy3								**0.79**							
learning_ strategy5								**0.82**							
motif1									**0.76**						
motif10									**0.79**						
motif11									**0.83**						
motif2									**0.83**						
motif4									**0.70**						
motif5									**0.85**						
motif6									**0.83**						
motif7									**0.79**						
motif9									**0.74**						
eportal1										**0.93**					

	Acquired skills	Assessment	Attitude	Barriers	Expecta - tion	Group work	Innova -tiveness	Learning strategy	Motiva - tion	Quality - eportal	Quality-instructor	Quality-materials	Quality-online	SCA	Satisfaction
eportal2										**0.92**					
eportal3										**0.92**					
materials1												**0.86**			
materials2												**0.87**			
materials3												**0.83**			
materials4												**0.82**			
materials5												**0.86**			
online1													**0.82**		
online2													**0.84**		
online3													**0.87**		
online4													**0.86**		
online5													**0.83**		
online6													**0.80**		
satisfaction1															**0.84**
satisfaction2															**0.83**
satisfaction3															**0.87**
satisfaction4															**0.79**
sustain6														**0.84**	
sustain7														**0.85**	
sustain8														**0.74**	

The Fornell-Larcker criterion is another approach that can be used to assess discriminant validity. It compares the square root of the AVE values with the latent variable correlations (Hair et al., 2017). If we want to have an ideal figure for discriminant validity, each construct's AVE should be higher than its squared correlation with any other construct (Fornell & Larcker, 1981). The diagonal values shown in Table 3 are the square root of the AVE of the latent variables, which are the highest in any column or row, thereby indicating good discriminant validity (see Table 3).

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

	Attitude towards sustainability	Barriers to sustainability	Effectiveness of distance education	Innovativeness
Attitude towards sustainability	**0.806**			
Barriers to sustainability	-0.381	**0.798**		
Effectiveness of distance education	0.553	-0.465	**0.758**	
Innovativeness	0.348	-0.151	0.297	**0.888**

Besides the Fornell-Larcker criterion, the Heterotrait-Monotrait Ratio of Correlations-HTMT was also used to assess the discriminant validity of the model. HTMT is the ratio of between-trait correlations to within-trait correlations (Hair et al., 2017). HTMT that are equal to the disattenuated correlation between two constructs and the HTMT and which are not close to 1 indicate good discriminant validity (Henseler, Ringle & Sarstedt, 2014). In Table 4, it could be claimed that the measurement paradigm of this model corresponds to the reliability and validity criteria of the measurement model.

Table 4. Discriminant Validity (Heterotrait-Monotrait Ratio of Correlations-HTMT)

	Attitude towards sustainability	Barriers to sustainability	Effectiveness of distance education	Innovativeness
Attitude towards sustainability				
Barriers to sustainability	0.591			
Effectiveness of distance education	0.584	0.683		
Innovativeness	0.426	0.259	0.352	

Assessing Structural Model Results

The assessment of the structural model results involves the evaluation of the model's predictive capabilities and the relationships between the constructs. The structural model assessment procedure starts with the assessment for collinearity issues, followed by assessing the significance and relevance of the structural model relationships, level of R_2, effect size f_2, predictive relevance Q_2, and q_2 effect size.

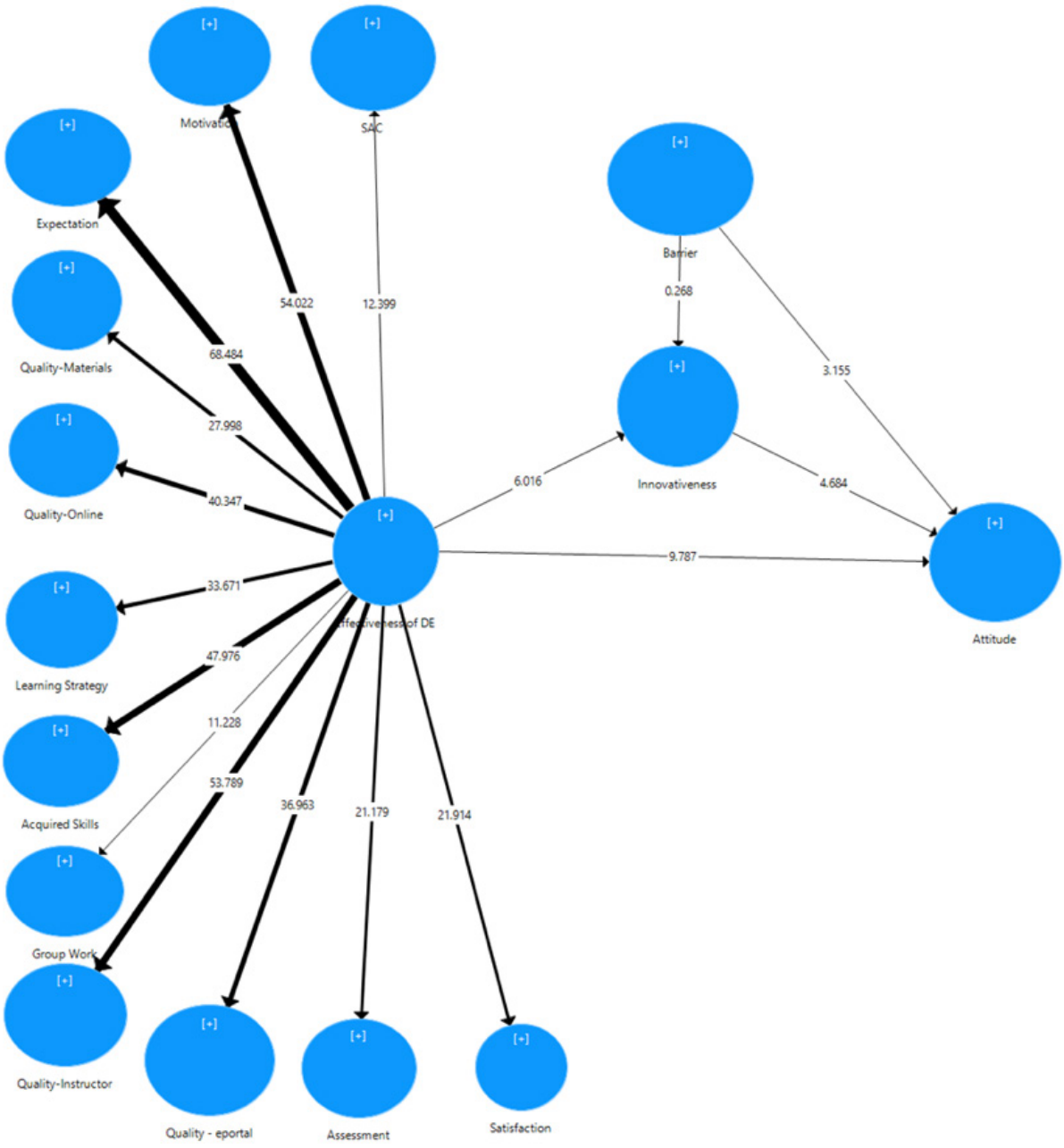

Figure 1. Structural Model

Step 1: Collinearity Assessment (Model Fit)

The standardised root mean square residual (SRMR) and root mean square residual covariance (RMS_theta) are two main approaches that have been used recently to judge the fit of the hypothesised model structure with the empirical data and, hence, to identify model misspecifications (Henseler, Ringle & Sarstedt, 2014). SRMR measures the difference between the observed correlation and the model's implied correlation matrix. If the SRMR is < 0.1 or < 0.08, the data fit the model (Henseler et al., 2014). RMS theta follows the same logic as SRMR but depends on covariance. RMS_theta values below 0.12 indicate a well-fitting model, whereas higher values indicate a lack of fit (Henseler et al., 2014). The results show that the SRMRs' values for saturated and estimated models are 0.074 and 0.087, respectively. The RMS_theta is 0.119. Therefore, the model fits and has predictive power.

Step 2: Structural Model Path Coefficients

The bootstrapping analysis suggested by Preacher and Hayes (2008) was run to test the correlation of bootstrapping samples with a 95% confidence interval (CI) on 5,000 sub-samples This was done to test all the hypotheses. The analysis of the mediating role of innovativeness was based on the indirect effect analysis shown in Table 5. The results illustrate that the effectiveness of distance education has a significant positive influence on the attitude towards sustainability (β = 0.419, p <.001), thus supporting H1. The barriers to sustainability in distance education have a significant negative effect on the attitude towards sustainability (β =-0.16, p <.001), thus supporting H2. There is also a significant positive influence of effectiveness of distance education on innovativeness (β = 0.29, p <.001), which validates H3. On the other hand, the barriers to sustainability in distance education imposed no significant impact on innovativeness (β = 0.018, p =.268), which refutes H4. Innovativeness has a significant positive influence on attitude towards sustainability (β = 0.199, p <.001), backing H5. The indirect effect analysis was used to show the mediating role of innovativeness between effectiveness of distance education, barriers to sustainability and attitude towards sustainability.

Table 5. Direct and Indirect Relationships Between Constructs

Relationship	Std. beta	Std. Error	T-value	Decision	F_2	Q_2	95% CI LL	95% CI UL
Effectiveness of distance education -> Attitude towards sustainability (H1)	0.419	0.043	9.787**	Supported	0.201	0.105	0.347	0.488
Barriers to sustainability -> Attitude towards sustainability (H2)	-0.16	0.049	3.155**	Supported	0.028	0.016	-0.241	-0.081
Innovativeness -> Attitude towards sustainability (H3)	0.199	0.043	4.684**	Supported	0.055	0.031	0.129	0.271
Effectiveness of distance education -> Innovativeness (H4)	0.29	0.048	6.016**	Supported	0.072	0.051	0.21	0.369
Barriers to sustainability -> Innovativeness (H5)	-0.018	0.06	0.268	Not Supported	0.001	-0.002	-0.115	0.081
Barriers to sustainability -> Innovativeness -> Attitude towards sustainability (H6)	-0.004	0.012	0.262	Not Supported	-	-	-0.023	0.016
Effectiveness of distance education -> Innovativeness -> Attitude towards sustainability (H7)	0.058	0.017	3.47**	Supported	-	-	0.034	0.09

**p<.01, *p<.05

The direct paths between the predictors and endogenous construct were compared between the events with and without the inclusion of innovativeness in the analysis to further investigate whether innovativeness has a full or partial mediation effect. It can be concluded from the results that innovativeness has a partial mediation effect in the direct path between the effectiveness of distance education and the attitude towards sustainability. The path was significant but reduced in terms of the standardised beta values with the inclusion of innovativeness as the mediating construct. On the other hand, there was no mediating effect between the barriers to sustainability in distance education and the attitude towards sustainability following the non-significance in both the direct and indirect paths between the constructs. Thus, H6 is not supported. Since the indirect and direct effects are both significant and point in the same direction, innovativeness is said to have a complementary mediation effect between the effectiveness of distance education and the attitude towards sustainability. Therefore, H7 is supported.

Step 3: Coefficient of Determination (R_2 value)

The coefficient of determination (R_2) is a measure of the model's predictive power and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values (Hair et al., 2017). The R_2 values of 0.75, 0.50 or 0.25 describe the substantial, moderate or weak predictive power of the

model, respectively. In this study, the R_2 value for attitude towards sustainability is 0.405, which indicates a slightly moderate level, whereas innovativeness is 0.125, which indicates the weak predictive power of the model (see Table 5).

Step 4: Effect size f_2

Effect size (f_2) refers to the change in the R_2 value when a specific exogenous construct is omitted from the model; it is used to evaluate whether the omitted construct has a substantial impact on the endogenous constructs (Hair et al., 2017). According to Cohen (1988), an effect size (f_2) value of 0.35 indicates a large effect size, 0.15 indicates a medium effect size and 0.02 indicates a small effect size. The relationship between effectiveness of distance education and attitude towards sustainability has a medium effect size, whereas other relationships have a small effect size (see Table 5).

Step 5: Blindfolding and Predictive Relevance Q_2

Stone-Geisser's Q_2 value is an indicator of the model's out-of-sample predictive power or predictive relevance (Hair et al., 2017). Q_2 values larger than zero ($Q_2 > 0$) for a specific reflective endogenous latent variable indicates the path model's predictive relevance for a particular dependent construct. In this study, the Q_2 for attitude towards sustainability is 0.245 and that for innovativeness is 0.044, indicating that the model has predictive relevance.

Step 6: Effect size q_2

The relative impact of predictive relevance can be compared by means of measuring the q_2 effect size. It allows assessing an exogenous construct's contribution to an endogenous latent variable's Q_2 value (Hair et al., 2017). With regards to the predictive relevance (q_2) of the predictor exogenous latent variable q_2, a value of 0.35 indicates a large predictive relevance, 0.15 a medium predictive relevance and 0.02 a small predictive relevance (Henseler, Ringle & Sinkovics, 2009). In the study, the relationship between the effectiveness of distance education and attitude towards sustainability has a medium predictive relevance, whereas other relationships have a small predictive relevance (see Table 5).

DISCUSSION

Studies have revealed that learners' grasp of knowledge and practice regarding the concept of sustainability has been below expectations, although distance education has been acknowledged as a mechanism through which sustainable development can be achieved (Aleixo et al., 2018; Ramos et al., 2015). Although the assessment of the sustainability nurtured through distance education programmes/courses has been a complex issue, the importance of online and distance education in shaping the right attitude for sustainability is beyond doubt since the effectiveness of the latter is deemed to play an incredibly significant role in encouraging a positive attitude towards sustainability. The realisation that graduates from the programmes are of great economic significance and have strong social and environmental impacts makes it essential to focus on the influence of the effectiveness of distance education on fostering an ideal attitude towards sustainability among learners. With regards to enhancing the explanatory power of such an influence as a mediator, which is rarely investigated, innovativeness is found to be an undeniably important trait to be instilled in learners, along with their studies, to further enhance the outcome of the effectiveness of distance education on their attitude towards sustainability.

Effectiveness of Distance Education and Attitude Towards Sustainability

From the findings, it can be deduced that the effectiveness of distance education will surely create a positive attitude towards sustainability and produce a sense of innovativeness among learners. If we are to understand the way by which the effectiveness of distance education fosters a positive attitude towards sustainability and innovativeness, an in-depth explanation of the factors influencing the construct needs to be carried out. The

expectations of students, motivations and reasons to pursue, quality of learning, evaluation and assessment, sustainability competencies acquired and satisfaction among learners need to be considered in a systematic manner.

Expectations of Students

The expectations of students are an inevitable factor in nurturing the ideal attitude towards sustainability, aside from sharpening the innovativeness of learners. Prior to and during the enrolment, expectation is the foremost aspect that determines the smoothness of the subsequent process of nurturing a positive attitude towards sustainability and innovativeness among distance learners throughout their studies. There is a consensus that learners do not only expect the same extent of lessons delivered in face-to-face teaching (Ana Pinto de Moura, Luís Miguel Cunha, Ulisses Miranda Azeiteiro, Luísa Aires, Pedro Graca, 2010; Martinho et al., 2010) but also the benefits resulting from enrolling in the distance education programme, especially in their work or jobs (Azeiteiro et al., 2015). In addition, the study has extended such benefits expected beyond the job requirements of learners, such as acquiring more knowledge and being more up to date than others in their fields of expertise, being able to apply different aspects of knowledge in life and being a role model for others in the family, which are topics that have not been discussed to a great extent by researchers. The higher their expectations from distance education programmes, the more positive their attitudes towards sustainability and innovativeness.

Motivation and Reasons to Pursue

This researcher has come to the conclusion that students' motivations (Dimitrious, 2015) and reasons for pursuing distance learning studies (Azeiteiro et al., 2015) are indeed the important factors underlying the effectiveness of distance education in nurturing a positive attitude towards sustainability among learners. By expanding the conceptual understanding of motivation and reasons to pursue distance education programmes (Md Harizan & Hilmi, 2019), the current study has provided empirical evidence of such a notion within the context of attitude formation towards sustainability as a result of enrolling in an effective distance education programme. The findings also reveal that learners with strong motivation and firm reasons to pursue their studies via the distance education mode are keen to be more innovative than those who are not. Learners are motivated the most by the flexibility of distance learning studies, their eagerness to experience university life and its milieu, as well as the reputation of the university in delivering lessons via the distance education mode. In addition, families, friends and job-related motives are also among the motivations and reasons why learners want to pursue such studies. The stronger their motivation and reasons to pursue distance education programmes, the more positive their attitude towards sustainability and innovativeness.

Quality of Learning

Issues pertaining to quality should never be taken lightly in distance education (Azeiteiro et al., 2015; Markova et al., 2017). The quality of learning is another important aspect underlying the effectiveness of distance education in shaping the ideal attitude towards sustainability, as well as enhancing innovativeness among learners. The findings are in line with Chou et al.'s (2015) study, wherein the quality of teaching activity significantly improved the attitude towards energy saving and carbon reduction of students in Taiwan in a classroom setting. However, the current study has extended such a notion by analysing the effect of learning quality on the attitude towards sustainability in the context of distance education and on the newly examined variable (i.e. innovativeness). Furthermore, the quality of learning has been classified into several dimensions, namely, online learning activities, instructors, e-portals, teaching materials, collaborative or group work among learners, acquired skills and learning strategies.

Online learning activities were found to contribute positively towards the effectiveness of distance education in forming a positive attitude towards sustainability and innovativeness. The study found that online learning activities are associated with flexibility in learners' work schedules, learning time saved, increased comprehension and achievement in the courses, preparation of assignments or projects and ease of interaction with instructors. All these activities are essential for effective learning via distance education

mode. The quality of instructors is another learning quality aspect that is significant in making distance education effective for the attitude formation towards sustainability among learners. Based on the findings, an instructor of good calibre is expected to be innovative, possess in-depth knowledge and experience in teaching the subject matter, be able to explain a particular topic in an interesting way and be capable of providing valuable feedback to students. Instructors are expected to be vibrant and flexible in time and space while equipping themselves with state-of-the-art teaching techniques and technology.

Besides instructors, the quality of the electronic portal is another important indicator of learning quality in distance education, which dictates the attitude towards sustainability and innovativeness of learners. Some of the criteria of a high-quality electronic portal are easy accessibility, ease of communication and enables prompt feedback. Such criteria should be emphasised to ease the learning curve and process for learners who need to adopt new technology that would enable them to learn effectively. Teaching materials are also another vital quality criterion for distance education courses to enable learners to attain the ideal attitude towards sustainability and innovativeness. Teaching materials are required to be comprehensive, easy to understand, compact, up-to-date and useful. Otherwise, with the rapidly evolving technology, the current teaching materials might become obsolete and less relevant within the context and needs of learners in the near future.

Learning quality also comprises the quality of the collaborative or group work for students' assignments/ projects. In distance education, the quality underlying the collaborative work is expected to fulfil several criteria, such as ease in the preparation of assignments or projects, the possibility of such work to be carried out regardless of location among group members, workload reduction and nurturing teamwork. With the aid of new technology, collaborative work can be organised virtually without depending on physical face-to-face interactions among group members, which makes it an ideal option for carrying out assignments and projects during the COVID-19 pandemic. Such learning quality is truly remarkable for distance education to be sustainable amidst the pandemic. Acquired skills are another important criterion that reflects the learning quality of distance education. Learners with distance education experience have usually acquired soft skills such as being independent, having more confidence, being more responsible, mastering unique learning strategies, being better at computer-related literacy and having time management skills. These attributes are either learned directly from the courses that learners are enrolled in or indirectly through the overall learning process since the first day of enrolment in distance education programmes.

Similarly, another criterion of learning quality found to be significant is the learning strategy. The learning strategy adopted in distance education is quite different from the traditional classroom mode since it emphasises self-learning, uniqueness, attractiveness and systematic content. Such attributes are important for teaching and learning via the distance education mode, which have made it distinct from the traditional face-to-face mode. These attributes should always be taken into consideration by instructors in planning their lessons, learning activities, teaching materials, lesson delivery sessions and assessments. Meanwhile, learners should also embrace such distinctive criteria into their study plan and strategy to get the most out of their courses and programmes. In short, if the learners have a good perception of the learning quality of distance education, the higher will be the extent to which such mode is effective in fostering a positive attitude towards sustainability and a sense of innovativeness among learners.

Evaluation and Assessment

Evaluation and assessment have been found to be important aspects underlying the effectiveness of distance education in nurturing a positive attitude towards sustainability (Azeiteiro et al., 2015), as well as enhancing innovativeness among learners. Evaluation and assessment are undeniably important in measuring the extent to which the learning outcomes have been achieved by learners and constitute the benchmarks for a course or programme against its targeted aim. A multi-form approach to evaluation and assessment is appropriate and accepted by learners to provide a broader perspective and holistic feedback on their performance. The composition of various evaluation and assessment methods and their complexity should be balanced and appropriate for any given course to produce the best outcome. In short, the more appropriate the evaluation and assessment method perceived by learners in the distance education programmes, the more positive their attitude towards sustainability and innovativeness.

Sustainability Competencies Acquired

The sustainability competencies acquired through the enrolment of distance learners are crucial in guiding the effectiveness of distance education (Azeiteiro et al., 2015), as well as in shaping the ideal attitude towards sustainability and innovativeness among distance learners. Through their enrolment in distance education programmes, learners have become more responsible citizens with regards to social welfare. They have gained higher awareness of the sustainability goals and are more sensitive towards multicultural and religious communities. These competencies are crucial and need to be acquired by learners as they complete their studies to enable them to be the catalysts in transforming the world into a better place for all living species. Hence, the more sustainability competencies acquired by learners from distance education programmes, the better their attitude towards sustainability and their sense of innovativeness.

Satisfaction

Learners' satisfaction is one of the aspects that is highly essential in determining the effectiveness of distance education in developing the ideal attitude towards sustainability and a sense of innovativeness among learners. The study has expanded the importance of student satisfaction as one of the determinants of an effective distance education programme (Azeiteiro et al., 2015; Harris and Martin, 2012) and, this time, within the context of forming attitude towards sustainability among learners.

The learners are satisfied with the distance education programmes that they are enrolled in when they perceive that they can achieve the same efficiency and learning outcome as that obtained in full-time learning because of the good learning experiences provided by their study environment. Overall satisfaction with distance education as a means through which the sustainability agenda has been transformed into attitudinal outcome was found to be high among the learners. The higher their satisfaction towards distance education programmes, the more positive their attitudes towards sustainability and innovativeness.

Barriers to Sustainability in Distance Education and Attitude Towards Sustainability

Despite the significance of distance education in effectively forming the attitude towards sustainability of learners, barriers that are associated with the context were found to impose a slight threat. This is partially supported by the notion posited by various studies stating that barriers are seen as obstacles in promoting the effectiveness of e-learning as a sustainable education approach (Azeiteiro et al., 2015), as well as in building a positive attitude towards sustainability in higher education settings (Aleixo et al., 2016). Two of the barriers that were significantly highlighted in this study are time management conflict between working and studying and the lack of support from the community at large. Although distance education is preferred as a career-friendly mode of study due to its flexibility for learners who are also working adults, learners may also encounter hardship in balancing their careers and studies. This situation may affect their scholastic performance even though the completion of the course itself might be a stepping stone in climbing the corporate ladder, given that they must earn a living for themselves or/and their dependents.

It is also interesting to find that despite families, friends and employers being the ones who strongly support their studies, the learners perceived that the community at large did not seem to provide support, although it should be noted that the outcomes of the distance education process of graduates are significant to economic, social and environmental sustainability. This situation might be due to the nature of non-materials or physical or immediate results in the community in which the learners are currently residing, where the community at large does not seem to receive direct and instantaneous benefit from members of the community who are pursuing distance education programmes rather than those who are closer to them. One fact that should be realised is that the development of a nation does not take place immediately. It might take years or centuries for the overall change to be realised or for a country to become great. Therefore, the abovementioned barriers could jeopardise the attainment of sustainable development goals if they are not tackled well. On the other hand, barriers to sustainability in distance education were found to impose no influence at all on innovativeness. The learners' innovativeness is intact regardless of whether the barriers are present or absent. This significantly influences the effectiveness of distance education, which is heavily imbued with technology, in shaping the sense of innovativeness among learners.

Innovativeness

Another important explanatory variable that arose from the process in which distance education programmes nurture the attitude towards sustainability among its learners is innovativeness. Being part of the lifeline of distance education programmes, ICT remains essential in facilitating teaching and learning in distance education programmes. The enrolment of students has somehow enhanced the sense of innovativeness, which further mediates the impact of the effectiveness of distance education programmes on the attitude towards sustainability of learners.

The findings provided further elaboration for Eastlick and Lotz's (1999) study, whereby innovativeness is believed to affect the attitude of individuals and impose a significant positive effect on the receptiveness towards new ideas (Crespo & del Bosque, 2008), which is the sustainability agenda in this current century, and products (Mansori, Sambasivan, & Md Sidin, 2015), as well as innovative behaviour (Siti Hajar Mohd Roffeei et al., 2016, 2018). These appear to be in the form of attitudinal behavioural outcome towards sustainability among learners. Innovativeness has also been proven as an important mediator in the relationship between internal/external organisational environment and innovative behaviour, as suggested by Siti Hajar Mohd Roffeei et al. (2016), by significantly mediating the relationship between the effectiveness of distance education, which constitutes both internal/external environment for distance education and innovative behaviour. This is reflected through learners' attitude towards sustainability, which is achieved partly through the technological venture itself.

Theoretical Implications

Theoretically, the study has provided further understanding regarding the effectiveness of distance education in nurturing awareness of sustainability in developing an ideal attitude towards sustainability. Moreover, since the studies on the sustainability concept in distance education thus far are mostly understood based on a narrow environmental dimension, the study has expanded the understanding of sustainability by incorporating other mainstream sustainability dimensions, namely, social and economic domains. This study has provided further understanding pertaining to contextual-specific barriers that hinder sustainability practices in distance education since there is a dearth of studies identifying barriers to sustainability in distance education. The findings also provide empirical evidence by unveiling the impacts of such barriers in the formation of an ideal attitude towards sustainability among learners. The study has demonstrated the mediating effect of innovativeness in such a relationship in an empirical manner. It is ground-breaking research that is unique in the field, as very few researchers have explained the influence of the effectiveness of distance education and the barriers to sustainability in distance education on the attitude towards sustainability.

This study has been able to model both the Social Cognitive Theory for personal and social changes (Bandura, 2004) and the Transformational Learning Theory (Mezirow, 1997) in an empirical manner. For the Social Cognitive Theory, this study has shown the impact of the effectiveness of distance education programmes in influencing a learner's own functioning and life circumstances to be an agent for a better world. It models the transactional view of learners and society of the theory wherein graduates are considered both producers and products with the attitudinal outcome of their social environment, which, in this study, gained via the distance education environment. By formulating their social environment through effective distance education programmes/courses, the learners are made to participate in the enhancement of their life, as reflected by their attitude towards sustainability.

On the other hand, hindrances to personal and social changes expressed in the form of barriers to sustainability in distance education are found to not be significant in influencing the development of an ideal attitude towards sustainability among learners. The findings suggest that learners are resilient in overcoming any barriers that they encounter, or they might not even perceive the barriers as something that could hinder their ability to develop an ideal attitude towards sustainability throughout their studies.

A sense of efficacy, as modelled in the form of innovativeness, was found to be significant in bridging the impact imposed by the effectiveness of distance education in producing the ideal attitude towards sustainability. Being dependent on technology usage throughout their enrolment as distance learners has

yielded a form of efficacy that has materialised in a sense of innovativeness developed from the early days until the completion of their studies. Innovativeness is not found to be a part of the important outcome because of enrolling in distance education programmes but also as an enabler that might further enhance the nurturing of attitude towards sustainability among learners.

The study has also modelled the Transformational Learning Theory (Mezirow, 1997) in an empirical manner by demonstrating the changes in meaning structures that have evolved in two domains of learning, namely, instrumental learning and communicative learning. In instrumental learning, the effectiveness of course activities related to sustainability awareness and involvement reflects the notion of learning through task-oriented problem solving and determining cause-and-effect relationships. This, in turn, enhances learners' sense of innovativeness in further enabling them to nurture an ideal attitude towards sustainability. Communicative learning is demonstrated by embracing the meaning of values, ideals, feelings, moral decisions, freedom, justice, labour, love, autonomy, commitment and democracy, which constitute the sustainability agenda, as underscored in their attitudinal outcome.

From the marketing perspective, the findings may expand the literature pertaining to consumer behaviour by providing rare insights into understanding the behaviour of learners who are also consumers of higher education services. The findings may further enhance the knowledge regarding the attitudinal and behavioural profiles of environmentally friendly or green consumers.

Practical Implications

On a practical level, the study provides an avenue through which the sustainability concept can be assessed and achieved via the role of higher education providers in offering courses by means of the distance education mode. It also expands the understanding of the concept of sustainability and its nuances in the areas of curriculum delivery through online and distance learning programmes. This will enable institutions of higher education to contribute in a more dynamic manner to achieving sustainability goals. Besides encouraging sustainability in the context of distance education, the utilisation of technology in distance education may also prepare the institutions to survive the Fourth Industrial Revolution, which has changed the landscape of 21st century education. This will surely strengthen its attribute of sustainability in terms of always preserving the continuity in education for lifelong learning in all segments. The study also contributes significantly towards the national initiatives as an attempt to combat the global warming phenomenon by promoting environmentally friendly practices, such as reducing greenhouse gas emissions, increasing efficiency and reducing paper usage, which are achievable via the distance education mode of teaching and learning. The behavioural outcome of learners' attitudes towards the sustainability of distance education may add further value to the services delivered by distance education programme providers. The competitive advantage of distance education programmes that has been sorely overlooked is definitely appealing to sustainability in the higher education context and may be further harnessed.

Limitation of the Study

The limitations of the study involve the non-significant effect of the barriers to sustainability in distance education on innovativeness, which negates the mediating effect of innovativeness in the relationship between barriers to sustainability in distance education and attitude towards sustainability. Future research may re-examine the relationship to provide an explanation for the situation and further explore specific barriers that inhibit innovativeness and hinder the acquisition of a positive attitude towards sustainability. Due to the rapid change in the technology used in delivering lessons via distance education mode, the factors underlying the effectiveness of distance education in nurturing sustainability may also be limited to the current context. It is suggested that practitioners and all those involved in distance learning should continually expand the underlying factors to suit the current state of technology, such as apparatus, techniques, methods or approaches. The model may also be examined during the post-COVID-19 pandemic to better understand its applicability, as well as any remarkable change in the sustainability view.

CONCLUSION

The recent COVID-19 pandemic has witnessed a surge of enrolment in courses delivered via online and distance education modes. Apart from being the mainstream method for learning in this Industrial Revolution 4.0 era, the resilience of distance education has further highlighted its prevailing role in transforming the sustainability agenda into attitudinal outcome among learners. This study proves that distance education is effective in nurturing a positive attitude towards sustainability through the mediation of innovativeness. The barriers related to distance education did not seem to impose serious threats on innovativeness, although they may potentially hinder the development of a positive attitude towards sustainability. Future research may investigate the further applicability and relevancy of the model of this study in various contexts related to the role of distance education in achieving sustainable development.

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DISTANCE LEARNING AND FACE-TO-FACE LEARNING: STUDENT PERCEPTION OF QUALITY ASSURANCE AND PROSPECTS FOR IMPROVEMENT IN EDUCATION MANAGEMENT TECHNOLOGIES

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ABSTRACT

Global challenges are an objective factor influencing the development of socio-economic and socio-political subsystems of society. The influence of this factor is not uniform, causing a different impact on every social activity sphere. The actualization of challenge to people's health risk, determined by the widespread of the COVID-19 infection in 2020, has become the cause of changes in modes of operation for most of social institutes, including that of education. To implement the national governments' decisions concerning prevention of population's infecting with COVID-19, the administrations of most European universities have refrained from teaching educational programs in the face-to-face mode and adopted the decision of applying the distance form of training. This forced step by the universities has determined the raise in stakeholders' interest in the problematics of the quality of education obtained through the distance mode of higher education. In their attempt to provide the answer concerning the potential of the distance form of training in ensuring education quality, the authors of this article have conducted a poll of 544 students from higher education establishments of Eastern Ukraine. The answers obtained were analyzed by the following aspects: comparing education quality depending on the mode of obtaining it; perspectives of applying the distance form of education at each stage of higher education; efficiency of applying the distance training instruments in the training process. On the results of analyzing the respondents' answers, recommendations and conclusions as to the state of distance education and the perspectives of its development were formulated. Besides, the article offers a classification of distance education instruments and proposes recommendations concerning their application in the training process. The article's content will be of interest not only for specialists working at agencies that ensure quality of higher education, but also for stakeholders and administrations of the universities that are planning to raise the level of their presence at the education services market on account of implementing the distance training's potentials.

Keywords: Distance education, questionnaire of students, higher education quality, education management, distance education instruments.

INTRODUCTION

The acutement of certain global challenges, and consequently the actualization of risks connected with them, change our ideas of the place and role of common things. Each of the presently identified global challenges makes a certain impact on the dynamics and the vector of higher education system development. Besides, the global challenges actualization, as well as national governments' reacting to them, determine the changes in the contents and forms of training. For instance, such global challenge as "sustainable development and climate change" has fostered popularity of such education programs as "Ecology and environment preservation", "Ecology and the balanced use of nature", "Environment protection technologies" and so on among applicants to higher education institutions. In its turn, the acutement of the challenge of coordination of the global ethics with the norms of national cultures has become a reason for introduction of the education programs and separate training subjects with corresponding content, namely "Historic regional studies", "Regional studies" (American studies, European studies, Orientalism), "International political regional studies", etc. The global challenge connected with the growth of terrorism threat has become the cause of the raise in demand for specialists in national security and defense. Such correlation between global challenges and the higher education response is not exhaustive and can be treated both in terms of its content and context.

Each of the global challenges, depending on its urgency for society at a particular period of time, influences both the society with its main subsystems and immediately an individual person to a different extent. In other words, it is impossible to speak of a rigid hierarchy in global challenges because the threat levels of their risk development are constantly changing. For example, just recently the world scientific community's attention was drawn to solving the problems of counteracting the global warming and the climate change (The UN conference on the issues of the climate change Madrid, December 2 – 13, 2019) – discussing the issues of climate protection and the need in decreasing harmful exhausts. Likewise, at the World economic forum at Davos (January 24, 2020) climatic problems were discussed, while presently the most urgent challenge for mankind is becoming the risks connected with health deterioration, namely dangerous viruses' mutations and the spread of dangerous pathogens. According to experts' estimations, the most urgent risk facing society is currently that of virtually non-controlled proliferation of the COVID-19 infection in the world.

By the power of its impact on the civilizational development, this challenge is the most significant and such that influences all the spheres of social life with no exceptions. As the practices of taking measures to counteract the spread of COVID-19 attest, the most affected areas appeared to be the material sphere and the socio-cultural structure of the public life sphere.

