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Dear TOJDE Readers,

Welcome to Volume 24 Issue 1 of TOJDE.

There are 15 articles in January 2023 issue of TOJDE. 32 authors from 13 different countries contributed to the issue. These countries are Australia, Bahrain, Brazil, Netherlands, Oman, Philippines, Saudi Arabia, Slovenia, Turkish Republic of Northern Cyprus, Turkiye, United Arab Emirates, United Kingdom and USA.

INFLUENCE OF SOCIAL MEDIA ADDICTION ON ACADEMIC ACHIEVEMENT IN DISTANCE LEARNING: INTERVENING ROLE OF ACADEMIC PROCRASTINATION authored by Kevin D. CARATIQUIT and Lovely Jean C. CARATIQUIT is the first article. This study examines the indirect effect of the relationship between learners' social media addiction and academic achievement in distance learning as mediated by academic procrastination. The findings indicates a positive and significant relationship between social media addiction and academic procrastination. There is also a negative and significant relationship between academic procrastination and learners' academic achievement. The findings are discussed in the article.

The title of the 2nd article is METACOGNITIVE AWARENESS, REFLECTIVE THINKING, PROBLEM SOLVING, AND COMMUNITY OF INQUIRY AS PREDICTORS OF ACADEMIC SELF-EFFICACY IN BLENDED LEARNING: A CORRELATIONAL STUDY. The authors are Fatma Gizem KARAOGLAN-YILMAZ, Ahmet Berk USTUN, Ke ZHANG and Ramazan YILMAZ. The purpose of this research is to examine the effect of metacognitive awareness, reflective thinking, problem solving and community of inquiry on students' academic self-efficacy in blended learning. The article discusses the practical and research implications of the study and suggests future research directions.

The 3rd article, INSTITUTIONAL ADOPTION AND IMPLEMENTATION OF BLENDED LEARNING: DIFFERENCES IN STUDENT PERCEPTIONS, is written by Ramiz ALI. This study aims to explore how university students perceive blended learning, and to compare differences in perceptions across subjects. According to results, students are generally happy about the use of blended learning, despite facing multiple barriers in using the learning approach.

TOO MUCH SCREEN? AN EXPLORATORY EXAMINATION OF DIGITAL EXHAUSTION OF EDUCATORS IN TURKIYE is the title of the 4th article, and the authors are Aysegul LIMAN KABAN and Neslihan KAYNAR ZEHIR. The purpose of this study is to analyze the digital exhaustion of educators in Turkiye and its proposed antecedents. Key findings are that educators have digital exhaustion and there are three main types of exhaustion (emotional, social, and physical). Educators offers some practical solutions for digital exhaustion.

Ali AL GHAITHI and Behnam BEHFOROUZ are the authors of the 5th article titled THE EFFECT OF CORRECTIVE FEEDBACK VIA A COMPUTERIZED COURSE ON OMANI EFL LEARNERS` WRITING PERFORMANCE. The present research investigates the efficiency of corrective feedback on learners` writing performance through electronic platforms. The survey findings show that participants emphasize the importance of receiving corrective feedback from their teachers.

The title of the 6th article is AN ANALYSIS OF PERSONAL FACTORS AFFECTING LEARNING MOTIVATION: A RESEARCH ON THE ONLINE EDUCATION PROCESS DURING COVID-19 PERIOD IN TURKIYE. Aytekin ISMAN, Ayda SABUNCUOGLU INANC and Nesrin AKINCI COTOK are the authors. This study aims to determine the factors of arousal, beliefs, goals, and needs that affect the students' learning motivations as personal factors during online education in Turkiye during the Covid-19 pandemic. These factors are discussed in the article.

MINORITY EDUCATION DURING THE PANDEMIC: THE CASE OF THE SLOVENE MINORITY IN ITALY is the 7th article. Daniel DOZ and Tina STEMBERGER are the authors. The authors highlight that teachers and students preferred face-to-face classes, since they faced several issues connected with remote learning, such as a lack of interaction during remote learning, technology and connection problem, health issues and psychological distress.

The authors of the 8th article are Oznur GURLEK KISACIK, Munevver SONMEZ and Azize OZDAS. The title is HOW ATTITUDES TOWARDS E-LEARNING AFFECTED THE ACADEMIC ACHIEVEMENT DURING THE COVID-19 PANDEMIC: AN EXAMPLE OF A NURSING SKILLS TEACHING. The aim of the study is to determine the relationship between attitudes toward e-learning and the academic achievements. The results show that negative attitudes and negative satisfaction with e-learning may lead to a decrease in e-learning academic achievement.

Cecilia GORIA and Angelos KONSTANTINIDIS are the authors of the 9th article. The title of this article is A PARTICIPATORY PEDAGOGICAL MODEL FOR ONLINE DISTANCE LEARNING: IDEATION AND IMPLEMENTATION. The authors propose a pedagogical model for distance learning which promotes the synergy of eight ingredients – Community, Openness, Multimodality, Participation, Personalization, Learning, Experience, Technological-Enhancement, with their initial letters generating the acronym COMP-PLETE – for the shaping of a highly participatory online learning experience and the creation of an active and cohesive community characterized by a strong sense of commitment towards the learning of the individuals and that of the group.

The 10th article which is authored by Kelmara MENDES VIEIRA, Reisoli BENDER FILHO, Elizeu DA SILVA COSTA JUNIOR and Gilberto MARTINS SANTOS. The title is DETERMINANTS OF DISTANCE EDUCATION DROPOUT: EVIDENCE FOR OPEN UNIVERSITY OF BRAZIL/ FEDERAL UNIVERSITY OF SANTA MARIA COURSES. This research seeks to understand the determinants of student dropout in the courses offered at the Open University of Brazil system at the Federal University of Santa Maria. The authors suggest that the increase in face-to-face activities has a greater impact on the probability of dropout than the physical conditions of the pole.

THE VIEW OF PROSPECTIVE SOCIAL STUDIES TEACHERS ON BLENDED LEARNING is the 11th article authored by Sercan BURSA. The aim of this study is to determine the views of social studies prospective teachers on blended learning. As a result of the study, it is recommended to include blended teaching practices in teacher education.

The 12th article is written by Nisrin ALNAIM and Aeshah ALSARAWI. The title is OBSTACLES TO DISTANCE EDUCATION FOR STUDENTS WITH LEARNING DISABILITIES AND WAYS TO FACE THEM: FROM THE POINT OF VIEW OF FEMALE TEACHERS. This study's aim was to explore the obstacles to distance education for these students and ways to face them based on teachers' opinions. The teachers provide recommendations to support students with learning disabilities, enhance family engagement in making instructional decisions, and provide distance education training to students with learning disabilities and their teachers.

Sule SAHIN DOGRUER is the author of the 13th article titled AT SCHOOL OR HOME? EIGHT GRADERS' FIRST PRACTICES WITH ONLINE GEOMETRY LESSONS. The aim of this study is to obtain whether any changes occur in their geometry attitudes during the process and to reveal their preferences between online distance learning and regular face-to-face education. The results show online distance learning does not cause any change in students' attitudes towards geometry lessons; moreover, students commonly prefer face-to-face education over online distance learning.

The 14th article titled TECHNOLOGY FATIGUE DURING THE COVID-19 PANDEMIC: THE CASE OF DISTANCE PROJECT-BASED LEARNING ENVIRONMENTS is authored by Ensaf Nasser AL MULHIM. This study aims to investigate final-year students' technology fatigue in distance project-based learning environments during the COVID-19 pandemic. The results show that technology does not highly fatigue final-year students in distance project-based learning environments.

The title of the 15th article is STEM FACULTY MEMBERS' PERSPECTIVES AND CHALLENGES TOWARDS DISTANCE LEARNING AND VIRTUAL CLASSES DURING COVID-19 OUTBREAK and the authors are Ali Khaled BAWANEH and Ehab MALKAWI. According to study, the university should continue supporting the current efforts to provide all the requirements of teaching and learning via distance learning and virtual classes such as suitable infrastructure, internet, smart apps, and technical support. There is always a need for continuous updates of the teaching and learning platforms in line with ongoing development and training for instructors and students.

I wish a happy new year for all of you. Hope to meet again in the next issue of TOJDE.

Cordially,

Dr. T. Volkan YUZER

Editor in Chief

INFLUENCE OF SOCIAL MEDIA ADDICTION ON ACADEMIC ACHIEVEMENT IN DISTANCE LEARNING: INTERVENING ROLE OF ACADEMIC PROCRASTINATION

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ABSTRACT

Using Partial Least Squares-Structural Equation Modeling with WarpPLS, this study examines the indirect effect of the relationship between learners' social media addiction and academic achievement in distance learning as mediated by academic procrastination. The study participants were 223 Filipino students at a secondary school in Cagayan, Philippines, who were chosen using convenience sampling. Sample sizes were calculated using the inverse square root and gamma-exponential methods. The findings indicated a positive and significant relationship between social media addiction and academic procrastination. There is also a negative and significant relationship between academic procrastination and learners' academic achievement. In terms of the indirect effects of the mediation model, the relationship between social media addiction and academic achievement is fully mediated by academic procrastination. This indicates that academic procrastination substantially impacts the strength of the correlation between social media addiction and academic achievement. The findings of the undertaking were discussed regarding their implications for institutions and future research.

Keywords: Social media addiction, academic achievement, academic procrastination, distance learning, PLS-SEM.

INTRODUCTION

COVID-19 is having a tremendous effect on the educational system worldwide. As a result of these difficulties, academic officials resolved to establish a new normal education. The Department of Education Philippines adopted the distance learning modality for K to 12 learners. Despite the pandemic, the department ensures that all students receive a high-quality and accessible education. Given that the mode of instruction provides learners with flexibility and other advantages, school dropout, low retention, educational success, and academic procrastination continue to be quite prevalent (Cerezo et al., 2017; Ucar et al., 2021; Baccal & Ormilla, 2021). This is because the educational learning modality leaves all responsibility for learning and achievement to students virtually. Students are given self-learning modules, take-home assignments, activities, and self-discovery exercises (Caratiquit & Pablo, 2021). Because this is the digital era, most students rely on getting information via the internet or the web.