Prior, the authors of this publication have drawn attention to the fact that being influenced by most of the global challenges, the higher education changed its content, but in the past such changes were rather optional than necessary. The decisions to introduce the new education programs, as well as new academic subjects, used to be taken by higher education institutions arbitrarily and on their own accord. Non-adoption of such decisions could only influence the competitiveness of a higher education institution in the education services market. In other words, the impact of the global challenge on the higher education sphere was, on the one hand, not ruinous, and, on the other hand, facilitated the development of higher education content. The global challenge of the COVID-19 spread is of an utterly different nature of its influence both on the education system in general and the higher education subsystem in particular. The reflexing of the higher education subsystem on counteracting this challenge is not limited by either the universities' competency or by altering the content of higher education alone. Besides, the reflexing on the part of a higher education institution is not viewed any more through the prism of goodwill and desirability of certain actions of the university administration. Solving the issue of counteracting the challenge is administered exclusively on the government level and with non-alternative course of action for higher education institutions' administrations. It should also be noted that among the results of countering the spread of the COVID-19 infection on the part of the higher education system is, among other things, the change in the mode of obtaining it. Here, the authors mean the changes to the conditions of education programs realization that were provided for by the norms of the Order of the Ministry of Education and Science of Ukraine No. 406 of 16.03.2020 "On organizational measures to prevent the spread of the COVID-19 virus". This document requires that the realization of education programs for the period of the quarantine should be maintained exclusively "through organizing the training process with the adoption of the distance learning technologies that do not suppose

attendance of education facilities by students" (the Ministry of Education and Science of Ukraine, 2020). The fulfilment of this order supposes the use of the distance form of learning as the main form of interaction between the subjects and the objects of the training process. Prior to the introduction of this order's norms, the distance learning was considered the main form of obtaining a profession quite conventionally. In other words, the distance form of training, despite its all advantages comparing with traditional forms (full-time training and extramural training), was not popular enough with students and obligatory for application by higher education institutions. Therefore, there arises a situation wherein the problematics of the use of distance form of education by higher education establishments is gradually shifting from the education sphere to that of national security due to the risk of the COVID-19 coronavirus infection spread, this risk being identified at the global challenge level, namely that of deterioration of population's health. It is quite obvious that such a change in the place and the role of the distance form of training in the higher education system cannot currently be viewed exclusively within the context of scientific interest of individual researchers, moreover, within the problematics of the pedagogic scientific thought. This is connected with the fact that the distance form of training is ever more often considered not only as one of the instruments of training communication, but also as a peculiar mechanism of the guaranteed ensuring the sustainable development of the productive force of society, and, consequently, of national security.

Emphasizing on the connection of the education problematics with the national security issues is not something utterly new to scientific thought. Earlier, attention was paid to the cause-and-effect connection between the mentioned phenomena in the report for the American government "Reform of American Education and National Security" (Klein, Rice & Levy, 2012). On the results of the monitoring undertaken for compiling the report, it was determined that the education system of the USA does not ensure competitive advantages for higher education graduates. This means that in the long perspective the country may lose its ability to dominate the global economy and play the decisive role within the system of international relations. Considering the chosen topic, it is expedient, at least in this publication, to leave the problematics of determining the correlation between the education system and the national security without further consideration, and concentrate on the issues of the distance learning, namely those connected with the estimation of its further development perspectives.

LITERATURE REVIEW

The problematics of the distance learning, considering its significance for development of teaching technologies, is constantly within the circle of scientific attention of researchers and practicing specialists. Among the latest scientific researches, deserve for attention the works by such scientists as I.E. Allen and J. Seaman – undertook the analysis of the state of the distance form of training application in the USA (Elaine & Jeff, 2016).

A. Bozkurt, E. Akgun-Ozbek and S. Yilmazel (Bozkurt, Akgun-Ozbek & Yilmazel, 2015) performed the analysis of the thematic directions in scientific research on the distance learning problematics, as well as determined the vectors of further scientific research.

E. Erichsen, D. Bolliger and C. Halupa researched the peculiarities of students' perceiving of doctorate programs in the training subjects taught by means of the distance and traditional forms of teaching (Erichsen, Bolliger & Halupa, 2014).

S. Kruk undertook the analysis of the online education practices and determined the peculiarities of planning it (He Xu & Kruck, 2014).

R.L. Moore considered the peculiarities in organizing and support of the interaction between subjects and objects of the training communication within the distance training system (Moore, 2014).

G. Rumble considered a method of distance learning systems formation depending on their varieties, as well as determined the peculiarities in managing the distance learning system's development (Rumble, 1986).

M. Simonson and S. Zvacek established the conditions for efficient application of the distance learning, as well as considered theoretical aspects of building up a distance course (Simonson, Zvacek & Smaldino, 2014). O. Simpson considered the directions in students' training in the course of their assimilating the contents of the training subjects in the distance mode (Simpson, 2002).

K. Stoessel, M. Barbarino, Bjorn Fisseler, S. Sturmer determined the efficiency dependency for the distance form of training application on teaching subject material to students from different socio-economic groups (Stoessel, Ihme, Barbarino, Fisseler & Sturmer, 2015) and so on.

On analyzing the content of the mentioned scientists' works as well as researches by scientists not mentioned in the literary review, the following basic problems in the distance education were identified:

- uneven rates in changes of popularity levels of distance learning instruments at private not-for-profit institutions and private for-profit institutions attest to the existence of problems in monetizing those education services that were provided by higher education institutions through the distance form of training. To the decrease in economic attractiveness of universities' realization of distance education programs also attests the fact that prevailing majority of such programs is implemented by state-owned universities (Elaine & Jeff, 2016);
- the diversity of content and practices in distance education determines the absence of a possibility to solve them within the contextual direction of one individual science. The complexity in perceiving, and correspondently, in solving the distance education problems rests in their simultaneous positioning within several branches of scientific cognizance, namely: pedagogic science; legal science; economic science; sociology science; public administration, etc. (A. Bozkurt, E. Akgun-Ozbek and S. Yilmazel, 2015);
- the spatial and time gap between the training communication participants is the reason for a decrease in distance training efficiency (the absence of a sense of community in the distance training environment) (Moore, 2014);
- imperfection of theoretic-and-methodological foundation of distance education development along with the problems in managing it (Rumble, 1986);
- complexity of ensuring observation of the training activity by the training communication participants and as a result inability of its timely correction depending on peculiarities in these or other students' perceiving the learning material (Simpson, 2002);
- complexity in ensuring quality of the training process organized by means of distance training instruments (estimating the quality of procedures and the actions algorithms for training communication subjects) and quality of distance education in general (Simpson, 2002), etc.

This enumeration of problems in distance education is obviously far from being complete in its content and can be appended both in terms of peculiarities in the distance education system operation within this or other national institutional environment and of cultural and mental peculiarities in higher education students.

The problematics of the distance education is quite often represented in scientific researches by Ukrainian scientists. A considerable contribution to the research of the issues of digitalizing education and the use of the distance form of learning in the training process was made by: V.Yu. Bykov, who conducted the analysis of the distance form of learning application in the European universities (Bykov, 2005). Yu.M. Bogachkova, V.Yu. Bykov O.P. Pinchuk established peculiarities in forming and organizing the operation of the distance education resource centers network for general education establishments (Bogachkov, Bykov & Pinchuk, 2014).

A.M. Gurzhiy, R.S. Gurevich, M.E. Kademia, V.O. Umanets established the place and the role of information-communicative technologies in the vocation-and-technical education system (Gurzhiy, Gurevich, Kademia & Umanets, 2016). L.V. Kravtsova, T.V. Zaitseva, N.G. Kaminska elucidated the results of creating a distance learning platform (Kravtsova, Zaitseva & Kaminska, 2017).

S.V. Kurbatov researched the problematics in the distance education development in Ukraine through the prism of temporal and spatial challenges (Kurbatov, 2011). V.M. Kuharenko, S.M. Berezenska, K.L. Bugaichuk considered the distance education potentials through the prism of mixed learning and provided recommendations as to conditions of its efficient application (Kukharenko, Berezenskaya & Bugaychuk, 2016). N.V. Morze, O.G. Glazunova established the content and technologies needed to form the distance training potentials to teach competencies (Morse & Glazunova, 2012).

O.G. Romanovsky, O.V. Kvasnyk, V.M. Moroz, N.V. Pidbuska, S.M. Reznyk, V.V. Shapolova and A.I. Cherkashyn performed the analysis of the extent of separate determinants influencing the distance education development (Romanovsky, Kvasnyk, Moroz, Pidbutska, Reznik, Cherkashin & Shapolova, 2019). M.L. Smulson, Yu.I. Mashbitz, M.I. Zhaldak substantiated the content of the concept of designing efficient developmental environments of distance learning (Smulson, Mashbyts & Zhaldak, 2012). L.A. Shtefan, O.P. Borzenko considered the peculiarities of organizing distance learning for student youth in higher education institutions of Canada (Stefan & Borzenko, 2015) and so on.

In its most simplified form, the itinerary of problems in distance education, developed as a result of analyzing the works by Ukrainian researchers, can be viewed through the prism of the following problems:

1. Organization-and-pedagogical problems, namely inability to ensure full-fledged real time communication between the training process participants; a decrease in efficiency of pedagogic control on the part of a teacher and as a result the loss of the ability of timely adjustment of the content, focuses of attention, and dynamics of the training process; overloading of students with learning materials, etc.
2. Information-technology problems, namely technical limitation of training communication participants' access to the internet as well as imperfect software and outdated technical equipment to be applied; imperfection of the procedures of identifying the students, especially in the course of knowledge assessment without the use of visual contact between the teacher and the student, etc.
3. Psychological problems, namely the loss of emotional contact between the teacher and students and, correspondently, actuation of the risk of ruining such principles of learning as anthropocentrism and humanism; a distinct correlation between training communication efficiency and the level of a student's independence, motivation, and ability to self-regulation, etc.

The problems of distance education within the education environment of Ukraine generally correspond to those that are characteristic of higher education systems of other foreign countries, although they have some specific peculiarities in its content. Among such peculiarities, the following should be accentuated on: imperfection of software and technical support of distance education procedures; unpreparedness of most of the teachers for systematic use of distance training instruments in day-to-day teaching practices. Another issue is society's prejudiced attitude to the outcomes of the distance form of attaining education leading to lack of motivation in students and teachers to use the distance form of education for obtaining professional knowledge.

The comparison in the problematics of scientific researches enables to speak of a certain discrepancy between the focus of interest shown by Ukrainian and foreign scientists in their choice of the related topics. The prevailing majority of the mentioned scientific works by foreign scientists concentrated on learning the opinion of the training communication participants on the distance form of learning, namely the correlation of the obtained results with the competencies stipulated by the education program. Also, a considerable part of the research by foreign scientists was focused on determining psychological aspects of the interaction between the immediate participants of the training communication (teacher – student; student – student; tutor – student). Despite a variety in the directions of studying the distance learning problematics, which is observed in foreign scientific thought, the prevailing majority of them was built up around the object of teaching. In other words, the student acted as either a source of obtaining by scientists the information needed for their research, or was positioned as an expert in estimating these or other aspects of the distance education or its outcomes.

Such attention of scientists just to the objects of training communication can be explained through a norm of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), which positions the students along with the higher education institutions' personnel at the level of one of the chief stakeholders as to evaluation the quality of the training process and the training results (European Association for the Quality Assurance of Higher Education, 2015). In other words, it is the student who is the key element in the training system implemented by means of the distance learning instruments, and consequently, his/her estimation is of utmost importance. It should be reminded that among the principles of quality assurance management (the ISO 9000:2007 standard), the principles of "orientating at the customer" and "involvement of employees in management" are identified as being of utmost importance (the National Standard of Ukraine, 2008).

Unlike foreign scientists, the national (Ukrainian) researchers tended to concentrate on the issues that were for the most part of strictly technical character or dealt with procedural and support aspects, namely theoretical aspects of distance learning, the methodology of applying information-communicative technologies in the training process, pedagogic technologies in the distance learning, science-and-methodology ensuring of the distance training quality, etc. Among the mentioned directions of scientific search, there are no those directed immediately at the acquirer of education (learner-centered approach). Within the national (Ukrainian) scientific thought there is practically no researches focusing on the specifics in evaluating the process, the results, and the development perspectives of the distance education by the training communication objects (pupils, students, trainees, etc.), with the exception of evaluating purely psychological aspect of their behavior. This has determined the occurrence of a certain disproportion in the research of the corresponding phenomenon.

Such a disproportion not only tells on the quality of knowledge about the distance education in general, which in itself is a sufficient reason for drawing researchers' attention. It also affects the efficiency of measures taken by higher education institutions' administrations and the national government concerning the use of the advantages of the distance form of education and minimizing the risks involved. Besides, the knowledge concerning the peculiarities of precisely Ukrainian higher education students' perception of these or other aspects of distance education is of utmost importance for clarifying the market strategy by those foreign universities that are interested in entering the Ukrainian education services market. This accentuation of authors' attention is determined, among other things, by a considerably large number of those interested in obtaining a higher education in Ukraine (according to the Ministry of education and science of Ukraine, the number of applicants in 2018 was calculated to be 335.8 thousand, and in 2019 it reached 354.1 thousand people). On the other hand, part of these applicants try to obtain an education outside the national higher education system (according to the CEDOS analytical center, more than 80 thousand citizens of Ukraine obtain their education abroad).

The decrease in Ukrainian population's well-being level caused by the current global economic crisis will enhance the growth of the number of those interested in obtaining a higher education at foreign higher education institutions. This growth may occur on account of those applicants for higher education who had intended leaving Ukraine for studying abroad, but were unable to afford that due to financial problems. Daytime training at a foreign university is usually more financially burdensome for a student than studying at the same university, but on conditions of the distance form of training. Besides, the growth in the number of Ukrainian applicants who choose the distance mode of training at foreign universities may also take place due to the growth in price of education services in Ukraine.

As of 2020, the Ministry of science and education of Ukraine has established the norm of indicative cost of education, which has made it more expensive. Due to these conditions, Ukrainian applicants may consider obtaining a qualification through distance training at a foreign university as an alternative to obtaining daytime education at a national higher education institution. The choice of this alternative is determined by the fact that the cost of daytime education at Ukrainian universities is quite compatible with that of distance training at foreign higher education institutions.

Therefore, an analysis of the Ukrainian student's opinion about the distance education is of utmost importance for the subjects of higher education system of Ukraine, for instance to improve the state policies in the higher education sphere. It will also be useful for the administrations of foreign universities, for instance to improve the content and practices of applying the mechanisms of running an enrollment campaign and raising their attractiveness level at one of the most powerful education services markets of the Eastern Europe.

PAPER OBJECTIVE

Considering the mentioned afore, and due to controversies in the world statistics as to changes in popularity level of the distance form of education, the goal of this article was to find out students' opinion on quality of distance training by conventional comparing it with face-to-face learning. Another issue to be studied was the expediency of using it at various levels of providing an education service, and to determine efficiency of applying individual instruments of distance training.

METHODOLOGY

Prior, attention was drawn to the fact that due to the threat of spreading the COVID-19 infection, all the higher education institutions of Ukraine with no exception, like those in most of the countries of the world, have stopped using the traditional form of teaching in their training systems and transited to the distance form of training. The forced step by the Ministry of education and science of Ukraine concerning the limitation of training by solely distance form of education has stipulated the raise in researchers' interest in the studying of this problematics.

The researches of this phenomenon in the scientific environment of Ukraine were conducted mostly with the use of strictly theoretical methods of scientific cognizance and with the accentuating on the issues of distance education that are strictly of technical and procedural-and-support character. The use of theoretical methods by scientists to study the phenomenon of distance education has stipulated the development of the system of laws, ideas, and paradigms of knowledge. The researchers' preferences for applying theoretical methods of scientific cognizance have certainly raised the extent of the research of the distance education problematics, especially in the context of applying the theoretic-and-methodological approach to understanding its content.

At the same time, such preference for theoretical methods has caused the occurrence of a disproportion in the comprehensiveness of studying the topic, and, consequently, has affected the quality of the scientific knowledge obtained. A distortion of scientific knowledge related to the distance education makes it next to impossible to establish the perspective and the determinants of its development in the national higher education environment. It also considerably diminishes the efficiency of its application within the system of the interaction between the subjects and the objects of training communication. The correction of this disproportion seems possible on account of amassing the knowledge related to the distance education, which was obtained by means of the empiric methods of scientific cognizance. These methods are used, as a rule, to research the practices of functioning of the object to be studied.

In order to ensure observing the principles of systemacy and comprehensiveness in the research of the distance education problematics, the authors of this publication selected the instruments pertaining to the empirical methods of research, namely the method of survey in the form of an expert interview and questionnaire. Choosing the survey as one of the principal instruments of obtaining information was stipulated, on the one hand, by comparative ease of using it and the possibility to increase significantly the number of experts involved in analyzing the problematics. Its another advantage is comparatively reliable information (it is traditionally believed that information obtained through an anonymous polling is more accurate and reliable). Also, the use by the publication's authors of the surveying method enabled to involve the students interested in participation in science research as stakeholders, and also as interviewers (on par with immediate initiators of polling), as well as technical workers for initial processing of the information obtained. Gaining experience by the students involved in organizing and carrying out a scientific research can be considered as so-called parallel results. Involving students in participation in scientific projects is a desirable step on the part of researchers both in the context of forming conditions for students' gaining certain skills and development of the competencies stipulated by the education program, and from the point of strengthening the solidarity of the university community of an individual higher education institution.

The students were involved into conducting the research on their free will and without their obtaining any material remuneration. It should also be noted that involving students in conducting the poll as interviewers enhanced the raise in quality of the fulfilled questioning. This raise in quality was stipulated by the fact that that the persons involved in questioning as respondents are more trustful, and, correspondently, give more candid answers to those interviewers who are closer to them by their age and social status. The availability of values orientations similar in their content (a common system of norms) along with the absence of differences in age usually facilitates establishing of trust between the communication participants. Thus, involving the student youth into taking part in the survey as interviewers to conduct a research is not only useful (gaining experience of participating in science-research work), but also justified, considering a possibility of raising quality of the information thus obtained.

The goal was achieved on account of organizing and carrying out the questionnaire "The attitude towards the distance education and its quality estimation". This poll is the second stage in realizing the author's program of a non-grant-supported project "Higher education quality evaluation" (by S.A. Moroz), participated by

such counter-agents as the Baltic International Academy (Riga, Latvia) and the Institute of the International and Comparative Education at the Beijing Pedagogic University (Beijing, China).

At the first stage, there was conducted a poll of Ukrainian, Latvian, and Chinese students along with employers from Ukraine concerning the quality of higher education regardless of the form of training. Some of the obtained results were published in the author's previous works (Moroz, Buka & Gren, 2019; Moroz & Buka, 2018; Moroz, 2019). The fulfilment of the second stage in the author's project supposed organizing of another poll of students from the mentioned countries concerning the quality of higher education but with adjustment of its content to the distance form of education. Presently, the analysis of the Ukrainian students' responses has been completed, and processing of the Chinese students' responses is going on. By the end of this (2020) year, it is planned to conduct the poll for the Latvian students and to complete the analysis of the results obtained. In this publication, the authors intend to present to scientific community some of the results of surveying Ukrainian students.

In accordance with the procedures for the second stage of the project (carrying out the poll titled "The attitude towards the distance education and its quality"), the author(s) developed a questionnaire. The authors' preferences for applying the survey method was determined by the fact that it is this method of collecting information that enables a researcher to find out the opinion of many stakeholders in a comparatively short time. According to S. Yaremchuk's research, the survey is one of the most efficient, widespread, and reliable method of collecting initial social information. In the scientist's opinion, up to 90% of information on the subject of immediate attention can be obtained through surveying (Yaremchuk, 2015). Besides, in sociological scientific thought there is an opinion that it is the survey that possesses the largest potential for a precise clarification of an opinion of a considerably large social group and obtaining reliable knowledge about the society (or individual representatives of society) and its (their) attitudes (Moser, 2017; Bulmer, 2017).

Compiling the questionnaire, the authors took into account methodological recommendations by T.Lukina concerning peculiarities in compiling the structure and the contents of questionnaires for monitoring researches in education (Lukina, 2012). Also, the authors studied the outcomes of implementing the grant project titled "Quality of Education Ensuring System in Ukraine QUAERE-562013-EPP-1-2015-1-PLEPPKA2-CBHE-SP: Development Based on European Standards and Recommendations" in the part related to theory and practices of compiling questionnaires concerning the problematics of ensuring quality of education activities (Report on the results of questioning higher education institutions of Ukraine, 2015). Compiling the questionnaire's content was made with taking into account the methodological advice by Seymour Sudman, Norman M. Bradburn and Norbert Schwarz as to the peculiarities in forming the questions of the poll and the sequence in presenting them (Sudman, Bradburn & Schwarz, 2010). The final formulation of the poll questions, as well as clarifying the level of comprehending them by potential respondents, took place on the results of a pilot interview with a students' focus group. At this stage of fulfilling the research, the authors of this publication acted as interviewers.

A possibility of involving students as the subjects of expert evaluation was substantiated in its time by V.P. Sadkovyi and V.M. Babayev. Therefore, sharing the scientists' opinion on necessity of involving students into the procedures to ensure the quality of education activities and the quality of higher education (Moroz, Sadkovy & Babayev, 2018), the authors think it expedient to leave their choice of the respondents' category without further explanations.

During the pilot interview, it was established that the focus-group representatives understood the poll questions and the offered variants of responses correctly. Also, in this interview, potential respondents displayed their interest in the participation in the project and demonstrated their ability to conduct a balanced evaluation. In other words, the focus-group representatives (participants in the interview) did not demonstrate the so-called "tiredness of interviewing – being interviewed" and expressed not only their wish, but also their readiness to act on par with experts in estimating the quality of higher education. On analyzing the pilot group's opinion regarding the focus of attention of the interview, the project's authors improved the formulations of some of the questions and the variants of possible responses to them. The discussion with the experts of the distance form of training problematics and the quality of education that can be ensured as a result of applying it, enabled the authors to obtain preliminary information concerning the students'

attitude towards these or other aspects of the distance training application as well as its quality. Later on, in the course of analyzing the results obtained from the survey, this information will be used to formulate certain generalizations.

The questionnaire, amended on the results of discussing it with the experts, consisted of twelve questions, the content of three of them constituting the basis of this publication. The complete list of the poll questions is provided in the table 1.

Table 1. The questions to the questionnaire titled "The attitude towards the distance education and its quality evaluation" and the order in which they appear

No	The question formulation
1-3	demographic information
4	Evaluate the extent of the manifestation of separate factors of the distance education development. (respondents are offered to determine the extent of influence of several factors on the dynamics of the distance education development in Ukraine)
5	In your opinion, can the quality of higher education obtained through the distance form of training correspond to that ensured by the traditional forms of the training process organization?
6	Do you think that in future, the distance form of education will become a more popular form of obtaining education on speciality (profession) compared with the traditional forms of training?
7	At which of the training communication levels is the use of the distance form of training most efficient? (the respondents are offered to choose the education level (initial, first and second higher education levels; education-science and science levels; the qualification improvement level and that of mass information courses) where the use of the distance form of training will be the most efficient)
8	In your opinion, which of the following statements is the most correct? (the respondents are offered to choose one of the statements regarding the level of independence of the distance form of obtaining education)
9	Evaluate the significance of these or other advantages of the distance form of training (from the offered list of advantages of the distance form of education, the respondents are offered to evaluate the extent of their manifestation)
10	Evaluate the significance of these or other disadvantages of the distance form of training (from the offered list of disadvantages of the distance form of education, the respondents are offered to evaluate the extent of their manifestation)
11	Have you or your acquaintances an experience of using the distance form of learning for obtaining a profession?
12	Evaluate the efficiency of using the instruments of distance education in training communication (respondents are offered to evaluate the potentials of using these or other instruments of distance education)

Considering the fact that the so-called closed questions were offered in the questionnaire, each of them was followed by the offered variants of responses. These options in the form of specific statements (to be chosen by respondents) were used for all the questions, except questions 9 and 10, or in the form of a numerical scale to evaluate the level of manifestation of a specific phenomenon (the respondents were offered to evaluate the significance level of this or other phenomenon by the ten-point scale). Considering the limitations of this publication, and taking into account the chosen object of our scientific interest, the authors have decided to limit the analysis of the responses by those given to questions 5, 7, and 12 of the questionnaire.

The survey was conducted between December 2017 and November 2019 on the territory of the administrative units of Eastern Ukraine. Due to a comparatively long period of the project realization and the changes in the teams of the interviewers, the organizers of the research systematically met with the students willing to join the project. During such sessions, the interviewers' training took place, their tasks were clarified, and the plans for the time and locations of polling were adjusted.

544 respondents aged between 18 and 35 took part in the survey. They were students (trainees, postgraduates) of higher education institutions, as well as persons who had recently obtained a higher education acted as respondents. Of the total number of the filled-in and returned questionnaire forms, 17 turned out to be unfit for further analyzing. Therefore, the findings that follow were developed on the results of analyzing 527 questionnaire forms.

The conducted survey can be considered quite representative for the Eastern Ukraine, so the conclusions formulated on the results of analyzing the respondents' answers can be of certain value for both the subjects

of state management of higher education system development, and for higher education institutions administrations. This value can be substantiated, for instance, through the prism of the need in constant development of the information-analytic support of taking administrative decisions in the higher education system. Besides, the processed generalizations and the formulated conclusions can be of practical significance for foreign in relation to Ukraine higher education institutions in the aspect of their improvement of the content and practices of using marketing strategies to raise their positioning level in the education services market of Ukraine.

FINDINGS AND DISCUSSION

Previously, the authors have drawn attention to the fact that in this publication they intend to limit the analysis of the respondents' answers to only those questions of the poll that are relevant to the subject of the research. In other words, the focus of the authors' attention was concentrated on analyzing students' opinion on the following issues:

1. comparing the quality of higher education obtained by means of traditional forms of the training process organization with that obtained by means of the distance form (question 5 in table 1);
2. perspectives in using the distance form of training on separate levels of higher education, as well as in the qualification improvement system and for the mass information non-specialty-related courses (question 7 in table 1);
3. the estimation of the efficiency of applying these or other instruments of distance education within the training communication (question 12 in table 1).

The results of the analysis of the respondents' answers related to the first item of the above enumeration are given in Figure 1.

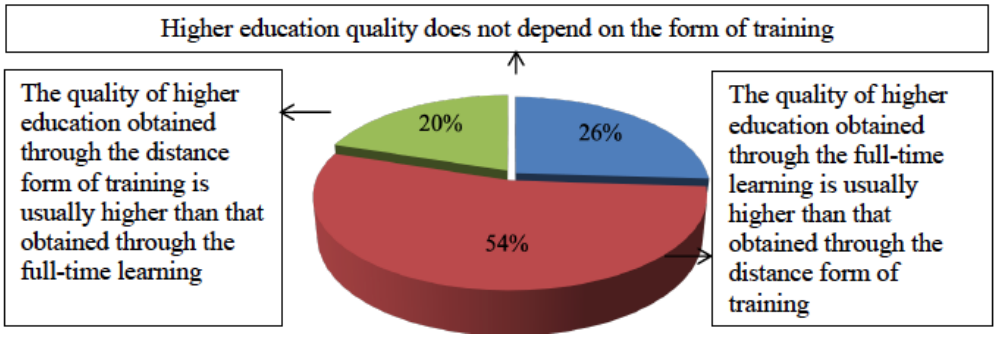

Figure 1. Comparison by students of the quality level of higher education obtained through the full-time learning and the distance form of education

Considering the division of the respondents' preferences given in figure 1 concerning their choice of one or the other statement, it is possible to formulate the following principal generalizations.

Firstly, most of the students (54%) are positive that the quality of higher education obtained through full-time learning is higher if compared with that of higher education obtained through the distance form of training. This result was quite expected by the survey initiators, due to the fact that at the initial stage of conducting the expert interviews in order to specify the questionnaire's content, most of the respondents supported this very idea. Such preference by students can be explained by the absence of deep-rooted traditions of the distance education system operating in Ukraine. Another reason is insufficiently complete readiness of society to accept the distance form of training on the level of a comparatively independent form and as such that is capable of ensuring a rather high level of quality of the knowledge obtained through it.

This assumption made by the authors was confirmed in the course of several selectively held interviews with representatives of job agencies and employers. At the same time, it is impossible to consider the lack in popularity of the distance form of training with potential consumer of educational services as their biased attitude. For instance, only 65% of the US universities have determined the distance education development as strategic direction of their development (Karpenko, 2014), i.e., nearly every third university in the country (35%) does not recognize the perspectives in the development of this form of training. Therefore, there occurs a situation wherein the distance form of education is, on the one hand, ever more often considered by potential consumers of educational services as an alternative form of obtaining professional knowledge in higher education, while on the other hand, its quality does not correspond to the requirements that have been formed in the labor market.

Secondly, every fifth respondent (20%) is positive that the quality of higher education obtained by means of distance learning is higher in comparison with that obtained by means of full-time training. Considering the fact that 26% of respondents deny the existing of a dependency of the higher education quality on the mode of obtaining it, the aforementioned result is quite considerable in its significance. In other words, 46% of the students who took part in the poll have demonstrated quite a positive attitude to the distance form of obtaining a higher education of sufficient quality.

This result was unexpected for the survey initiators, for during the preliminary expert interviews, students had demonstrated some mistrust to the distance form of learning and expressed their doubts concerning the quality of thus obtained knowledge. Despite the sufficient level of support for the distance form of learning on the part of the students, the fact of relative restraint of respondents in their expressing ideas about the quality of higher education obtained by means of this form influences considerably the sum total expert estimation.

In the authors' opinion, among the prevailing reasons for the distance form of education lacking in popularity with applicants for higher education is the absence of culture of individual and systematic work of students on gaining knowledge and forming professional skills through information-and-communication technologies. In other words, the larger part of learners need a constant emotional influence on the part of teachers. Besides, during the pilot with students, there was established a rather low motivation level in the latter for gaining professional knowledge. At the full-time form (face-to-face) of education, the low motivation level in students is usually compensated by the teacher's professional skills and his/her ability to maintain a high level of interest in students' in both the immediate academic subject and in the specialization in general.

It can be conventionally assumed that the students who preferred the statement that "the quality of higher education obtained by means of the distance form of training is usually higher than that obtained by means of full-time learning" are more motivated and capable of studying on their own. If this assumption is true, it will be possible to state that only one student in five in the higher education system has a persistent motivation for learning activities. This assumption is not relevant to the object of the research and needs additional confirmation in other directions of scientific researches.

The results of the respondents' answers to the second item of the research are given in Figure 2.

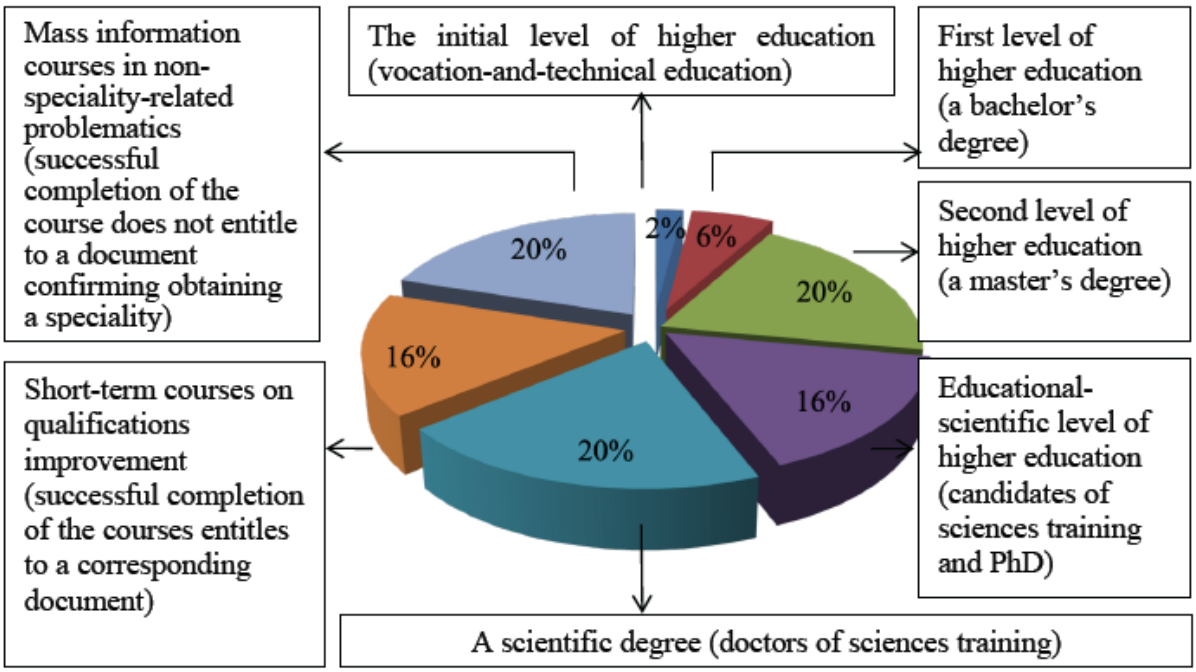

Figure 2. Efficiency of the distance training form application at different levels of higher education, as well as in the qualifications improvement system and mass information courses

On the results of the respondents' answers as to the expected efficiency effect of applying the distance form of training at different levels of higher education makes it possible to formulate the findings that follow.

First, in the respondents' opinion, the distance form of education is the most efficient within the system of masters and doctors of sciences training, as well as in the system of mass information courses. This result is quite interesting relating to the higher education level (the respondents did not appreciate the efficiency of the distance learning at the initial and the first levels of higher education; neither they did for the PhD training system). Notably, the same efficiency values for each of the levels (20%) were demonstrated by the respondents.

Such a choice can be explained through the prism of cause-and-effect connections between the higher education levels, the volume and the significance of practical classes for obtaining a profession and the peculiarities in the stages of a person's socialization. For instance, the persons who obtain speciality at the initial and first levels of higher education are usually relatively young, and are not completely formed personalities. At this stage of their socialization, a person needs immediate and daily participation of pedagogues in correcting their behavior. It is next to impossible to ensure such (immediate) participation of pedagogues in the formation of a student's personality within the system of distance education.

Also, it should be noted that at the initial and the first stages of higher education, obtaining practical skills on speciality is one of the determinants of student's motivation for studying. The distance education potentials in forming practical skills on speciality are rather limited, therefore a comparatively low evaluation of e-learning's efficiency at these education levels by the respondents is quite reasonable.

The respondents' preferences presented above can also be explained through the prism of the topicality of the trainers' control. For instance, at the initial and the first stages of higher education, as well as at the PhD training level, the control of a student's or a postgraduate's activities is of considerable importance. At the master's and the science levels of higher education, the function of control gives way to the function of self-control by its impact on the trainee. The master's degree level is the final one for obtaining an education in professional training of a future specialist.

A similar situation is observed at the science level, which is also final in the system of training science and science-pedagogic personnel of the highest qualification. At those levels of education, which are final in a

separate cycle of specialists training, respondents evaluate the potentials of the distance form of education at the highest level. In other words, the distance form of education, in the respondents' opinion, is more efficient at the final stage of specialists training, that is, at the stage when the training communication object is quite a formed personality with an established values system and motivation constructs.

Second, the use of the distance form of learning beyond the system of higher education, despite the research initiators' expectations, was not evaluated by the respondents as highly as expected. For instance, the sum total significance of the "short-term qualifications improvement courses" and "mass information non-speciality-related courses" items scored 36% (16% and 20% correspondently). Such a result can be explained by mistrust of society (in this case, respondents) to the training process subjects. During the expert interview, it was established that the prevailing majority of the experts identifies "short-term courses" and "mass information courses" with organizations non-related to the training process. There is a situation when the respondents perceive studying at "courses" not as the principal mechanism of raising qualitative characteristics of their professional potential beyond the university education system, but as a source of satisfying an interest. At the same time, the authors have to ascertain the fact that more than one-third of respondents (36%) awarded the maximum effect of the distance form of learning precisely to the extra-university education environment.

Considering the aforementioned, the authors can ascertain the fact of the readiness of students to accept the distance form of obtaining a speciality as the chief mechanism of forming qualitative characteristics of their professional potential within the system of masters and doctors of sciences training, as well as in the mass information courses system.

The results of analyzing the respondents' answers by the third item are given in Figure 3.