Nevertheless, it is frequent to observe students so engaged in social media that they neglect their academic responsibilities. The negative influence of social media could be characterized as a misdirected priority in time management, which is required for students to pay close attention to their educational responsibilities. The enjoyment of social media use might cause learners' academic assignments to be delayed significantly during this new normal education, which, if not appropriately managed, can result in academic procrastination (Anierobi et al., 2021).

Several studies have discovered that procrastination relates to discomforts such as worry, self-regulating failure, and low self-efficacy (Hen, 2018; Hailikari et al., 2021; Hajifathali et al., 2021). Many of these studies have been conducted on adolescent students, suggesting that academic procrastination has a detrimental effect on students' academic progress (Goroshit, 2018; Alih & Alvarez, 2021). Academic procrastination happens when students put off performing or completing an academic task for an extended period of time without a valid reason. This occurs when students redirect their attention away from their academic responsibilities. Moreover, academic procrastination, for instance, arises when students become engaged in social media and become sidetracked from finishing academic obligations on time. According to Ipem and Okwara-Kalu (2020), students spend an excessive amount of time on social media, which causes them to become distracted from their academic activities.

The researchers scrutinized these previous studies by proposing a structural equation model to examine the intervening effect of academic procrastination in the relationship between social media addiction and academic achievement. Additionally, the proposed model was evaluated using Partial Least Squares – Structural Equation Modeling.

Academic Procrastination

Academic procrastination is most defined as actively delaying or deferring work that must be performed in an academic setting (Schraw et al., 2007). It is becoming an increasing source of concern in the educational sector, especially in light of the present pandemic (Hong et al., 2021). It may be worsened in a digital learning environment because students' behavior is not expected (Elvers et al., 2003). Additionally, a previous study discovered that students who procrastinate are more likely to use social media during lectures, which could be a factor in problematic digital use (Rozgonjuk et al., 2018). This is because learners choose to spend their time interacting online and making new acquaintances on social media platforms during their distance learning sessions rather than reading instructional materials.

According to previous research, low self-efficacy, disorganization, low intrinsic motivation, inadequate effort control, and ineffective time management are all significant predictors of academic procrastination among students (Howell & Watson, 2007; Wolters et al., 2017, as cited by Melgaard et al., 2022). Students who struggle with these indicators are significantly more likely to be identified, particularly in this time of distance education. Academic procrastinators exhibit a diminished capacity for self-regulation, which impairs their success in distance education.

Students' self-regulation and time management skills are inferior in remote education, and they demonstrate lower levels of motivation and self-regulation than in traditional education (Klingsieck, 2013; Garcia-Perez et al., 2020). It is because self-regulation becomes even more critical in this situation, and one of the primary concerns of students is inadequate time management. Lack of a timetable, excessive distractions, and multitasking during homeschooling can contribute to ineffective time management. Hence, academic procrastinators have a lower capacity for self-regulation, which has a detrimental effect on performance in online courses (Rasheed et al., 2020).

Also, many studies reported that academic procrastination has been associated with poor learning outcomes and psychological difficulties (Hussain & Sultan, 2010; Klingsieck et al., 2012; Dikmen & Bahadir, 2021; Rajapakshe, 2021) and may also affect assignment completion times and dropout rates from distance learning courses (Grunschel et al., 2012). Furthermore, when academic procrastinators are learning at a distance, they are often inspired to begin but then want to quit after some time (Michinov et al.,2011).

Social Media Addiction

Social media addiction has been a growing issue, with a notably high prevalence among learners (Yakut & Kuru, 2020; Marengo et al., 2022). A variety of advantages are provided by social media, such as making it easy for undergraduates to communicate information and supporting collaborative learning (Adjin-Tettey et al., 2022). Likewise, previous research indicates that social media allows learners to share instructional resources more quickly. When utilized properly, this can assist the learning process of learners (Okeke & Anierobi, 2020; Adjin-Tettey et al., 2022). According to a previous study, social media and the internet positively affect students' learning outcomes and social well-being (Sandeep et al., 2019).

On the other hand, some studies oppositely reported that students' excessive use of social media had been found to have a negative impact on a range of aspects of their lives (Brailovskaia et al., 2021). Previous studies discovered that social media addiction had a negative effect on students' academic performance, health, interpersonal connections, and general well-being (Alaika et al.,2020; Whelan et al., 2020).

Social media addiction could also result in bad eating habits, insomnia, brain drain, despondency, and academic failure (Haand & Shuwang, 2020). Besides, during this new normal education, students perceived an inability to manage their time spent on social media platforms and the amount of time spent on platforms for academic purposes.

Furthermore, internet addiction was connected with academic procrastination among learners (Karatas, 2015; Azizi et al., 2019; Nwosu et al., 2020). Meanwhile, Hayat et al. (2020) also discovered a significant association between internet addiction and academic procrastination among Shiraz University medical students. Male students use the internet at a higher rate than female students. Uztermur (2020) study discovered that social media addiction is negatively associated with academic achievement but positively associated with academic procrastination.

Academic Achievement

Academic achievement results from getting a quality education, and it continues to be vital to the development of the learners and society. Crede et al. (2015) defined academic success as the intellectual accomplishment measured by the General Average (GA) reported on students' most recent report cards. The grades were tallied and averaged as measures of academic proficiency based on the marks received in each course within that quarter.

Poor academic performance is generally associated with academic procrastination in the prior literature (Akinsola et al., 2007; Elvers et al., 2003; Moon & Illingworth, 2005; Karatas, 2015). Previous research indicates that students' reports of procrastination suggest a significant negative association with their academic performance. The more students procrastinate, the lower their grades are, and procrastinators have less motivation to succeed (Moon & Illingworth 2005; Steel 2007, Karatas, 2015).

Also, numerous research established a correlation between social media addiction and students' academic performance (Anierobi et al., 2021, Ipem & Okwara-Kalu, 2020; Kolhar et al., 2021; Durak et al., 2022). Another study discovered that academic institutions might use social media to increase student involvement, enhance communication, foster a positive attitude toward learning, and inspire students to learn (Kabilan et al., 2010, Cao & Tian, 2020). Additionally, it was positively associated with academic success among learners (Al-Rahmi et al., 2018). On the other hand, some study suggests that social media addiction has no correlation with academic success (Rashid & Asghar, 2016). Thus, the relationship between social media addiction and academic achievement intervened by academic procrastination is the focus of this study.

PURPOSE OF THE STUDY

This study examined the indirect effect of the relationship between learners' social media addiction and academic achievement in distance learning as mediated by academic procrastination. As a result, relevant literature and studies established the following hypothesized relationships.

Hypothesis 1. Social media addiction is significantly related to academic performance.

Hypothesis 2. Social media addiction is significantly related to academic procrastination.

Hypothesis 3. Academic procrastination is significantly related to academic performance.

Hypothesis 4. Academic procrastination mediates the relationship between social media addiction and academic performance.

Additionally, the following research structural equation model was developed considering the analyzed literature and investigations.
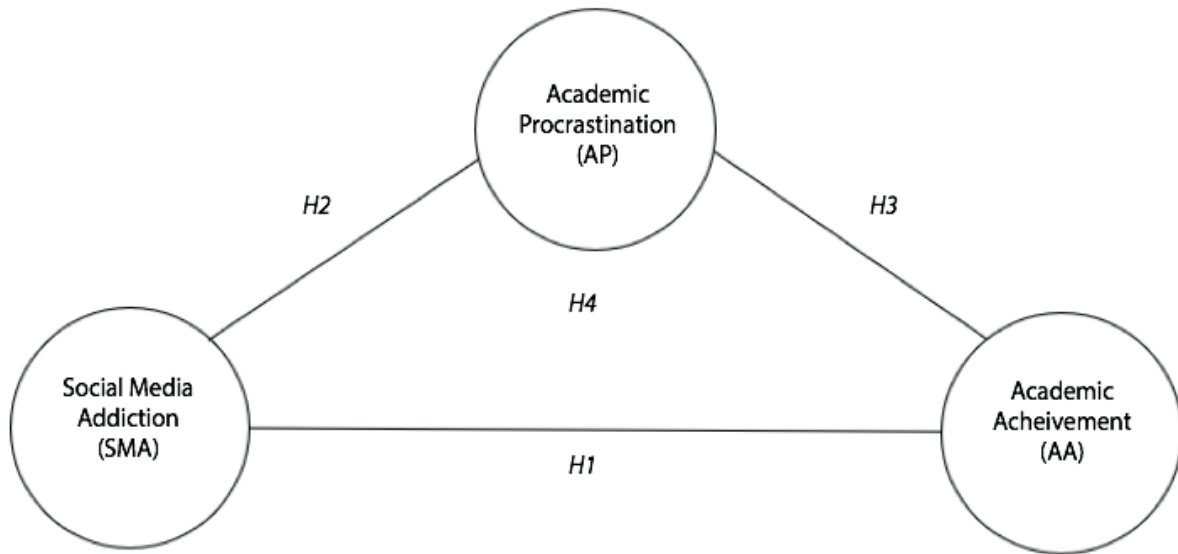
Figure 1. Proposed Structural Equation Model of the Study

METHOD

The study was quantitative, and it employed a causal research approach. It investigates the indirect effect of the relationship between social media addiction and achievement through academic procrastination. Additionally, the Partial Least Squares – Structural Equation Modeling (PLS-SEM) method was used in conjunction with the WapPLS 7.0 software package to estimate the parameters of the mediation model. The software is also a tool for evaluating the reliability and validity of structural equation models using the Partial Least Squares technique.

Participants

The respondents were the 223 K to 12 Filipino students enrolled in an outstanding secondary school in the Division of Cagayan, located in Lal-lo, Cagayan, Philippines. The respondents of the study were chosen through the convenience sampling method. The data collection period began in September 2021 and concluded in January 2022.

The inverse square root and the gamma-exponential methods were used to estimate the required minimum sample size of the model based on the following elements: the minimal absolute significant path coefficient, the significance level used for hypothesis testing, and the power level of the model. The inverse square root method overestimates the required sample size, but the gamma-exponential method provides a more precise estimation, making it necessary to report both results. (Kock, 2017). Using WarpPLS 7.0, the inverse-square root method recommended 92 samples, whereas the gamma-exponential method proposed 78 samples. As a result, the required sample size for the PLS model must be 92–78. The study has 223 respondents; thus, the sample size is sufficient to explain the structural model's conclusions (See Figure 2).
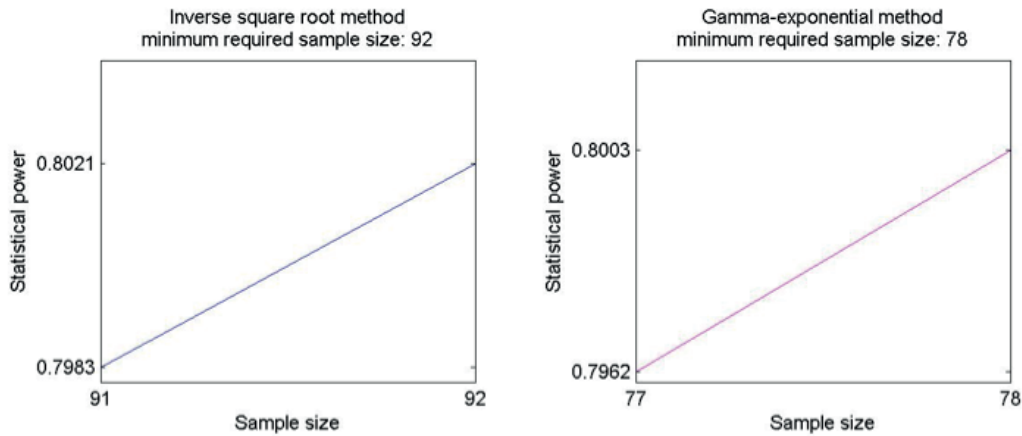
Figure 2. Sample Size Estimation using Inverse square root and Gamma-exponential method

As illustrated in Table 1, the majority of the respondents were female (59.6 %). In addition, 56.5 % of respondents were 17-18 years of age. In terms of track, most respondents (90.1 %) are on the academic track. In terms of class sections, most respondents were in HUMSS 1 (22.4 %) and STEM 1 (21.5 %). Moreover, most respondents have less than 10, 000 (74.4 %) family monthly income.

Table 1. Demographic Characteristics of the Respondents

Levels	Frequency	Percent	Levels	Frequency	Percent
Sex			Class Section		
Female	133	59.6	ABM	36	16.1
Male	90	40.4	HUMSS 1	50	22.4
Age			HUMSS 2	35	15.7
16-below	85	38.1	STEM 1	48	21.5
17-18	126	56.5	STEM 2	34	15.2
19-20	8	3.6	TVL - CSS	20	9.0
21-above	4	1.8			
Track			Family Monthy Income		
Academic Track	201	90.1	10,000-29,999	43	19.3
Arts and Design Track	2	0.9	30,000- 59,000	10	4.5
TVL Track	20	9.0	60,000 and above	4	1.8
			Less than 10, 000	166	74.4

Data Collection and Analysis

The data collected for this study were analyzed regarding social media addiction, academic procrastination, and academic achievement. The WarpPLS 7.0 software package was employed to estimate the parameters of the mediation model. Partial Least Squares is the second-generation statistical analysis, allowing for correlations between a large number of variables, including latent constructs (Chin et al., 2003; Haenlein & Kaplan, 2004; Oluyinka et al., 2021). PLS-SEM is a variance-based estimating technique used to determine the reliability and validity of constructs while also evaluating their correlations (Reinartz et al., 2009). Additionally, PLS-SEM has been a highly successful tool for establishing causal associations between variables (Hair et al., 2011; Hair et al., 2012). It is a technique for developing structural equation models based on the variance that is fast gaining prominence in social sciences (Issa & Hamm, 2017). Meanwhile, the Jamovi 2.2.2 software package was used for supplementary purposes, most notably in the summary of participant measures. The proposed mediation analysis procedure of Preacher and Hayes (2008) was employed in the study.

The Scale

Social media addiction scale

The social media addiction of the learners was measured using the Bergen Social Media Addiction Scale (BSMAS) developed by Andreassen et al. (2016). The scale comprised six items which were proposed by Griffiths (2005) and classified into six core components, namely: salience, mood, modification, tolerance, withdrawal conflict, and relapse (e.g., "I use a lot of time thinking about or planning using social media."). It utilized a 5-point Likert scale rated 5 (Very Rarely) and 1 (Very Often). The scale is a well-known instrument to assess social addiction over the past years. The Bergen Social Media Addiction Scale (BSMAS) is a redesigned version of the Bergen Facebook Addiction Scale (BFAS) (Andreassen et al., 2012; Andreassen et al., 2016). The BFAS has been translated into several languages and has been shown to have good psychometric properties in several studies (Andreassen et al., 2013; Andreassen et al., 2012; Andreassen, 2015; Ulke et al., 2017; Ahmed & Hossain, 2018; Mahmood et al., 2020). The adaptation of BSMAS replaces the term "social media" with "Facebook and the like." In the original study, the BSMAS demonstrated a high degree of Cronbach's alpha reliability coefficient of 0.88. Thus, the scale is both relevant and reliable for assessing the social media addiction of the students.

Academic procrastination scale

The students' academic procrastination was measured using the Academic Procrastination Scale-Short Form (APS-S) (McCloskey, 2011, as cited by Yockey, 2016). The scale is a widely used 5-item scale for assessing students' academic procrastination (e.g., " I get distracted by other, more fun, things when I am supposed to work on schoolwork.") with an internal consistency reliability estimate of 0.87. It utilized a 5-point Likert scale rated 5 (Agree) and 1 (Disagree). Yockey (2016) validated the instrument with other measures of procrastination, the 16-item Tuckman Procrastination Scale of Tuckman (1991) and the 12-item Procrastination Assessment Scale–Students of Solomon and Rothblum (1984), and the results suggested that the shorter APS-S has a strong association with PASS and Tuckman Scale. Thus, the scale is valid and reliable for assessing students' academic procrastination.

Academic achievement

The learners' academic performance was determined using their General Average (GA) from the first quarter of the school year 2021-2022. Reliability and validity tests were also performed using WarpPLS to ensure the instruments were acceptable and trustworthy for the current study (See Tables 2 & 3).

FINDINGS

Reliability and Validity Measurements

Convergent and discriminant validity are two often utilized types of validity assessment in PLS-based data analysis. As Barclay et al. (1995) defined, discriminant validity is the degree to which constructs inside a model differ. For each variable, the Average Variation Extracted (AVE) square root should be greater than the square root of any of the variables' correlations. (Fornell & Larcker, 1981; Rasoolimanesh, 2022). AVE square roots and cross-loadings tests are widely employed to assess the discriminant validity of a PLS model.

Internal consistency is a concept that refers to the evaluation of a hypothesis's convergent validity. Correlation loadings between items and their variables validate the item's reliability (Barclay et al., 1995; Rasoolimanesh, 2022). A factor loading should be higher than 0.6 to indicate that the factor takes an acceptable variance from the variable. Nevertheless, an item loading of 0.5 is acceptable as long as the loading of other factors within the same construct is high (Chin, 1998; Keil et al., 2000). Composite reliability is frequently used in structural equation modeling to measure build dependability (Fornell and Larcker, 1981).

Additionally, the Average Variation Extracted (AVE) measurement compares variance explained by items to variance produced by measurement error (Chin, 1998). Fornell and Larcker (1981) established that convergent validity could be assured if AVE is higher than 0.5; however, we can accept 0.4 when the

composite reliability is more than 0.6. As seen in Table 2, the results show that the measures utilized in the study had discriminant validity. Additionally, Table 3 reveals that the variables are inside the convergent validity ranges.

Table 2. Results of the Square Roots of AVE Coefficients and Correlation Coefficients

	SMA	AP	AA
SMA	(0.715)		
AP	0.431	(0.737)	
AA	0.015	-0.188	(1.000)

Non-diagonal elements represent construct correlation, while diagonal elements are AVE square roots.

Table 3. Results of the Item Loadings, Average Variation Extracted, and Reliability of the Variables

Constructs/Items	Item Loading	AVE	CR	Cronbach Alpha
Social Media Addiction (SMA)				
1. I spent a lot of time thinking about social media or planned use of social media	0.680	0.511	0.862	0.808
2. I felt an urge to use social media more and more.	0.692			
3. I used social media to forget about personal problems.	0.706			
4. I tried to cut down on the use of social media without success.	0.754			
5. I become restless or troubled if you have been prohibited from using social media.	0.753			
6. I used social media so much that it has had a negative impact on your job/studies.	0.700			
Academic Procrastination (AP)				
1. I put off projects until the last minute.	0.624	0.500	0.543	0.787
2. I know I should work on schoolwork,but I just don't do it.	0.802			
3. I get distracted by other, more fun, things when I am supposed to work on schoolwork.	0.768			
4. When given an assignment, I usually put it away and forget about it until it is almost due.	0.714			
5. I frequently find myself putting important deadlines off.	0.764			
Academic Achievement (AA)				
GA First Quarter	1.000	1.000	1.000	1.000

Each item is significant at (p<.001). AVE stands for average variance extracted, and CR stands for composite reliability

Model Fit and Quality Indices

The Goodness of Fit Model can be employed to evaluate the structural equation model. The model's value is determined by comparing it to its standard deviation. Several different measures were employed to determine the model's goodness of fit using the WarpPLS analysis (Wardhani et al., 2020). Table 4 illustrates that the structural equation model is fit and that the quality index requirements were met using the criteria provided. Through the results, it can assume that the model's Goodness of Fit was acceptable. Thus, the proposed model that has been developed can be utilized to test hypotheses.