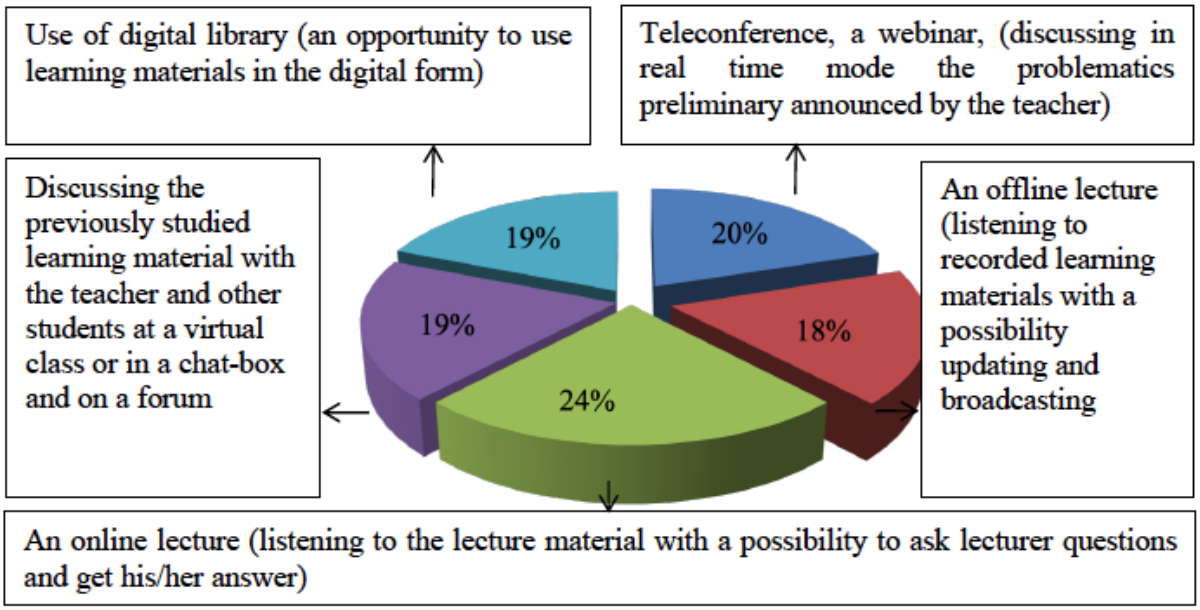

Figure 3. Efficiency of using the distance learning instruments by subjects of training communication

On analyzing the respondents' answers considering evaluation of the efficiency of using the main instruments of distance learning by training communication subjects, it is possible to formulate the following generalizations.

First, the most efficient instrument of the distance form of learning in students' opinion is the online lecture with the possibility of further communication with the teacher in real time after its finishing. Nearly one in five of the respondents (24%) evaluated precisely this instrument of distance learning as the most efficient tool. This result, on the one hand, turned out to be quite expected, for during the preliminary expert interviewing the students expressed this very idea.

On the other hand, this result somewhat contradicts to the commonly agreed ideas as to the most significant advantages of distance education. Among such advantages the scientists agree, among other things, on the ability for the student to choose individually the time for organizing his/her learning process. For instance, V. Yu. Bykov in his characteristic of distance education accentuated on its ability to adapt the training process to the needs and abilities of the training communication objects. In the scientist's opinion, this advantage of the distance education is disclosed through its ability to ensure delivering the learning materials at a convenient time for a student and at a convenient for him/her place (Bykov, 2008).

This advantage is of utmost significance for those students who combine their training at a higher education institution with professional activity. The controversy between students' awarding maximum scoring to such an instrument as "an online lecture with a possibility of asking the lecturer a question after the lecture" as the one that ensures higher education quality as opposed to such a criterion of distance education as "an ability for a student to choose the time of training individually" can be explained by the category the respondents pertain to. The prevailing majority of the students involved in the polling were obtaining higher education at the full-time form of education, therefore their responses to the questionnaire were chosen from the point of their own experience of using the distance learning instruments for studying only separate topics or academic disciplines. In other words, the prevailing majority of respondents did not have the experience of combining the study at a higher education institution with professional activity, therefore taking into account the factor of a student's choosing time and place of learning was not reflected in the respondents' answers.

Second, by students' evaluation, nearly the same efficiency level in ensuring the quality of the distance higher education was given to such instruments as teleconference in the form of real-time discussing the topic previously announced by the teacher (20%), discussing of the previously studied learning material with the teacher and other students in a chat-box and (or) at a forum (19%), and the use of digital library (19%).

Nearly the same significance level of these two first instruments of ensuring the education process quality at the distance form of training can be explained by their dialogism, that is, their ability to correspond to a student's communicative need. According to the researches by J. Collins, M. Hammond and J. Wellington, the distance education influences negatively the dynamics of forming communicative skills in students and decreases their socializing level (Collins, Hammond & Wellington, 1997). It is most probably that this very fact was the reason for the respondents' evaluating the significance of the instruments in question at quite a high level.

The smallest potential scoring in ensuring quality of the distance education according to the respondents' evaluation was awarded to an off-line lecture (18%). This result turned out to be unexpected for the research organizers, for in the course of holding preliminary expert interviews, the students expressed their support for this instrument, at least as one of the most efficient instruments. At the same time, the students' opinion concerning a comparatively small efficiency of the use the instrument of offline lectures by the participants in the distance learning can be explained by the principal disadvantages of distance education. For instance, V. Arkorful and Nelly Abaidoo have determined the absence of communication between the education process participants as one of the most significant factor by its impact on the quality of education (Arkorful & Abaidoo, 2015). The use by the training communication subject of an offline lecture as the distance education instrument does not provide for a possibility of obtaining the explanations of the learning material, which are attainable when using other instruments (online lecture, teleconference, webinar, etc).

Third, in the case when the distance education instruments, offered for students to evaluate, are conventionally subdivided into the three classification groups by the criterion of their technological difficulty in using, it will be possible to speak of the existence of a certain difference in their significance levels within the system of ensuring quality of higher education.

To the group of accessible instruments of distance education by its technical-and-technological complexity of using them (the first classification group) can be referred the off-line lecture and the use of a digital library. These methods, despite the need in preliminary digitalization of learning materials and preparing the medium for storing and using them, are comparatively simple. To make a video recording of one's lecture and to ensure access to it is not difficult for a teacher even beyond the web-resources of a higher education institution. We certainly can speak of the quality of a video recording made by a teacher or of the presentability level of the end-product, but all these issues are somewhat beyond the issue of technological

complexity and pertain to the quality criterion in its pure sense. Omitting a discussion concerning the issues of mutual connection between the technical-and-technological complexity of using a product and its end-quality, for this topic deserves a separate study, the authors will draw attention to the fact that the significance of the distance education instruments included in the first group was evaluated by students at 37%.

To the second group of comparatively accessible by their technical-and-technological complexity level instruments of distance learning can be related the learning material discussing in a chat-box or on a forum. Prior, the authors have drawn attention to the fact that students had evaluated the significance of this distance-learning instrument for ensuring the quality of higher education at the level of 19%.

The use of this instrument requires the availability of the so-called interaction field wherein the communication between the training process participants takes place. The forming and registration of such an environment, as well as moderating its use requires additional attention on the part of the teacher and (or) the tutor. Unlike the group of distance education instruments classified by the authors to the first group, a discussion in a chat-box or on a forum cannot be conducted without participation of the training communication subjects. Teachers (tutors) should constantly take care of administrating the forum's and (or) chat-box' operation and take measures of maintaining its topicality and content on a high level. At the same time, the use of this instrument enables recording and analyzing students' activeness in discussing these or other issues, which in its turn raises the level of control of students' learning activity.

To the group of the distance education instruments with a high complexity of use (the third classification group) can be referred a teleconference and a webinar. According to the respondents' evaluation, the sum total significance of these instruments of ensuring the quality of the distance higher education equals 44%, which is the largest by its value indicator among the classification groups.

The use of the third classification group instruments is the most complicated, for it supposes organizing a real-time interactive communication. In addition, the use of this instrument requires a simultaneous presence of the training communication participants in the virtual environment in real time. Technical support of this process is beyond the competencies of teachers (the efforts of one teacher for using these instruments is not enough) and requires resource support of the IT-subunit of a higher education institution. In other words, the use of the third classification group instruments of distance education is only possible on condition of coordinated concentration of the potentials of the training communication participants and representatives of the university IT-subunit in real time. Doubtless, such coordination of efforts and means within just one instrument of distance education is quite a complicated direction in the training process organization.

Therefore, considering the level of their technological complexity, the distance education instruments influence its quality rather differently. The most influential of them are the most complicated to be used in the training process. The research of the cause-and-effect connection between the complexity level in the distance education instruments applied by a teacher and the quality of the competencies formed in students through them is somewhat beyond the limits of the studied issue, therefore it should be considered as another direction of scientific research.

Fourth, if the distance education instruments offered for students' evaluation can be conventionally subdivided into two classification groups by the criterion of the mode of their use (the instruments of online and offline use), it will be possible to state the fact of their different significance in the quality ensuring system of higher education.

To the distance education instruments with the online mode of use, one can refer a teleconference, an online lecture, and learning material discussion in a chat-box or on a forum. The sum-total value of these instruments' significance in ensuring the distance education quality was evaluated by students to be 63%. This result decisively attests, on the one hand, to the predominance of the communicative component in the training process, and, on the other hand, to a subconscious desire of students to minimize the disadvantages of distance education. For instance, such a disadvantage of the distance education as the absence of a possibility for a student to obtain teacher's commentaries and explanations concerning the presented material or to quickly obtain answers to the arisen questions (Santana de Oliveira, Penedo & Pereira, 2018) can partially or even totally be overcome as a result of a teacher's using online instruments.

The sum total significance of the influence of the distance education instruments used in offline mode (offline lecture and the use of a digital library by a student) equals, according to the respondents' answers, 37%. Such a significance of these instruments' influencing the quality of distance education is not the dominant one but, at the same time, quite substantial. The use of these instruments in the training process augments such advantages of the distance form of training as flexibility (the absence of a rigid time-table of classes and the ability to choose a convenient schedule), and its availability (unlimited in time and the number of repetitions accessibility of the material) (Santana de Oliveira, Penedo & Pereira, 2018).

Fifth, if the distance education instruments offered for students to evaluate are conventionally subdivided into two classification groups by the criterion of being used individually or by a group, it will be possible to speak of the existence of a certain balance between their significance levels in the system of ensuring the quality of the distance higher education.

The individual mechanism of the material assimilation at the distance form of training supposes a student's listening to (or watching) offline lectures and using a digital library. On condition of abstracting from the need in students' participating in discussing learning material after teleconferences and online lectures, these instruments can also be included to the group of the individual materials assimilation instrument. The group instruments of material assimilation at the distance form of education presume discussing the learning material during teleconferences (webinars), online lectures, and during communicating in a chat-box or on a forum.

Prior, the authors have drawn attention to the fact that separate instruments from this classification group, namely a teleconference (webinar) and an online lecture are positioned equally in two classification groups simultaneously, and therefore the significance of each of them for ensuring the quality of higher education cannot be evaluated correctly. Despite the need in perceiving the instruments of the individual and the group mechanisms of obtaining knowledge within one complex in distance education, it is still possible to speak of a certain disproportion between the mentioned groups of the distance higher education quality ensuring instruments. On condition of abstracting from the numerical expression of this disproportion, it is possible to state that collaborative learning is more significant, and consequently, more efficient for the distance form of higher education.

Sixth, if the distance education instruments offered for students to evaluate are conventionally subdivided into two classification groups by the criterion of the purpose for re-translation of theoretical knowledge versus formation of practical skills, it is possible speak of a disproportion between the levels of their significance for ensuring the quality of the distance higher education. This disproportion cannot possibly be demonstrated through a numerical expression. It is complicated not only because of simultaneous positioning of some of the distance education instruments in two classification groups, but also due to actual limitations of distance training in practical skills formation.

As researches have demonstrated, not all education programs and academic subjects can be taught with using the distance form of training (Arkorful & Abaidoo, 2015). For instance, in the list of branches of knowledge and specialities, there are those training for which requires physical presence of a higher education student at doing certain tasks (doing practical work on certain equipment; personal participation in controlling technological processes, etc.). It is difficult to imagine a doctor, a pilot, or a fire fighter whose training was conducted by means of solely the distance training instruments.

Nevertheless, such assumption should not be perceived as a categorical negation of the place and the role of distance education in the formation of practical professional skills in future specialists, for there are so-called simulators and virtual training equipment for preparing specialists in the mentioned specialties. These simulators can certainly be applied without physical presence of students at a specialized laboratory or in a room with training equipment. In other words, distance education possesses certain potential in forming practical skills in specialists-to-be, but the efficiency in utilizing its instruments in the training process is quite limited. Therefore, it is possible to assume that the use of the distance education potentials is more justified in those branches, training for qualifications of which does not require forming and development of practical skills.

Going back to the established classification groups, the authors propose to consider a possibility of their conventional filling in. The conventionality of inclusion of the distance education instruments to this or

another classification group is connected, first of all, with the fact that any of the distance education instruments possesses a rather limited potential in practical skills formation, and, consequently, the classification that follows is a separate case. To the group of theoretically directed instruments were included off-line and online lectures, as well as using a digital library. To the group of practically directed instruments were included a teleconference and discussing of the learning material in a chat-box and (or) on a forum. Despite the conventionality of the offered classification and insufficient precision of referring certain instruments to the classification groups, it is possible to speak of a greater significance level of the theoretically directed instruments.

When interpreting the conclusions formulated above should be noted, that "The attitude towards the distance education and its quality" survey was conducted before the COVID-19 pandemic and the forced transition of most of higher education institutions to the distance mode of operation. Despite this, the formulated above conclusions have certain practical value not only for characterizing the normal mode of higher education institutions' operation but also to characterize the conditions of the enforced utilizing of the distance form of training exclusively. On analyzing these conclusions, the authors propose the following recommendations on the use of distance education instruments under the conditions of enforced transition of higher education institutions exclusively to the distance form of receiving / passing knowledge in the training process, namely:

- the most efficient of the distance education instruments for students who under normal conditions had studied in the face-to-face mode is an on-line lecture and a teleconference. The use of these very instruments ensures a so-called live communication between the training process participants and facilitates students' adapting to the new conditions of an education program realization;
- among the distance education instruments, the most efficient ones from the perspective of the quality of training activity and that of higher education are those that provide for organizing of training communication between a teacher and students in real time (a webinar, an on-line conference, etc.);
- the individual and the group mechanisms of knowledge assimilation possess the same potentials in forming professional competencies in future specialists, therefore they should be applied by a teacher in their inseparable dialectic connection, that is in complex;
- the use by a higher education institution of these or other distance education instruments should take place with taking into account their material, technical, and personnel resources on the one hand, and the level of students' technical and psychological readiness to use the distance education instruments;
- the lack in the prevailing majority of both teachers and students of skills in using information technologies, as well as psychologic discomfort from being under new conditions of training organization should be taken into account by both teachers when organizing current and final assessment of students' knowledge, and the university administration when taking managerial or personnel decisions or on issues of expelling students for poor academic performance.

The above-formulated recommendations are not exhaustive and more can be added on the results of further researches that will be conducted following the higher education institutions' returning to normal conditions of their operation.

CONCLUSIONS

Considering the findings stated above, as well as the results obtained by the authors in the course of solving other tasks of the "Attitude towards the distance education and estimating its quality" survey and left beyond this publication (due to the limits in the volume of the publication), it is possible to formulate the conclusions that follow. These conclusions are based on the results of analyzing the answers of 527 respondents to some of the questions of the "Attitude towards the distance education and estimating its quality" questionnaire; the students' opinion, expressed by them in the course of pilot interviews, was also taken into account.

1. The prevailing majority of students are interested in a possibility of using the distance form of learning for obtaining professional knowledge and developing competencies both as the principal means of obtaining a speciality, and as an additional instrument in studying separate modules and (or) academic subjects.

Due to the absence in the national (Ukrainian) higher education institutions of sustainable traditions in realizing of education programs by means of the distance form of training, the most attractive for students is the second direction in the use of distance education, namely the use of its instruments for studying separate modules and (or) academic subjects. This interest may be put in the foundation of strategies development of both national higher education institutions (for instance as the direction of raising their competitiveness level) and those foreign universities that intend entering the education services market of Ukraine. When building up such a strategy, the higher education institutions' administrations should take into account that society does not demonstrate a high level of trust to the results and quality of the distance higher education.

In order to popularize the distance form of training among the applicants and higher education students, the universities interested in raising the level of their presence in the world education services market in general and in the Ukrainian one in particular should offer to potential consumers financially inexpensive and short-term education courses with the use of the distance education instruments. Getting a positive experience of using the distance form of education in such training courses by consumers of education services will enhance, on the one hand, the raise in the level of trust to distance education, and, on the other hand, it will influence beneficially the image of an individual higher education institution.

2. The distance education instruments are quite diverse, and therefore they need certain classification. The classification of methods can be made:
    - by the technical-and-technological complexity criterion (accessible and comparatively accessible by their technical-and-technological complexity level instruments, as well as high-complexity-level instruments);
    - by the mechanism of obtaining knowledge criterion (the instruments of individual and group use);
    - by the criterion of the purpose of use (the instruments for re-translation of theoretical knowledge and forming practical skills), etc.
    - The given list of classification groups is not exhaustive, so it can be supplemented by further scientific research. The significance of each of the classification group for distance education quality ensuring is different. The numerical expression of this significance is not always possible, for some of the distance education instruments are positioned simultaneously in several classification groups. At the same time, it is possible to speak of a possibility of comparing the instruments' significance between one another, that is, without attributing them to any specific classification group.
    - Therefore, the distance education instruments can be ranged by their level of significance for ensuring quality of the higher education in the following way (in the order of the significance level decrease for each instrument):
    - an on-line lecture (listening to the lecture material by the student with a possibility of asking questions to the teacher and get the answer in real time);
    - a teleconference and (or) a webinar (discussing by the training communication participants of the previously announced problematics in real time);
    - discussing of the learning material in a chat-box and (or) on a forum;
    - an off-line lecture (listening to the previously recorded lecture material with unlimited number of repetitions).

Despite the variety in the online mode instruments, it should be understood that their potentials for ensuring quality of higher education have certain limitations. Among such limitations, noted by the students involved in the expert interviews, is the unstable quality of the communication channel (technical imperfection of equipment and situationally law speed of the internet connection). Contrary to this, the experts highlighted the high quality of the content offered in the off-line regime. So, the teacher's choice of this or other instrument of distance learning to be used in the training process should be determined by not only its significance level for ensuring quality of higher education, but also by the ability of using the chosen instrument's potential in specific conditions of realizing the education program.

In other words, before starting a distance-training course, a representative of the IT-subunit of a higher education institution should obtain and estimate the information on the quality of the communication channel between the teacher and the student. Availability of such information will enable a teacher to select the most expedient distance education instruments to be used in specific circumstances. The substantiated selection of the distance education instruments will enhance raising its quality.

3. Prior to the beginning of applying the distance form of learning, as well as the use of the information-and-communication technology potential within separate courses or academic subjects, the applicant's motivation level and his/her personality type and behavior peculiarities should be established. The availability of the information on the personality type of an individual applicant will enable teachers to take into consideration the peculiarities of his/her world-view and to place them into such an academic group, where training is maintained with predominant use of the offline or online instruments of distance education.

Determining an applicant's personality type to be considered in the training process will certainly be expedient on condition that a higher education institution is able to form at least two academic groups with different modes of the distance learning instruments application. Establishing the personality type of an applicant who has expressed their wish to obtain a higher education by means of information-communicative technologies, as well as determining their motivation level to use the distance education instruments can be made during the applicant's submitting their documents needed for enrollment to the higher education institution. Among the possible instruments to be used for determining the motivation level of an applicant and their personality type are testing, interview, expert interview, etc.

If these instruments could be integrated within a combined mechanism, for instance a higher education institution getting acquainted with an applicant could be supplemented with the diagnostic means by the university's IT sub-unit to establish an efficient interaction channel with a student-to-be. IT workers could establish the speed of the internet connection and clarify the capability of the applicant's technical equipment to ensure efficient use of the distance training instruments.

Among the most perspective directions in organizing further scientific research in this area, attention should be paid to those related to a detailed study of the content of the mechanism of acquaintance with an applicant willing to use the distance form of learning to obtain a higher education.

The conclusions formulated on the results of analyzing the interviewing of students are of considerable significance for improvement the management system of higher education sphere under conditions of the COVID-19 challenges. Among the perspective directions of improving the mentioned system are the following:

A. At the organizational (university) level:
   - in order to raise the teachers' readiness to apply the distance education instruments in the training process, the authors propose to consider a possibility of stimulating them by university administration to raise their qualification in theory and practice of applying information-and-communication technologies for receiving / passing knowledge. Besides, the competencies in the use of the distance education instruments can be included by a university administration to the list of competition requirements when announcing a vacancy for science-and-pedagogic positions;
   - in order to raise a higher education institution's readiness for applying the distance form of training, the authors offer to include to its development strategy the tasks that provide for establishing a university IT unit and its material-and-technical development. Operation of such a unit within the structure of a higher education institution will ensure, on the one hand, methodological support of using the distance education instruments and, on the other hand, it will raise the quality of education activity;
   - for the training process participants to attain positive experience in the use of information-and-communication technologies in training process organization, the authors propose to consider a possibility of introduction and realizing the policy of e-administration at a university. Implementation of such policy will result in students' and teachers' having a possibility of not only experiencing the advantages of computerized interaction, but also of gaining skills in using it in everyday life;

- in order to ensure education activity quality under enforced application by higher education institutions of the distance training form, the authors propose to consider a possibility of using those distance education instruments that provide for real-time communication of the training process participants. The so-called live communication will, on the one hand, raise the quality of students' assimilating learning material (as mentioned above) and, on the other hand, it will make a positive impact on students and teachers' psychological state. The human need in communication increases sharply when restricted and has to be taken into account when organizing distance training;
- in order to create a friendly and efficient education environment at a higher education institution, especially during the period of its enforced transition to the distance education, the authors propose to consider an opportunity of organizing and improving on-line work of each structural unit of a university and of its every employee. Introduction of short-term and possibly not financially burdensome courses on development of these or other professional competencies can become the mechanism of fulfilling this proposition. Creation of the atmosphere of involvement in the university community along with the training process participants' gaining additional professional skills (after attending of virtual attending courses) will facilitate, on the one hand, corporation culture development and a raise in the unity level of the training process participants. On the other hand, it will ensure a raise in quality of a university activity and quality of higher education in general.

The directions in improving the management system of higher education sphere at the organizational (the university) level should be perceived through the prism of the place and the role of a university institution in enhancing development of a person, an organization, a state, and a society.

B. At the state (national) level:

- in order to ensure sustainability of a state's human capital development, as well as to ensure its citizens' security in the time of risks of uncontrollable spread of infectious diseases, the authors propose to provide for a norm to be included into the state accreditation system of education programs on a possibility of training in the distance mode. In other words, every education program offered by a higher education institution should provide for a possibility of organizing the training process both in the face-to-face and in the distance mode;
- in order to ensure development of theoretic-and-methodological foundation for the distance education system's operation, the authors propose to consider a possibility of providing grants by the state for science institutions to conduct researches in corresponding directions. As a result of such researches there should be developed models of organizing distance education adapted to the traditions of higher education system's operation in Ukraine, as well as recommendations concerning their efficient application;
- in order to ensure universities' readiness for a rapid transition to the use of the distance education form, the authors propose to consider a possibility of including to the programs of highly qualified specialists' training (PhD programs) the elements which would enable forming competencies in the use of information-and-communication technologies in future teachers at higher education institutions;
- in order to popularize the distance form of learning with pupils and students youth and as a result to raise the level of their readiness for using the distance learning instruments, the authors propose to consider a possibility of institutionalizing the norms as to obligatory realization of some elements of education programs or their separate modules in the distance mode;
- in order to encourage higher education institutions to use the distance education instruments in the training process, the authors propose to consider a possibility of introduction of a state program for support of the corresponding initiatives. Among the instruments of realizing such a program might be state subventions for purchasing equipment and software for applying information-and-communication technologies. The results of using such subventions will secure for the state the stability of its higher education system in case of challenges like COVID-19, while universities will be able to raise their readiness for using the distance training instruments

(development of simulators for each program of specialists training, renovation of computers and multimedia equipment, obtaining licensed software, and so on).

The directions of improving the higher education management sphere at the state level should be perceived through the prism of their indirect influencing a raise in the national security level. The relation of the distance education issues to the national security problematics is one of perspective directions in organizing further scientific research.

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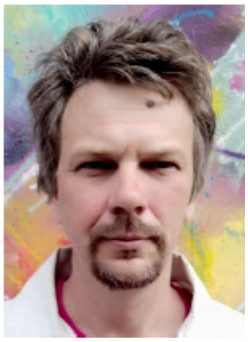

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EMERGENCY REMOTE TEACHING DURING COVID-19 PANDEMIC: CHALLENGES, OPPORTUNITIES AND FUTURE SUGGESTIONS

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ABSTRACT

This article explores the perceptions of high school students of emergency remote teaching (ERT) in Turkiye. The research used the qualitative method of conducting semi-structured interviews with 144 students at higher education. The descriptive case study type (a single case with embedded units) was applied. The qualitative data collected through the interviews were analyzed using content analysis technique. Research results reveal that views of the participants on the challenges of ERT are developed into 8 themes: Digital pedagogy, technical infrastructure and accessibility, digital competences, compatibility, assessment and evaluation, heavy workload, and lack of learning motivation while their opinions on opportunities of distance education include 5 themes: lifelong learning opportunities, flexibility, experiencing ERT or hybrid education, digital transformation in education, and an alternative to student mobility. The suggestions made by students are developed into 7 themes: creating accessible materials, university and institutional IT department-supported digital technologies, adopting a flexible approach to student participation, ensuring financial support and equipment, adopting hybrid learning, developing digital competences, and evaluation and assessment methods.

Keywords: Emergency remote teaching, COVID-19, challenge, opportunity, suggestion, education.

INTRODUCTION

Since the March of 2020, Turkish universities have been experiencing emergency remote teaching (ERT) due to the COVID 19 pandemic. It was a real crisis that educational authorities have to deal with for they are not ready for migration from face-to-face teaching to online education. Indeed, COVID-19 is a viral pandemic that affects all of us, all around the world. Particularly, the interest is significant after the start of Covid 19 focusing on the disease to improve our understanding of it (Mondal et al., 2020). However, the health crisis has quickly evolved into an economic, cultural, educational, and social crisis. The pandemic has had a big impact on educational and social lives of students, limiting their physical contact with others. In other words, social distancing or physical distancing has been the preventive action to reduce the spread of COVID -19. It is only possible to stay socially connected to friends and even family members by calling, using video chat or staying connected through social media.

According to UNESCO (2020) school closures in response to the COVID-19 pandemic have shed a light on numerous issues affecting access to education, as well as broader socio-economic issues. The COVID-19 pandemic has affected more than 91% of students worldwide, with approximately 1.6 billion children and youngsters unable to attend physical schools due to temporary closures and lockdowns. Online

learning has become a critical lifeline for education. Technology can enable teachers and students to access specialized materials well beyond textbooks, in multiple formats and in ways that can bridge time and space. Many schools across the world began conducting classes via videotelephony software such as Zoom. The Organisation for Economic Co-operation and Development has created a framework to guide an education response to the COVID-19 Pandemic for distance learning (Reimers & Schleicher, 2020). ERT has become one of the ways of which is used to support learning during worldwide crisis.

As we try to understand school closures and ERT during Covid-19, previous experiences may provide insight. For example, following Hurricane Katrina in the US, in 2005, large numbers of Louisiana and Mississippi residents were evacuated to safety. Within a month of relocation, the children were attending new schools in their temporary homes (Barrett et al., 2008). In Taiwan and elsewhere in Asia and beyond, during the 2009 H1N1 influenza pandemic,various schools in affected areas were closed for short periods (Chen et al., 2011; Klaimanet al., 2011). The 2013-16 Ebola epidemic caused extended school closures in the three main effected countries of Guinea, Liberia, and Sierra Leone (Yao, H., Memon, A.S., Amaro, D., Rigole, A., and Abdou, Y.D., 2021). Nevertheless, the school closure extension due to Covid- 19 required the use of fully remote teaching solutions for instruction or education. Using the term ERT appropriately to the context of a crisis is significant since it varies from an online distance education to avoid "wrong assumptions…wrong definitions will make us more vulnerable to errors along the way…when things are settled and go back to normal, what people will remember will be bad examples from a time of crisis, and the years of efforts it has taken to prove the effectiveness of distance education can vanish all of a sudden" (Bozkurt & Sharma, 2020). In contrast to experiences that are planned from the beginning and designed to be online, emergency remote teaching (ERT) is a temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances.

Educational institutions deployed a strategy of ERT, which can be considered as a branch of distance education (Bozkurt et al., 2020). ERT differs from online learning, for it offers rapidly developed temporary instructional support in a crisis without pre-planned resources infrastructure (Hodges et al., 2020). In the literature, several advantages of online learning have been highlighted. According to Nagrale (2013) the best advantage of distance education is you can learn from anywhere and anytime. Brown (2017) added that distance learning is cheaper than traditional learning. It is also way of saving time, for your classroom is in your bedroom (Bijeesh, 2017). On the other hand, Brown (2017) explained that computer, webcam, and internet connections are needed for distance education. Moreover, digital competences are necessary to follow online education. Online learning is thus becoming more and more important for education during the time of the worldwide health emergency, offering the opportunity to remain in touch, even if remotely, with classmates and teachers and to follow lessons. However, online learning has challenges as technology, digital competence, intrusions, assessment and supervision, heavy workload and compatibility. Online learning, for example, in its entirety is dependent on technological devices and internet. Lack of access to technology or good internet connectivity is an obstacle to continued learning, especially for students from disadvantaged families. School closures negatively impact student learning outcomes (Aristovnik et al., 2020). Besides this, the unexpected appearance or interruption of family members, friends and or pets that may cause disruption or diversion of online learning participants' attention during the online teaching and learning process. Similarly, while remote teaching entails some difficult issues, it still presents a chance for innovation, creativity, and an opportunity to broaden communication between home and school.

Online education or distance education has been studied for decades. However, institutions of higher education have had to move to from traditional to online to help prevent the spread of COVID-19. Hodges and his colleagues (2020) called is method as emergency remote teaching due to crisis circumstances. Emergency remote teaching is a temporary teaching solution to an emergent problem. "The primary objective in these circumstances is not to re-create a robust educational ecosystem but rather to provide temporary access to instruction and instructional supports in a manner that is quick to set up and is reliably available during an emergency or crisis" (Hodgeset al., 2020, p. 6). In real, the threat of COVID-19 has presented some unique challenges for institutions allowing to highlight challenges and opportunities to

get ready for future to implement a better system. A no of reserahes have supplied information about the topic of ERT in different views: digital pedagogy responses to COVID 19 (Crawford etal., 2020), 13 central topics across the instutions- workload, communication and interaction, prior experience and the impact on courses, and the evaluation of the switch from in-person to online learning(Arndt et al., 2020), three trends- blended learning, access and availability to e-resources, and stakeholder theory in distance education- emerged witH ERT during COVID 19 (Bhuwandeep and Das, 2020). In order to highlight potential effects of COVID 19 on higher education in Turkiye, this paper focuses on a case of Turkish university students at education faculty in the process of transitioning to online teaching platform. In other words, to understand the challenges and opportunities of ERT on higher education and future suggestions, the following questions were addressed:

The COVID-19 has affected the higher education and face-to-face education has been replaced by ERT.

R1. What are the challenges of ERT on higher education?

R2. What are the opportunities of ERT on higher education?

R3. What are your suggestions for continuing emergency remote educational activities at higher education?

METHOD

This section includes research design, population, data collection tools, validity and reliability, research process, and analysis of data.

Research Design

In this research study the qualitative case study approach was used. There are several thypes of case studies: exploratory, descriptive, and explanatory (Yin, 2003). Guiding by the study purpose and its boundaries, the descriptive case study type was applied. The descriptive case studies set to describe a contemporary phenomenon in depth and within its real-life context. It is also a single case with embedded units. In order to ensure objectivity and clarity, the researchers collaborated closely with the participants during data collection through a series of individual interviews. The following steps were applied in the study (Figre 1):

1. The research questions were deined.
2. The design of the case sudy was decided.
3. The data was collected.
4. The data was categorized, tabulated and cross checked to address the initial propositions or purpose of the study.
5. The results were presented in a manner that allows the reader to evaluate the findings in the light of the evidence presented in the report

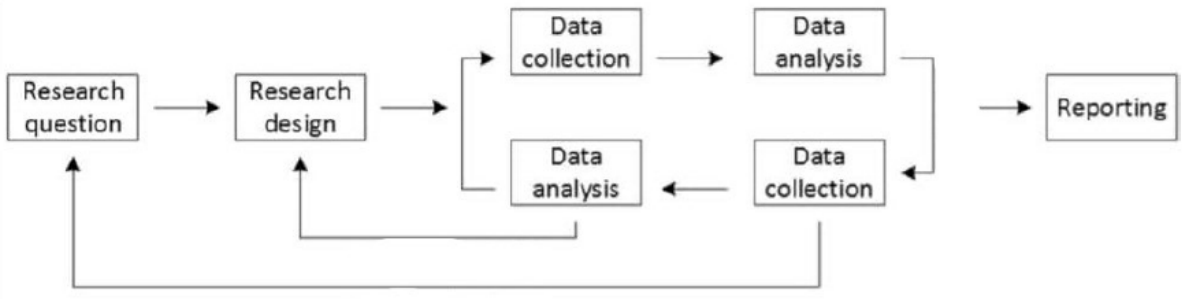

Figure 1. Research design

Sampling

The sample of this research was determined by using purposeful sampling. Purposeful sampling is a technique widely used in qualitative research for the identification and selection of information-rich cases for the most effective use of limited resources (Patton, 2002). This involves identifying and selecting individuals or groups of individuals that are especially knowledgeable about or experienced with a phenomenon of interest (Cresswell & Plano Clark, 2011). The population of the research consisted of 144 higher education students who had the experience of ERT at Anadolu University, Educational Faculty. The profile of respondents is broad with higher education students (3rd level of special education and Germen language teaching). Demographic information of students is shown in Table 1.

Table 1. Demographic Information of Students

Variable	Sub variable	f	%
Gender	Female	81	56
	Male	63	44
Branch	Special education	97	67
	German teaching education	47	33

Data Collection Tool

The data of the research were collected through semi- structured interview forms. A semi-structured interview is a key technique as a much more flexible version of the structured interview in real-world research (Gillham, 2000). In the first part of the two-part interview forms, there are questions regarding the demographic information of the participants. The second part includes three open-ended questions. After literature review, the draft of the questionnaire was edited by the expert of the qualitative research method. Data collections were done in stages, through online surveys and then semi-structured interviews to obtain in-depth data.

The questions are open ended which gave participants the opportunity to report on the most important challenges encountered during the crisis; the questions allowed them to identify potential solutions with positive or negative effects on COVID-19 on education.

Data Analysis

Due to the COVID-19 pandemic semi-structured interview forms prepared for collecting data were sent to the participants in electronic environment. Nicknames were used like S1, S2, S3 … Content analysis method was applied to analyse the data. According to Babbie (2001), content analysis can be defined as "the study of recorded human communications" (p.304). It is "essentially a coding operation," with coding being "the process of transforming raw data into a standardized form" (Babbie, 2001, p. 309).