Table 4. Results of the Model Fit and Quality Indices

Model Fit and Quality Indices	Criteria	Value	Interpretation
Average Path coefficient (APC)	Accepted if p < 0.05	0.262, p<0.001	Acceptable
Average R-squared (ARS)	Accepted if p < 0.05	0.131, p=0.012	Acceptable
Average adjusted R-squared	Accepted if p < 0.05	0.125, p=0.015	Acceptable
Average block VIF (AVIF)	Accepted if ≤ 5	1.026	Acceptable
Average full collinearity VIF	Accepted if ≤ 5	1.193	Acceptable
Tenenhaus GoF (GoF)	Small > 0.1, Medium > 0.25, Large > 0.36	0.299	Medium

Mediation Model Results

The path coefficients, coefficient of determination (R^2), and effect sizes are calculated to assess the structural equation model. Figure 3 depicts the PLS path model in more detail. It is represented by the beta coefficients (β), which are path coefficients in the mediation model.

The beta coefficient of the direct relationship between social media addiction and academic achievement is positive and not significant (β = 0.09, NS). Also, the beta coefficient of the relationship between social media addiction and academic procrastination is positive and significant (β = 0.44, p<.01). On the other hand, academic procrastination and academic achievement have a negative and significant relationship (β = -0.26, p<.01).
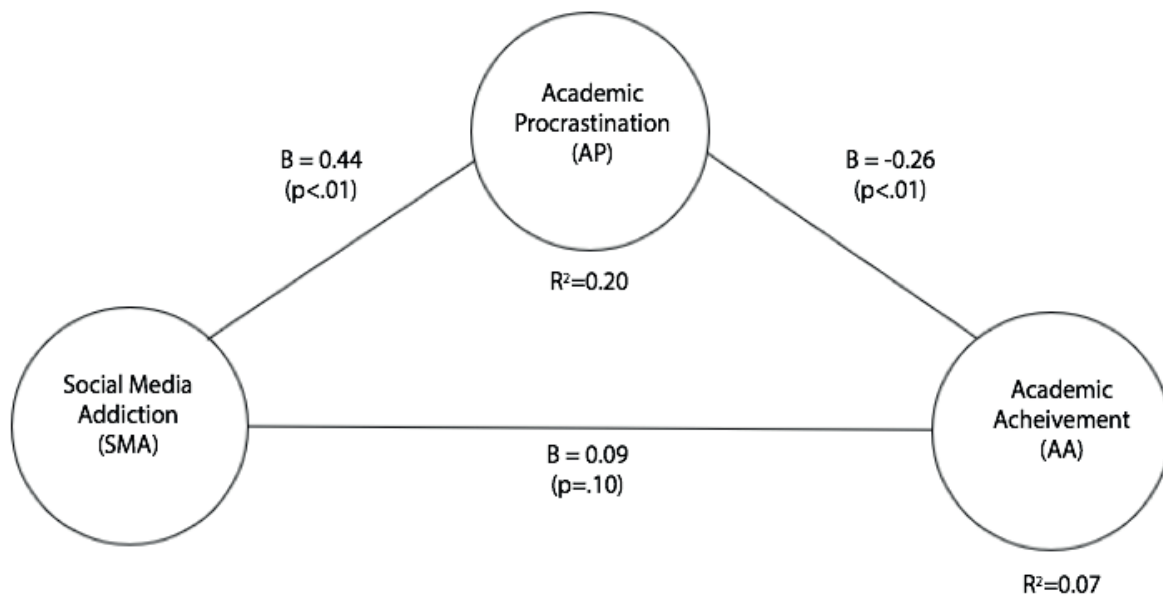
Figure 3. Results of the Mediation Model

Full Collinearity VIFs Assessment

Multiple regression models with a high degree of multicollinearity make determining the correlation between independent and dependent variables difficult. According to a rule of thumb obtained for SEM analyses, full collinearity variance inflation factors (VIFs) of 3.3 or less suggest that the model is not multicollinear and that no common method bias exists (Kock & Lynn, 2012; Kock, 2015; Lacap, 2019). On the other hand, prior studies mentioned that VIFs should be fewer than 5, although less than 10 is still acceptable and a more critical criterion (Hair et al., 1987; 2009; Kline, 1998; Kline, 2015; Kock, 2014). According to the results in Table 5, the VIFs of the variables are within acceptable ranges. This indicates that the model is not multicollinear and does not show common method bias.

Table 5. Results of Full Collinearity VIFs Assessment

SMA	AP	AA
1.242	1.287	1.049

Direct and Indirect Effects

Table 6 depicts the results of the direct and indirect effects of the structural equation model. The analyses show that the direct relationship between social media addiction and academic achievement has no significant effect (β = 0.086, NS) with the effect size of small (Cohen's f^2 = 0.004). Hence, H1 is not supported. A positive and significant association exists between the two constructs regarding the relationship between social media addiction and academic procrastination (β = 0.442, p<.001). The effect size of path SMA $\Rightarrow$ AP is medium (Cohen's f^2 = 0.195). Thus, H2 is supported. Likewise, the relationship between academic procrastination and academic achievement has a negative and significant result (β = -0.257, p<.001) with an effect size of small (Cohen's f^2 = 0.062). Therefore, H3 is supported.

In terms of the indirect effect of the structural equation model, the analyses show that the relationship between social media addiction and academic achievement is mediated by academic procrastination (β = -0.113, p=.008). The effect size of path SMA $\Rightarrow$ AP $\Rightarrow$ AA is small (Cohen's f^2 = 0.005). Therefore, H4 is supported.

Table 6. Results of the Direct and Indirect Effects

Type	Effect	β	SE	p-value	f2
Indirect	H4: SMA $\Rightarrow$ AP $\Rightarrow$ AA	-0.113	0.046	0.008	0.005
Component	H2: SMA $\Rightarrow$ AP	0.442	0.062	<0.001	0.195
	H3: AP $\Rightarrow$ AA	-0.257	0.064	<0.001	0.062
Direct	H1: SMA $\Rightarrow$ AA	0.086	0.066	0.096	0.004

β=*standardized path coefficient, f2 = Cohen's (1988) effect size: 0.02=small, 0.15=medium, 0.35=large; SE = standard error*

DISCUSSIONS AND CONCLUSION

The study revealed that social media addiction is not directly related to academic achievement. This implies that academic procrastination as the intervening variable causes the relationship between the two constructs. (Moon & Illingworth, 2005; Karatas, 2015; Azizi et al, 2019; Abbasi et al., 2021; Zimmer, 2022). Pekpazar et al. (2021) discovered that procrastination functions as a mediator between social media addiction, such as Instagram, and academic accomplishment. Procrastination hinders students from exhibiting their real potential throughout their academic careers. Meanwhile, Khalifa (2021) and Uztermur (2020) found that procrastination affects the relationship between social media addiction and educational aspirations. Students who excelled academically but were prone to procrastination could not arrange themselves and fulfill their academic goals. With this, academically disadvantaged students may exhibit poor academic performance, poor learning habits, and a lack of drive to gain new skills and knowledge. Academic achievement declines when a student is unable to regulate procrastination.

Furthermore, social media addiction significantly influences academic procrastination. This means that when learners spend too much time on social media are likely to have academic procrastination. Due to distance learning and homeschooling, learners are addicted and distracted by social media. The higher the social media addiction, the higher the tendency of learners to procrastinate their academic responsibilities in this new normal education. Learners who procrastinate lose their educational priorities, self-regulation, and time management (Melgaard et al., 2022, Lewis, 2022; Gokalp et al., 2022). Prior studies discovered that social media addiction had an unfavorable effect on students' academic performance and overall well-being (Alaika et al.,2020; Whelan et al., 2020; Navarro-Martinez & Pena-Acuna, 2022). Additionally, Haand and Shuwang (2020) assert also that social media addiction might result in sleep problems, depression, and academic failure. This finding is supported by other studies (Li et al, 2020; Aalbers et al., 2021; Wartberg et al, 2021).

Moreover, the study found that academic procrastination negatively influences learners' academic performance. This implies that the more learners procrastinate their educational responsibilities, the lower their academic grades. When the deadline for an academic task approaches, students who procrastinate experience heightened frustration and worry, resulting in low scores, decreased motivation and productivity, incompliance with academic assignments, and low quality of intellectual outputs. Prior studies also found that this can also lead to severe difficulties such as low self-esteem and depression in some cases (Kurtovic et al., 2019). Academic procrastination has previously been linked to various academic concerns, including lower grades, increased academic misconduct, increased course failures, increased course withdrawals, and a greater likelihood of dropping out (Sarid et al., 2021). Other studies support this finding (Baars et al., 2021; Scheunemann et al, 2021; Khalifa, 2021).

According to Preacher and Hayes (2008), a statistically and practically significant indirect effect is a fundamental component of mediation. Despite the insignificant direct effect, the study revealed a significant indirect effect on the relationship between social media addiction and academic achievement. This means that the relationship between the two constructs is fully mediated by academic procrastination. The results imply that social media addiction influences learners' academic procrastination, leading to poor academic achievement. The more learners spend their time on social media, the more they procrastinate their educational tasks, thus getting low grades. Academic procrastination plays a significant role in the context of social media addiction among students in this new normal education, which impacts their educational progress. Other studies are related to this finding (Uztermur, 2020; Nwosu et al, 2020; Anierobi et al., 2021; Koppenborg & Klingsieck, 2022; Kryshko et al., 2022; Cemiloglu et al., 2022).

In conclusion, the undertaking discovered that social media addiction of learners leads to academic procrastination. When students spend excessive time on social media, they are more prone to academic procrastination. In addition, the current study revealed that academic procrastination impacts the educational accomplishment of learners in distance learning. As a result, the more students put off academic work, the lower their grades. As the educational deadline approaches, students who procrastinate face increased aggravation and anxiety, resulting in low grades, performance, and non-compliance with academic responsibilities. Furthermore, the undertaking showed that academic procrastination fully mediates the relationship between social media addiction and the learners' academic achievement in this time of new normal education.

According to the findings and conclusion of the study, the researchers recommend that future research be conducted to determine the additional factors that influence social media addiction, academic procrastination, and academic achievement. Similarly, future studies may replicate the study and increase the number of participating students.

Despite social media distractions, students should improve their self-regulation, time management skills, and ability to create and attain educational goals to lessen academic procrastination. Additionally, teachers should assign homework with reasonable due dates and hold students accountable for doing it on time. Apart from the fact that remote learning is a self-paced mode of instruction, teachers should consider the level of difficulty and quantity of educational activities assigned to students to reduce procrastination and increase learners' motivation to complete the assignments on time. Together with the guidance counselor, the classroom advisers should help the students overcome academic procrastination due to social media addiction. On the other hand, parents should teach their children about the adverse effects of social media addiction, which may cause them to procrastinate and lose concentration on their academic activities.

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METACOGNITIVE AWARENESS, REFLECTIVE THINKING, PROBLEM SOLVING, AND COMMUNITY OF INQUIRY AS PREDICTORS OF ACADEMIC SELF-EFFICACY IN BLENDED LEARNING: A CORRELATIONAL STUDY

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ABSTRACT

Blended learning (BL) has been increasingly implemented in higher education. However, limited research is available to understand the role of metacognitive awareness, reflective thinking, problem solving and community of inquiry as related to students' academic self-efficacy in BL. The purpose of this research is to examine the effect of metacognitive awareness, reflective thinking, problem solving and community of inquiry on students' academic self-efficacy in BL. This correlational study collected data from 217 undergraduate students in an introductory computer course, using five well-established instruments. The research found a strong and positive relationship between self-efficacy and metacognitive awareness, reflective thinking and problem solving skills. There was also a moderate positive relationship between students' academic self-efficacy and community of inquiry. In addition, the predictive models revealed that metacognitive awareness, reflective thinking, problem solving skills and community of inquiry were the predictors of academic self-efficacy as well as its subdimensions, such as learners' engagement, social status and cognitive applications. The article then discusses the practical and research implications of the study and suggests future research directions.

Keywords: Academic self-efficacy, metacognitive awareness, reflective thinking, problem solving, community of inquiry, blended learning.

INTRODUCTION

The rapid advancement of technology has altered the ways of teaching and learning in this digital age. Technological advancements empower students to learn anytime and anywhere by connecting to the internet or offline via mobile devices. Instructors can provide collaborative activities, give interactive learning assignments, and use diverse assessment strategies such as peer assessment and self-assessment by means of ICT tools (Ustun & Tracey, 2020). These tools can be used in blended learning (BL) to meet students' learning needs for flexible and personalized instruction (Jonker, März, & Voogt, 2018). BL is seen as an accelerator for technology adoption in higher education in the short term and institutions should be ready for adopting a pervasive, adaptive and effective BL approach to address the various needs of students from different backgrounds as stated in the New Media Consortium Horizon Report (Adams Becker et al., 2017). BL potentially creates a collaborative, interactive and engaging learning environment by offering enhanced accessibility, pedagogical effectiveness and flexibility (Dziuban, Graham, Moskal, Norberg, & Sicilia, 2018). Ustun, Karaoglan-Yilmaz and Yilmaz (2021) reveal that students' engagement and sense of community can be increased when students are willing to utilize ICT tools in BL. Similarly, Jusoff and Khodabandelou (2009) demonstrate that BL alleviates the discomfort of transactional distance and escalates the interaction between instructors and students.

Researchers have found many merits and benefits of BL (e.g., Rasheed, Kamsin, & Abdullah, 2020). For instance, it facilitates knowledge acquisition (Maza, Lozano, Alarcón, Zuluaga, & Fadul, 2016), promotes engagement (Ustun & Tracey, 2021), improves collaborations among students and interactions between instructor and students as well (Geng, Law, & Niu, 2019). It also allows students to learn at their own pace (Ustun & Tracey, 2020). BL inherently has flexibility and accessibility, which increases the quality of students' learning experiences. Besides, learning experiences can be tailored to address students' interests and preferences (Adams Becker et al., 2017). In this way, students are encouraged to participate as active knowledge seekers in a flexible learning environment. Previous research has inconsistent findings. Some indicate that the adoption of BL significantly increases student satisfaction (Li, He, Yuan, Chen, & Sun, 2019; Sadeghi, Sedaghat, & Ahmadi, 2014) and improves academic achievement (Al-Qahtani & Higgins, 2013; Li et al., 2019). While another study finds no significant effect of BL on student satisfaction or academic achievement (Yen, Lo, Lee, & Enriquez, 2018). Researchers also point out varied challenges for students to develop self-efficacy skills and technological competency in BL environments (Rasheed et al., 2020).

One of the key challenges of BL is the design and implementation of an effective BL environment. Instructors find the planning and designing of BL very challenging (Jokinen & Mikkonen, 2013). More specifically, the four design challenges include incorporating flexibility, stimulating interaction, facilitating students' learning processes, and fostering an effective learning climate (Boelens, De Wever, & Voet, 2017). A few studies have provided frameworks and guidelines for the design and implementation of optimal BL environments (Graham, Woodfield, & Harrison, 2013; Porter, Graham, Spring, & Welch, 2014; Ustun & Tracey, 2020, 2021). Successful adoption of BL also requires students to develop self-efficacy, because it is a significant predictor of academic achievement (Robbins et al. (2004). Although a few studies focused on student self-efficacy in the context of BL (e.g., Rafiola, Setyosari, Radjah, & Ramli, 2020; Shea & Bidjerano, 2010), the predictors of self-efficacy have not been studied in BL. Thus, this study was designed to investigate the effect of metacognitive awareness, reflective thinking, problem-solving and community of inquiry (CoI) on students' academic self-efficacy in BL.

THEORETICAL BACKGROUND AND HYPOTHESES

Community of Inquiry

Garrison and Akyol (2013) define Community of Inquiry (CoI) as "a group of individuals who collaboratively engage in purposeful critical discourse and reflection to construct personal meaning and confirm mutual understanding" (p.105). The definition confirms that CoI is theoretically grounded in social constructivism indicating that student interactions facilitate and accelerate meaningful knowledge construction (Garrison, Cleveland-Innes, & Fung, 2010). Rovai (2002) points out that in order to create an effective online learning environment, the CoI model aims to build a learning community that enables inquiry-based learning and

deep learning. When students' ties to a learning community are getting stronger, their willingness to share ideas and experiences, engagement in interactions among themselves and collaborative knowledge creation increase. Their engagement in interactions with instructors and each other helps construct new understanding and knowledge (Garrison et al., 2010).

The CoI model consists of three types of presence including cognitive presence, social presence and teaching presence (Anderson, Rourke, Garrison, & Archer, 2001). Cognitive presence refers to the individual student's abilities to construct knowledge through continued communication and reflection in a learning community (Garrison, Anderson, & Archer, 2000). In other words, students gain an understanding of the meaning as a result of continuing discussions. Social presence refers to students' ability to build interpersonal relationships with each other in the learning environment by being a social and emotional presence in a CoI (Garrison et al., 2000). It implies the importance of students' communication skills and how their communication skills contribute to constructing a collaborative learning community. Teaching presence refers to the design and implementation of learning processes to realize the learning outcomes and facilitating learning (Anderson et al., 2001). These presences explicitly demonstrate that students' active involvement constructs knowledge in a learning community. In this sense, self-efficacy is essential in order to build interpersonal relationships and construct meaning in a learning community because students have the beliefs to execute a particular behaviour. There might be a positive relationship between CoI and self-efficacy. Accordingly, the following hypotheses were proposed:

- CoI is a significant predictor of academic self-efficacy
- CoI is a significant predictor of social status
- CoI is a significant predictor of cognitive applications
- CoI is a significant predictor of technical skills

Reflective Thinking

Reflective thinking describes the way of thinking process that bridges the gap between what is already known and what needs to be known in order to control learning (Dewey, 1933). Schon (1987) elucidates reflective thinking as the consideration of action in a careful, systematic and detailed way. Reflective thinking is a high-level thinking skill because it requires problem recognition, reflection on action in solving a problem and analyzing what has been done well or wrong for further improvements (Van der Schaaf, Baartman, Prins, Oosterbaan, & Schaap, 2013). Students who have reflective thinking skills are cognizant of their learning experiences and apply them to different problem situations to deal with these situations (Yilmaz, 2020). They also understand what they need to do in order to accomplish more difficult tasks when they are aware of their learning experiences. However, students without developed reflective skills are likely to fail to critically and carefully evaluate situations due to being unable to identify and prioritize solutions and consequently make a decision to implement the right solution (van Velzen, 2016).