Validity and Reliability

Numerous frameworks have been developed to assess the trustworthiness of qualitative data (Lincoln & Guba, 1985) and strategies for establishing credibility, transferability, dependability, and confirmability have been extensively written about across fields (Krefting, 1991; Sandelowski, 1986). Case study research design principles lend themselves to include numerous strategies that promote data credibility or "truth value." The researchers ensured credibility by reexamining the data so that the codes and themes were consistent. Triangulation of data sources, data types or researchers is a primary strategy that can be used and would support the principle in case study research that the phenomena be viewed and explored from multiple perspectives. Yin (2017) suggests the existence of four types of triangulation: (i) data triangulation through the use of multiple data sources; (ii) researcher triangulation through the involvement of different evaluators; (iii) theory triangulation through the adoption of multiple perspectives on the same data set; and (iv) methodological triangulation through the adoption of different complementary methods. The role

of researchers in the process, the process of devel-oping data collection tools, data collection, and analysis procedures were explained in detail in order to ensure trustworthiness of the research. In order to ensure internal validity (credibility) experts opinion was obtained and triangulation technique (involvement of different evaluators) was applied. rich and dense description of the research results with direct quotations was supplied for the external validity. The qualitative data were analyzed using the content analysis method. In content analysis reliability is interpreted as intercoder reliability or the extent of agreement. Percentage of agreement is the simple percentage of agreement among all coders' decisions in coding the same units of data (Neuendorf, 2002). For this reason, the data were examined by two researchers. Miles and Huberman (1994) note that 70% or greater inter rate agreement is an acceptable level for the reliability of the research. The agreement rate in the study was 95% which shows great agreement between two coders.

FINDINGS

The perceptions of high school students on ERT in Turkiye were grouped into three themes:

Views on Challenges

The views on challenges have 8 themes: Digital pedagogy, infrastructure and accessibility, Digital competences, the field of study (compatibility), assessment and evaluation, intrusions (unexpected appearance or interruption of family members), heavy workload, lack of learning motivation (see Table 2).

Table 2. Themes and Codes for the Challenges of Distance Education

Themes	Codes	f
Digital pedagogy (communication and interaction)	Interaction, communication, sociability, nonverbal communication, facial expressions, inactivity, emotion transition, virtual environment, peer interaction, inefficiency, ineffectiveness	38
Technical infrastructure and accessibility	Infrastructure, hardware, computer, tablet, smartphone, technology, network, system crash, system breakdown, sound cut off, unclear image, technical problems	131
Digital competences	Inexperience, direct expression, competence, incompetence, digital competence, online information transfer, distance to technology	17
The field of study (compatibility)	Applied course, theoretical course, theoretical knowledge, professional life, vocational courses, business life	12
Assessment and evaluation	Homework, academic language, resource shortage, need for computer, online exam, sloppy homework	9
Intrusions (unexpected appearance or interruption of family members)	Environment, noise, impossibilities, unsuitable environments, financial impossibilities	11
Heavy workload	Exam, homework, digital education process, fatigue, stress	4
Lack of learning motivation	Motivation, apathy, inability to adapt, working at work, inability to focus, virtual environment, distraction	14

According to findings the most important challenge is technical infrastructure and accessibility. The perception of S12 on this code was as follows:

"Lack of computers, tablets, smart phones and internet access is one of the most important problems for most students." S113 added: "One of the important problems encountered in the distance education process is the technical problems experienced during the lesson. Technical problems such as sound interruption, disconnection, and unclear image reduce students' interest in the course and negatively affect their learning." S22 said: "I think the most important issue of all students living in Turkiye is that not accessibility to the online education system. Today, there are a lot of students from all age groups who do not have the internet, computers or phones at home."

The Other challenge is digital pedagogy, communication, and interaction problems. S66 remarked on this as *"Being away from sociality is the biggest problem. If my teacher does not touch my eyes, I do not understand anything from that lesson." S109 explained: "Being away from peer interaction and classroom environment, which are very effective in the learning process, negatively affects the success of the individual." S11 reported: "Regardless of the level of teacher and student; there is an invisible bond between them and this shapes the communication between them. However, in distance education they are deprived of eye contact, non-verbal means of communication, affirmative or rejecting gestures."*

Another hinder that is related to challenges of ERT is digital competences. S68 made the following comment: *"In my opinion, the most important problem encountered in terms of distance education during the COVID-19 pandemic process is the lack of digital competence of the students of the families with financial difficulties, and therefore, they cannot attend classes online that negatively affected the students." S45 added: "We are not satisfied with the education given by teachers who are used to teaching face- to- face and who are not good with technology."*

14 of the participants reported that lack of motivation is one of the challenges of ERT. The opinion of S9 regarding this is as follows: *"In my opinion, the biggest problem encountered in distance education is that students who have previously received face-to-face education throughout their school life suddenly experience adaptation problems due to reasons such as not being able to focus on distance education, lack of communication, inefficiency, etc." S17 added: "One of the problems I observe is that students' attention and motivation have difficulties in creating a new scheme for distance education, and their desires and motivations are not caused by the abstract virtual environment."*

Another theme students consider as a challenge of ERT is the field of study (compatibility). Some students views on the theme are as follows: S55: *"One of the most important problems in this period is the lack of practical courses. Although distance education is sufficient for theoretical courses, distance education can pose difficulties for practical courses." S11: "I think that distance education is not useful and effective for students who will be educators. Especially for the 3rd grade where vocational courses are concentrated. I can clearly see in my comparison between the first semester and the second semester last year that the lectures in which practice and experience are transferred rather than theoretical knowledge are more beneficial."*

Other challenges voiced by the students are intrusions, heavy workload and assessment and evaluation. S87 stated: *"Apart from that, it is almost impossible to attend and present live lectures with audio and video because there is no quiet environment at everyone's home (I assume most students are in their family home here)." Besides this, S33 remarked: "Homework-style exams, constant computer-based lessons tire and overwhelm us." S7 made the following comment on assessment and evaluation problem: "We are faced with many problems in the distance education process. For example, injustice in exams, low scores due to problems in the system during the exam."*

Views on Opportunities

Views on opportunities include 5 themes: lifelong learning opportunities, flexibility, experiencing distance or hybrid education, digital transformation in education, and an alternative to student mobility (see Table 3.). The opinions of students on digital transformation in education as follows: S23: *"Great steps have been taken in digitalization through distance education and important developments have been achieved." S101: "It has been ensured that educators and students become more integrated with technology and benefit more from technology in education."*

Table 3. Themes and Codes for the Opportunities of Distance Education

Themes	Codes	f
Lifelong learning opportunities	Access to information, discovery of information, research, self-learning, language learning, reading books, participating in courses, self-discipline, self-control	46
Flexibility (more flexible learning opportunities)	Flexible learning, listening to the registered lecture, being independent from time and place, participating in events, being able to plan your life, special education, equal opportunity.	39
Experiencing distance or hybrid education	Distance learning, hybrid education, face-to-face education, education anywhere, digital education, access to education	30
Digital transformation in education	Digitalization, digital education, digitalization process, use of technology, technology in education, digital literacy, digital competence, adaptation to technology	55
An alternative to student mobility	Distance education, Transition to distance education, eba, canvas, alternative education, innovative education model, technological infrastructure, strengthening the technological infrastructure, renewal of the education system	28

Some students emphasize the lifelong learning opportunities like access to information, self-learning, or self-control. S43 explained: *"In this process, I think I learned very well how to do research, search for articles and access information myself. Because I was very anxious about accessing information at the beginning of the first period of distance education, I learned how to access it, how to use the internet and how to choose the right information from the pool of information." S37 added: "The distance education process contributed to the development of students' own learning responsibilities, independent research skills, digital literacy skills, and skills to find, understand, analyse and share information."*

Another opportunity related to ERT is flexibility. S109 remarked on this as: *"The fact that online education is independent of time and place shows how flexible it is. In other words, when we do not have the opportunity to watch live lectures instantly or when we want to watch the lecture again, it provides the opportunity to be recorded on the system and watch it later whenever we want. I think this is a very good advantage. In addition, it has been very convenient for students with physical disabilities to receive online education without going to school." S8 made the following comment: "One of the positive effects of distance education is time flexibility. Concepts such as absenteeism and attendance, which put pressure on most students, have almost come to an end with distance education. The absence of education due to illness or special circumstances has disappeared."*

Other opportunities stated by students are experiencing distance education or hybrid education and an alternative student mobility. S33 said: *"It is an important step for using technology and distance education as additional support after COVID-19 pandemic is over. COVID-19 pandemic process taught that education can continue not only in a physical environment but also in a virtual environment."* S65 explained this: *"Staying away from face-to-face lessons, which we teach interactively, offered us another option as an alternative to traditional education: Digital Education."* On the other hand, students stated on student mobility as: S11: *"The transition of schools to distance education taught us that the school does not consist of four walls and that learning can be adapted to any environment."* S113: *"Distance education helped us to devote the time we spend to and from school for ourselves and our hobbies."*

Suggestions on the Future of Distance Education

Table 4. shows the suggestions made by students for continuing ERT that are developed into seven themes. Most of the students suggest that financial support and equipment like free internet service, tablet distribution, internet package should be ensured. S78 remarked on this: *"Students who do not have these technological devices in their homes should be identified and these devices should be provided, and free internet service should be supplied to all students to enter distance education applications."* S2 added: *"Students should be provided with unlimited internet valid for online course applications with free tablets."*

Table 4. Themes and Codes for Suggestions for Continuing Distance Education

Themes	Codes	f
Create accessible materials	Materials, software, video, technology, discussion, content, content development, effective learning	20
Use university and institutional IT department-supported digital technologies	Support point, digital support center, internet cafe, library, e-library	13
Adopt a flexible approach to student participation	Flexibility, tolerance, course follow-up, obligation to attend, working student, inability to access the internet	13
Ensure financial support and equipment	Infrastructure, hardware, reinforcement, free internet service, network lines, internet package, tablet distribution, software works, aid, non-governmental organizations, government support	116
Adopt hybrid learning	Hybrid model, mixed system, Face-to-face education, opening schools, socializing	23
Develop digital competences	Competence, digital competence, training, seminar, educational application, technology training, educational video, informative content, communication, and cooperation with parents	15
Evaluation and assessment methods	Assessment, homework, curriculum, exam, grade anxiety, feedback, adaptation to distance education	10

Some students suggest adopting hybrid learning. S97 stated: ‘*“The solution is to implement the hybrid education model. Curricula and course contents can be rearranged in accordance with hybrid education.”* S27 emphasized: *“The implementation of the hybrid system in schools and universities will carry the socialization process to a certain level, if not as before.”*

Another suggestion for the future of distance education is to create accessible materials, in fact content development and materials are emphasized for effective learning. Some students views on the theme are as follows: S87: *“Teachers should share many materials and resources required for the lesson in a way that they can reach the students. The lessons can be enriched with the necessary presentations and visuals, helping students learn more easily.”* S136: *“Live and interactive lesson plans can be produced with students. In addition, to benefit from the peer effect on learning, group assignments and weekly discussions can be planned, which students can carry out in communication.”* S1: *“For effective learning, live lessons should be done by posting videos on channels such as YouTube. Students who do not have the opportunity during the class time can access these videos later.”*

Digital competences may be developed by training courses or seminars. S4 made the following comment on this suggestion: *“Students and teachers should be informed about distance education, teaching and learning. Students and teachers should have more knowledge about the use of technological tools and educational applications.”* S76 added: *“Students should be guided about how online education should be, how it should be studied, how students can be more efficient.”* In addition, universities and institutions should support IT departments and digital technologies. S57 said: *“Providing internet service support from certain centres will be a great advantage for students.” Digital support centres should be established in villages.”* S15 remarked: *“Applications such as EBA support centres should be increased and diversified.”*

Some students suggest adopting a flexible approach to student participation with evaluation and assessment methods. S44 stated: *“Listening to the recorded broadcasts of the lectures should be sufficient without the obligation to attend.”* S78 explained this as follows: ‘*“Students who do not have the internet and have to work at certain hours can go to a place with internet at an appropriate time, take their notes by watching recorded live lectures, and participate in discussion forums.”* S12 made a remark on evaluation and assessment: *“Exams and evaluations should be suitable for distance education; homework was very tiring for us.”* S19 added: *“The education curriculum should be handled and some adaptations in the curriculum according to the distance education system should be made. Required facilities should be provided in exams and assignments.”*

DISCUSSIONS AND CONCLUSION

According to UNESCO, on 1 April 2020, schools, and higher education institutions (HEIs)were closed in 185 countries, affecting 1.542.412.000 learners, which constitute 89.4% of total enrolled learners (Marioni, Land & Jensen, 2020, p. 8). ERT was implemented within weeks following Cocid-19 pandemic all over the world. In order to understand the effect of distance education on higher education, this research was implemented, predominantly focusing on the challenges and opportunities of ERT with the suggestions for the future of it.

Research results show that views of participants on the challenges of ERT are developed into 8 themes: Digital pedagogy, technical infrastructure and accessibility, digital competences, the field of study (compatibility), assessment and evaluation, intrusions (unexpected appearance or interruption of family members), heavy workload, and lack of learning motivation. In the research it is seen that most of the students remarked 'technical infrastructure and inaccessibility' as the hardest challenge of the distance education. Infrastructure and online access are a prerequisite for shifting to distance teaching and learning (Marioni, Land & Jensen, 2020, p. 24). Many students explained that they had limited or no internet access and many were not be able to afford computer, laptop or supporting mobile phones in their homes. This challenge may enhance the gap between advantaged and disadvantaged groups. Indeed, according to Sikirit (2020), the most significant obstacle that students face when studying at home is the lack of Internet access and electronic devices. Similarly, Lau, Yang, and Dasgupta (2020) state that the successful implementation of distance education brings along infrastructure and equipment needs, which cause problems for individuals with low socioeconomic status. Similar challenges have been faced in Gabna, Malaysia, and Pakistan. Most of the students do not have access to internet and adequate learning environment (Mukhtar et al., 2020; Owusu-Fordjour, et al., 2020; Yusuf, 2020). In brief, there are those HEIs for which, within the same institution, there is a divide between students who have access to the internet and students who do not, making it difficult to provide equal opportunities for students to complete their academic year (Marioni, Land & Jensen, 2020, p. 25). In addition to technical infrastructure and inaccessibility, digital competences are emphasized by students in the research. Following the the unusual situation caused by Covid-19, Tejedor, Cervi, Escoda and Jumbo (2020) pointed out that the necessity of enhancing the main aspects such as the teacher's digital skills. They suggested rethinking higher education learning and reinforcing main issues for this transformation, mainly: communication, teaching, and digital competences. Otherwise, digital literacy is not being guaranteed, which means higher education is not accomplishing one of its main objectives.

Besides this, some participants stated that a different pedagogy is required for the distance education. In fact, teachers are not ready for the transition from face-to-face education to ERT. Laurillard (2002, p. 22) asserted that 'if there is to be innovation and change in university teaching—as the new technology requires, as the knowledge industry requires, and as students demand—then it follows that academics must become researchers in teaching.' Moving from the traditional to online education needs to explore the challenge of integration and communication practices (Garrison et al., 2010, p. 31). In real, the pedagogical role includes the intellectual and task-based activities of the online instructor. It includes activities such as setting clear objectives, encouraging participation, questioning, providing feedback, presenting, or eliciting a range of perspectives (Redmond, 2015, p. 112). Guichon (2013) implies that teacher educators are supposed to learn how to coordinate their pedagogical strategy by utilizing the available instructional platforms and to rethink their pedagogical strategy to make it appropriate to apply in their virtual classrooms.

According to Keller and Kopp (1987) instructional material should be designed with the strategies which increase the attention, satisfaction, and interest of students. In real, there are many motivational difficulties of distance learning. Perrin (2005) argued that changes in digital pedagogy are needed to support motivation of students in distance education. However, Patronis (2005) stated in his research result that online interaction can enhance learners' motivation and engagement in the learning process.

Views of students on opportunities of ERT during Covid-19 pandemic include 5 themes: lifelong learning opportunities, flexibility, experiencing distance or hybrid education, digital transformation in education, and an alternative to student mobility. One of the most important opportunities stated by students is digital transformation in education that is a shift in mindset an experience opening a new horizon of opportunities for teaching and learning. Ensuring learning continuity during the time of school closures

became a priority for governments the world over, many of which turned to ICT, requiring teachers to move to online delivery of lessons (UNICEF, 2020, p. 12). Life-long learning opportunities and flexibility are mentioned by students as opportunities of distance education. Similarly, Lou (2004) and Alharthi (2020) stated the lifelong learning as the benefit of distance education. Karadeniz (2009, p. 358) stated that learning is a process that continues formally or informally throughout the life that undERTines the idea of lifelong learning. Secondly, flexibility is mostly remarked by students as an opportunity of distance education. As reported by Zhang, Burgus & Dawson (2019, p. 303) "Formal and informal learning opportunities through open, flexible and distance learning (OFDL) models are necessary elements within the broader education system. As such, contemporary educators are increasingly experimenting with open and flexible learning and teaching models and technologies that can create socially engaged and active learning contexts."

The suggestions made by students for continuing ERT that are developed into 7 themes: creating accessible materials, university and institutional IT department-supported digital technologies, adopting a flexible approach to student participation, ensuring financial support and equipment, adopting hybrid learning, developing digital competences, evaluation and assessment methods. In real, educational institutions have been moving towards hybrid learning due to Covid-19. In other words, hybrid learning seems to be the new way of learning at higher education. However, access to technology and digital capabilities should reach the remote and poor communities to facilitate the student-learning. As Jena (2020) remarked in his research institutions and government organizations should support student digital learning. Similarly, Hurst (2001) reported that learning process of students within and outside the campus, by mixing various tools and methods. In addition, teachers' experience of distance education with digital competences is one of the most stated challenge in the literature (Conrad & Donaldson, 2011; Ko & Rossen, 2017). Methods of measurement and assessment must be consistent with the objectives and contents of teaching. Moore, Locke and Burton (2002) stated out formative assessment is the best way to ensure quality in a unit or course. It is very helpful to design formative tests in multiple choice test formats to provide rapid feedback for a large group of students. Summative assessment is used both at the end of the course and during the course. In summative assessment, performances of students on some units are measured broader than formative assessment. Research results grouped into three themes:

1. Views on challenges: Views of participants on the challenges of ERT are developed into 8 themes: Digital pedagogy, technical infrastructure and accessibility, digital competences, the field of study (compatibility), assessment and evaluation, intrusions (unexpected appearance or interruption of family members), heavy workload, and lack of learning motivation.
2. Views on opportunities: Views on opportunities include 5 themes: lifelong learning opportunities, flexibility, experiencing distance or hybrid education, digital transformation in education, and an alternative to student mobility
3. Suggestions on the future of distance education: The suggestions made by students for continuing distance education are developed into 7 themes: Create accessible materials, use university and institutional IT department-supported digital technologies, adopt a flexible approach to student participation, ensure financial support and equipment, adopt hybrid learning, develop digital competences, and evaluation and assessment methods.

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AGENCY IN ONLINE FOREIGN LANGUAGE LEARNING AMIDST THE COVID-19 OUTBREAK

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ABSTRACT

The coronavirus disease 2019 (Covid-19) outbreak has forced a sudden transition from face-to-face learning to online learning in higher education. This circumstance challenges university students to be more self-directed in learning with relatively minimum assistance from their lecturers or peers. Therefore, it is becoming increasingly important to conduct a study on the issue of learner agency which remains little explored. The present study aimed at investigating the agency of first-year university students in online learning of Arabic as a foreign language. In particular, this study examines their intention, motivation, self-regulation and self-efficacy in online learning of Arabic delivered synchronously by using Google Meet and asynchronously by using Edmodo. An exploratory research method was employed in the study with the participation of 76 first-year university students at an Islamic public university in Jakarta, Indonesia. Results of the study reveal that first-year university students have a relatively high intention, motivation, self-regulation and self-efficacy in Arabic online learning. Looking these findings into more detail, however, the students seem to have limited information and preparation to achieve their goals, are undermotivated to speak with native Arabic speakers, have shallow learning commitments, and are less likely to believe their performance. One of the practical implications that emerge from this study is to introduce first-year university students to a variety of strategies for learning Arabic in more self-directed ways, and this may be supported by lecturers as to not only delivering content but also promoting skills during their teaching practices.

Keywords: Learner agency, online learning, distance learning, Arabic as a foreign language.

INTRODUCTION

The emergence of coronavirus disease 2019 (Covid-19) as a global pandemic has forced higher education institutions to immediately shift from face-to-face learning to online learning. Consequently, this circumstance has also challenged university students to learn in more independent ways. While it is evidence that remote learning could be the measure to prevent massive transmission of the virus, this way of learning serves considerable challenges which mainly regarding students' lack of motivation and engagement (Argaheni, 2020; Lee et al., 2015). The effectiveness of online learning relies on the active participation of learners

(Mick, 2011). Learners must be able to drive themselves by taking advantage of available resources in web-based learning environments (Li, 2020). Furthermore, being a highly self-directed learner is inevitable so that they could learn flexibly at anytime and anywhere with minimum assistance from their lecturers and peers (McClaskey, 2018). Their abilities to learn independently thus appears to have a significant influence on online learning performances.

Learner agency could play a pivotal role in Arabic online learning at this tumultuous time. The concept of learner agency refers to learners' natural potential for self-directed engagement (Mercer, 2011) and their capability to deal appropriately with any particular learning circumstances (Reeve & Tseng, 2011). Xiao (2014) argues that learner agency may support students to learn more independently by enhancing self-efficacy, identity, motivation, and learner metacognition. Accordingly, Larsen-Freeman (2019) recommends that learner agency should be improved gradually to promote effective foreign language learning. By doing so, it contributes to increasing learners' awareness of their responsibilities in learning.

So far, however, there have been few studies exploring learner agency in the learning of Arabic as a foreign language. Previous studies focused on the role of learner agency in English as foreign language learning (Chi & Hamid, 2015; Ferlazzo & Hull-Sypnieski, 2016; Liao, 2019; Teng, 2019). Research on Arabic online teaching and learning In Indonesia by far tend to address the online learning process and students' attitude (Febriani et al., 2020), the use of teaching media (Ahmadi & Ilmiani, 2020), the impact of technology (Febriani & Anasruddin, 2020), and obstacles faced by teachers (Zulaini et al., 2020). The significance of this study lies in the fact that Arabic is a foreign language used by more than 150 million people as the language of everyday communication and is in the fifth position after Chinese, English, Spanish and Indian (Muis, 2020). Moreover, Arabic is the second most widely used foreign language in Indonesia and becomes the icon of Islamic higher education (Warnis et al., 2019). Studying the agency of learners in Arabic as second language learning thus could contribute to the growing body of knowledge in foreign language learning.

The present study investigates the agency of first-year university students in online learning of Arabic as a foreign language by drawing on the theory of human agency (Bandura, 2008) with four core elements namely intentionality, forethought or learning motivation, self-regulated learning and self-efficacy. After reviewing the literature and describing the research methodologies used in this study, the results are presented and discussed according to the focus that covers intentionality, learning motivation, self-regulated learning and self-efficacy in online learning of Arabic as a foreign language.

REVIEW OF RELATED LITERATURE

Learner Agency in an Online Learning Setting

Agency plays a prominent role in learning. It is generally defined as an individual's awareness and capability to decide and be responsible for the decision (Gao, 2010; Martin, 2004). According to Vaughn (2020), agency consists of dispositional, motivational and positional dimensions which allow individuals to transform environments, regulate actions, and interact with complex societal contexts. Regarding learner agency, Larsen–Freeman (2019) defines it as learners' ownership and control of their learning (pp. 70–71). It comprises both ability and preparedness of learners to take fully-responsible actions, which can be identified from their interest and commitment to undertake learning assignments or tasks (Siry et al., 2016). More specifically, learner agency establishes students' capacities to be aware of individual goals, manage classroom interactions, personalise learning, and enhance overall learning environments (Jaaskela et al., 2017; Luo et al., 2019; Reeve & Tseng, 2011). Those performances may happen with an active interplay between students' autonomous learning engagement and contextual factors (Mercer, 2012). Chaaban et al., (2021) point out that learner agency is influenced by students' motivation and self-regulation as well as socio-cultural support. The higher agency of the students, the higher possibilities for them to succeed in learning.

Learner agency plays an even more critical in the context of online instructions as the learning environments are by far different to that of face-to-face ones. Students have limited physical contact and social interaction with their lectures and peers (Almendingen et al., 2021). They have to be able to manage their cognitive, affective, and behavioural processes themselves as they interact mainly with virtual learning resources and environments (Code, 2020). Students' learning intention, motivation, and self-regulation are therefore critical and have significant influences on their online learning outcomes (Greener, 2010; Zeiser et al.,

2018). It is evident that learning remotely requires intensive learner agency.

There are several aspects of learner agency. Based on Bandura (2006) conceptualises four features of learner agency namely intentionality, forethought, self-reactiveness (self-regulation), and self-reflectiveness (self-efficacy). Intentionality is a deliberate action by an individual to achieve properly a particular planned outcome (Bandura, 2001) with full awareness in action and mind (Brownell, 2013; Noctor, 2017). In the learning context, intentionality can be seen as students' competence for planning and achieving learning goals. Forethought refers to the individual ability to stimulate self-motivation and manage outcomes in an appropriate way (Bandura, 2006). If students are motivated to learn, they may regulate their behaviour to attain established goals (Brady & Gilligan, 2020; Garcia-Martin & Garcia-Sanchez, 2020). Self-reactiveness or self-regulation is an active process where students could monitor, regulate and control their motivation and behaviour to reach their goals (Pintrich, 2004). According to Zimmerman (2002), self-regulation was defined as a learner's self-directive process to transform mental abilities into academic skills. The application in learning is that students should be able to select and regulate appropriate strategies to achieve desired goals (Bandura, 2006). Self-efficacy is awareness to conduct self-reflection and self-improvement on their efficacy, thoughts, and actions (Bandura, 2006). Self-efficacy empowers students to evaluate their plans for the corresponding outcomes.

As this study investigates agency in online learning, it is also important to acknowledge the Community of Inquiry (CoI) model. Within this model, it is possible to describe how learning happens in a particular context by individual or group with the intersection of social, cognitive and teaching presence (Garrison et al., 2001). In the latest literature, this also involves learning presence (Shea & Bidjerano, 2010; 2012). Learning presence indicates students' proactiveness to organise thoughts, motivations, behaviours and strategies (Shea et al., 2012) which is related closely to the notion of learner agency. Meanwhile, in comparison with learning presence, learner agency has one more component namely self-reflectiveness or self-efficacy as a final element that enables students to self-evaluate their milestones contributing to the continued motivation, interest, and performance (Garcia-Martin & Garcia-Sanchez, 2018; Panadero et al., 2017) specifically in the online classroom (Landrum, 2020; Yokoyama, 2019). The concept of learner agency complements learning presence in a way that students have not only the capability to control and direct themselves but also the capacity to reflect and improve their personal decisions, actions, and goals in digital environments.

Arabic Language Teaching in the Indonesian Context

Since the vast majority of Indonesian are Muslim, the Arabic language has been very well-accepted in the country. It is the language of the Holy Qur'an (Al Shlowiy, 2019) and Islamic worship (Wekke, 2015). Following the popularity of English, Arabic becomes the second most learned language in Indonesia (Lauder, 2008) widely taught in state and private schools and universities. In Indonesian Islamic universities, Arabic is a compulsory language course for all students (Albantani & Madkur, 2019). Therefore, the language is very familiar to almost everyone although with different levels of proficiency.

Despite the familiarity, there are still many challenges in teaching the Arabic language in Indonesia. It can be said that the learning of Arabic was not as successful compared to those of English, Korean, or Mandarin (Kuraedah et al., 2018). One of the critical problems is that Arabic language teaching practices remain teacher-centred and based mainly on textbooks (Taha-Thomure, 2008). As a result, the learners are rather passive and have minimum engagement in the classroom. Another main problem is that the integration of educational technologies into Arabic learning is somehow limited compared to the English ones (Harahap, 2017; Andika 2020). These challenges indicate further work in the future.

Teaching Arabic as a foreign language for Indonesian students has become more challenging during the Covid-19 pandemic. The dramatic shift from conventional to online learning was demanded a high degree of learning agency (Xiao, 2014; Zeiser et al., 2018). The tendency of students for being passive and non-independent learners may create bigger barriers to the successful implementation of Arabic remote learning. Therefore, this study was aimed at exploring learner agency in online learning of Arabic as a second language in higher education with the main research question: how do university students perceive their agency and how do they apply it in online Arabic language learning?

The study may contribute to understanding university students' agency in a distance learning environment. Learner agency has a dynamic process and varies in a different context (Schoon, 2018). It is another vital concern to study learner agency in a digital learning setting (Jaaskela et al., 2017) as it has a typical learning experience and presence (Prakasha et al., 2020). The results of this study could be valuable for practitioners and policymakers to design and develop more tailored instructions and policies in the field of Arabic online learning.

METHOD

An investigative exploration approach (Stebbins, 2001) was administered in this study to understand learner agency in Arabic language learning delivered remotely during the Covid-19 crisis. The exploratory research method was chosen as it seems to be suitable to investigate learner agency within an online learning mode during the pandemic, and it also provides flexibility to comprehensively reflect the understudied problems (Schutt, 2019). Moreover, it was conducted at an Islamic public university in Jakarta, the capital city of Indonesia, from July to October 2020. The research setting was decided in an urban area as it appears to have relatively proper access to Internet connections.

Participants

The present study was participated by 76 first-year university students after attending an Arabic language online course in one semester. Those students come from two classes with the same instructor. Detailed information about their profiles is provided in the following table.

Table 1. The Profile of the First-Year University Students

Class	**Students**	**Percentage**
A	38	50%
B	38	50%
Total	76	100%
Gender	**Students**	**Percentage**
Male	33	43 .42 %
Female	43	5 6.58 %
Total	76	100%
Age	**Students**	**Percentage**
<18	7	9 .21 %
18-20	50	6 5.79 %
21-23	14	18 .42 %
24-26	4	5.26 %
> 26	1	1 .32 %
Total	76	100%
Marital status	**Students**	**Percentage**
Single	70	92 .11 %
Married	6	7.89 %
Total	76	100%
Socioeconomic status	**Students**	**Percentage**
High	4	5.26 %
Middle	54	71.05 %
Low	18	23 .69 %
Total	76	100%

Devices for distance learning	Students	Percentage
Smartphones	67	88 .16 %
Tablets	1	1 .32 %
Laptops	8	1 0.52 %
Desktop computers	0	0 %
Total	76	100%

Table 1 describes the profile of first-year university students participating in this study and their used technologies for distance learning. The majority of students are female, aged between 18 and 20 years old and come from middle socioeconomic status with more than 70% of them. In terms of devices, smartphones are the most used ones (88%) to access online learning, followed by laptops (10%) and tablets (1%). No one uses desktop computers to participate in remote learning.

Procedures

An online questionnaire (using Google Form) was distributed to the first-year university students following their attendance in an Arabic online course delivered in asynchronous (using Edmodo) and synchronous (using Google Meet) modes. The course consists of 14 weekly meetings including midterm and final examinations. Regarding the questionnaire, the study employed the Agency for Learning Questionnaire (AFLQ) developed by Code (2020) from the theoretical framework of human agency comprising its features: intentionality, learning motivation, self-regulation, and self-efficacy (Bandura, 2008). It has six levels on the Likert scale: 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = slightly agree, 5 = agree, and 6 = strongly agree.

Regarding the validity and reliability of the questionnaire, AFLQ was chosen as it offers a reliable, valid, multidimensional measure of agency for learning based on current theoretical and empirical findings (Code, 2020). All data from the questionnaire were then analysed using descriptive statistical techniques to simplify, analyse, and describe the main features of the data (Holcomb, 2017). It started by tabulating the data in the Microsoft Excel application, adding a percentage score to the data, then presenting the analysed data in a summary table.

Ethics

The participants voluntarily participated in this study and information related to ethical research has been also communicated to them. It was informed in advance to the students that their participation would not affect the formative and summative examination grades. Further, all generated data from the questionnaire could only be used for scientific purposes.

RESULTS

The main findings of the study are presented in this section. The findings focus on the analysis of students' learner agency in the Arabic language course and are divided into four sub-headings including intentionality, learning motivation, self-regulated learning, and self-efficacy. Furthermore, the discussion in this study criticises some specific issues in students' learner agency. Several implications for improving students' Arabic language proficiency and Arabic language learning are presented as well.

Intentionality

Intentions are realised by setting the goals of learning and planning the strategies to achieve them (Bandura, 2008). To see students' intention in online learning of Arabic as a foreign language, the developed questionnaire examines some specific aspects such as their decision making, willingness to master language skills, learning goals and strategies.

Table 2. The intentionality of the First-Year University Students in Arabic Online Learning

Statements	Mean	SD
I decided to study Arabic of my own accord	5.37	0.73
I gathered a lot of information in deciding to learn Arabic	4. 79	1. 00
I feel confident in deciding to learn the Arabic language	5.03	0.83
I want to master the elements of the Arabic language (mufradat, qawaid, ashwat)	5.18	0.99
I want to master Arabic language skills (listening, speaking, reading, writing)	5.43	0.57
I have a specific goal in learning Arabic	5.04	0.86
I prepared a strategy to achieve the goal of learning Arabic	4.91	0.91
Total	**5.11**	**0.84**

Table 2 describes the intention of first-year university students in Arabic online learning. Overall, students have a relatively high intention to learn Arabic, but they seem to have limited abilities to search for information and prepare learning strategies. The students' decision to learn Arabic and intention to master elements and skills related to the Arabic language have an average score over 5.15. In contrast, students' efforts to obtain information and use strategies to achieve learning goals have an average of less than 5.00. The average in other aspects could be categorised in the medium category with a slightly higher value than the previous category. The data is quite varied as indicated by the standard deviation values for all items that reach above 0.5.

Learning Motivation

Learning motivation in this study refers to what Bandura (2008) named forethought. Code (2020) highlights that through forethought, students motivate themselves and guide their actions to anticipate upcoming events. The more detailed objective of this study is to investigate the internal and external motivation of students in Arabic online learning. More specifically, it was aimed to evaluate students' motivation in learning the Arabic language in terms of their future orientation, interest in learning Arabic, willingness to face challenges, and target making.

Table 3. The Motivation of the First-Year University Students in Arabic Online Learning

Statements	Mean	SD
I feel that learning Arabic is important for the future of my education	5.49	0.55
I feel that learning Arabic will allow me to get to know more people from various countries	5.33	0.62
I am very interested in learning Arabic	5.37	0.56
I am challenged to be able to speak to native Arabic speakers well	5.07	0.81
I am challenged to be able to complete all assignments in Arabic courses well	5.17	0.72
I am challenged to be able to read Arabic texts well	5.22	0.70
I try to make the results of studying Arabic courses satisfying	5.38	0.56
Total	**5.29**	**0.64**

Table 3 describes the motivation of first-year university students in Arabic online learning. It is noticeable that overall students have a relatively high motivation to learn Arabic, but they appear to be less challenged to practice speaking with native Arabic speakers. The importance of learning Arabic has an average value of over 5. 40. On the contrary, students' motivation to challenge themselves to speak with native speakers has an average value below 5.10. The average value on other aspects can be categorised in the medium category with a slightly higher value than the previous category. The data is quite varied as indicated by the standard deviation values for all items that reach above 0.5.

Self-Regulated Learning

To investigate students' self-regulated learning ability in Arabic language learning, this study addressed some specific aspects such as their plan makings, target settings, learning strategies selection, problem-solving strategies, learning strategies adjustment and use of reward and punishment in the learning process.

Table 4. The Self-Regulation of the First-Year University Students in Arabic Online Learning

Statements	Mean	SD
I make plans (for example, what to do, when to start, where to do it, etc.) before starting to work on assignments in Arabic courses.	4.82	0.71
I set the target I should achieve in Arabic language courses	4.92	0.69
I chose learning strategies that can help me achieve the targets to be achieved	5.05	0.71
I will find ways to solve the problem if problems arise in the process of learning Arabic	5.08	0.63
I can judge whether I have progressed or not in learning Arabic	5.01	0.76
I will adjust or change the learning strategy if my learning strategy is not effective	5.18	0.53
I give rewards or punishment to myself if my assignments have or have not been completed	4.43	1.18
Total	**4.93**	**0.74**

Table 4 describes the self-regulation of first-year university students in Arabic online learning. Overall, it can be seen that students have relatively high self-regulation to learn Arabic, but they still do not provide rewards or punishment for learning outcomes. Student self-regulation to adjust or change Arabic learning strategies has an average score above 5.15. Conversely, a lower value of 4.50 was shown in giving rewards or punishment for learning outcomes. The average in other aspects can be categorised in the medium category with a slightly higher value than the previous category. The data is quite varied as indicated by the standard deviation values for all items that reach above 0.5.