Reflective thinking is one of the necessary skills for students to enhance several skills (Ulucinar Sagir, Aslan, Bertiz & Oner Armagan, 2016). Ersozlu and Arslan (2009) point out that reflective thinking enables students to perform better by comprehending, organizing, transferring and evaluating knowledge rather than just applying memorized knowledge when facing problems and they are also able to identify their strengths and weaknesses while coming up with a solution to these problems due to their reflective thinking skills. Previous research has proved that reflective thinking plays a role in students' task performance (van Velzen, 2016). In this sense, it might play a significant role in self-efficacy because self-efficacy is also students' belief in their abilities and skills to perform a task, accomplish goals and cope with obstacles. However, the relationship between reflective thinking and self-efficacy remains obscure with limited studies (Ulucinar Sagir et al., 2016). This study attempted to address this gap and accordingly the following hypotheses were proposed:

- Reflective thinking is a significant predictor of academic self-efficacy
- Reflective thinking is a significant predictor of social status
- Reflective thinking is a significant predictor of cognitive applications
- Reflective thinking is a significant predictor of technical skills

Problem Solving

Problem Solving has been considered an essential part of the curriculum because there is a strong need for students to be immersed in learning environments in which they are required to apply their higher-order thinking skills to solve problems on their own. The importance of the concept of problem solving can be understood by its definition. It is defined as high-level cognitive processes to resolve a problem situation that even has no explicit clue to solve a problem (Bahar & Maker, 2015). It is vital for students to be successful in their educational life (Agran, Blanchard, Wehmeyer, & Hughes, 2002) so teaching and learning processes stimulate students to develop their problem-solving skills to meet the high demands of their professional and personal life (Barr & Stephenson 2011). Similarly, Lesh and Zawojewski (2007) state that students who possess problem solving skills can use their high-level intellectual functions and cognitive processes to gain new knowledge and skills when they encounter any real-life problems to adapt to changes in their life. It is obvious that the possession of problem solving is vital for students to comprehend a problem, determine the causes of the problem, plan reasonable possible solutions and carry out the best solution.

Self-efficacy plays an vital role in critical thinking processes in terms of considering putting in a great deal of sustained effort while achieving challenging tasks (Dehghani, Jafari-Sani, Pakmehr, & Malekzadeh, 2011). In this sense, it has possibly a link to problem solving. When previous literature is reviewed, it is seen that the concepts of self-efficacy and problem solving are theoretically related. Empirical studies have shown a positive and significant correlation between self-efficacy and problem solving (Cansoy & Turkoglu, 2017; Kozikoglu, 2019). Also, Dwiyogo (2018) finds that the implementation of BL positively affects problem solving and another study conducted by Shea and Bidjerano (2010) reveals that there is a strong relationship exists between self-efficacy and CoI in BL. Although empirical evidence has proved the strong relationship between self-efficacy and problem solving and there is enough body of research to show the importance of self-efficacy and problem solving in BL, there is a need to investigate the predictive power of problem solving directly on students' academic self-efficacy in BL. One of the aims of this study was to close this existing gap and accordingly the following hypotheses were proposed.

- Problem solving is a significant predictor of academic self-efficacy
- Problem solving is a significant predictor of social status
- Problem solving is a significant predictor of cognitive applications
- Problem solving is a significant predictor of technical skills

Metacognitive Awareness

Metacognition can be defined as one's awareness of cognitive processes as well as regulation and control of these processes (Flavell, 1979). In other words, it refers to one's ability to plan, manage and assess his own learning processes. Knowledge of Cognition" and "Regulation of Cognition" are two elements of metacognitive awareness (Brown, 1987). Cognitive knowledge refers to knowledge about one's own thinking of how, when and where learning strategies can effectively be utilized for learning and cognitive regulation refers to adjustments of one's own cognition to control and management of learning (Karaoglan-Yilmaz, Yilmaz, Ustun, & Keser, 2019). Metacognitive awareness enables students to understand what they know, what they don't know, and what they need to know to fill the gaps in their knowledge. It also enables students to understand how to control their cognitive processes and what cognitive strategies lead them to learn (Jaleel, 2016). Metacognitive strategies including planning, monitoring and evaluation increase metacognitive awareness that enhances the quality of the learning process (Karaoglan Yilmaz, Olpak, & Yilmaz, 2018). Previous studies reveal that students who have a strong metacognitive awareness increase the probability of achieving learning goals and improving learning performance (Choy, Yim, & Tan, 2020; Ramirez-Arellano, Bory-Reyes, & Hernandez-Simon, 2019). Metacognitive awareness is an important factor in learning environments as indicated in the previous studies, it potentially plays a significant role in student self-efficacy in BL. Accordingly, the following hypotheses were proposed.

- Metacognitive awareness is a significant predictor of academic self-efficacy
- Metacognitive awareness is a significant predictor of social status
- Metacognitive awareness is a significant predictor of cognitive applications
- Metacognitive awareness is a significant predictor of technical skills

METHOD

This study adopted a correlational research design, which aids in revealing the relationships between independent and dependent variables as well as assessing the independent variables' predictive potential on the dependent variable (Creswell, 2012). The dependent variable of the study was students' academic self-efficacy. The independent variables of the study were metacognitive awareness, reflective thinking, problem solving and community of inquiry. Within the scope of the research, the effect of metacognitive awareness, reflective thinking, problem solving and community of inquiry on students' academic self-efficacy was examined in BL environments based on correlational research.

Participants and Research Process

The study was conducted in an introductory computer course with 217 university students. The introductory computer course was taught in the BL environment. Purposive sampling method was used in the research. Accordingly, the criterion to select the sample group of participants in the study was that the students take the course delivered according to the BL approach. The participants were the students who are studying at the faculty of education in a public university, Turkiye and who took the introductory computer course delivered according to the BL approach. Students were at the departments of Turkish language education and primary school mathematics education. Participants included 63% female and 37% male undergraduate students.

Within the scope of the research, the introductory computer course was delivered according to the BL approach. Accordingly, the conceptual and theoretical issues of course topics were asynchronously presented to the students through instructional videos, e-books and discussion forums prepared by the instructor before coming to the F2F instruction in the computer laboratory. Students came to the F2F instruction by preparing these course materials. However, the course instructor concisely lectured theoretical topics delivered online if any issue remained unresolved in online learning and students needed further clarification. Afterward, they did practices related to course topics that they had theoretically learned. Each student did practice on their own in the computer laboratory. This is the way how the course was taught each week during an academic term

A web-based survey was applied to the students at the end of the academic term. This survey consisted of three main parts. In the first part, the students were informed about the research. The students who agreed to participate in the study reached the second part of the survey. Students' demographic information, such as age, gender, department, etc., was obtained in this part. In the third part of the survey, there were the scales used in the study. Students were required to fill in all the items of the web-based survey. Therefore, there was no data loss resulting from answering the survey.

Data Collection Instruments

Personal Information Form

A personal information form developed by researchers was used to collect data on participants' demographic information such as gender, age and technological equipment.

Academic Self-Efficacy Scale

Owen and Froman (1988) originally developed the self-efficacy scale to ascertain the academic self-efficacy levels of students, and Ekici (2012) adopted the scale into Turkish. The scale had 33 items in 3 dimensions including Cognitive applications (19 items), Social status (10 items) and Technical skills (4 items). It used a five-point Likert scale with 5 being "strongly agree" to 1 being "strongly disagree". The reliability coefficient was recalculated for the scale and found to be .96. The high scores on the scale mean a high level of academic self-efficacy.

Community of Inquiry Scale

The community of inquiry scale developed by Arbaugh et al. (2008) and adapted into Turkish by Ozturk (2012) was employed to ascertain the level of community of inquiry. The scale had 34 items in 3 dimensions including Social presence (9 items), Teaching presence (13 items), and Cognitive presence (12 items). It used a four-point Likert scale with 4 being "Certainly Agree" to 1 being "Certainly Disagree". The reliability coefficient was recalculated for the scale and found to be .98. The high scores on the scale mean a high level of community of inquiry.

Reflective Thinking Scale

The reflective thinking scale developed by Kember et al. (2000) and adapted into Turkish by Cigdem and Kurt (2012) was employed to ascertain the level of reflective thinking skills. The scale had 16 items in 4 dimensions including Understanding (4 items), Critical reflection (4 items), Reflection (4 items) and Habitual action (4 items). It used a five-point Likert scale with 5 being "Certainly Agree" to 1 being "Certainly Disagree". The reliability coefficient was recalculated for the scale and found to be .89. The high scores on the scale mean a high level of reflective thinking skills.

Problem Solving Inventory

The problem solving inventory developed by Heppner and Peterson (1982) and adapted into Turkish by Sahin, Sahin and Heppner (1993) was employed to ascertain the level of problem solving skills. The scale had 32 items in 6 dimensions including Avoidant style, Reflective style, Impulsive style, Planfulness, Problem-solving confidence and Monitoring. The scale used a six-point Likert scale from "strongly disagree" to "strongly agree". The reliability coefficient was recalculated for the scale and found to be .86. The high scores on the scale mean a low level of problem solving skills.

Metacognitive Awareness Inventory

The metacognitive awareness inventory developed by Schraw and Dennison (1994) and adapted into Turkish by Akin, Abaci and Cetin (2007) was employed to ascertain the level of metacognitive awareness. The scale had 52 items in 8 dimensions including Planning (7 items), Conditional knowledge (5 items), Procedural knowledge (4 items), Declarative knowledge (8 items), Information management (9 items), Debugging (5 items), Evaluation (6 items) and Monitoring (8 items). It used a five-point Likert scale with 5 being "always true" to 1 being "always false". The reliability coefficient was recalculated for the scale and found to be .99. The high scores on the scale mean a high level of metacognitive awareness.

Data Analysis

A total of 217 university students were surveyed in the study. Data analysis was carried out to conduct the stepwise multiple linear regression. Before carrying out the analysis, the mandatory statistical assumptions were assessed. The distribution of normality was tested by calculating skewness and kurtosis values. They were in the range of +1 to -1. Determining outliers in multivariate data was done by calculating Mahalanobis distance and the data set was found suitable. Afterward, the normality assumptions of the data were also examined through skewness and kurtosis values (from -1 to +1), and a histogram graph. The data set showed a normal distribution. A multivariate scatter diagram was checked to determine if the multivariate normality assumption was met. It was found to be met. Besides, information about multicollinearity was obtained by this normality test. Bivariate correlation coefficients were performed to determine if a multicollinearity problem existed among the (independent) predictor variables in multiply regression analysis. There wasn't a problem (.49, .54, .53, .64). Durbin-Watson test was performed to examine the problem of autocorrelation and the suitability of the model was confirmed. Thus, stepwise multiple linear regression and descriptive statistics such as correlation, percentage and frequency were conducted to analyze all of the 217 responses when assumptions were met.