Self-Efficacy

To examine students' self-efficacy in online learning of Arabic as a foreign language, this study focused on some specific issues such as their effort, self-judgment, sustained interest in learning, reflection of their proficiency and adjustment in any necessary circumstances.

Table 5. The Self-Efficacy of the First-Year University Students in Arabic Online Learning

Statements	Mean	SD
I feel that my efforts have been maximized in understanding the lecture material	4.42	1.15
I understood the material presented after attending Arabic language lectures	4.68	0.88
I continued studying during the Arabic class even though other things were more interesting	4.82	0.96
I have better Arabic skills than some of my friends	3.25	1.47
I was able to motivate myself to do all assignments in Arabic courses	4.75	0.98
I am proud to be able to use Arabic in my daily life	5.00	0.94
I was able to help a friend who had difficulty understanding Arabic course material	4.42	1.15
Total	**4.48**	**1.08**

Table 4 describes the self-efficacy of first-year university students in Arabic online learning. In general, it is clear that students have relatively high confidence in learning Arabic, but they are unlikely to believe themselves when creating any judgments about their Arabic proficiency. Students' confidence in using

Arabic in their daily life have an average score above 5.15. However, their belief in Arabic proficiency has an average of only 3.25. The average in other aspects can be categorised in the medium category with a slightly higher value than the previous category. The data is quite varied as indicated by the standard deviation values for all items that reach above 0.5.

DISCUSSION

The discussion is presented critically according to the aims and results of this study which covers intentionality, learning motivation, self-regulated learning and self-efficacy in online learning of Arabic as a foreign language.

Intentionality

First-year university students have a relatively high intention to learn Arabic although they prepare minimum strategies to achieve learning goals. Knowing which strategies are suitable for students to reach their goals is essential as it benefits learners to overcome any arisen problems in learning the Arabic language (Hapsari, 2019). A study by Sukardi (2014) has also shown that learners who can determine and use language-learning strategies have higher possibilities to achieve good examination scores. It is suggested for lecturers to promote strategies for learning Arabic in remote ways during teaching practices.

Students gather little information before deciding to learn Arabic. It is common for students to assume that online learning of Arabic could be joined without any preparations (Ediyani et al., 2020; Robinson, 2020). They also tend to learn Arabic as a means of completing obligations as it is a mandatory course (Alghamdi & Li, 2012). Lecturers have an important role, in this case, to provide information as rich as possible about the Arabic language course before it starts.

It is of great importance to introduce students to a variety of strategies for learning Arabic and this must be supported by lecturers with not only teach the content but also the language skills during their teaching in the online classroom. A study shows that Arabic learners understand the subject matter well but they are poor in implementing oral and written communication skills (Ghani et al., 2011). Mastery of content and language skills could certainly prepare students to practice Arabic as a foreign language more communicatively in both oral and written means (Mistar & Umamah, 2014; Yaqub, 2012).

Learning Motivation

First-year university students have a relatively high motivation to learn Arabic and it is mainly due to their perception that Arabic is important for their future. This finding inlines with Husseianali (2005) reveals that students perceive learning Arabic as more valuable compared to other languages from the standpoint of the labour market. The previous evidence is in contrast with Ajape et al (2015) which show that, from the students' perspectives, learning Arabic cannot provide proper jobs in the future. They believe that Arabic is only useful for better understanding Islam. Therefore, lecturers may strengthen students' motivation in online learning of Arabic in terms of job and religious orientation. In this sense, Sa'fan & Mahmud (2005) noted that Arabic language teaching should address four demands, namely demand for technological change, demand for value changes that develop in society, demand for social and economic change, and demand for educational change.

Students appear to be less challenged to speak with native Arabic speakers. This contradicts Al-Mohsen (2016) who shows that students are by far very interested to interact with native speakers in the Arabic language. According to Haron et al (2016), students are not challenged to speak with native Arabic speakers because there is no institutional support to provide an adequate Arabic language environment. Additionally, the practice of teaching and learning Arabic tends to memorise structured dialogues rather than teaching students to have natural speaking competencies with native speakers (Sarip et al., 2018). Lecturers individually or institutionally have to provide more real-world language instructions so that students may have a higher interest in speaking with natives (Zailaini et al., 2015).

In online learning, the use of audio-visual media could increase students' motivation to learn and practice Arabic language communicative skills (Rachmawati et al., 2020). Although there are no native Arabic teachers who can be involved in the learning process (Binti Jasni & Ardiansyah, 2020; Haron et al., 2016) or students tend to be afraid to make mistakes when speaking in Arabic (Dajani et al., 2014), integrating learning technologies (Rahmadi, 2021) and advanced lesson plans that provide students possibilities to remotely communicate with native Arabic speakers such as OME TV could be a solution.

Self-Regulated Learning

First-year university students have relatively high self-regulation to learn Arabic and they have attempted to adapt relevant learning strategies according to the current situation. It is great to know that students have tried to decide possible strategies for them to learn Arabic as it may enhance Arabic learning performance (Al-Ahdal and Al-Ma'amari 2015; Nurhidayati, Irhamni, and Ainin 2020). Lecturers could help students with corresponding learning strategies personalised to their characteristics and learning styles.

Students are less likely to reward or punish themselves for achieving goals in Arabic online learning. Having balance to appreciate or penalise is of great importance to disciplinaries students and this could be done by verbal and non-verbal actions (Irawati & Syafei, 2016). This is also in line with a study by Putri and Refnaldi (2020) stating that a reward-and-punishment strategy may change students' behaviour so that students would join the course more seriously (Sutaman & Febriani, 2021).

Self-regulated learning requires students' independencies in online learning of Arabic. They must be prepared to plan, gain, and reflect on their accomplishments. Properly planning the learning is useful to improve target achievements significantly in Arabic online learning (Arifin et al., 2020; Wekke, 2018; Faryadi, 2012; Hazhar Fachrial et al., 2018). In the teaching practice, lecturers may also help students to improve their independencies in learning by introducing a variety of tactics for being more self-regulated learners.

Self-Efficacy

First-year university students have relatively high self-efficacy to learn Arabic and they can evaluate their efforts in online learning of Arabic. This skill is critical in the current situation where students are mostly separated from their lecturers and peers. Students who could assess themselves are commonly more interested in their studies (Tillema, 2010). Since they know what they learn, the students achieve relatively better performance as well.

Students are unlikely to believe themselves about their performance compared to their peers. Self-confidence contributes to the development of students' learning strategies to improve Arabic language skills (Adnan & Mohamad 2011; Tibi et al. 2016), thus this might be a serious issue to address. Promoting peer learning may be one of the solutions (Albantani and Madkur 2019; Arifin et al 2020) and could increase their learning achievements (Zarifnejad et al., 2018) more collaboratively.

Another issue is related to cooperation among students when facing difficulties in learning Arabic. This happens due to students' backgrounds who come from public schools where Arabic is not included in the curriculum (Al-Wabil, 2012; Syukran, 2019; Zubaidah, 2020). They are more struggle to understand Arabic learning as they learn it for the first time (Zurqoni et al., 2020). Lecturers may deal with this issue by mixing these students with students who graduated from Islamic schools.

Overall, consistent with the previous research on learner agency in an online educational setting (e.g., Xiao, 2014; Ligorio, Impedovo, & Arcidiacono, 2017; Stenalt, 2021), the findings of this study delineate the positive nature of agency among Arabic language learners in an online learning environment. The findings are also in line with the other study focused on students' self-regulation or labelled as learning presence by Shea & Bidjerano (2012)a construct that we label \"learning presence\" moderates relationships of the other components within the CoI model. Consistent with previous research (e.g.; Means, Toyama, Murphy, Bakia, & Jones, 2009; Shea & Bidjerano, 2011 for the significant role of students' self-regulated learning strategies within a fully online learning environment. In addition, while Shea & Bidjerano's (2012)a construct that we label \"learning presence\" moderates relationships of the other components within the CoI model.

Consistent with previous research (e.g.; Means, Toyama, Murphy, Bakia, & Jones, 2009; Shea & Bidjerano, 2011 study showed differences in students' help-seeking behaviour as an important aspect of self-regulated learning, the present study unpacked not only students' help-seeking but also their beliefs to be able to give help to other students.

The present study has some limitations and future research directions. Firstly, this study has the nature of exploratory research, in which the results are less generalisable thus it should be strengthened with other studies. The exploration of learner agency in online foreign language learning amidst the Covid-19 crisis is an ongoing study that may be investigated further by comparing among several languages or with the post-pandemic context. Secondly, the survey was administered at a university located in the city with a relatively small number of participants. Expanding the survey coverage that not only cover urban areas but also rural areas of Indonesia would be inevitable fruitful to enrich the data and broaden comprehensive understanding towards university students' learning agency in foreign language instructions. Finally, this study focused on investigating learner agency based on Bandura's (2008) theory of human agency with four core properties, namely intentionality, forethought, self-regulated learning and self-efficacy. Meanwhile, the agency of the learner has many underlying theories and dimensions that could also be relevant to guide future studies. In addition, more research employing mix-method is recommended to provide a wider understanding of learner agency in online language learning.

CONCLUSION

The present study explored the agency of first-year university students in online learning of Arabic as a foreign language with a focus on their intentionality, motivation, self-regulation and self-efficacy. Results of the study reveal that first-year university students have a relatively high intention, motivation, self-regulation and self-efficacy in online learning of Arabic. Looking the findings into more detail, however, the students do not understand how to search and learn Arabic learning resources properly, are less challenged to practice speaking with native Arabic speakers, have a minimum commitment to rewards and punishments in learning, and are less likely to believe that they have good Arabic skills compared with their peers. The current findings add to a growing body of literature on learner agency in online foreign language learning amidst the Covid-19 pandemic.

Some implications have emerged from this study for the practice of remote Arabic language teaching and learning in higher education. Firstly, it is of practical relevance for lectures to raise students' awareness of their goals and to tailor learning based on their needs in terms of stimulating active engagements in online classes. Secondly, lecturers should continuously motivate students by informing the real-life benefits of mastering the Arabic language for their future careers. Last but not least, lecturers are expected to assure students' performance as accurately as possible by ameliorating their weaknesses and maximising their strengths. For the students themselves, they may reflect regularly on their learning achievements and endeavour possible strategies to better enhance performances on online learning of Arabic as their second language.

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COVID-19 PANDEMIC AND EMERGENCY DISTANCE TURKISH TEACHING

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ABSTRACT

The aim of this study is to determine the teachers' views on emergency distance Turkish teaching as a foreign language after Covid-19 pandemic. In this context, the quantitative and qualitative data were collected simultaneously in the study, which was created by using the convergent mixed design of the mixed method, which is one of the basic research methods. The study group of the research consisted 137 of teachers who were obliged to switch to emergency distance Turkish teaching while teaching Turkish face to face to international students studying at Turkish Teaching Centers affiliated with universities. According to the findings of the research, it was determined that teachers faced with many technological and pedagogical problems. In addition, it was identified that before the process started, teachers did not receive any training for distance Turkish teaching and therefore started distance teaching without experience. Moreover, it was concluded that class sizes are suitable for distance teaching, writing is the most difficult skill to develop and measure in distance teaching, and there is a lack of materials to be used in distance teaching.

Keywords: Covid-19, distance teaching, foreign language, Turkish teaching.

INTRODUCTION

Considering the history of education, it is seen that teaching activities generally continue in a certain routine without radical changes. However, this current process has passed as an exceptional period in the history of education in general and in the history of educational technology and distance education in particular (Yildirim, 2020). Although there have been epidemics such as Plague, HIV/AIDS, Spanish and Asian Flu, Smallpox, Cholera, Malaria, Typhus, etc. from past to present, such epidemics have not reached the size that will interrupt education and teaching activities for a long time or make a radical change in the teaching method. However, as Karadag and Yuzel (2020) stated, the new type of Corona virus (Covid-19) reported by China in December 2019 has turned into a pandemic affecting the whole world in a few weeks.

Looking at the data published by the World Health Organization, it is clearly understood to what extent this pandemic affected the world. In this context, globally, as of 22 March 2022, there have been 470.839.745 confirmed cases of COVID-19, including 6.092.933 deaths, reported to WHO. In Turkiye, from 3 January 2020 to 22 March 2022, there have been 14.707.959 confirmed cases of COVID-19 with 97.347 deaths, reported to WHO (WHO, 2022). These data clearly reveal how devastating the relevant pandemic has been both globally and in the context of Turkiye. All of a sudden, teachers and students around the globe have to deal with distance teaching and learning during the coronavirus disease crisis as a consequence of a working-from-home policy to prevent further transmission of the virus (Rahmadi, 2021). In this regard, the relevant pandemic caused serious problems in the field of education and teaching, as in every field. So much so that one of the sectors most affected by the Covid-19 pandemic was higher education. Almost all schools in the world were closed to face-to-face education, and almost 2 billion students suddenly switched to compulsory online education (Erkut, 2020). Although the history of distance education goes back approximately 150 years around the world, the pandemic has negatively affected education activities. This is because while traditional distance education activities aim to realize learning, the distance learning activities carried out during the pandemic process aimed to continue the teaching activities and not to distract the students from the process rather than the realization of learning (Yavuz, Kayali, Bala & Karaman 2020). The most fundamental factor underlying such a goal is the thought that the pandemic will decrease significantly, although it will not disappear completely in a short time. However, due to the fact that the situation is not as expected, it can be said that distance education activities, which started about 150 years ago, were seriously interrupted during the Covid-19 process. In this context, the historical ranking of the relevant distance education activities is as follows:

Table 1. Starting Dates and First Applications of Some Distance Education Implementations in the World

Starting Date	First Application Place
1840	England (Pitman Shorthand by Letter)
1874	USA (Illinoins Wesleyan University)
1884	Germany (Rustinches Distance Education School)
1898	Sweden (Hans Hermod High School)
1910	Australia (University of Qucensland)
1922	New Zealand (Correspondence School)
1956	Turkiye (Ankara University Banking and Commercial Law Research Institute)
1966	Poland
1972	Spain (National Distance Education University)

Reference (Kaya, 2002:30)

Looking at the table above, the distance education activity, which started with letters in 1840, developed until the establishment of a university in Spain in 1972. However, since the distance education activities that started about 150 years ago have not been a necessity until today, it can be said that they were shaped especially within the framework of the educational understanding of institutions and the needs of learners. However, the Covid-19 pandemic has increased the importance of distance education, which cannot gain much place in every stage of the education and teaching process, and has revealed the readiness of all components of the education system (curriculum, teacher, student, technological infrastructure, etc.) for distance education in order to perform the relevant trainings. According to Rahmadi (2021) it is becoming increasingly important to understand teachers' technology integration and distance learning adaption after a sudden implementation of the working-fromhome policy as a precaution towards the further transmission of the virus. Distance education is not an easy process for the following reasons:

- Learner and teacher are in different places
- Both teachers and learners do not have a good level of technology use skills
- Lack of equal opportunity especially for learners in access to technology

- The need for more interactive materials unlike the materials used in formal education
- Having unique teaching methods,
- Greater responsibility for learners to learn autonomously than in formal education

In the context of the above information, it can be said that distance education is a process that requires having sufficient knowledge and experience in addition to having infrastructure, equipment, hardware and software. In this sense, especially Moore and Kearsley (2012) define distance education as follows: "Distance education is planned learning and teaching where the teaching function usually takes place in a different place than learning, requiring communication through technologies as well as a private corporate organization." This definition can be regarded as the definition that best describes distance education provided by universities as an alternative to formal education, which was interrupted due to the Covid-19 pandemic. The reason is that distance education is mostly seen as a process, in which learners try to learn any subject voluntarily in a different place and time period from the learning environment. While emergency distance teaching activities provided by universities due to the Covid-19 pandemic do not require spatial unity as in formal education, they made it necessary to carry out the lessons in a planned and interactive manner because they include a certain common time, a curriculum that needs to be followed, interaction and a valid-reliable measurement and evaluation. From this point of view, as Karadag and Yucel (2020) stated, although distance teaching is not an easy process and the universities were caught unprepared for distance education due to the fact that YOK (The Council of Higher Education) has allowed distance education up to 30% of formal programs and attached importance to digitalization in the context of internationalization regarding the future of higher education for the last decade, the planning of the relevant process and the distance education of the lessons started in a short time. In this regard, Anadolu University can be cited as an example. Dating back to 1981 Open Education Faculty started its service as the first faculty to provide education in higher education with the principle of equal opportunity with high standards and through open and distance education. In the first year, 29,500 students were enrolled in Economics and Business Administration undergraduate programs (https://www.anadolu.edu.tr/). Even though universities have begun to adapt rapidly to the emergency distance teaching process, especially in the context of theoretical courses, the same is not the case for Turkish Teaching Centers operating within their organization. Although the relevant centers started distance teaching in order to prevent interruption of the Turkish learning process of international students, various difficulties were encountered in the process. The target audience's learning of Turkish as a foreign language, teachers' lack of experience in distance Turkish teaching, lack of materials for distance Turkish teaching, the inadequacy of the technological infrastructure (programs) used by universities for distance teaching activities in terms of teaching all the listening, reading, speaking and writing skills that should be taken as a whole in language teaching and should be acquired by the student in an interactive way, the necessity for distance language teaching to be carried out simultaneously, Turkish language learners and teachers' attitudes towards technology, their distance learning and teaching experiences, teachers' perspectives on distance language learning and teaching, their technology use competence and access to technology, class size and similar issues directly affected the distance Turkish teaching process in language learning and teaching. This is because, as Adiyaman (2002) stated, foreign language teaching through distance education requires special teaching methods and in cases where geographical and administrative factors make distance education preferable, it is extremely important to provide interactive communication in the foreign language learning process for success. Likewise, it is an extremely difficult task to design, prepare and implement a web-based distance language teaching program. Web-based distance language teaching is an interdisciplinary study that brings together educators working in the field of language teaching and experts working in the field of technology (Pilanci, 2015). For this reason, she underlined that effective distance teaching is not an easy matter in language teaching. In addition to this information, Pecenek (2005) lists the features that tools should have when it comes to distance language learning. They should:

- be effective (innovation, change, interesting presentation, attractive content) and applied in an interesting way,
- make the learners feel comfortable,
- develop the learners' confidence and give a sense of achievement,
- direct the learner to use the original language,

- allow learners to use the target language for communicative purposes,
- allow for individual implementation,
- contain activities that stimulate right-left brain functions,
- allow self-assessment,
- help learners to develop cultural awareness and sensitivity,
- reflect the reality of language use,
- help learners to learn in similar conditions in which they will use the language.

Considering the features listed above, it cannot be said that the emergency distance Turkish teaching activities carried out in Turkish teaching centers fully meet the relevant characteristics. The main reasons for this situation are both the lack of experience of the relevant centers in distance education and an unprepared introduction to the process in the context of Turkish teaching. So much so that this study focused on Turkish teaching in Turkish Teaching Centers after the Covid-19 pandemic in the context of teacher opinions, which is one of the most important pillars of the process. As Baris and Cankaya (2016) stated, the most important actors of the education process are the teaching staff. For this reason, it is of great importance to evaluate the opinions of the relevant lecturers on the implementation of distance education, both in terms of restructuring the ongoing processes and shaping future studies accordingly. In this context, an answer to the question "What are the teachers' views on distance Turkish teaching after Covid-19?" was tried to be sought in the research.

METHOD

In this study, which was created using the mixed method, one of the basic research methods, quantitative and qualitative methods were used together in collecting the data while determining the views of those who teach Turkish as a foreign language about the emergency distance Turkish teaching after Covid-19. Since the relevant data were collected simultaneously from those who voluntarily participated in the research, the research was designed with the convergent parallel mixed method, which is one of the mixed method types. In the convergent parallel design, quantitative and qualitative data are collected and analyzed at the same time. Both data types are of equal importance to the researcher and the data is not intended to confirm each other. Data analysis is usually done separately and aggregation is done in the process of interpreting the data. The reason for collecting data using both methods in the study is that, as Creswell and Plano Clark, (2007) stated, the use of qualitative and quantitative research methods together or in a blend will provide a better understanding of research problems and questions than using these methods separately. Likewise, Morse (2003) states that more daydetailed and complete information about human behaviors and experiences can be obtained by using more than one method in research, and thus research objectives can be achieved more quickly. In this connection, the steps applied within the scope of the research method are as follows:

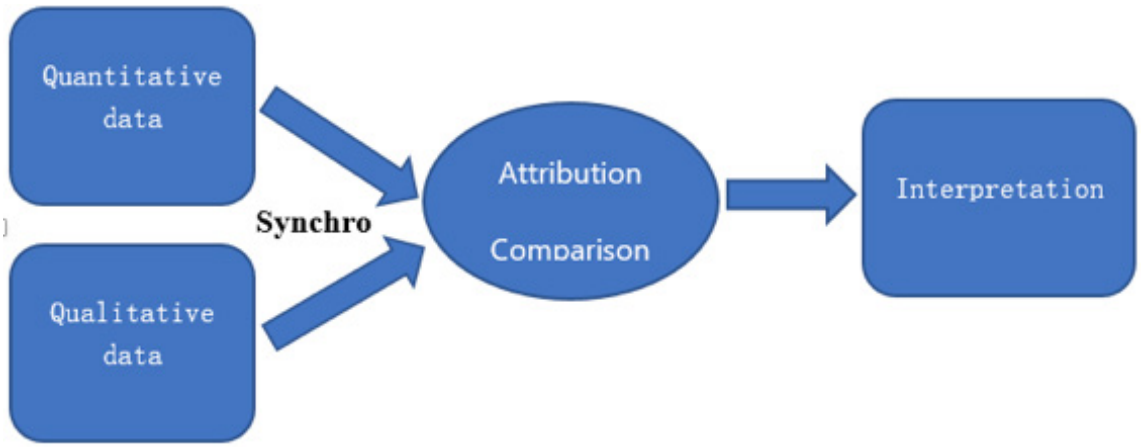

Figure 1. Method design of the research

Data Collection Tools and Collection of Data

In the research, the quantitative data of the teachers were collected with the "Emergency Distance Turkish Teaching Questionnaire after Covid-19" prepared by the researchers. Qualitative data, on the other hand, were collected using a semi-structured interview form created from open-ended questions. The questionnaire consists of 2 parts and 18 questions. In the first part, 6 questions are for the personal information of teachers and 12 questions are for determining their views on distance Turkish teaching. Because the demographic characteristics of the target audience and their views on a subject can be determined through the questionnaire (Buyukozturk, 2005), a questionnaire was used in the relevant study. In this context, the preparation of the relevant questionnaire was carried out in four stages. In the first stage, the difficulties experienced in distance Turkish teaching after Covid-19 were investigated and based on the compiled findings, the second stage of questionnaire development - item writing - was started. After the relevant items were written and the draft form was prepared, expert opinion was consulted and experts were asked to evaluate the items in terms of both content and language control. The questionnaire, which was finalized in line with expert opinions, was filled out by five lecturers working in Aydin TOMER (Istanbul Aydin University Turkish Language Teaching, Application and Research Centre) for pre-application and when no negative opinions were received from the relevant instructors, the questionnaire was finalized and applied to other teachers working in the relevant field via "Google Form".

The semi-structured interview form, also was composed of 7 items by the researchers in order to reveal in more detail the teachers' views on distance Turkish teaching after Covid-19. In line with expert opinions, three items were removed and a form consisting of four open-ended questions was prepared. Meetings could not be held face to face due to the epidemic. Therefore, qualitative data were collected by conducting online meetings with each teacher who answered the questionnaire and agreed to be interviewed. In addition, the participants who could not spare time for the online interview were sent the relevant form via the Google form and were asked to reflect their views in writing. In the study, both quantitative and qualitative data on teachers were collected in a period of approximately one month.

Analysis of Data

The data obtained through the "Distance Turkish Teaching Questionnaire after Covid-19"" used in the collection of quantitative data in the research were transferred to the Excel table and interpreted by creating a meaningful whole through the tables with percentage (%) and frequency (f). Content analysis was used in the analysis of the data obtained from the semi-structured interview form used to collect the qualitative data of the research. The relevant analysis process was carried out in three stages as code-category-theme, as stated by McMillan and Schumacher (2010). In this context, each participant was numbered in accordance with ethical rules in the data collected. Common codes are categorized in the context of the questions that are sought to be answered in the research. The common codes obtained were themed and transferred to tables. Besides, the qualitative findings obtained were supported by direct or indirect quotations, and at the last stage, associations were made and presented to form a meaningful whole. In this context, the relevant process can be described as follows.

Participants

The study group of the research consisted of teachers who give a distance lecture to foreign students studying at Turkish Teaching Centers affiliated with universities. In this context, in line with the purpose of the research, teaching Turkish with formal education before Covid-19 and with distance education after Covid-19 was deemed necessary for participation in the research. Since participants who fulfill this requirement and who can be reached easily are needed, easily accessible situation sampling, which is one of the purposive sampling methods, was used in the study. Easily accessible situation sampling is often used when the researcher is not able to use other sampling methods (Yildirim & Simsek, 2013). In this context, it was tried to collect both quantitative and qualitative data at the same time from 137 teachers who voluntarily approved to participate in the research. The demographic information of the participants in the research is as follows.

Table 2. Teachers' educational information

Education Status	f	%
Undergraduate	32	23,4
Postgraduate	81	59,1
Doctorate	24	17,5
Total	137	100

Of the 137 teachers participating in the research, 81 have master's degrees, 32 have bachelor's degrees and 24 have doctorate degrees.

Table 3. Information on the departments the teachers graduated from

Department	f	%
Turkish Language and Literature	65	47,4
Turkish Language Teaching	48	35
Any foreign language education department	9	6,6
Linguistics	8	5,8
Contemporary Turkish Language and Literature	2	1,5
Classroom Teaching	2	1,5
Other	3	2,1
Total	137	100

According to Table 3, the departments of the majority of teachers teaching Turkish to foreigners are Turkish Language and Literature (n=65) and Turkish Language Teaching (n=48). Other departments are, respectively, any foreign language education department, Linguistics, Contemporary Turkish Language and Literature, and Classroom Teaching.

Table 4. Information on teachers' experiences in the field

Experience	f	%
0-1 year	19	13,9
1-3 years	31	22,6
3-5 years	33	24,1
Over 5 years	54	39,4
Total	137	100

When Table 4 is examined, it was identified that 39,4% of those who teach Turkish to foreigners have more than 5 years of experience in the field. There are teachers with 3-5 years (24,1%), 1-3 (22,6%) years, and less than 1 year (13,9%) of experience, respectively.

FINDINGS AND INTERPRETATION

Quantitative Findings

Table 5. Information on teachers' training in technology use

	f	Yes	f	No
Have you received training in the use of technology for language teaching?	51	37,2%	86	62,8%
Did you receive in-service training from your institution after the transition to distance education was determined?	44	32,1%	93	67,8%

When Table 5 is examined, it was determined that most of the teachers (62,8%) have not received any training on technology use in language teaching. With this result, it can be interpreted that teachers have learned how to use language teaching in technology with their own means during distance education.

Looking at the same table again, it can be seen that 67,8% of the teachers working in institutions that switched to distance education with the pandemic process did not receive in-service training for distance education from their own institutions.

Table 6. Teachers' experiences of distance Turkish teaching before Covid-19

	f	%
No, I have no experience.	105	76,6
Yes, I have a short-term experience.	19	13,9
Yes, I have more than a year of experience.	13	9,5

It was established that 76,6% of the teachers teaching Turkish to foreigners did not have experience in distance Turkish teaching before the pandemic process. While the rate of teachers with less than one year of experience was 13,9%, the rate of those with more than one year of experience was 9,5%.

Table 7. Information on the number of students in transition to distance education

	f	%
The number of my students has not changed.	41	29,9
The number of my students decreased with distance education.	90	65,7
The number of my students increased with distance education.	6	4,4

With the transition of Turkish lessons to distance education during the pandemic, changes were observed in the number of students attending the lessons. In this context, when Table 7 is examined, it was determined that the number of students of most of the teachers (65,7%) has decreased.

In this section, the opinions of teachers who teach Turkish as a foreign language about distance Turkish teaching after Covid-19 are included.

Table 8. Views on the easiest and hardest skills to develop in distance teaching

	Listening	Reading	Speaking	Writing
Easiest	21,9%	25,5%	50,4%	2,2%
Hardest	16,1%	6,6%	15,3%	62%

When Table 8 is examined, it was identified that teachers think that the easiest skill to develop in distance education is speaking (50,4%) and the hardest is writing (62%). In this context, it can be said that developing narrative skills in distance Turkish teaching is harder than comprehension skills.

Table 9. Views on the ideal class size in distance Turkish teaching

Number of Students	f	%
1-5	20	14,6
6-10	84	61,3
11-15	29	21,2
Over 15	4	2,9

When Table 9 is examined, teachers (61,3%) stated that the ideal class size should be 6 to 10 students. A small group of 2,92% stated that the ideal class size for distance teaching is over 15 students. In this context, it can be inferred that distance Turkish teaching to a student group of 15 or more will not be efficient.

Table 10. Teachers' views on the suitability of class sizes for distance Turkish teaching

View	f	%
Suitable	92	67,2
No	45	32,8

When Table 10 is examined, it was determined that the class sizes are suitable for most of the teachers (67,2%). In this context, it can be said that the classes of the teachers in distance Turkish teaching consist of groups of 6-10 students on average. The reason is that as can be seen in Table 7, teachers stated that the number of students attending the lesson decreased when distance Turkish teaching was started.

Table 11. Views on how measurement takes place in distance education

View	f	%
Process oriented	103	75,2
Result oriented	34	24,8

When Table 11 is examined, it was established that teachers (75%) make measurement and evaluation in the distance education process in a process-oriented manner. In this context, the data showing the criteria of homework, in-class participation, and exam scores that teachers use for process-oriented measurement and evaluation are as follows.

Table 12. Average of measurement and evaluation scores in distance education

Implementation	f	%
Exam	47	34,1
In-class participation	46	33,7
Homework	44	32,2

Looking at Table 12, it is seen that in process-oriented measurement and evaluation, 34,1% of the teachers use the exam, 33,7% in-class participation and 32,2% homework as a criterion in terms of measuring.

Table 13. Views on the easiest and hardest skills to measure in distance education

	Listening	Reading	Speaking	Writing
Easiest	13,1%	21,2%	60,6%	5,1%
Hardest	17,5%	10,2%	14,6%	57,7%

Looking at Table 13, teachers stated that the easiest skill to measure in distance Turkish teaching is speaking (60,6%) and the hardest skill is writing (57,7%).

Table 14. Students' adaptation to distance education

	f	%
Yes	45	32,8
No	13	9,5
Partially	79	57,7
Total	137	100

When Table 14 is examined, while more than half of the teachers (57,7%) stated that students partially adapted to distance education, 32,8% of the teachers stated that their students adapted to distance education.

Table 15. Teachers' views on their perspectives on distance education after Covid-19

Perspective	f	%
My perspective was positive before, and it is still positive.	46	33,6
My perspective was negative before, and it is still negative.	25	18,2
Yes, my perspective was negative before, but now it is positive.	53	38,7
Yes, my perspective was positive before, but now it is negative.	13	9,5

When Table 15 is examined, it was determined that Turkish teachers who switched from face-to-face teaching to distance teaching due to Covid-19 had a negative (38,7%) perspective on internet-based distance teaching, but their perspectives turned into positive. Furthermore, it is seen that the perspectives of a section of 33,6% have not changed, that is, their perspectives, which were positive before, are still positive. However, it is noteworthy that the perspective of a group (9,5%) who had a positive perspective before the pandemic changed negatively after the pandemic.

Table 16. Teachers' views on ways of developing themselves in distance Turkish teaching

Development	f	%
I watch what I can do through the videos.	93	67,9
I adapt the applications I have just learned for my own lessons by looking at what is done from the distance education systems of foreign languages.	86	63,5
I attend seminars.	83	60,6
I want help from my colleagues who are experienced in distance education.	63	46,7
I read academic articles.	62	45,3

When Table 16 is examined, it was determined that most of the teachers (67,9%) watched videos about the field in order to improve themselves and learned what they could do with these videos and integrated them into their own lessons. As the second choice, the participants (63,5%) aimed to improve by analyzing the distance education systems in foreign languages and adapting the learned new ideas to their own lessons. In addition, it is observed that teachers try to complete their individual development by reading academic articles, attending seminars on the internet, watching various videos and getting ideas, examining the distance education systems of foreign languages and applying them to their own lessons, getting help from their colleagues or trying to achieve their own development. Moreover, the reason why the frequency sum is not equal to the total participant is that in this item, teachers are given the opportunity to tick more than one option.

Table 17. Views on whether distance Turkish teaching is implemented properly or not

	f	%
Yes, distance teaching is being implemented successfully in the field.	16	11,7
No, there are serious problems in the implementation of distance teaching in the field.	27	19,7
Distance teaching is partially implemented in the field, but there are some deficiencies.	94	68,6

Looking at Table 17, it was identified that 68,6% of the participants have the view that there are deficiencies in distance Turkish teaching. While 19,7% of them argued that teaching could not be achieved successfully, 11,7% of them found the implementation of distance teaching in the field successful.

Table 18. Views on having sufficient course material for distance Turkish teaching

	f	%
Yes	7	5,1
No	78	56,9
Partially	52	38

As can be seen in Table 18, it was determined that more than half of the teachers (56,9%) had the view that the course materials used in distance teaching were not sufficient. 38% of the teachers think that it is partially sufficient. The rate of those who think that there is sufficient material in distance education is 5,1%, which should be emphasized especially. In this context, the views of the teachers regarding the preparation of the course contents in distance Turkish teaching are as follows:

Table 19. Information on the preparation of course contents in distance teaching

	f	%
I am using original material.	102	74,5
I am using a textbook.	96	70,1
I am using ready-made materials for distance teaching.	44	32,8

Looking at Table 19, it was established that teachers first preferred original materials (74,5%) they created to use in distance teaching and they used the textbooks (70,1%) secondly and finally the ready-made materials for distance teaching (32,8%).

Table 20. Views on the 5 most commonly used applications in distance Turkish teaching

Application	f	%
Zoom	52	38
Youtube	41	30,5
Kahoot	33	24,6
Edmodo	18	13,4
Quizlet	17	12,6

When Table 20 is examined, it was determined that "Zoom" application takes the first place with 38% in the first 5 applications that teachers use most in distance teaching. Other applications are Youtube (30,5%), Kahoot (24,6%), Edmodo (13,4%) and Quizlet (12,6%), respectively.

Table 21. Information on whether distance Turkish teaching can replace face-to-face teaching after Covid-19

	f	%
Yes	25	18,9
No	93	68,6
Partially	13	10,2

When Table 21 is examined, it is seen that 68,6% of the teachers stated that face-to-face teaching cannot be replaced by distance teaching after the pandemic is over. In addition to that, 18,9% of the teachers stated that face-to-face teaching might take the place of distance teaching after the pandemic is over.