FINDINGS

Descriptive Statistics of Participants' Responses

As summarized in Table 1, the participants' average score on the academic self-efficacy scale was 115.85 (3.51 out of 5), while their average score on the community of inquiry scale was 104.02 (3.06 out of 4). Their average score on the problem solving inventory was 125.98 (3.94 out of 6) and it was computed as 56.12 (3.51 out of 5) on the reflective thinking scale while their average score on the metacognitive awareness inventory was 191.96 (3.69 out of 5). Therefore, scores of community of inquiry scale and metacognitive awareness inventory were at a high level, while scores of problem solving inventory, reflective thinking scale and academic self-efficacy scale were at a moderate level.

Table 1. Descriptive statistics

Scales	Number of items	Minimum score	Maximum score	$\overline{X}$	sd	$\overline{X}$/k
Social status	10	17.00	50.00	34.29	6.29	3.43
Cognitive applications	19	35.00	95.00	67.72	11.03	3.56
Technical skills	4	5.00	20.00	13.84	2.87	3.46
Academic Self-Efficacy Scale	33	57.00	165.00	115.85	18.84	3.51
Community of Inquiry Scale	34	71.00	136.00	104.02	13.63	3.06
Reflective Thinking Scale	16	40.00	73.00	56.12	7.20	3.51
Problem Solving Inventory	32	66.00	172.00	125.98	19.28	3.94
Metacognitive Awareness Inventory	52	97.00	260.00	191.96	34.39	3.69

Relations between Students' Academic Self-Efficacy, Community of Inquiry, Metacognitive Awareness, Problem Solving, and Reflective Thinking

Pearson correlation coefficients were calculated to examine the relations among student reflective thinking, community of inquiry, academic self-efficacy, problem solving, and metacognitive awareness. The results are summarized in Table 2.

Table 2. Correlations between students' academic self-efficacy, community of inquiry, reflective thinking, problem solving, and metacognitive awareness

		Social status	Cognitive applications	Technical skills	Academic Self-Efficacy	Community of Inquiry	Reflective Thinking	Problem Solving	Metacognitive Awareness
Social status	r	1							
Cognitive applications	r	.798**	1						
Technical skills	r	.740**	.754**	1					
Academic Self-Efficacy Scale	r	.914**	.967**	.841**	1				
Community of Inquiry Scale	r	.402**	.488**	.446**	.488**	1			
Reflective Thinking Scale	r	.466**	.531**	.457**	.536**	.482**	1		
Problem Solving Inventory	r	.456**	.540**	.412**	.531**	.442**	.378**	1	
Metacognitive Awareness Inventory	r	.520**	.653**	.528**	.636**	.553**	.559**	.687**	1

**. Correlation is significant at the .01 level (2-tailed).

The correlation coefficients between scores on students' academic self-efficacy and other scales were determined as students' academic self-efficacy - community of inquiry (r=.488, p<.01), academic self-reflective thinking (r=.536, p<.01), academic self-efficacy - problem solving (r=.531, p<.01) and academic self-efficacy - metacognitive awareness (r=.636, p<.01). Pallant (2001) highlights that r = .30 to .49 means a moderate relation and r = .10 to .29 shows a small relation. He also adds that r = .50 to 1.0 shows a strong relation. Thus, the results suggest that there was a positive, strong relationship between students' academic self-efficacy and self-reflective thinking, academic self-efficacy and problem solving, and academic self-efficacy and metacognitive awareness. Besides, there was a positive, moderate relationship between students' academic self-efficacy and community of inquiry.

Concerning the correlation between social status and other variables, it was found as social status - community of inquiry (r=402, p<.01), social status - reflective thinking (r=.466, p<.01), social status - problem solving (r=.456, p<.01) and social status - metacognitive awareness (r=.520, p<.01). The results thus confirm a positive, strong relationship between social status and metacognitive awareness. There was also a positive, moderate relationship between social status and community of inquiry, social status and reflective thinking, as well as social status and problem solving.

Calculating the correlation between cognitive applications and other variables showed cognitive applications - community of inquiry (r=488, p<.01), cognitive applications - reflective thinking (r=.531, p<.01), cognitive applications - problem solving (r=.540, p<.01) and cognitive applications - metacognitive awareness (r=.653, p<.01). Therefore, there was a positive, strong relationship between cognitive applications and reflective thinking, cognitive applications and problem solving, and cognitive applications and metacognitive awareness. A positive, moderate relationship also existed between cognitive applications and community of inquiry.

Calculating the correlation between technical skills and other scale scores demonstrated technical skills - community of inquiry (r=446, p<.01), technical skills - reflective thinking (r=.457, p<.01), technical skills - problem solving (r=.412, p<.01) and technical skills - metacognitive awareness (r=.528, p<.01). The results confirm a positive, strong relation between technical skills - metacognitive awareness. A positive, moderate relationship also existed between technical skills and community of inquiry, technical skills and reflective thinking, and technical skills and problem solving.

Predictors of Students' Academic Self-Efficacy

Stepwise multiple linear regression was performed to determine the predictors of students' academic self-efficacy. As summarized in Table 3, four models significantly predict students' academic self-efficacy. When model 1 was examined, metacognitive awareness explained 41% of the total variance of students' academic self-efficacy. In model 2, reflective thinking explained 5%, while problem solving skills explained 2% of the total variance in Model 3. In model 4, community of inquiry explained 1% of the total variance of students' academic self-efficacy. A positive relationship existed between each variable and students' academic self-efficacy upon addressing regression coefficients. These four variables explained the 48 percent of the total variance in students' academic self-efficacy. Examining regression coefficients related to the model revealed that metacognitive awareness (β=.636, p<.05), reflective thinking (β=.263, p<.05), problem solving skill (β=.182, p<.05) and community of inquiry (β=.123, p<.05) contribute to students' academic self-efficacy.

Table 3. Stepwise regression analysis for variables predicting students' academic self-efficacy

Model	Variable	R	R^2	Adjusted R^2	Standard Error	β	t
1	(Constant)	.636	.405	.402	14.569		8.706
	Metacognitive Awareness Inventory					.636	12.093
	R= .636, R^2=.405, F (1,215) = 146.230, p=.000						
2	(Constant)	.672	.452	.447	14.009		3.392
	Metacognitive Awareness Inventory					.489	8.023
	Reflective Thinking Scale					.263	4.305
	R= .672, R^2=.452, F (2,214) = 88.344, p=.000						
3	(Constant)	.685	.470	.462	13.815		1.977
	Metacognitive Awareness Inventory					.364	4.745
	Reflective Thinking Scale					.264	4.392
	Problem Solving Inventory					.182	2.652
	R= .685, R^2=.470, F (3,213) = 62.901, p=.000						
4	(Constant)	.692	.479	.470	13.721		1.045
	Metacognitive Awareness Inventory					.323	4.100
	Reflective Thinking Scale					.233	3.778
	Problem Solving Inventory					.167	2.441
	Community of Inquiry Scale					.123	1.986
	R= .692, R^2=.479, F (4,212) = 48.815, p=.000						

Predictors of Students' Social Status

Stepwise multiple linear regression was performed to determine the predictors of student's social status. As summarized in Table 4, three models significantly predict students' social status. When model 1 was examined, metacognitive awareness explained 27% of the total variance of students' social status whereas reflective thinking explained 5% of the total variance in model 2. In model 3, problem solving skill explained 2% of the total variance of students' social status. A positive relationship existed between three variables and students' social status upon addressing regression coefficients. These three variables explained 33% of the total variance in students' social status. Examining regression coefficients related to the model demonstrated that metacognitive awareness (β=.520, p<.05), reflective thinking (β=.256, p<.05) and problem solving skill (β=.190, p<.05) contribute to students' social status.

Table 4. Stepwise regression analysis for variables predicting students' social status

Model	Variable	R	R²	Adjusted R²	Standard Error	β	t
1	(Constant)	.520	.270	.266	5.388		7.723
	Metacognitive Awareness Inventory					.520	8.915
	R= .520, R²=.270, F (1,215) = 79.473, p=.000						
2	(Constant)	.561	.315	.308	5.231		3.002
	Metacognitive Awareness Inventory					.377	5.519
	Reflective Thinking Scale					.256	3.749
	R= .561, R²=.315, F (2,214) = 49.179, p=.000						
3	(Constant)	.578	.334	.325	5.169		1.690
	Metacognitive Awareness Inventory					.245	2.852
	Reflective Thinking Scale					.258	3.819
	Problem Solving Inventory					.190	2.475
	R= .578, R²=.334, F (3,213) = 35.613, p=.000						

Predictors of Students' Cognitive Applications

Stepwise multiple linear regression was performed to determine the predictors of students' cognitive applications. As summarized in Table 5, three models significantly predict students' cognitive applications. When model 1 was examined, metacognitive awareness explained 43% of the total variance of students' cognitive applications whereas reflective thinking explained 4% of the total variance in model 2. In model 3, problem solving skill explained 2% of the total variance of students' cognitive applications. A positive relationship existed between three variables and students' cognitive applications upon addressing regression coefficients. These three variables explained 48% of the total variance in students' cognitive applications. Examining regression coefficients related to the model revealed that metacognitive awareness (β=.653, p<.05), reflective thinking (β=.241, p<.05) and problem solving skill (β=.177, p<.05) contribute to students' cognitive applications.