Qualitative Findings

Views on What is Done to Increase the Motivation of Students in the Process of Distance Turkish Teaching

Table 22. Views on what is done to increase the motivation of students in distance Turkish teaching

Applications to increase motivation	Individual interest	(P1, P2, P3, P5, P18, P23, P38, P46, P64, P76, P82, P85, P95, P103, P112, P114)	Using different technology tools	(P9, P26, P27, P35, P48, P96, P97, P108, P115, P119, P120, P128)
	Supportive advice	(P24, P31, P42, P45, P49, P50, P51, P52, P54, P59, P67, P77, P91, P100, P107, P111, P113)		
	Fun activities	(P8, P10, P11, P12, P13, P17, P28, P22, P29, P33, P41, P44, P47, P53, P55, P56, P57, P61, P66, P68, P69, P70, P71, P72, P73, P75, P79, P81, P86, P90, P92, P102, P105, P106, P126, P131)	Awarding	(P4, P25, P80, P109)

When Table 22 is examined, the situations that teachers use to increase students' motivation are divided into 5 themes: individual interest, supportive advice, fun activities, using different technology tools and awarding. In this context, themes are examined below.

Individual Interest: During the pandemic, teachers individually dealt with students who were away from their families for both lesson motivation and general motivation. In their statements, they stated that they dealt with the students individually through different tools: P2 *"Need attention and follow-up. I am dealing with them through all kinds of communication tools"*, P3 *"I am trying to deal with the students individually"*, and P64 *"I dedicate the first 10/15 minutes of my lessons to listening to them. We are chatting and I want them to explain their problems. I am trying to find solutions. We are in contact at all times and I answer every question from either Zoom or Whatsapp"*, P85 *"I'm calling them. It is good to hear each other's voices. We are texting on Whatsapp and I try to answer their questions no matter what time it is"*.

Supportive Advice: The teachers supported the students with encouraging speeches and nice words that gave them hope that they would learn Turkish. In this process, they reminded that they could learn Turkish at home in order to improve themselves and gave various recommendations. They emphasized that they give support and motivation to students with their views: P31 *"I always motivate them by making positive reviews. I make them confident"*, P49 *"Convincing them to believe this by making speeches that they will learn the language, being in good relationship with the student, and continue to follow so that they do not give up"*, P52 *"Giving students encouraging conversations, making them believe they will succeed, and empathizing through one-on-one meetings"*, and P111 *"I talk a lot about the awareness that this process gives us. I make them realize how much they have improved online"*.

Fun Activities: In order to increase the motivation of the students, it was determined that the teachers prepared different contents and benefited from songs, videos and short films. These teachers' views indicate the motivational tools they use against students: P17 *"First I start with the song. Then I occasionally tell about daily life events. Our sine qua non is an anecdote. Occasionally educational games. Finally, short documentaries"*, P33 *"I make them watch theatrical videos, listen to songs, play games, do creative drama and solve puzzles"*, P79 *"I share videos, audio recordings, and news that will attract students' attention. I assign a movie watching homework and talk about the movie. I use images or videos related to the subject I am telling. I definitely ask the students' opinions on the subject and try to keep them active in the lesson"*, and P102 *"I'm trying to create fun games. I have videos on the subject. When I realize that they are bored in the lesson, I have them watch a short animation. I want them to show and interpret different pictures"*.

Using Different Technology Tools: The opinions of the teachers who try to keep students in the lessons and to make a positive contribution to their motivation by using technology-based applications are as follows: P26 *"I use up-to-date resources that will work for them and every opportunity provided by technology. Thus, the lessons are far from monotonous and more creative",* P27 *"I find materials that may be of interest to them in parallel with the course topics and I want homework related to them. I use Web 2.0 tools more often to place them in the course",* P35 *"I use videos. I use short movies. I am trying to use Edpuzzle, Padlet, Kahoot etc. I share the latest news. I try to be in constant interaction with Whatsapp",* and P48 *"I use posters, word programs, listening, writing and reading programs".*

Awarding: Another element that teachers apply to increase the motivation of students during the pandemic process is awarding. Turkish teachers aimed to change the morale of their students positively with the awards they gave both verbally and via the internet within the limits of their possibilities: P4 *"I give small awards, I praise them a lot",* P25 *"I give motivating small symbolic prizes to students",* P80 *"I offer awards such as tea and coffee break",* and P109 *"I give award points".*

Views on Ensuring that Students are Active in Distance Teaching

In the distance teaching process, the methods teachers use for their students to be active in the course are interpreted by collecting under 4 themes: individual addressing, encouragement, assignment and creating a competitive environment.

Table 23. Views on what is done for students to be active in distance teaching

Themes for students to be active	Individual addressing	(P4, P5, P6, P9, P11, P14, P20, P21, P28, P32, P45, P51, P74, P75, P79, P86, P115, P134)	Encouragement	(P1, P29, P50, P52, P60, P77, P131)
	Assignment	(P8, P10, P17, P24, P31, P34, P36, P38, P46, P56, P59 P67, P69, P71, P72, P73, P90, P92, P94, P99, P105, P107, P108, P121, P122, P125, P128)	Creating a competitive environment	(P39, P48, P49, P98, P102, P106, P109)

Individual Addressing: Teachers address students individually in order to be active in the lesson. In this context, they tried to attract them to the lesson by giving the right to speak one by one and addressing them with their names: P6 "*I address them by their names*", P51 "*I talk to the student one to one*", P79 "*I give the students the right to speak in turn, I get answers to my questions*", and P134 "*I give the word one by one by addressing their names*".

Encouragement: As can be exemplified by the following views, teachers try to encourage their students to keep them active during the lesson: P1 *"I encourage them to talk*", P29 "*I encourage them with motivational words. So I encourage them to attend the class*", and P77 "*I say words of encouragement at every step*".

Assignment: Teachers stated that they assign individual tasks to students in distance education as another way to keep students active in the lesson: P10 *"I assign individual tasks in which they will be active*", P67 "*I have them make presentations at advanced levels one by one*", *P99 "I make them prepare for the next lesson by assigning them, I have the right to speak during the lesson, I want a written answer during the lesson, I ask true-false, yes-no or multiple-choice instant questions during the lesson",* and P108 *"I'm sharing events. I give task-oriented assignments. I set time for them to make presentations. Students speak, and students ask".*

Creating a Competitive Environment: It was determined as another way of keeping students active in the lesson. Teachers tried to keep the students in the lesson with various competitions they held over the internet: P102 *"We organize competitions with different Web 2.0 tools. As the competition increases, the students become more active in the lesson. I give different tasks. I allow them to share screens and make presentations in lectures*", and P109 *"I organize competitions by including students in games".*

Views on the Positive and Negative Aspects of Distance Turkish Teaching

Table 24. Positive aspects of distance teaching

Positive Aspects	Ease of sharing course material	(P34, P91)	Accessing the course again	(P8, P61, P93, P103, P108, P114, P125, P127, P128)
	Affordability	(P6, P13, P29, P35, P45, P47, P94, P97, P111, P117, P118, P121, P130)	No distance and space problems	(P14, P17, P19, P25, P26, P36, P40, P43, P62, P66, P67, P71, P73, P83, P85, P99, P104, P112)
	Comfortable environment	(P10, P51, P57, P60, P72, P80, P110, P119, P131)	The diversity of the virtual environment	(P18, P22, P33, P38, P46, P48, P86, P126)
	Free time	(P5, P11, P20, P28, P105, P122)	Being away from in-class negativity	(P24, P106)
			Saving time	(P4, P7, P9, P12, P15, P23, P30, P41, P49, P53, P64, P65, P76, P79, P88, P93, P96, P102, P107, P134)

As can be seen in Table 24, teachers' views on the positive aspects of distance teaching are grouped under nine different themes. The relevant themes and the views of the teachers under these themes are as follows:

Ease of sharing course material:

P34- "*Since the notes taken in the course are sent as PDF, the student leaves a very nice note like a book at the end of the lesson."*

P91- *"It provides convenience in terms of material access and sharing during the lesson."*

Accessing the course again:

P8- "*Students can watch the recording of the course again from wherever they want."*

P93- *"Since the trainings are recorded, they can be watched over and over again."*

P61- *"Students make up for their shortcomings with the recorded courses. Accessibility has increased."*

Affordability:

P13- *"It saves students time and money."*

P35- *"We can take lessons from our home. Our expenses decreased because we did not leave the house."*

P117- *"Economically requires less cost."*

No distance and space problems:

P25- *"Removing the space boundary, eliminating the concept of distance, reaching more people."*

P66- *"Being able to participate in education from all over the world."*

P71- *"Location doesn't matter. The course can be attended wherever desired."*

Creating a comfortable environment:

P51- *"Home comfort. (pyjamas, tea, coffee, how nice!)"*

P60- *"It is a great comfort for students and teachers to be able to take lessons from home."*

P110- *"I have lessons by drinking coffee and tea, I create a comfortable environment."*

Benefiting from the diversity of the virtual environment by teachers and students:

P38- "*I direct them to resources and applications that can be accessed and interested in the virtual environment."*

P46- *"It is easier to attract the attention of the student thanks to different teaching tools."*

P48- *"You can use many applications at the same time, using the opportunities of the internet is unlimited."*

Free use of time:

P28- *"There is no time limit, so we can do lessons at any time during the day."*

P105- *"Lesson hours are more flexible. Being able to extend the time when necessary."*

P122- *"Flexibility of course hours."*

Being able to move away from in-class negativity:

P106-"*The noise in the classroom environment is not on the internet, I do not waste time with warnings such as stop-and-shut. Students sitting in the back can listen to the lecture directly. They can adapt to the lesson in a quiet environment."*

Saving time:

P102- *"In a big city like Istanbul, it is very time consuming to commute to classes, so the time we spend on the road in distance* teaching *is now left to us."*

P93- *"It saves time from negativities such as road and traffic."*

P96- *"The time spent at home is used efficiently."*

Table 25. Views on the negativities of distance teaching

Technical problems	(P4, P2, P8, P13, P15, P19, P21, P22, P26, P34, P38, P41, P46, P50, P56, P57, P60, P62, P64, P66, P71, P74, P79, P84, P88, P94, P96, P99, P102, P106, P111, P114, P118, P121, P122)
Student participation	(P5, P11, P14, P20, P23, P27, P35, P36, P40, P45, P53, P54, P65, P70, P78, P81, P91, P107, P112, P117, P119, P128, P130, P131)
Lack of course material	(P32, P33, P95, P37, P42, P69, P100, P103, P110, P113, P115, P116, P124, P125, P126, P127, P132, P133)
Low motivated students	(P18, P24, P25, P55, P63, P75, P86, P109, P128)
Class management	(P7, P17, P30, P47, P48, P49, P61, P124)
Lack of writing skills	(P9, P43, P67, P73, P82, P92, P105)
Measurement and evaluation problem	(P10, P12, P28, P41, P83, P113)

As can be seen in Table 25, it was determined that teachers mostly have trouble in distance teaching due to technical problems (32,4%) *(P4- "Voice problem and interaction is weak because students do not open cameras", P50- "The biggest problem at the moment is the lack of technological infrastructure").* The course, which is affected by the problems in the system, internet speed, and problems with sound and video during distance teaching, constitutes an obstacle to teaching for teachers. Another difficulty was identified as student participation (21,2%) *(P23- "Students are reluctant to participate in the lesson and therefore participation is low", P128- "Students' participation decreases").* With the comfort of being at home in distance teaching, not being followed by the teacher because the camera is not turned on, laziness and demoralization caused by the pandemic, sufficient participation of the students to the lesson cannot be achieved. For this reason,

teachers had problems as they could not provide mutual active teaching during the course. In addition to these problems, students who do not have necessary materials such as computers and internet for distance teaching (12%) *(P32- "Students have lack of microphone and computer", P103- "Not every student has internet opportunity"),* students with low motivation due to the pandemic (8,3%) *(P24- "Students cannot catch the motivation in the classroom", P75- "Writing is a big problem, there are many alternatives, but I think students do not want to do it because their motivation is low. Of course, health anxiety also affected negatively")*, teachers who cannot master the classroom because they cannot see everyone at once (7,4%) *(P7- "I cannot follow up the student who leaves the class during the lesson", P124- "Classroom management skills cannot be used in online programs as in formal education"),* teachers' lack of information on how to improve students' writing skills (6,4%) *(P9- "Lack of suitable programs that can support the writing skill", P105- "Inability to dictate for writing, or evaluate the result of dictation"),* inability to make clear measurement and evaluation on the internet (5,5%) *(P41- "Reliability problem in measurement and evaluation", P113- "I think the measurement and evaluation process is difficult")* have been identified as other negatives.

Views on Recommendations for Turkish Teachers who will Teach Turkish for the First Time in Distance Education

Table 26: Recommendations for first-time lecturers in distance education

Recommendations	Individual development	(P1, P18, P24, P33, P75, P86, P95, P109, P124, P126, P128, P132)	Getting training	(P25, P32, P55, P63, P115)
	Creating fun activities	(P37, P42, P69, P100, P103, P110, P125)	Going off the book	(P113, P116, P127, P133)
	Getting help from colleagues	(P3, P5, P11, P14, P20)	Dealing with students individually	(P23, P27, P36, P35, P40, P45, P107)
	Assigning tasks to the students	(P53, P54, P65)	Planning ahead	(P7, P10, P12, P17, P28, P30, P44, P47, P48, P49, P61, P70, P78, P81, P91, P112, P117, P119, P130, P83, P93, P131)
	Preparing original material	(P2, P4, P8, P13, P15, P21, P34, P50, P71, P74, P79, P99, P102,)	Having problem solving skills	(P19, P22, P26, P38, P41, P46)
	Being patient	(P56, P57, P60, P62, P64, P66, P84, P88, P94, P96, P106)	Mastering technology	(P6, P9, P51, P67, P105, P43, P72, P73, P77, P82, P92, P111, P114, P118, P121, P122, P134)
	Making all students talk	(P90, P16, P108)	Managing time well	(P29, P31, P39)

When Table 26 is examined, it was determined that teachers' recommendations for first-time lecturers in distance education are as follows: individual development, getting training, creating fun activities, going off the book, getting help from colleagues, dealing with students individually, assigning tasks to students,

planning ahead, preparing original materials, having problem solving skills, being patient, mastering technology, making all students talk and managing time well. In this context, teachers suggested the following to their colleagues who will teach Turkish from distance education for the first time:

- Developing themselves both in terms of knowledge and in the field of technology
- Training in technology and computer use, if necessary
- Having the ability to provide immediate solution to any possible problem.
- Being patient no matter what happens
- The necessity of creating original materials and providing fun activities to the lesson
- The necessity of making a plan before each lesson, considering that unplanned lessons will be disrupted.
- Communicating with each student and enabling students to talk one by one and become active in the lesson
- Being able to manage the short lesson time well

DISCUSSIONS AND CONCLUSION

Considering the technological, pedagogical and social difficulties experienced in the distance teaching process (Ferri, Grifoni & Guzzo, 2020), it is seen that one of the most fundamental factors affecting learner success in the distance teaching process is "teacher competence". This is because, considering that the achievements of the learners are directly affected by the competencies of the instructors, as Gurer, Tekinarslan and Yavuzalp (2016) stated, determining the views of the instructors about the distance education process is important for the improvement and development of the distance education system. In the study conducted in line with this understanding, based on the data obtained from the "Distance Turkish Teaching Questionnaire after Covid-19"", it was identified that the teachers had not received any training for distance Turkish teaching before, but after Covid-19, they were given in-service training for distance Turkish teaching by the institution they worked with. Moreover, due to the fact that most of the teachers do not have experience in distance Turkish teaching, it can be said that the relevant teachers were inexperienced at first, even though distance Turkish teaching activities were started after the Covid-19 pandemic.

In the research, it was determined that teachers think that the easiest skill to develop in distance Turkish teaching is speaking, and the hardest is writing. In this context, it can be said that developing narrative skills in distance Turkish teaching is more difficult than comprehension skills. The teachers stated that the ideal class size for distance Turkish teaching should be 6 to 10 students and it was established that their own class sizes were also in this range. In this regard, it can be said that teachers' classes in distance Turkish teaching consist of groups of 6-10 students on average.

In the research, it was determined that teachers make process-oriented measurement and evaluation in the distance teaching process. Since teachers use homework, participation in class and exam as criteria in process-oriented measurement and evaluation, it can be said that teachers make an appropriate measurement and evaluation for the functioning of distance teaching. In addition to this information, teachers are of the opinion that the easiest skill to measure in distance Turkish teaching is speaking, and the hardest one is writing. In this context, especially the paper-based teaching of writing skill in TOMER and the fact that the distance teaching programs used by the related centers do not have an infrastructure to measure the writing skills are two of the main reasons for this situation. Karakus et al. (2020) identified that almost no activities were carried out for the writing skill in lessons as one of the issues that teacher candidates insistently emphasize. In this context, it can be said that the use of this skill is incomplete since distance education systems do not support writing, which is one of the language skills.

In the research, more than half of the teachers stated that their students partially adapted to distance Turkish teaching. In this sense, it can be interpreted that students' transition from face-to-face teaching to distance teaching for an unexpected reason negatively affected their adaptation process. This situation reveals the importance of Gurkan's statement even if there is a spatial difference in distance education, it does not seem possible for the student to learn without mental participation (2020). The reason is that

when students cannot adapt to the lesson, it is difficult to learn adequately. Similarly, Karakus et al. (2020) found that teacher candidates' motivations in the lessons in the distance education process are very low. In this context, it can be said that low motivation in distance education is a general problem. In the research, it was determined that Turkish teachers who switched from face-to-face teaching to distance teaching due to Covid-19 had a negative perspective on internet-based distance education before, but turned into positive later. In this context, it can be said that the related teachers have positive perceptions that Turkish can be taught with distance education. In addition to this information, when we look at the opinions of the teachers about how they improve themselves in distance Turkish teaching, it was established that most of them first watched videos about the field and learned what they could do with these videos and integrated them into their own lessons. Secondly, it is seen that teachers are trying to improve by examining what is done in the distance education systems of foreign languages and adapting the learned new ideas to their own lessons. Apart from these, it was identified that teachers try to complete their personal development by reading academic articles, attending seminars on the internet, watching various videos and getting ideas, examining the distance teaching systems of foreign languages and applying them to their own lessons, getting help from their colleagues or trying to achieve their own development. This situation can be explained by the lack of information about distance education in the relevant field.

In the research, it was determined that some of the teachers have the view that distance Turkish teaching has deficiencies. However, even though there are various deficiencies, the high rate of those who think that distance Turkish teaching is done effectively is an important issue for the related field. In addition to these findings, more than half of the teachers have the opinion that the course materials used in distance teaching are not sufficient. Although instant material sharing in distance teaching is seen as positive both in this study and in the study of Gungor, Cangal and Demir (2020), the lack of material is a very important deficiency in distance Turkish teaching. The fact that the rate of those who think that there is enough material in distance education is very low is an issue that should be especially emphasized because this rate actually gives an important clue about the need for materials prepared for distance Turkish teaching. In this context, considering the findings of teachers' opinions on the preparation of course contents in distance Turkish teaching, it was determined that teachers first preferred the original materials they created to use in distance Turkish teaching. Secondly, it was established that they made use of textbooks and finally, ready-made materials for distance education. In this connection, considering the rate of use of textbooks, it can be said that distance Turkish teaching activities are carried out over the textbooks used in formal education. Within this scope, considering the study of Karadag and Yucel (2020), this problem is actually a result of the transition to compulsory distance teaching. This is because according to the study conducted with 17,939 students in 111 state and 52 private universities across the country, students complained that their faculty members shared the ready-made content instead of producing original content, the material was not relevant to the course, and the content was technically poor.

In the research, it was identified that the "Zoom" application took the first place in the first five applications that teachers use most in distance teaching. When the studies were examined, it was determined that the "Zoom" application made positive contributions to both teachers and students in online education (Nurieva & Garieva, 2020; Ramadani & Xhaferi, 2020). Other applications used by teachers are Youtube, Kahoot, Edmodo and Quizlet, respectively. Ilyas and Putri (2020), Nami (2020), Yuliyanto et al. (2020) stated in their studies that applications such as "Youtube" and "Edmodo" increase students' speaking skills and are complementary elements in language teaching. Considering the applications used in this context, it can be said that the reason for teachers to choose these applications is to increase the interaction with the student more.

Based on the quantitative findings of the research, it was determined that most of the teachers were of the opinion that distance teaching could not replace face-to-face teaching after the pandemic was over. In this sense, it can be inferred that in the context of teaching Turkish after Covid-19, we will switch from distance education to formal education again. The reason for this is that distance Turkish teaching is not efficient compared to face-to-face education, does not provide socialization, and cannot create an emotional bond. Likewise, in recent studies (Karakus et al., 2020), teacher candidates stated the necessity to switch from distance education to face-to-face education.

In the quantitative findings of the research, teachers stated that their students partially adapted to distance Turkish teaching. As this situation negatively affects their motivation, teachers stated in qualitative findings that they engage in activities that increase students' motivation. These activities are divided into 5 themes: individual interest, supportive advice, fun activities, using different technology tools and awarding. In this context, teachers stated what they did to increase students' motivation with the following explanations: In the theme of individual interest, the teacher codded P85 said, *"I'm calling them. It is good to hear each other's voices. We are texting on Whatsapp and I try to answer their questions no matter what time it is."* In the theme of supportive advice, the teacher codded P31 said, *"I always motivate them by making positive reviews. I make them confident."* In the theme of fun activities, the teacher codded P33 said, *"I make them watch theatrical videos, listen to songs, play games, do creative drama and solve puzzles."* In the theme of using different technological tools, the teacher codded P35 said, *"I use videos. I use short movies. I am trying to use Edpuzzle, Padlet, Kahoot etc. I share the latest news. I try to be in constant interaction with Whatsapp."* Finally, in the theme of awarding, the teacher codded P109 said, *"I give award points."*

When the findings of teachers' opinions about ensuring the students to be active in distance Turkish teaching were examined, the results were collected under four themes: individual addressing, encouragement, assignment, and creating a competitive environment. In this context, when looking at what teachers do to minimize the problem of not participating actively in the lesson, which is one of the most important negative aspects of distance education, it can be seen what teachers do with the following explanations: In the theme of individual addressing, the teacher codded P134 said, *"I give the word one by one by addressing their names."* In the theme of encouragement, the teacher codded P77 said, *"I say words of encouragement at every step."* In the theme of assignment, the teacher codded P108 said, *"I'm sharing events. I give task-oriented assignments. I set time for them to make presentations. Students speak, and students ask."* Finally, in the theme of creating a competitive environment, the teacher codded P102 said, *"We organize competitions with different Web 2.0 tools. As the competition increases, the students become more active in the lesson."*

In addition to the above information, distance Turkish teaching has positive aspects such as ease of material sharing, accessing the course again, diversity of the virtual environment, free time, lack of distance and space problems, saving time, affordability, stress-free environment and being away from in-class negativity. There are also negative aspects such as technical problems, less participation in class, lack of course material, low motivation, difficulty of classroom management and measurement and evaluation problem. In this context, considering the existence of both positive and negative aspects of distance education, this result is similar to other studies (Ozkose, Ari, Cak**ir, 2013; Ozbay, 2015; Baris** & Cetinkaya, 2016; Paydar & Dogan, 2019; Gungor, Cangal & Demir, 2020; Karakus et al. 2020; Kaya, 2020; Erzen & Ceylan, 2020; Er Turkuresin, 2020; Sumardi & Nugrahani, 2020; Balbay & Erkan, 2021).

Verification of the problems in the quantitative findings of the research also with qualitative data is very important in terms of seeing the source of the problems experienced in distance Turkish teaching. Examples of these problems are having too many deficiencies in distance Turkish teaching, the fact that writing skill is the most difficult skill, and low motivation of students. In this context, teachers suggested the following to their colleagues who will teach Turkish from distance education for the first time:

- Developing themselves both in terms of knowledge and in the field of technology
- Training in technology and computer use, if necessary
- Having the ability to provide immediate solution to any possible problem.
- Being patient no matter what happens
- The necessity of creating original materials and providing fun activities to the lesson
- The necessity of making a plan before each lesson, considering that unplanned lessons will be disrupted.
- Communicating with each student and enabling students to talk one by one and become active in the lesson
- Being able to manage the short lesson time well

Also in the study of Baris and Cetinkaya (2016), it was concluded that an instructor with distance education should be in the position of a teacher who uses technology, shares information, prepares course content and materials, and can use different teaching methods. In this context, it can be said that the basic pedagogical competencies expected from teachers in distance education (Ferri, Grifoni & Guzzo, 2020) are similar. Based on all these information and findings, the following suggestions can be given.

Suggestions to Instructors:

- In-service trainings to increase teacher competencies for distance Turkish teaching should be organized.
- Programs that allow the development of writing skills should be used in distance teaching.
- There should be studies aimed at minimizing the negative aspects of the distance Turkish teaching process.
- Material development studies should be carried out for distance Turkish teaching.
- Studies should be conducted to minimize motivation and adaptation problems in distance Turkish teaching.

Suggestions to Researchers:

Studies should be conducted on the following subjects in distance Turkish teaching:

- Student opinions
- Determination of instructional competencies
- Material design and effectiveness
- Measurement and evaluation implementations
- Tools to be used in developing language skills

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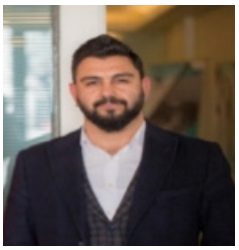

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SCHOOL TEACHERS' BEHAVIOR IN REMOTE LEARNING DURING COVID-19 PANDEMIC: INDONESIA PERSPECTIVE

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ABSTRACT

This study aims to uncover the extension of the Technology Acceptance Model (TAM) in understanding, explaining, and predicting elementary school teachers' behavior in Indonesia to use online learning technology during the covid-19 pandemic. The TAM model in this study is extended by accounting for four additional variables, which are subjective norms, and job relevance as a predictor of perceived usefulness, also, computer self-efficacy and computer anxiety to predict perceived ease of use. This study uses an online survey method with a purposive sampling technique involving 475 elementary school teachers located in Jakarta, Palu, and Sorong (some of the big cities in Indonesia). The data analysis technique is Structural Equation Modeling (SEM) with the help of IBM SPSS AMOS 21 software. The results of this study show that the TAM model developed in this study can explain and predict the intentions of elementary school teachers in using online learning technology during the covid-19 pandemic as indicated by the support of the hypotheses tested in this study. Overall, TAM is a very popular model for understanding, explaining, and predicting the use of new technology systems. The implications and limitations of this study are also discussed in this article.

Keywords: Computer anxiety, computer self-efficacy, job relevance, subjective norm, SEM, TAM.

INTRODUCTION

The outbreak of Covid-19 in Indonesia, since March 2, 2020, has harmed various areas of people's lives. After more than a year, there is no sign that the pandemic will recede, instead, the number of Covid-19 cases is increasing at an alarming rate. Deputy Minister of State-Owned Enterprises (BUMN) Kartika Wirjoatmodjo argued, three sectors are most affected by the Covid-19 pandemic, which are energy, tourism, and infrastructure (Artanti, 2020). The Indonesian government has taken some measures to break the chain of virus transmission, such as implementing a social distancing policy, where residents must carry out most activities at home including working, studying, and praying.

The implementation of social distancing policy has a profound impact on many sectors. Apart from impacting the three sectors that have been described, the education sector is also severely affected. Many educational institutions have chosen to cancel all face-to-face classes, including laboratories and other learning activities, and have required students to study remotely from home to help avoid the spread of the virus that causes Covid-19 (UNESCO, 2020). Bond (2020) stated that almost every person in the world has suffered from the pandemic since the beginning of 2020, also institutional education has suddenly shifted to emergency remote education.

In Indonesia, nationwide school closures began on March 23, 2020, while localized closures in some provinces, e.g., DKI Jakarta, Central Java, Banten, West Java, and Aceh, started early on March 16, 2020 (Kumparan, 2020). More than 60 million students and 2.3 million educators across the nation, at 425,451 educational institutions from early childhood to higher education, have been forced to study and work from home during the Covid-19 pandemic (Indonesia ministry education and culture, 2020).

The adoption of online learning in a situation of emergency represents a need, but it has also stimulated experts, policymakers, citizens, teachers, and learners to search for new solutions. This is producing a shift from the concept of online learning to emergency remote teaching, which represents a temporary shift of instructional delivery to an alternate delivery model due to crisis circumstances. In this study, the term "Emergency Remote Learning (ERL)" is used to illustrate the education that took place during school closure, not online or virtual learning, since well-planned online learning experiences are substantially different from those that are delivered online in response to a crisis or catastrophe. ERL is a temporary change from instruction delivery to alternative delivery due to crisis circumstances. It requires the use of entirely remote teaching approaches for instruction or education that would otherwise be provided face-to-face or as blended or hybrid courses, and which will revert to that model once the crisis or emergency has finished (Hodges et al., 2020). The primary objective in this context is not to re-create a stable educational environment, but rather to provide immediate access to education and training in a manner that is easy to develop and easily accessible during an emergency or crisis. Milman (2020) described the situation as emergency remote teaching and learning — or "pandemic pedagogy."

Bozkurt and Sharma (2020) differentiate the difference between distance education and remote education. They stated that distance education is characterized by the distance of time and/or space between students and learning resources, where the learning system is planned systematically. As a student he will automatically undergo distance learning courses, he realizes that some or even all courses will take place remotely without face-to-face contact with the teacher (Bozkurt & Sharma, 2020). While remote education according to Bozkurt and Sharma (2020) is a learning system that refers to the spatial distance where distance is considered differently and seeks to explain it through transactional distance. In other words, this learning system still requires close contact with the teacher, whether through email, chatting, or voice call in which educators remain to have some sort of control in the learning process.

ERL has posed many challenges to both teachers and learners since they are not accustomed to having distance during the learning process. Problems in remote learning arise due to uneven access to technology and inadequate online teaching methods. That is, many of them do not have adequate devices as basic tools required for remote learning. In addition, the ability to access and use online or virtual learning technology is highly limited for teachers, especially in primary and secondary schools. The concern is now growing that remote learning could worsen inequalities in education. Several countries face many obstacles and gaps in the distance learning process (Favale et al., 2020; Goldschmidt, 2020; Guernsey, Ishmael, & Prescott, 2020; Masters et al., 2020). Education systems around the world are facing an unprecedented challenge in the wake of massive school closures mandated as part of public health efforts to contain the spread of Covid-19. Governmental agencies are working with international organizations, private sector partners, and civil society to deliver education remotely through a mix of technologies to ensure continuity of curriculum-based study and learning for all.

In contrast to research conducted by the leading educational organization Cambridge International which is part of the University of Cambridge in England where the results show that Indonesian students use technology in classrooms more than in many other countries including some developed countries. According to the study results, Indonesian students have the highest global use of computer space (40%) (BBC NEWS, 2018). In reality, many teachers and students could not utilize various Information and Communication Technology (ICT) devices and online learning platforms that are widely available in supporting distance implementation, either due to the ability of teachers, parents' economic factors, limited internet access, and the absence of guidance (Azhari & Fajri, 2021). Several studies have shown that Indonesian teachers' ICT competencies are not evenly distributed across regions (Widodo & Riandi, 2013). Furthermore, there are also significant gaps in the quality of education across regions in Indonesia, especially between Java and outside Java, and between socio-economic conditions (Azzizah, 2015; Muttaqin, 2018). In addition, uneven

internet access, gaps in teacher qualifications, quality of education, and a lack of ICT skills increase the challenges in distance learning initiatives in Indonesia (Azzahra, 2020).

The following are five excerpts from the initial interviews of 30 elementary school teachers conducted by the authors. These teachers are spread across three major cities in Indonesia, namely Jakarta, Palu, and Sorong.

> *Oh no…that thing again? how could I manage? I don't have proper computer ability. What can I do now? (Female; age 38; Tenure time 15 years)*
>
> *Mhmmm…that means I need to learn more about communication technology and computer. I could be lag behind if we have to do distance learning now (Male; age 40; Tenure time 18 years)*
>
> *Oh my goodness…hahaha…. that means I have to take a special course on computer and technology. I shall be doomed. All I know is using Facebook and Whatsapp (female; age 35; Tenure time 10 years)*
>
> *mhmm….We are already struggling with technology. we definitely will need a lot of guidance to do this (Male; age 47; Tenure time 18 years)*
>
> *I am really bad with online or distance learning. I could only use Facebook, Whatsapp, or Youtube when I use the internet. That means I need to learn real hard so I won't embarrass myself (Female; age 50; Tenure time 20 years)*

To understand, explain, and predict this phenomenon, we apply the Technology Acceptance Model (TAM) as the theoretical basis. TAM proposed by Davis (1985) has been widely accepted and has been proven applicable in identifying the willingness of consumers to take advantage of information and communication technology (ICT) (Cengiz & Bakirtas, 2020). This theory proposes that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) are determinants of individual attitudes, while attitudes are determinants of Behavioral Intention (BI) and Behavioral Intention (BI) as determinants of usage behavior (Venkatesh, 2000; Venkatesh & Davis, 2000; Venkatesh & Bala, 2008).

However, there are some challenges among theorists who put forward several strengths and weaknesses regarding TAM. As suggested by Venkatesh and Davis (2000), the TAM model proposed by Davis (1985) does not consider factors such as subjective norms, image, job relevance, output quality, and result demonstrability. Additionally, according to Venkatesh and Davis (2000), these factors may serve as antecedents of perceived usefulness. Further, as they identified that TAM has some limitations in explaining why someone thinks that specific systems are beneficial, they suggest that these variables can be added as antecedents of perceived usefulness.

Moreover, Venkatesh (2000), Venkatesh and Davis (2000), and Venkatesh and Bala (2008) stated that it is also important to reveal the factors underlying the reasons why a person thinks that a particular system can be used efficiently or is user friendly. These researchers point out factors underlying the reasons for someone to think that a system is very user-friendly, such as computer self-efficacy, perceptions of external control, computer anxiety, computer playfulness, perceived enjoyment, and objective usability (Davis, Bagozzi, & Warshaw, 1992; Venkatesh & Davis, 1996; Venkatesh, 2000).

Therefore, Venkatesh (2000), Venkatesh and Davis (2000), and Ali, Gongbing, and Mehreen (2018) conveyed the necessity to reveal the ability of the TAM model in understanding, explaining, and predicting individual behavior in using ICT systems by including the variables previously described in the model. Faqih and Jaradat (2015) and Ali, Gongbing, and Mehreen (2018) stated that the main limitation of TAM is despite the model can provide adequate insight into the acceptance and use of technology by users, TAM only focuses on the consequences of perceived ease of use and perceived usefulness and does not reveal how such perceptions are formed or how they occur. In other words, how these two perceptions can be manipulated to encourage acceptance by system users and increased use are not discussed (Godoe & Johansen, 2012; Faqih & Jaradat, 2015).

Technology Acceptance Model (TAM)

Significant progress has been made over the last decade in explaining and predicting user acceptance of the information technology adopted by organizations. In particular, theoretical support and substantial

empirical research results have been accumulated to support the development of the Technology Acceptance Model (TAM) (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). Several empirical studies have found that TAM is consistently able to explain and predict most of the variance (usually around 40%) of phenomena associated with the intention and behavior of adopting new technologies and that TAM performs better than alternative models such as Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) (Venkatesh, 1999).

TAM states that an individual's behavioral intention to use information system technology is determined by two beliefs/perceptions, namely: perceived Usefulness (PU), which is defined as the extent to which a person believes that using the system will improve his job performance, and perceived ease of use / perceived ease of use (POU), which is defined as the extent to which a person believes that the technology system to be used is user friendly. TAM also states that the external effects of variables (e.g., system characteristics, development process, training) on the intention to use a new technology system are mediated by their perceived usefulness and ease of use. According to TAM, perceived usefulness is also influenced by perceived ease of use because the easier a system is to use, the more valuable the system will be. Thus, the hypotheses proposed in this study are as follows.

H1 : Perceived Usefulness positively affects elementary school teachers' intention toward using ICT during the Covid-19 pandemic.

H2 : Perceived Ease of Use positively affects elementary school teachers' intention toward using ICT during the Covid-19 pandemic.

H3 : Perceived Ease of Use positively affects elementary school teachers' perceived usefulness toward using ICT during the Covid-19 pandemic.

Subjective Norms

Consistent with the Theory of Reasoned Action (TRA), as the fundamental theoretical basis for the development of TAM, in this study, the authors include social influence through subjective norms. Subjective norms refer to the belief that an important person or group of people will approve and support a particular behavior, and it is determined by the perceived social pressure from others for an individual to behave in a certain manner and their motivation to comply with those people's views (Ajzen & Fishbein, 1980). Subjective norms were included as direct determinants of behavioral intention in the TRA (Fishbein and Ajzen, 2010) and TPB (Ajzen & Madden, 1986; Ajzen, 1991) models. Studies on user acceptance of adopting new technology and examining the direct effect of subjective norms on behavioral intention have produced mixed results. Hwang, Al-Arabiat, and Shin (2016), in their research, did not find a significant effect of subjective norms on behavioral intention, while Ratten (2012) found a significant effect.

A contingency underlying the mixed findings regarding subjective norms was identified by Igwe et al (2020) where they separated respondents into the context of mandatory and voluntary use. Their results revealed that subjective norms had a significant effect on behavioral intentions for categories of mandatory use but not voluntary use. Thus, in the context of implementing online learning technology during ERL, the authors refer to the causal mechanism that underlies this influence as compliance.

In general, when an individual perceived his/her important persons is disapproved of specific behavior, and that person can respect his/her behavior or give punishment if he/she does not behave accordingly, then this individual is having an obedience effect of subjective norms (Rogers, 2003; Lin, 2007; Kim, Kim, & Shin, 2009). Therefore, based on the TAM model in the context of computer use, the direct compliance-based influence of subjective norms on behavioral intention will occur compulsorily, not voluntarily. Thus, based on this description, the hypothesis proposed in this study is as follows.

H4 : Subjective norms positively affect elementary school teachers' perception toward using ICT during the Covid-19 pandemic.

Job Relevancy

One of the critical components in the TAM model that should be considered is the user's assessment of new technology is job relevance, which is defined as an individual's perception of the extent to which the new technological system can be applied to their work (Venkatesh & Davis, 2000). In other words, job relevance is a function of the essential elements in a series of tasks and a person's job that the new system can support (Venkatesh & Davis, 2000). Ketikidis et al (2012) and Venkatesh et al (2003) argue that users have different knowledge regarding their job situation, which they can use to determine which tasks to perform under a particular system. Therefore, the existence of a well-defined knowledge structure regarding job objectives is vital in the concept of personnel psychology as proposed by Legris, Ingham, and Collerette (2003). In this study, the authors consider job relevance as a cognitive assessment that directly affects perceived usefulness, different from the social influence process.

Empirically, user acceptance of new technology has been linked in other studies to variables similar to job relevance, such as job-defined interest variables (Holden & Karsh, 2010), engagement defined by Turner et al (2010) as the importance and personal relevance, task, and technology suitability (Partala & Saari, 2015), and cognitive suitability (Lee et al., 2005). Thus based on this description, the proposed hypothesis is as follows.

H5 : Job relevance positively affects elementary school teachers' perception toward using ICT during the Covid-19 pandemic.

Computer Self-Efficacy

Computer self-efficacy is a variable that is considered new which is proposed and examined as an additional explanatory variable in an individual's IT use model (Bao et al., 2013; Ong & Lai, 2006). Based on the social cognitive theory developed by Bandura (1986), self-efficacy is defined as a person's belief that he/she can perform certain behaviors. Bandura (1986) suggests that self-efficacy plays a vital role in influencing motivation and behavior. The perceived ability of individuals to achieve the standards they have set impacts cognitive reactions and behavior (Nath, Bhal, & Kappor, 2013; Wang et al., 2003; Monsuwe et al., 2004). In addition, it also has a critical influence on decisions involving computer use and the adoption of new technologies (Wang et al., 2003; Monsuwe et al., 2004). Individuals, who perceive computer technology as too complex and believe that they can never control it, will prefer to avoid it and will likely not use it.

To et al (2008) also show that self-efficacy is an essential motivational variable and affects individuals in terms of affection, persistence, and motivation. The relationship between self-efficacy and perceived ease of use is intended to present the effect of self-efficacy on motivation. In addition, individuals who perceived a lower control over a situation will avoid the situation due to the feeling of inadequacy or discomfort. On the other hand, individuals with high self-efficacy will consider a system that is easy to adopt and valuable which will automatically accept changes (Bandura, 1986). The perceived ability of individuals to use a product will successfully influence their evaluative response and behavior towards the product (Chircu & Kauffman, 2000). Therefore, self-efficacy tends to influence beliefs and behaviors. In particular, this will affect system use directly and indirectly through perceived ease of use and perceived usefulness. Thus, based on this description, the hypothesis proposed in this study is as follows.

H6 : Computer self-efficacy positively affects elementary school teachers' perception of easiness toward using ICT during the Covid-19 pandemic.

Computer Anxiety

Dependence on computer technology has become more common in the workplace. When the Covid-19 pandemic hit Indonesia, computer technology becomes a necessity. In this new era of global technology, teachers are faced with the challenge of being more familiar with online learning technology. In addition, teachers must maintain and improve their knowledge and skills in using various computer devices that support the learning process.

However, some people have not been trained adequately in this regard and they are classified as a different generation (e.g., baby boomers). These people pose high fear and anxiety when collaborating with computers and technology devices. Generally, anxiety refers to a complex combination of negative emotional responses that include worrying, fear, and agitation. Anxiety is a natural and unavoidable reaction to the perception of danger or risk. All humans experience anxiety in specific contexts and situations, but not all types of anxiety are the same (Agarwal, 2000).

In studies on the adoption of information systems technology, anxiety is seen as a personality variable that affects the use of the system (Agarwal, 2000; Song & Kong, 2017). Several studies dealing with information systems are very consistent with this view that the relationship between anxiety and behavior is mediated by individual personal beliefs (Chen & Tseng, 2012). Anxiety is included as an antecedent to beliefs of usefulness and convenience using information systems technology (Venkatesh, 2000; van Raaij & Schepers, 2008).

Interestingly, many researchers view anxiety as an intermediate variable in the relationship between beliefs and behavior (Pan & Tang, 2004). Thus, anxiety can be seen as a result of a person's beliefs, not as a predecessor. For example, someone who believes that he will be embarrassed when giving a speech will have anxiety in speaking (commonly known as stage fright). As a result of that anxiety, he will refuse to make a speech. Thus, beliefs that lead to fear are perceived as anxiety, which leads to avoidant behavior. This perspective is used in this study.

Song and Kong (2017) study anxiety over computer use, and define it as an individual's tendency to be uncomfortable, worried, or afraid about current or future computer use. Several studies have provided supporting evidence of a direct link between computer anxiety and computer use (Blut, Wang, & Schoefer, 2016; Beaudry & Pinsonneault, 2010; Bitner, Ostrom, & Meuter, 2002; Chen, Chen, & Chen, 2009; Collier & Barnes, 2015; Curran & Meuter, 2005). In addition, other studies have shown a direct relationship between anxiety and attitudes towards computer use (Chang & Tung, 2008; Escobar-Rodriguez & Monge-Lozano, 2012; Gong, Xu, & Yu, 2004). Studies on computer use anxiety clearly show that highly computer anxious individuals are at a significant disadvantage compared to their peers. One example of such an environment is ERL which is currently being held by almost all primary, secondary and tertiary education institutions, during the Covid-19 pandemic. Thus, based on this, the hypothesis proposed in this study is as follows.

H7 : Computer anxiety negatively affects elementary school teachers' perception of easiness toward using ICT during the Covid-19 pandemic.

PURPOSE OF THE STUDY

This study aims to reveal how the TAM model is expanded in understanding, explaining, and predicting the behavior of elementary school teachers in Indonesia in using online learning technology during ERL. This study will reveal various social factors which affect the perceived usefulness and perceived ease of use of Indonesia's elementary school teachers in using online learning technology. This study will also contribute to the development of marketing science specifically consumer behavior. The field study is the adoption of new technology and educational science focusing on teachers' behavior in using online learning technology.

The TAM model in this study is expanded by including four additional variables, namely subjective norms, job relevance as a form of perceived usefulness, and computer self-efficacy and computer anxiety as a form of perceived ease of use. The main reason for using these four additional variables is based on the results of a preliminary study conducted from April to June 2020 which reveals the factors that shape elementary teachers' perceptions of the benefits and convenience of using online learning technologies applied during the ERL.

Based on the theoretical review and hypothesis development, the models to be proposed in this study are as follows.

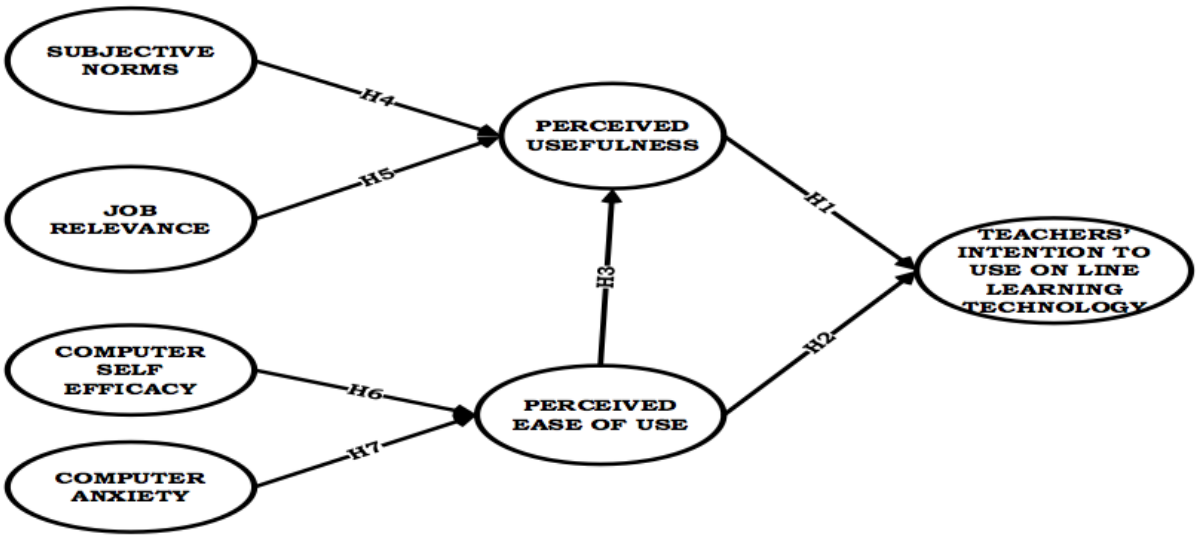

Figure 1. Theoretical Model

METHOD

The study consisted of two studies conducted sequentially as a sequential exploratory study design, where the first study was conducted from April to June 2020. A preliminary study is conducted to reveal the factors that consisted in the phenomenon under study. These factors are certainly related to the variables that will be measured in this research model. In this preliminary study, initial interviews were conducted with several respondents to determine their perceptions regarding the distance learning system implemented during the COVID-19 pandemic. Furthermore, the results from the initial interview will be used as the basis for compiling a questionnaire to be used in the second stage, the quantitative stage.

Participants

The population of this study is elementary school teachers in the cities of Jakarta, Semarang, Medan, Makassar, Palu, and Sorong. The sampling technique used in this study is purposive sampling. Respondents used in this study met the following three criteria: (1) Male or Female, (2) teachers (Civil Servant Apparatus or Non-Civil Servants) who served in elementary schools, (3) aged 30-60 years. In this study, the authors determined the sample size based on similar previous studies on the relationship between intention and behavior using the TAM model where the minimum sample size is ten, and the maximum is 1370 (Yousafzai, Foxall, & Pallister, 2007).

Other factors that influence the determination of the sample size in this study are closely related to SEM as an analytical tool. There are no clear directions for determining the appropriate sample size when using SEM. However, Alam, Sultana, and Rayhan (2019) stated that the sufficient sample size to use SEM, ranging from 100 to 200 samples. According to Ringle and Sarstedt (2016), the minimum sample size in a study using SEM is 5 to 10 times the number of indicators. Since the number of indicators is 17 indicators in this study, thus the minimum sample size is 17 x 10 = 350 respondents (Ringle and Sarstedt, 2016). Hair et al (2014) stated that the minimum sample size used in SEM is 300 with several constructs of 7 or less. According to Aaker et al (2013), the larger the sample size used, the better the study results because it will reduce the sampling error. Therefore, the appropriate sample size in this study is 500 respondents.

Data Collection and Analysis

Study 1

The authors conducted online interviews with 30 elementary school teachers in Jakarta, Palu, and Sorong areas. The sample size follows Creswell (2012) who stated that the ideal sample size for preliminary research

is around 20-30 respondents. In this stage, the author is assisted by colleagues at the city education office in implementing the online interview. The purpose of this stage is to reveal the factors that shape the perceived usefulness and perceived ease of using online learning technology for elementary school teachers.

Next, the authors determine the central ideas generated from the interview transcript by selecting the main ideas chosen by at least 10% of the respondents (Fishbein & Middlestadt, 1995) as the basis in generating a questionnaire for the Exploratory Factor Analysis (EFA) stage. Afterward, the authors conducted an EFA test by distributing the questionnaire to 100 elementary school teachers in Semarang, Medan, and Makassar city. The results of the EFA test show that four main factors shape the perceived usefulness (two factors) and the perceived ease of using (two factors) of online learning technology perceived by elementary school teachers during ERT. These factors are subjective norms and job relevance that shape perceptions of usefulness, also computer self-efficacy, and computer anxiety that shape perceptions of ease of use. See Table 1 for the details.

Table 1. The Factor Analysis Results

Construct	Indicator	Factor Loading Value
Computer Self-Efficacy	SE1	0.777
	SE2	0.861
Computer Anxiety	CA1	0.823
	CA2	0.831
	CA3	0.844
Job Relevance	JR1	0.719
	JR2	0.748
Subjective Norms	NS1	0.828
	NS2	0.824

Study 2

The second study was conducted from August to December 2020. At this stage, the authors formed a questionnaire based on the results obtained in the first study. There are seven constructs that 17 indicators will measure. After the questionnaire was formed, the authors conducted a Confirmatory Factor Analysis (CFA) test where questionnaires are distributed to 150 respondents, whose elementary school teachers in the cities of Jakarta, Medan, Semarang, and Palu. The authors were assisted by colleagues who serve in the Education Office of each city. Data were collected using an online survey via a google form, distributed by each of the Education Offices.

From 500 questionnaires distributed, only 475 were returned. Thus, the rate of return of the questionnaire in this study is 95 percent, which is adequate for further analysis since it exceeds the minimum response rate as stated by Aaker et al (2013), surveys that have high response rates (for example, 70 percent to 80 percent) have the most likely to avoid non-response bias.

The Scale

There are seven constructs that each indicator will measure in this study. The development of a measurement scale is carried out with a purification process for subjective norm, job relevance, computer self-efficacy, and computer anxiety construct based on study results and combined with previous studies. Development was carried out based on previous studies for the construct of behavioral intention, perceived usefulness, and perceived ease of use.

Measuring the subjective norm construct (two indicators) refers to studies by Ajzen and Madden (1986), Fishbein and Ajzen (2010), and Venkatesh (2000). The job relevance construct (two indicators) refers to studies by Venkatesh and Davis (2000). The computer self-efficacy construct (two indicators) refers to the studies by Taylor and Todd (1995), and the computer anxiety constructs (three indicators) refer to studies by Agarwal (2000) and Venkatesh (2000). Measurement of the behavioral intention construct (four indicators) was developed based on Ajzen and Madden (1986), Fishbein and Ajzen (2010), and Venkatesh (2000). The construct of perceived usefulness was developed based on Davis (1989), Venkatesh and Davis (1996), and Venkatesh (2000). Finally, the construct of perceived ease of use was developed based on Davis (1989), Venkatesh and Davis (1996), and Venkatesh (2000). All constructs in this study were measured using a Likert scale of 1 = Strongly Disagree to 5 = Strongly Agree.

FINDINGS

Respondent Characteristics

Table 2. Respondent Characteristics

Variables	Categories	Sum	Percentage
Gender	Male	143	30
	Female	332	70
Marital Status	Single	166	35
	Married	309	65
Age	< 30 years old	47	10
	31-45 years old	238	50
	>45 years old	190	40
Tenure	10-15 years	117	25
	16-20 years	143	30
	21-25 years	143	30
	>25 years	72	15
Education	Undergraduate	285	60
	Postgraduate	190	40
Montly Expenses	Rp 0 – Rp 1,000,000	0	0
	Rp 1,000,001 – 2,500,000	0	0
	Rp 2,500,001 – Rp 5,000,000	318	67
	Rp 5,000,001 – Rp 10,000,000	157	33
	More than Rp 10,000,000	0	0

Table 2 shows that the majority of respondents are female (332 people/70%) and married (309 people/65%). Also, the majority of respondents' age is between 31-45 years (238 people/50%) with a tenure track of 16-20 years (143 people/30%). Overall, the majority of respondents have a bachelor's degree (285 people/60%), and monthly spending of Rp. 2,500,001-Rp 5,000,000 (318 people/67%).

Validity and Reliability Results

Table 3. Discriminant and Convergent Validity Results

Construct (Cronbach Alpha)	Indicator	Loading Factor	Composite Reliability	AVE (Average Variance Extracted)
Computer Self Efficacy (0.902)	SE1	0.941	0.953	0.617
	SE2	0.948		
Computer Anxiety (0.682)	CA1	0.754	0.825	0.675
	CA2	0.817		
	CA3	0.725		
Job Relevance (0.729)	JR1	0.849	0.809	0.577
	JR2	0.746		
Norma Subyektif (0.721)	NS1	0.880	0.878	0.613
	NS2	0.853		
Niat berperilaku (0.963)	I1	0.969	0.973	0.527
	I2	0.877		
	I3	0.960		
	I4	0.950		
Perceived usefulness (0.724)	PU1	0.766	0.879	0.615
	PU2	0.765		
Perceived ease of use (0.962)	POU1	0.893	0.981	0.596
	POU2	0.890		

Table 3 (Fornell & Larcker, 1981; Nunnally & Bernstein, 1994) shows that the convergence validity for each construct is sufficient since the AVE value exceeds 0.5 (Hair et al., 2014; Chin, 1998). Table 3 also shows that the Cronbach alpha value and composite reliability of each construct exceed 0.7, thus the measure used in this study is reliable and better at estimating the internal consistency (Booth and Hughes, 2014; Kock, 2019; Elliott et al., 2021; Kragel et al., 2021).

Structural Model Examination

In conducting this test, the authors used Structural Equation Modeling (SEM) through a two-stage approach with the help of IBM SPSS Amos 21 software. The test results can be seen in Figure 2 and Table 4.

Table 4. The Correlation between Latent Construct

	Construct	1	2	3	4	5	6	7
1	Computer Self-Efficacy	1						
2	Computer Anxiety	0.223*	1					
3	Job Relevance	0.250**	0.192*	1				
4	Subjective Norms	0.141*	0.175*	0.312**	1			
5	Intention to Behave	0.224**	0.239**	0.347**	0.267**	1		
6	Perceived Usefulness	0.230**	0.413**	0.111*	0.211*	0.313**	1	
7	Perceived Ease of Use	0.212**	0.330**	0.201*	0.260**	0.102*	0.298**	1

*Notes: **. Significant at level 0,01 (2-tailed); *. Significant ar level 0,05 (2-tailed)*

Table 4 presents the result of the correlation between latent constructs used in this study. Based on this table, the correlation value between latent constructs is significant.

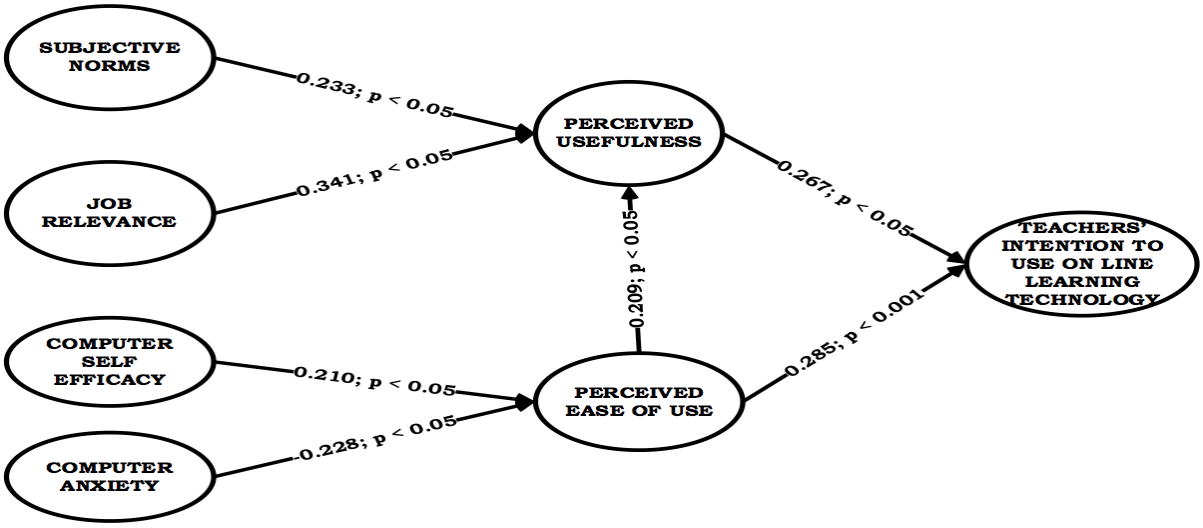

Figure 2. Structural Model Examination Result

*Notes: **. Significant at level 0.001 (2-tailed); *. Significant at level 0.05 (2-tailed);*

x^2= 179.927; CMIN/DF=1,697; GFI=0,905; AGFI=0,901; RMR=0,082; RMSEA=0,059; NFI=0,922; CFI=0,966.

Table 5. Estimated Structural Parameter

	Path Hypotheses	Path Coefficient	t-value	p-value	Conclusion
H1	Perceived Usefulness positively affects elementary school teachers' intention toward using ICT during the Covid-19 pandemic.	0,267	2,299*	0.022	Supported
H2	Perceived Ease of use positively affects elementary school teachers' intention toward using ICT during the Covid-19 pandemic.	0,285	4,607**	0.000	Supported
H3	Perceived ease of use positively affects elementary school teachers' perceived usefulness toward using ICT during the Covid-19 pandemic.	0,209	2,149*	0.030	Supported
H4	Subjective norms positively affect elementary school teachers' perception toward using ICT during the Covid-19 pandemic.	0,233	2,168*	0.030	Supported
H5	Job relevance positively affects elementary school teachers' perception toward using ICT during the Covid-19 pandemic.	0,341	2,752*	0.006	Supported
H6	Computer self-efficacy positively affects elementary school teachers' perception of easiness toward using ICT during the Covid-19 pandemic.	0,210	2,249*	0.026	Supported
H7	Computer anxiety negatively affects elementary school teachers' perception of easiness toward using ICT during the Covid-19 pandemic.	-0,228	-2,193*	0.030	Supported

*Notes: **. Significant level 0,001 (2-tailed); *. Significant at level 0,05 (2-tailed)*

DISCUSSIONS

Based on the results of estimating structural parameters using SEM, hypothesis 1 is supported. The results of this study are consistent with studies conducted by Holden and Karsh (2010), Blut, Wang, and Schoefer (2016), Venkatesh, Thong, and Xu, (2012), Chauhan (2015), and Albayrak et al (2021) which indicate the significant strength of perceived usefulness in explaining and predicting intentions to use or adopt new technological systems. In the TAM framework, PU is hypothesized as a direct predictor of behavioral

intention to use the technology of interest (Park et al., 2014; Catchpole et al., 2022). Previous studies have shown that PU is positively related to sustained intention in the context of research on the use or adoption of new technology systems, such as e-text (Baker-Eveleth & Stone, 2015; Stone & Baker-Eveleth, 2013), instant messaging (Wang, Ngai, & Wei, 2011), mobile service providers (Abbas & Hamdy, 2015; Catchpole et al., 2022), online travel services (Li & Liu, 2014; Albayrak et al., 2021), e-learning (Lin & Wang, 2012), blog learning (Tang, Tang, and Chiang, 2012), as well as knowledge creation (Chou et al., 2009). This study further emphasizes that when elementary teachers believe in the benefits of online learning technology during ELT, the intention to use this technology in the ERL process will be higher.

The second hypothesis is also supported. The results of this study are consistent with research conducted by Aboelmaged and Gebba (2013), Anderson and Agarwal (2010), Bagozzi (2007), Benson, Saridakis, and Tennakoon (2015), Liao, Tsou, & Huang (2007), Bryce and Fraser, (2014), Cengiz and Bakirtas (2020) which concluded that perceived ease of use has a positive and significant effect on using or adopting a new technological system. Researchers of TAM argue that perceived ease of use is the extent to which a person accepts the truth that using the correct method will not cause difficulties for the individual (Davis, Bagozzi, & Warshaw, 1989; Rosander & Eriksson, 2012; Chen, Shing-Han, & Chien-Yi, 2011; Hansen & Levin, 2016; Liang & Elliot, 2021). Rogers (1962) initially emphasized that perceived ease of use is a term that represents the extent to which an innovation is considered not challenging to understand, learn or operate (see: Venkatesh & Davis (2000); Liang & Elliot ((2021); Catchpole et al (2022)). Furthermore, they stated that ease of use is the extent to which consumers perceive a new product or service as a better product than its substitute product (Venkatesh & Davis, 2000; Cengiz & Bakirtas, 2020; Liang & Elliot, 2021). Similarly, Zeithaml, Parasuraman, and Malhotra (2002) and Catchpole et al (2022) stated that ease of use is defined as how innovation is easy to understand.

Extensive studies over the past decade have provided evidence regarding the significant effect of perceived ease of use on the intention of use, both directly and indirectly (Hernandez & Mazzon, 2007; Guriting & Ndubisi, 2006; Eriksson, Kerem, & Nilsson, 2005; Wang, Ngai, & Wei, 2011; Venkatesh, 2000; Venkatesh & Davis, 1996; Venkatesh & Morris, 2000). Early in 1962, Rogers argued that understanding technology leads to adapting innovative products by customers is known as ease of use (See Venkatesh & Davis (2000)). Chen and Barnes (2007) have shown empirically in their research that two aspects of interface technology, namely perceived ease of use and perceived usefulness, significantly influence customer adaptation intentions.

Furthermore, the third hypothesis is supported in line with Venkatesh and Davis (2000), Molobi, Kabiraj, and Siddik (2020), and Zhang, Wang, and Li (2021) who concluded that perceived ease of use has an important influence on shaping perceived usefulness. In other words, individuals who find it easy to use new technology will automatically form their perception of the benefits that will be received when adopting the system. Beliefs regarding the value of the usefulness and ease of use of new information systems have been the basis for the formation of TAM (Davis, 1989).

However, only little empirical research was conducted on how and why these two beliefs were used as antecedents at the beginning of the model (Venkatesh & Davis, 2000). Further, another question, for example, explains how users believe that the system will be helpful in their work? What might be a psychological antecedent to the belief that a system is simple or challenging to use? Therefore, from a theoretical perspective, TAM needs to be expanded to include these aspects of the user acceptance process. The results of this study provide evidence that the expansion of TAM by including the effect of perceived ease of use for electronic communication technology on perceived usefulness is well proven.

According to TAM, the use of new technology is determined by the beliefs held by users about perceived usability (PU) and perceived ease of use (PEU). PU is defined as the extent to which a person believes that using a system will improve their performance. PEU refers to the degree to which a person believes that using a particular system will be easy. Although both constructs are significantly correlated with the actual use of technology, Davis (1989) suggests that PU mediates the effect of PEU on actual user behavior (see: Molobi, Kabiraj, & Siddik (2020); Murillo, Novoa-Hernandez, & Rodriguez (2021)).

The fourth hypothesis is also well supported. The TAM model includes two additional theoretical mechanisms by which subjective norms can influence intentions indirectly through perceived usefulness through internalization and identification. According to Kelman (1958) and Warshaw (1980), internalization refers to a process, when a person feels confident that someone, he/she considers important thinks he must use a new

technological system (Venkatesh & Davis, 2000; Albayrak et al., 2020; Liang & Elliot, 2021). In other words, a person inserts these beliefs into his belief structure. This internalization is equivalent to what Deutsch and Gerard (1955) call informational social influence (as opposed to normative), which is defined as the influence to receive information from others as evidence of reality (Ali, Gongbing, & Mehreen, 2018; Molobi, Kabiraj, & Siddik, 2020; Tao et al., 2020; Zhang, Wang, & Li, 2021). In the current context, if a boss or coworker suggests that a particular system might be helpful, then someone might believe that the system is beneficial and thus form the intention to use it. In the taxonomy of power, according to French and Raven (1959), the basis of internalization is expert power, which is when the individual in question connects expertise and credibility with agents who have influence (Venkatesh & Davis, 2000; Cengiz & Bakirtas, 2020).

In the case of internalization, subjective norms have an indirect effect on intentions through perceived usefulness instead of the direct effect of adherence to intentions. A study on the social information processing model proposed by Salancik and Pfeffer (1978) is consistent with the intended effect of internalization (Chau & Hu, 2002; Molobi, Kabiraj, & Siddik, 2022). TAM maintains that internalization is not like compliance. Internalization will occur in the context of voluntary or mandatory use of the system. Even when the use of the system is mandatory by organizations, users' perceptions of usability may still increase in response to persuasive social information as this study demonstrated. When elementary teachers believe that their colleagues suggest that they want to use online learning technology in the ERL, a perception will form within them regarding the perceived usefulness of the technology system (Bozkurt & Sharma, 2020; Bond, 2020).

Furthermore, the fifth hypothesis is also supported in line with Venkatesh and Davis (2000), Molobi, Kabiraj, and Siddik (2020), and Murillo, Novoa-Hernandez, and Rodriguez (2021)), who demonstrated the positive effect of job relevance on perceived usefulness. In this study, TAM is expanded by including job relevance as a factor that directly affects perceived usefulness, as suggested by Venkatesh and Davis (2000), Molobi, Kabiraj, and Siddik (2020), and Murillo, Novoa-Hernandez, and Rodriguez (2021)). According to Venkatesh and Davis (2000), Molobi, Kabiraj, and Siddik (2020), and Murillo, Novoa-Hernandez, and Rodriguez (2021)), job relevance is the individual's perception of the extent to which the adopted information system technology can be applied to his job. Similarly, this study proposed that the relevance of the job held by elementary teachers affects the perceived usefulness of the use of technology during ERL. Thus, the relevance of work in this study is defined as teachers' perceptions of the relevance of the online learning technology system used in managing distance learning activities during ERL. Venkatesh and Davis (2000), Molobi, Kabiraj, and Siddik (2020), and Murillo, Novoa-Hernandez, and Rodriguez (2021))stated that job relevance is believed to have a direct effect on perceived usefulness positively. Thus, this study is successful in providing evidence that job relevance can influence perceived usefulness.

Kieras and Polson (1985) and Polson (1987) stated, new technology users, have different knowledge about their work situation, which they can use to determine the tasks performed with the adopted system (Lee, Kozar, & Larsen, 2003; Naruetharadhol et al., 2021). Furthermore, Roberson (1989) also stated that individuals have a well-defined knowledge structure regarding the purpose of their work in the organization (see: Lee, Kozar, & Larsen (2003); Albayrak et al (2021)). Thus, in line with previous studies, the authors consider job relevance as a cognitive assessment that directly affects perceived usefulness. Beach and Mitchell (1996, 1998) stated that the assessment of job relevance is related to the compatibility test (see: Ketikidis et al (2012); Liang & Elliot (2021)). When the system is judged to be irrelevant to the job, the system will be eliminated from the choices made for further consideration (Tao et al., 2020; Naruetharadhol et al., 2021).

The sixth hypothesis is well supported. Computers' self-efficacy has a vital role in mediating the impact of anxiety on perceived ease of use (Saade & Kira, 2009; Zhang, Wang, & Li, 2021). If these elementary school teachers manage to interact well with computers, they will feel confident in carrying out ERL. According to the concept of computer self-efficacy variables, this variable can reduce the strength and significance of the impact of anxiety on perceptions of the ease of use of computers. Secondly, this variable significantly affects anxiety on computers (Saade & Kira, 2009; Zhang, Wang, & Li, 2021). The results of this study are consistent with previous studies focused on the relationship of computer self-efficacy with some situational factors (Carroll et al., 2009; Rouidi, Elouadi, & Hamdoune, 2022). They further argued that belief in computer self-efficacy appeared to predict many research outcomes and was significantly associated with increased motivation and other academic performance. In addition, according to Weng, Cheong, and Cheong (2009), students with high self-efficacy consider the experience of failure as a challenge rather than a threat because

of more substantial self-efficacy expectations. Following this, Simsek (2011), Bond (2020), and Bozkurt and Sharma (2020) add that teachers' and students' attitudes and perceptions regarding education supported by computers are the main factors for achieving success in online educational practice. Thus, this study uses self-efficacy as a domain-specific measure of elementary school teachers' belief in their ability to operate computers that can influence their perception of the ease of using online learning technology.

Finally, hypothesis seven is well supported. The results of this study are consistent with Saade and Kira (2007) and Zhang, Wang, and Li (2021) who demonstrated that computer anxiety has a positive and significant effect on the perceived ease of using new information system technology adopted by an organization. The use of technology often has unpleasant side effects (Tao et al., 2020; Zhang, Wang, & Li, 2021). In this case, what may happen is the emergence of negative emotional feelings during interaction with computers. Frustration, confusion, anger, anxiety, and similar emotional states can affect the interaction itself and productivity, learning, social relationships, and overall well-being.

Researchers on Tam are currently trying to predict the individual factors that cause perceived computer anxiety. Often, factors such as age, gender, ethnicity, previous computer experience, mathematics anxiety, self-efficacy, learning styles, and attitudes toward computers are recognized as influencing computer anxiety (Tsai et al., 2020; Guo et al., 2013; Simsek, 2011; Saade & Kira, 2007, 2009; Abdullah, Ward, & Ahmed, 2016). As in this study, the respondents included in the sample were elementary school teachers, most of whom were generation X. They are not familiar with computer technology development and communication and information technology. When they became teachers in elementary schools, they were not required to master communication and information technology since most of the learning was conducted physically.

Therefore, with the covid-19 pandemic that hit Indonesia and the issuance of a policy by the government to carry out ERL, there is high anxiety regarding the use of computers by people who are not familiar with the development of communication and information technology. Thus, this provides psychological pressure on elementary school teachers when they are required to apply online learning technology, including computers. The concept is following Howard (1986) that when a person is in a stressful situation, such as in computer use, stress can cause tension to the computer (subliminal), anxiety about computers (conscious), fear of computers (specifically related to computer use), or a phobia of computers (severe physical anxiety) (Saade & Kira, 2007). This feeling will affect an individual perception of the ease of applying online learning technology through computers.

CONCLUSION, IMPLICATION, AND LIMITATION

The TAM model developed in this study can explain and predict the intention of elementary school teachers to use online learning technology during the Covid-19 pandemic that hit Indonesia. Perceived ease of use is a predictor variable that has the most significant influence on the intention of elementary school teachers to use online learning technology during ERL during the pandemic. Two factors affect perceived usefulness, namely subjective norms, and job relevance. Job relevance has the most significant influence on perceived usefulness. The factor that most influences perceived ease of use is computer self-efficacy compared to computer anxiety, which negatively affects. All predictor variables in TAM developed for this study can explain and predict criterion variables.

Overall, TAM is a superior model for understanding, explaining, and predicting the use of new technology systems. To date, there have been several interesting studies on the application of TAM. Although confirmatory results have been obtained, skepticism among researchers about the application and theoretical accuracy of the model is still rising. Thus, we can conclude that research on TAM may have reached a saturation level, so future research will focus on developing a new model that takes advantage of the strengths of the TAM model while ignoring its weaknesses.

The results of this study are expected to provide input for stakeholders, which in this case are parties related to the learning process of elementary, middle, and high school students regarding the factors that influence the intention of teachers to use online learning technology in the ERL. Further, the results of this study can also be used as input for the government through the education offices at the provincial and district or city levels in developing the competence of teachers, especially in using and implementing online learning technology for distance learning.

The results of this study can also be used as input in understanding the factors considered capable of influencing the intentions and behavior of organizational members in implementing or adopting information and communication technology systems that are applied and developed by the organization. A training system can be designed to enable them to adopt the new technological system by understanding these factors.

There are several limitations to this study. First, this study only measures the extent of the behavioral intention stage. Therefore, it is supposed to prove the ability of TAM in understanding, explaining, and predicting the behavior of the use or adoption of a new communication and information technology system. It is better to measure up to the behavioral stage. Furthermore, measuring the behavior stage should use actual user data.

Second, this study only involved elementary school teachers in five major cities in Indonesia. Further research is expected to involve teachers at the secondary and high school levels (for example, middle high school, high school, and vocational high school), likewise with the coverage area, which, if possible, covers all big cities in 34 provinces in Indonesia to generalize the results of the research better.

Third, this study uses an online survey. The online method often raises questions when collecting data, whether the elementary school teachers genuinely filled in the questionnaire. However, it cannot be avoided that this method is used because the authors are faced with regulations issued by the government regarding travel restrictions and maintaining distances during the Covid-19 pandemic. Therefore, further research should be carried out using surveys and interact physically with the intended respondents.

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A SNAPSHOT OF FLIPPED INSTRUCTION IN ENGLISH LANGUAGE TEACHING IN TURKIYE: A SYSTEMATIC REVIEW

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ABSTRACT

This study aims to explore the trends and the perceived benefits and challenges of flipped language instruction regarding student achievement and attitudes in Turkiye. To that end, the databases, including Web of Science Core Collection, Scopus, Eric and DergiPark were reviewed, and a total of 20 articles were analyzed. Systematic review was utilized as the research methodology. The findings revealed that flipped instruction in ELT has gained importance since 2015 in Turkiye and has been gradually receiving more attention in research and practice. In the reviewed studies, the most employed research method turned out to be the mixed method, whilst the purely quantitative and qualitative studies were not abundant. It is seen that writing has been the most frequently researched language skill with respect to flipped instruction, whereas the other skills were not subject to investigation considerably. Furthermore, apart from language skills as the primary focus, the studies also concentrated on students' perceptions, achievement, self-directed learning, attitudes, and classroom engagement. Finally, the reviewed studies illustrated the challenges and benefits of the flipped classroom in relation to students' achievement and attitudes towards learning. In the light of the findings, implications for practice and recommendations for future research are provided.

Keywords: Flipped instruction, flipped classroom, English Language Teaching, EFL, systematic review.

INTRODUCTION

Flipped instruction has been an approach that has received a lot of research attention in many educational fields over the last decade as a result of the advances in technology and their integration into educational methodologies (Akcayir & Akcayir, 2018; Dill, 2012; He, Holton, Farkas, & Warschauer, 2016; Zou, Luo, Xie, & Hwang, 2020). There is no doubt that English language teaching is one of these fields since teaching English is a primacy worldwide. The field of ELT also strives for innovative approaches and practical techniques to keep up with continuously changing student profiles and their needs. (Hsieh, Wu, & Marek, 2017). According to He et al. (2016), the escalation in flipped instruction is due to its potential to amalgamate active learning and online instruction. Although there is no absolute definition of the concept, it is widely acknowledged that it aims to transfer new information to students before class to allocate more time for more in-depth learning experiences at the practice and production levels. In this way, flipped classroom makes room for a flexible and interactive learning environment that incorporates more opportunities for hands-on practice and higher-order thinking (Turan & Akdag-Cimen, 2020).

Sustaining a growing interest, flipped instruction has been examined in many subject fields around the World (O'Flaherty & Phillips, 2015). However, the recent research studies concluded that the lack of comprehensive research studies regarding foreign language education is still salient in the literature. Indeed, a well-conducted review has also been recently published about flipped instruction by Turan-Akdag-Cimen (2020), referring to the general practices in the world. However, when a detailed look is taken at the Turkish EFL context,

it is observable that no review study focuses on flipped instruction in language teaching in Turkiye. To that end, the current study aims to provide a snapshot of flipped EFL instruction in Turkiye, address some critical points, highlight the current situation, and provide recommendations for future research.

LITERATURE REVIEW

Flipped instruction creates a dynamic, interactive learning environment where direct instruction is moved from the group learning space to the individual learning space (Flipped Learning Network, 2014). Fulton (2012) underpins that allowing students to move at their own pace, making room for using the class time more creatively and effectively, making learning environments more flexible through technology, paving the way for 21st learning and skills, and being able to customize the curriculum in relation to learners' needs are some of the motives for adopting flipped instruction or classroom.

The research studies conducted in flipped instruction explicitly indicate that this model has its roots in the constructivist theory of learning (Erbil, 2020). According to Dewey (1938), students build their own learning and understanding in a constructivist classroom thanks to the learning situations, activities, tasks, experiences that are created or facilitated by the teacher. In this regard, it is essential to pinpoint the roles of teachers and students in such a constructivist learning environment. To that end, it can be said that the studies conducted so far have indicated that flipped instruction, by challenging traditional classrooms, has brought about many changes in the ways of learning and the roles of teachers and students. In particular, apart from lecturers or knowledge transmitters, teachers have obtained the roles such as motivators, guides, feedback providers, content experts, instructional designers, and media developers (Hsieh et al., 2017). Moreover, Hung (2017) suggests that teachers are supposed to understand students' needs better and ensure their participation in comprehensive learning experiences. When it comes to students, they are expected to move away from being passive listeners and become autonomous and cooperative learners, problem-solvers, and active participants (Zou & Xie, 2019). In line with this, Schipke (2017) underlines that some researchers accentuate students act as more active learners and tend to obtain a more comprehensive and meaningful understanding of course content and the way it is implemented (Sams & Bergmann, 2013; Zappe, Leicht, Messner, Litzinger, & Lee, 2009).

As far as the design principles of flipped learning are concerned, today, the outline created by the Flipped Learning Network (FLN) titled "four pillars of flipped learning" is utilized by many researchers, practitioners, and program designers (Bauer-Ramazani, Graney, Marshall, & Sabieh, 2016). According to this outline, Flexible Environment, Learning Culture, Intentional Content, and Professional Environment are supposed to be incorporated into the practice of flipped instruction. In terms of flexibility, teachers are expected to create flexible learning spaces in which learners can choose when and where they learn. Secondly, learning culture needs to pave the way for sparing classroom time to go over subjects and topics in depth through generating rich learning opportunities. In such a learning culture, students are believed to get actively involved in constructing their knowledge and experience, think more critically, and interact with their peers, which is more meaningful than traditional classroom pedagogy (Jang, 2015). The third pillar, Intentional Content refers to the teacher's autonomy and freedom to choose what to teach and what materials to utilize to generate more opportunities to realize a student-centered learning environment in which learners make use of active learning strategies. In a similar vein, the National Education Association (2010) highlights teachers are required to engage their students with the "Four Cs": namely, critical thinking, communication, collaboration, and creativity. Moreover, He et al. (2016) describe flipped instruction with three essential attributes. First of all, it requires obligatory pre-class learning through new materials. Secondly, this pre-class learning or work needs to be followed by a thorough explanation and discussion in productive ways in the classroom environment. Finally, classroom attendance as a mandatory attribute is a crucial factor in reaching the model's goals. In this regard, these attributes might be considered in order to evaluate the success and effectiveness of a flipped class and should be taken into account in program design.

When it comes to the positive aspects of this approach, according to a considerable number of studies conducted in education, flipped instruction or flipped classroom model has yielded various educational benefits. Some of these are academic achievement and better learning performance (Deslauriers & Wieman, 2011; Turan & Goktas, 2016; Zainuddin & Halili, 2016), engagement and motivation (Dill, 2012; Strayer,

2012; Herreid & Schiller, 2013; Chen Hsieh, Wu, & Marek, 2017; Chuang, Weng, & Chen, 2018), and increased collaboration and peer instruction (Zou & Xie, 2019). When it comes to English language teaching, Turan and Akdag-Cimen (2020) note that language acquisition necessitates a considerable amount of investment in time and practice and students' involvement in diverse learning activities to improve their skills in the target language. However, since teachers have limited classroom time and due to large classroom sizes, the opportunities to practice language skills are unfortunately not ample. In that sense, researchers underscore that more room can be made for practicing language and learning activities by situating instruction outside the class through flipped instruction (Amiryousefi, 2017; Han, 2015). Although flipped instruction has received a lot of research interest in different disciplines, studies focusing on EFL learners are relatively limited. The available studies highlight that flipped learning contributes to the improvement of students' listening and speaking skills (Ahmad, 2016; Amiryousefi, 2017; Cetin Koroglu & Cakir, 2017; Chen et al., 2017), reading comprehension and writing skills (Ekmekci, 2017; Mo & Mao, 2017), grammar and vocabulary (Kang, 2015; Webb & Doman, 2016). Apart from these specific contributions to the development of language skills, some other studies also emphasize that flipped classroom boosts learner motivation, increase preparedness levels of learners, encourages deep learning and higher-order thinking, and contribute to students' ICT skills in EFL classrooms (Alsowat, 2016; Boyraz & Ocak, 2017; Choe & Seong, 2016; Gasmi, 2016; Huang & Hong, 2016).

On the other hand, it goes without saying that no instructional approach or method is without its limitations and challenges. To that end, the recent studies carried out in flipped language instruction have discussed an array of challenges in terms of the model (Herreid & Schiller, 2013). For instance, Turan and Akdag-Cimen (2020) conclude that most of the studies they examined reported issues, including students' extra workload and problems in relation to the Internet and technology. Likewise, Bauer-Ramazani et al. (2016) also attract attention to the increased time commitment to set up the tools and equipment for technology support, designing suitable language and assessment activities for flipped instruction. To that end, the authors drew the conclusion that flipped learning model works best with students who are motivated and willing to spend extra time to complete online tasks and activities outside school time and at home. On a different note, Zainuddin and Halili (2016) underscore that instructors without any quality training and poor video quality might decrease the efficiency of the approach, as well. Jiang et al. (2020) spotlight that some studies reported that some flipped classes were practiced with a low level of learner preparedness, although it is one of the critical elements of flipped instruction. According to Lin and Hwang (2019), teachers had challenges when it comes to improving students' higher-order thinking skills, which is also one of the goals of the methodology, and most of the studies concentrated on fundamental skills and knowledge in flipped instruction. In this regard, it can be stated that flipping out the basic content knowledge according to Bloom's taxonomy has been criticized by researchers since this kind of implementation and design is against the nature and philosophy of the flipped instruction model since it leads to a kind of knowledge transmission rather than focusing on the learning culture of the model and contradicts its purpose (Anderson & Krathwohl, 2001; Bergmann & Sams, 2013).

With respect to flipped language instruction in Turkiye, there has been a dramatic increase in flipped instruction in the last few years with the increasing engagement in instructional technology and new modalities of teaching. As a relatively new endeavor, flipped learning has attracted the attention of many educators and researchers as well as institutions in our country, as well. There is no doubt that this has led to a proliferation of studies that investigate its impact on students' achievement, motivation, and engagement. More specifically, different designs have been attempted using the approach in language teaching. Nevertheless, the nature and influence of flipped instruction remain unclear, and what we know about flipped instruction is derived mainly from small-scale studies. In this regard, providing a snapshot of research endeavors in flipped language instruction, particularly in Turkiye, might shed light on the status of flipped instruction in language teaching and learning and provide insights and directions for further research needed by reviewing the present research studies in Turkiye. In this respect, the research questions the present study intends to answer are as follows;

1. What are the trends in flipped instruction research in teaching EFL in Turkiye?
2. What are the perceived benefits and challenges of flipped language instruction in regards to student achievement and attitudes in Turkiye?

METHOD

Design

This study made use of a systematic review method that is a particular methodology to situate existing studies, choose and evaluate them by providing a comprehensive analysis and synthesis so that clear and sound conclusions might be drawn (Denyer & Tranfield, 2009). In this way, what is known and is not known about research foci could be made explicit to the reader.

Identification of the Relevant Studies

Within the scope of the current study, systematic research was carried out in the databases of Web of Science Core Collection, Scopus, ERIC, and DergiPark in order to reach quality articles on 23 January 2021 since they are considered to be major databases for the fields in the social sciences. The key terms employed in the search are "flipped instruction," "flipped classroom," "flipped teaching," "flipped learning," "ters yuz ogrenme" "ters yuz sinif", "EFL" and "English Language Teaching". Since this study's focus is flipped language instruction in Turkiye, the search results in the database were refined by the location "Turkiye". The search generated 227 studies at the very beginning. After the removal of duplicates and screening the studies based on the abstracts, the studies which were not related to ELT were omitted. 54 articles about flipped language instruction in Turkiye were detected in the beginning. Upon evaluating the full-texts, 29 studies were subject to the eligibility criteria, which resulted in excluding 9 other studies.

Criteria for Inclusion and Exclusion

For this systematic review, the studies in line with the following criteria were included. Firstly, studies that examined flipped instruction as the primary focus both in EFL contexts and ELT pre-service teacher education in Turkiye were selected. Secondly, studies published in peer-reviewed journals and with full texts were considered to be eligible. Lastly, theses, conference proceedings, and the studies that did not clearly explain reliability procedures and research design were excluded from the review process (see figure 1).

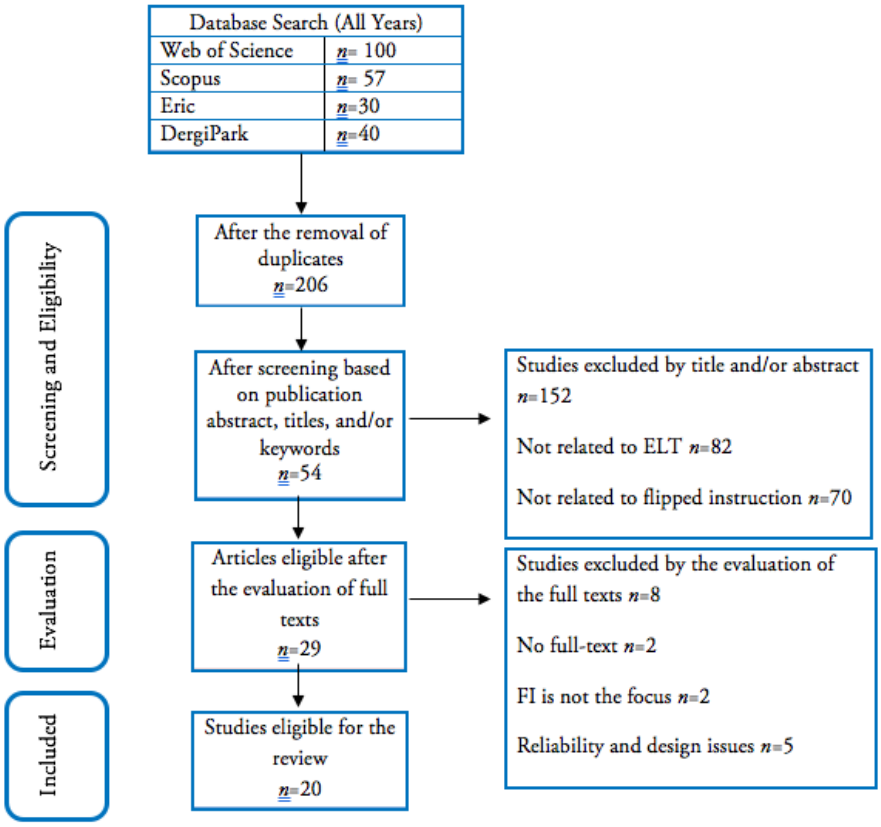

Figure 1. The flow diagram of the selection process

Data Analysis

The studies eligible for the review were analyzed through content analysis. Hsieh and Shannon (2005) propose that content analysis is a flexible data analysis method that enables researchers to conduct various types of analysis "from making impressionistic interpretations to highly systematic analyses of text-based data" obtained. O'Leary (2014) spells out that this process requires creating a pool of the texts to investigate and taking into account how they are to be accessed at the beginning, which was defined above. Within the scope of the current systematic review study, a data extraction form was created by the researcher to record all the required information to complete the review. The form included eleven dimensions, including the authors and years of the studies, the databases, the foci of the studies, the study samples and durations, the research designs and methods utilized, the journals in which the studies were published, theoretical frameworks of the studies (if given) and the findings and the main themes of the studies.

Credibility

Hsieh and Shannon (2005) state that failing to have a complete understanding of the context or documents, thus failing to identify key categories, has been one of the challenges of this kind of analysis, which might lead to findings that do not represent the data correctly and scrupulously. To Stufflebeam (1974), researchers might contribute to the credibility of their findings, especially by carrying out their studies openly and consistently in professional integrity. In line with this, all the processes during data collection and analysis procedures in the current study are clearly provided in the paper. Moreover, Lincoln and Guba (1985) underlined that peer debriefing, prolonged engagement, and member checks are some ways of establishing credibility. In this regard, after the content analysis was completed, a field expert, who was supervising the study, was consulted, and modifications were made in line with the expert opinion. Finally, According to Moller and Myles (2016), the value and credibility of a systematic review rely on the significance of the question, the quality of the original studies, the measures taken in order to minimize bias. To that end, the screening and selection process is transparently indicated throughout the paper in order to minimize potential biases.

FINDINGS

Trends in Flipped Instruction in ELT in Turkiye

Within the scope of the first research question, the trends were examined in accordance with some categories, including the foci of the studies, the theoretical frameworks, the language skills scrutinized, the distribution of the studies by year, research designs utilized, the sample characteristics of the studies and the journals in which the articles were published.

First of all, the distribution of the studies shows that flipped instruction has attracted attention in ELT in Turkiye starting in 2015, and it gained more importance gradually, as shown in Figure 2. Due to the cut-off date, only one article was included in 2021 in the current review.

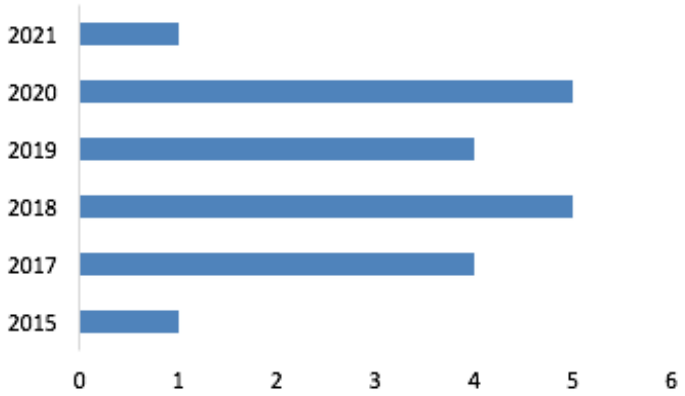

Figure 2. The number of the articles by year

As far as the studies' methods are concerned, the most commonly employed research method turned out to be the mixed method, whereas the purely quantitative studies were rare (see figure 3). On the other hand, there were approximately the same number of review studies (n=3) and qualitative ones (n=4). When the research foci of the studies are examined, it is seen that some of them concentrated on language skills and the others dealt with different dimensions such as students' perceptions (n=4), achievement (n=2), self-directed learning and attitudes (n=2), and classroom engagement (n=1). The most frequently researched language skill was writing (n=5), whereas speaking, pronunciation and vocabulary were included in three separate studies.

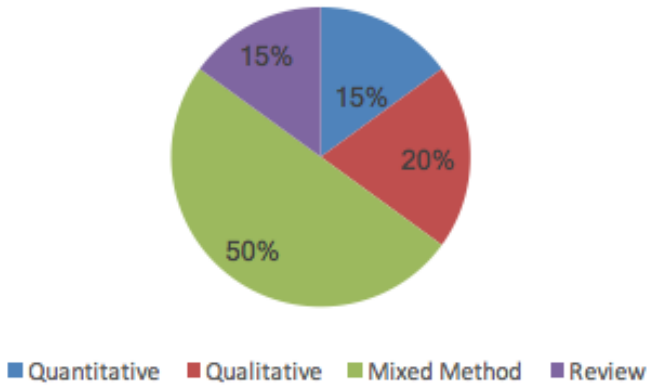

Figure 3. Research methods in the articles

When the samples of the studies are examined, preparatory class students constituted the majority (*n*=7), whereas the studies carried out in K-12 contexts (*n*=4) and pre-service teachers (*n*=5) were almost equal. In this regard, it is clear that most of the flipped language instruction studies were conducted at the tertiary level with adults rather than K-12 students. One of the studies included academics as the participants to investigate the effect of flipped instruction on their speaking skills. Lastly, as can be seen in figure 4, Journal of Language and Linguistic Studies and Turkish Online Journal of Distance Education turned out to have published relatively more flipped classroom studies.

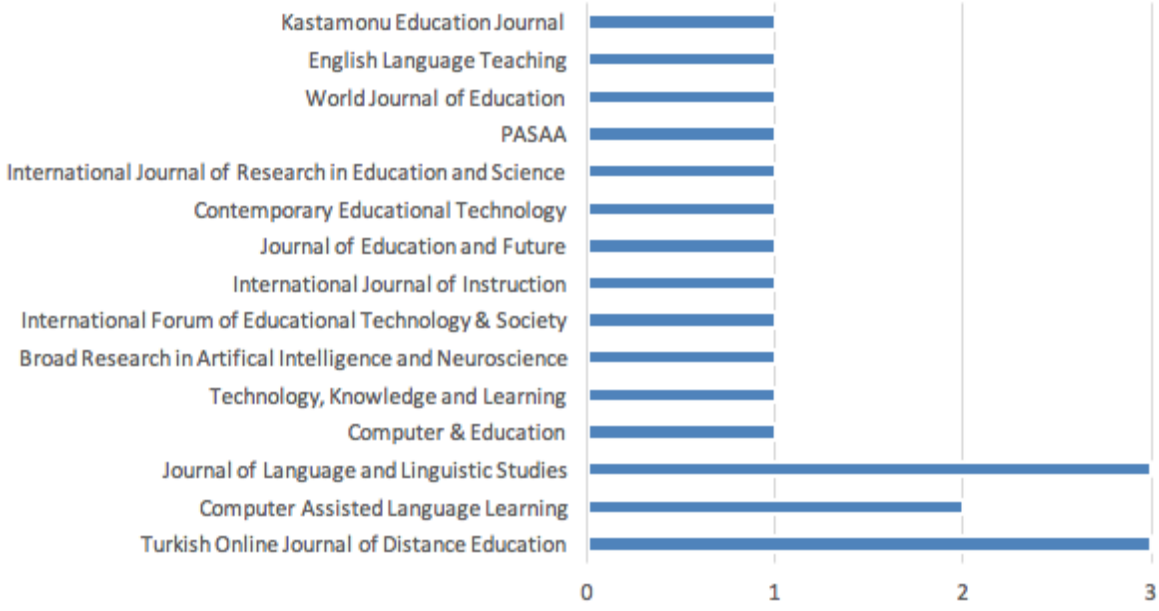

Figure 4. Articles by journals

In relation to the theoretical frameworks and instructional approaches employed in the reviewed articles, it would not be wrong to state that Bloom's taxonomy was mostly preferred as the guiding framework to design and implement flipped language instruction. Stating that flipped instruction is rooted in constructivism, self-directed or self-regulated learning was also frequently a visited theoretical lens in the studies, whereas some other studies also concentrated on different theoretical aspects in line with the nature of the studies, as shown in table 1.

Table 1. Theoretical frameworks in the articles

Theoretical frameworks and instructional approaches	Sample Studies
Self-determination theory	Akayoglu (2019)
Authentic learning	Oznacar, Koprulu & Caglar (2019)
Multimedia learning	Umutlu & Akpinar (2020)
Self-regulation	Okmen & Kilic (2020)
Skill Acquisition Theory, Bloom's Taxonomy, Output Driven / Input-Enabled Hypothesis	Yesilcinar (2019)
Self-directed learning	Ceylaner & Karakus (2018)
Self-regulated learning	Altas & Mede (2020)

Benefits and Challenges of Flipped Language Instruction

The current systematic review findings revealed that flipped instruction yielded better achievement test scores and student writing performance. On the other hand, flipped language instruction has the potential to contribute to learners' self-regulation skills and self-efficacy levels. Above all, most of the studies examining the students' perceptions conclude that this very instructional approach generates positive outcomes in terms of classroom engagement, course satisfaction, and motivation towards learning English for EFL learners and other ELT departmental courses (see table 2). Overall, the studies comparing flipped classroom model to the traditional classroom indicate that the latter is more effective than the former in many aspects. However, due to the lack of empirical studies in different language skills, it is not possible to comprehend how flipped instruction functions differently for each language skill.

Table 2. Benefits of flipped instruction

Benefits of FI	***f***	**Articles**
Better performance in writing	5	Adnan (2017), Altas & Mede (2020), Arslan (2020), Ekmekci (2017), Gurluyer & Elkilic (2020)
Positive perceptions in terms of motivation/effectiveness/ Engagement /satisfaction/ positive atttiudes	11	Adnan (2017), Akayoglu (2019), Bakla (2018), Basal (2018), Ceylaner & Karakus (2018), Ekmekci (2017), Gurluyer & Elkilic (2020), Oznacar, Koprulu and Caglar (2019), Okmen and Kilic (2020), Ozkurkudis and Bumen (2019), Yesilcinar (2019)
Higher levels of classroom engagement	1	Aycicek & Yelken (2018)
Better achivement test scores	6	Boyraz & Ocak (2017), Kirmizi and Komec (2019), Kurt (2017), Oznacar, Koprulu and Caglar (2019), Ozkurkudis and Bumen (2019), Umutlu and Akpinar (2020)
Higher self-directed learning readiness / self-regulation	2	Ceylaner & Karakus (2018), Okmen and Kilic (2020)
Higher levels of self-efficacy	1	Kurt (2017)
Improved speaking skills	1	Yesilcinar (2019)

When it comes to the challenges and difficulties of flipped language instruction that the reviewed studies dwelled upon, it is evident that most of the studies generated similar results that are essential for the implementation of flipped instruction (see table 3). To that end, the issues regarding technology and infrastructure as well as allocating time for flipped instruction outside the classroom emerge as the significant

challenges in FI. Secondly, there is strong evidence that this instructional model requires much effort and workload on both EFL learners and ELT pre-service teachers compared to the traditional classroom model. On a different note, it is vital to state that there might be resistance from students when it comes to getting exposure to flipped materials at home, which prevents a proper practice of the approach. In that sense, the fact that some students do not find the model appealing and some others do not do assignments has been another significant challenge the researchers and the practitioners have gone through. Some studies also highlight that students do not have the chance to ask their immediate questions and receive help, which is considered a pitfall by some students. Finally, it must be noted that flipped instruction is quite demanding when it comes to accessing proper resources and appropriate material development for flipped language instruction, which is believed to be a burden on teachers' shoulders and requires more time for instructional preparations.

Table 3. Challenges of flipped instruction

Challenges of FI	*f*	Articles
Workload	4	Akayoglu (2019), Adnan (2017), Turan & Akdag-Cimen (2020), Arslan (2020)
Slow Internet connection, time-related problems	6	Ekmekci (2017), Ozkurkudis & Bumen (2018), Turan & Akdag-Cimen (2020), Yesilcinar (2019), Boyraz & Ocak (2017), Arslan (2020)
Lack of the chance to ask instant questions	2	Ozkurkudis & Bumen (2018) Kirmizi & Komec (2019)
Resisting to watch the videos at home or can forget to watch them.	2	Ozkurkudis & Bumen (2018) Kirmizi & Komec (2019)
Learners not doing assignments, and not appealing to everyone	2	Yesilcinar (2019) Bakla (2018)
Lack of a device to watch lecturing videos, technical problems	3	Boyraz & Ocak (2017), Gurluyer & Elkilic (2020), Bakla (2018)
Preparing / finding proper materials / resources	1	Arslan (2020)

DISCUSSIONS AND CONCLUSION

In this study, 20 articles retrieved from Web of Science Core Collection, Scopus, Eric, and DergiPark were reviewed with respect to the trends and the findings related to the benefits and challenges of flipped language instruction. The findings revealed that in Turkiye, there has been a gradual increase in the number of studies scrutinizing flipped instruction in EFL contexts since 2015. This finding is parallel to the findings of the other studies examining flipped language instruction worldwide. (Turan & Akdag-Cimen, 2020; Tutuncu & Aksu, 2018; Filiz & Benzet, 2018). This increase might result from the vigorous efforts in ICT integration into language teaching and the prominence of catching up with contemporary instructional approaches in language teaching.

In the articles reviewed within the current study's scope, the mixed method research studies turned out to outnumber the other designs. On the other hand, purely quantitative studies seem to be quite rare. Pertaining to the study groups, it is seen that the studies were mostly conducted with university students (Zou & Zhang, 2021) while K-12 students were seldomly the focus of the studies, which was also indicated by Tutuncu and Aksu (2018), who also examined the other disciplines, as well. According to Turan and Akdag-Cimen (2020), this might be since students at the tertiary level are more likely to regulate their studies. Apart from this autonomy issue, it must also be noted that university students are considered to be more competent using technology in their studies, and they access the Internet and technological devices more easily for their academic purposes (Korucu-Kis, 2021).

With respect to the language skills examined, the reviewed articles mostly concentrate on writing. Likewise, Turan and Akdag-Cimen (2020) point out that the most commonly explored language skills were speaking and writing. In that sense, it can be said that there is a lack of studies that cater to the other language skills

such as speaking, listening, and reading rather than writing skills in the Turkish context. However, the number of studies focusing on writing is still limited in the literature. In this regard, there is a need for flipped instruction studies on different skills in language instruction in order to illustrate the dimensions and implementation of the flipped model in language teaching. The present review also revealed that flipped instruction engenders positive perceptions towards courses on the part of students, similar to the other studies (Alsowat, 2016; Boyraz & Ocak, 2017; Choe & Seong, 2016; Gasmi, 2016; Huang & Hong, 2016). In the light of the reviewed studies and the available literature, it is sound to underscore that flipped language instruction might contribute to students' classroom engagement by increasing their motivation (Chen Hsieh et al. 2017; Fisher, Perenyi, & Birdthistle, 2021; Park & Kim; 2021), self-efficacy beliefs, developing autonomy (Han, 2015; Santikarn & Wichadee, 2018; Zainuddin & Perera, 2017) and self-regulation (Zou & Zhang, 2021). However, Altas and Mede (2020) argue that studies investigating flipped instruction and self-regulated learning yielded inconsistent findings in the literature and note that learners' improvement in writing might be a consequence of receiving more and immediate feedback.

Apart from those studies mentioned above, it is seen that recent research trends in flipped language instruction engender new research foci such as collocations and different competencies in language. For instance, Suranakkharin (2017) suggests that flipped instruction enhanced students' knowledge of collocations. In a similar vein, Nugroho and Fitriati (2021) demonstrate that students' pragmatic competence significantly improved following the flipped learning instruction. However, the results available in the literature ought to be cautiously interpreted. Lastly, as far as the students' satisfaction levels in the reviewed studies are concerned, flipped instruction stands as a promising model to be practiced in language classrooms either for improving certain language skills or promoting students' engagement and increasing their motivation towards learning. Last but not least, Zou et al. (2020) conclude that second or foreign languages were the areas to which the flipped instruction model was mostly applied. However, this review revealed that the number of empirical studies is quite limited in the Turkish context. In that sense, considering the contradictory results in the literature, conducting more empirical studies on flipped instruction with respect to language teaching and different skills may play a pivotal role in understanding the impact of flipped instruction on foreign language teaching and learning.

Implications for Practice

The findings of the current study provide some suggestions for the practitioners. First of all, regarding the challenges of flipped instruction, teachers are required to ensure an environment that arouses student interest in flipped activities to encourage them to complete the relevant learning activities on time since it might be a problematic area (Wang & Qi, 2018). Even if instructors are very well-prepared for teaching and the pre-learning materials, it is not possible to gurantee the effectiveness of flipped learning without students completing the pre-learning assignments before class (Park & Kim, 2021). Teachers might also set reminders in order to make the whole class complete the flipped tasks before coming to classes. To that end, developing or adapting flipped course materials according to the learners' interests and level must be a top priority to keep them on track. In a similar vein, the flipped materials' quality and standardization are also of paramount importance.

Another suggestion on the completion of tasks is that since students do not have the chance to ask their questions while going through the flipped materials, peer interaction might be promoted so that students can ask questions to each other, which is believed to contribute to developing a collectivist classroom culture and engagement. To that end, teachers might set online discussion forums so that students keep in touch with each other to eliminate the problem mentioned above to a certain extent.

Secondly, flipped instruction brings about its own difficulties throughout the implementation; teachers had better beware of the challenges and problems that students come across (Adnan, 2017). By doing so, they can make room for flexibility and ensure proper implementation of the model at the same time. More importantly, as many studies reported, students might experience some technological and technical problems during their exposure to flipped materials. Some even cannot access a proper Internet connection. In this regard, teachers might ask for help from IT support teams to provide immediate solutions and also be well-equiped in terms of using technology (Zou et al., 2020).

Furthermore, before designing a flipped class, teachers are advised to carry out a survey to figure out students' access to technological equipment and the Internet and learn about their interests. When it comes to the workload that the approach entails, teachers are recommended to work collaboratively and prepare a shared library of flipped materials in the classrooms with similar characteristics and levels. Another significant recommendation is that teacher educators might integrate flipped instruction into pre-service teacher education curricula so that after graduation, teachers will have a better grasp of the workload and requirements of this instructional approach, which might lead to better designed and implemented flipped classes. As Zou et al. (2020) underscore, some students are accustomed to teacher-centered classrooms and might have problems exploiting online learning materials. In this sense, teachers who desire to flip their classrooms are recommended to gradually transform their classes by developing student autonomy step by step (Lo, Lie & Hew, 2018).

Recommendations for Future Research

The current review concludes that in flipped language instruction, most of the language skills other than writing have not been researched enough in the Turkish context to unearth the impact of flipped instruction thoroughly. That is why further empirical flipped instruction studies on speaking, listening, and reading might be conducted in future studies. When the trends and the available data are taken into consideration, this study underlines the need for longitudinal studies in order to have a comprehensible understanding of the flipped model since most of the studies conducted in Turkiye are short-term quasi-experimental studies and perception studies. Finally, as many other studies highlight, flipped instruction has been mostly applied and researched at the tertiary level. In this respect, there is no doubt that future studies to scrutinize the model in K-12 will contribute to the literature and the future directions.

Limitations

It is noteworthy to indicate that every study has their limitations. Within the scope of the current study, in order to review the studies conducted in flipped language instruction in Turkiye, a search was carried out in the databases of Web of Science Core Collection, Scopus, ERIC, and DergiPark. In that regard, to be able to provide a thorough picture of the phenomenon under investigation, the scope might be expanded. Secondly, due to the cut-off date of the study, only one article was included in 2021, thus it might be essential to revisit the recent studies, as well. Finally, the search strategy might be another limitation. Although it was meticulously conducted, there might have been some studies that remained outside the scope of the study. In this regard, the search terms might be increased to ensure a state of better inclusiveness.

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APPENDIX A

Lists of the Reviewed Articles about Flipped Instruction in Foreign Language Education

Adnan, M. (2017) Perceptions of senior-year ELT students for flipped classroom: a materials development course. *Computer Assisted Language Learning, 30 (3-4),* 204-222, DOI:10.1080/09588221.2017.1301958.

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