Table 5. Stepwise regression analysis for variables predicting students' cognitive applications

Model	Variable	R	R²	Adjusted R²	Standard Error	β	t
1	(Constant)	.653	.426	.423	8.381		8.512
	Metacognitive Awareness Inventory					.653	12.628
	R= .653, R²=.426, F (1,215) = 159.454, p=.000						
2	(Constant)	.683	.466	.461	8.102		3.426
	Metacognitive Awareness Inventory					.518	8.594
	Reflective Thinking Scale					.241	4.004
	R= .683, R²=.466, F (2,214)= 93.316, p=.000						
3	(Constant)	.695	.482	.475	7.994		2.024
	Metacognitive Awareness Inventory					.395	5.220
	Reflective Thinking Scale					.243	4.085
	Problem Solving Inventory					.177	2.613
	R= .695, R²=.482, F (3,213)= 66.181, p=.000						

Predictors of Students' Technical Skills

Stepwise multiple linear regression was performed to determine the predictors of student's technical skills. As summarized in Table 6, three models significantly predict students' technical skills. When model 1 was examined, metacognitive awareness explained 28% of the total variance of students' technical skills whereas reflective thinking explained the 4% of the total variance in model 2. In model 3, community of inquiry explained 2% of the total variance of students' technical skills. A positive relationship existed between three variables and students' technical skills upon addressing regression coefficients. These three variables explained 34% of the total variance in students' technical skills. Examining regression coefficients related to the model showed that metacognitive awareness (β=.528, p<.05), reflective thinking (β=.236, p<.05) and community of inquiry (β=.174, p<.05) contribute to students' technical skills.

Table 6. Stepwise regression analysis for variables predicting students' technical skills

Model	Variable	R	R²	Adjusted R2	Standard Error	β	t
1	(Constant)	.528	.279	.276	2.445		5.685
	Metacognitive Awareness Inventory					.528	9.127
	R= .528, R²=.279, F (1,215) = 83.297, p=.000						
2	(Constant)	.563	.317	.311	2.385		1.697
	Metacognitive Awareness Inventory					.397	5.826
	Reflective Thinking Scale					.236	3.460
	R= .563, R²=.317, F (2,214) = 49.760, p=.000						
3	(Constant)	.581	.337	.328	2.356		.360
	Metacognitive Awareness Inventory					.325	4.447
	Reflective Thinking Scale					.192	2.765
	Community of Inquiry Scale					.174	2.509
	R= .581, R²=.337, F (3,213) = 36.092, p=.000						

As shown in Table 7, community of inquiry was not a significant predictor of social status or cognitive applications. Besides, problem solving did not significantly predict technical skills. Findings show that all research hypotheses were accepted, except for three of them. As a result, findings provide evidence that community of inquiry , metacognitive awareness, problem solving inventory and reflective thinking are significant and strong predictors of students' academic self-efficacy.

Table 7. Summary of all hypotheses tests results

Hypothesis	Antecedents	Supported?
H1	Community of Inquiry → Academic self-efficacy	Yes
H1a	Community of Inquiry → Social status	No
H1b	Community of Inquiry → Cognitive applications	No
H1c	Community of Inquiry → Technical skills	Yes
H2	Reflective thinking → Academic self-efficacy	Yes
H2a	Reflective thinking → Social status	Yes
H2b	Reflective thinking → Cognitive applications	Yes
H2c	Reflective thinking → Technical skills	Yes
H3	Problem solving → Academic self-efficacy	Yes
H3a	Problem solving → Social status	Yes
H3b	Problem solving → Cognitive applications	Yes
H3c	Problem solving → Technical skills	No
H3	Metacognitive awareness → Academic self-efficacy	Yes
H3a	Metacognitive awareness → Social status	Yes
H3b	Metacognitive awareness → Cognitive applications	Yes
H3c	Metacognitive awareness → Technical skills	Yes

DISCUSSIONS

This study examined the relationships amongst learners' self-efficacy, reflective thinking, metacognitive awareness, social status and community of inquiry in BL. Regarding self-efficacy, it was confirmed that it had a strong positive relationship with variables like metacognitive awareness, problem solving and reflective thinking. In addition, it had a moderate positive relationship with community of inquiry. Concerning social status, the findings suggested a strong, positive relationship with metacognitive awareness, and a moderate positive relationship with community of inquiry, reflective thinking and problem solving as well. In terms of cognitive applications, it had a strong, positive relationship with metacognitive awareness, problem solving and reflective thinking, and a moderate positive relation with community of inquiry. As to students' technical skills, it had a strong, positive relationship with metacognitive awareness, a positive, moderate relationship with community of inquiry, reflective thinking and problem solving. The findings of the study were consistent with similar studies in flipped classrooms, which found a moderate, positive relationship between community of inquiry and self-efficacy (Karaoglan-Yilmaz, 2017), and a strong, positive relationship between metacognitive awareness and academic self-efficacy in a recent empirical study on flipped classrooms (Karaoglan-Yilmaz, 2020).

LIMITATIONS

Participants of this study were students in an introductory computer course in Turkiye. Thus, the results might not apply to students from other cultures or subject areas. As typical with self-reporting, possible bias in self-reported data is another limitation, although well-established, reliable data collection instruments were employed in this study.

IMPLICATIONS

Many studies have revealed a positive correlation between academic performance and self-efficacy (Lai & Hwang, 2016; Roick & Ringeisen, 2017). In addition, a recent study (Namaziandost & Cakmak, 2020) found that students' self-efficacy belief had a positive effect on students' participation in group discussions as well as their overall engagement in active learning. Extending previous research, this study built multiple predictive models to investigate students' self-efficacy through comprehensive statistical analyses. The predictive models indicated that metacognitive awareness, reflective thinking, problem solving skills and community of inquiry contributed to learners' engagement, social status and cognitive applications. Also, metacognitive awareness, reflective thinking, and community of inquiry contributed to students' technical skills. In summary,

variables such as community of inquiry, metacognitive awareness, problem solving and reflective thinking were significant and strong predictors of students' academic self-efficacy, as found in this study.

The findings of this study add to the limited body of research on self-efficacy and reflective thinking (Ulucinar Sagir et al., 2016), provide new evidence supporting the positive and significant correlation between problem solving and self-efficacy (Cansoy & Turkoglu, 2017; Kozikoglu, 2019), and between self-efficacy and community of inquiry (Shea & Bidjerano, 2010). They are also consistent with previous research on metacognitive awareness (e.g., Choy, Yim, & Tan, 2020; Ramirez-Arellano, Bory-Reyes, & Hernandez-Simon, 2019).

The findings shed light on an effective design of BL with practical guidance for instructors and instructional designers. For instance, strategies and learning activities in BL should aim to stimulate metacognitive awareness, to promote reflective thinking and problem-solving skills and to facilitate community of inquiry in various ways to enhance learner engagement, social status and improve cognitive applications. Such strategies may address the four vital design challenges in BL that researchers have identified previously (Boelens et al., 2017). Likewise, the learning environments, activities and materials that foster metacognitive awareness, reflective thinking, problem solving skills and community of inquiry in BL may improve learners' engagement, social status and cognitive applications as well as technical skills.

The study may also serve as a first attempt in bridging the gap between research on self-efficacy and reflective thinking (Ulucinar Sagir et al., 2016). To further advance related research on self-efficacy and its relationships with variables like reflective thinking, cognitive applications, metacognitive awareness, social status and community of inquiry, future research may employ various methods, including qualitative, experimental, mixed methods and educational design research, to name a few.

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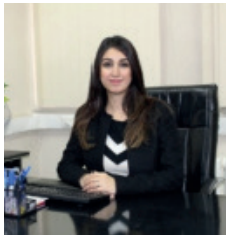
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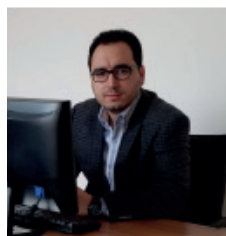
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INSTITUTIONAL ADOPTION AND IMPLEMENTATION OF BLENDED LEARNING: DIFFERENCES IN STUDENT PERCEPTIONS

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ABSTRACT

Blended learning (BL) has been a popular mode of course delivery in higher education, aiming to provide students with better learning experiences by integrating face-to-face (f2f) instructions and affordances of digital technology. However, lack of knowledge about how students perceive BL cross-disciplines can make it difficult for teachers to provide consistent learning experiences to students, yielding inequity in learning experiences. This study aims to explore how university students perceive BL, and to compare differences in perceptions across subjects. Participants were 407 university students from eight subject disciplines. Data were collected through a questionnaire and were analyzed using SPSS. A one-way ANOVA was performed to compare the differences between the groups. Results showed, students were generally happy about the use of BL, despite facing multiple barriers in using the learning approach. Results further revealed that students studying tourism/hospitality, and business subjects were more negative about BL, while students in science, and Islamic studies faculties were more receptive to BL compared to the rest of the university.

Keywords: Blended learning, institutional adoption, TAM, higher education.

INTRODUCTION

Blended learning (BL) is perceived as a promising mode of course delivery and has been adopted in various higher education contexts in recent years (e.g., Jeffrey & Higgins, 2014; Lai, Lam, & Lim, 2016; Mestan, 2019). Research have shown that BL provides increased learner access (Wang & Huang, 2018), increased flexibility to students and teachers (Thai, De Wever, & Valcke, 2020), and enhanced learner engagement (Mestan, 2019; D. Xu et al., 2020). In addition, with the COVID-19 pandemic where universities are being forced to deliver their courses remotely with limited face-to-face (f2f) interactions, blended learning appeared a preferred mode of course delivery for many higher education providers. The pedagogic approach allows teachers to have reduced f2f interactions with students, and also can help to eliminate some of the concerns that may arise in relation to fully online course delivery (Thai, De Wever, & Valcke, 2017).

BL is no longer a new mode of course delivery. In recent times, a plethora of research has been published about the pedagogic approach. It includes effectiveness blended learning (Jesus, Gomes, & Cruz, 2017; Olelewe & Agomuo, 2016), student perceptions on individual subjects (Owston, York, & Murtha, 2013; Posey & Pintz, 2017), application of various technology tools (Sumak, Pusnik, Hericko, & Sorgo, 2017), management approaches for adoption (Singh & Hardaker, 2017; Taylor & Newton, 2013), and barriers for adoption of blended learning (Boelens, Wever, & Voet, 2017; Porter & Graham, 2016), to name a few. However, there is limited empirical evidence to compare the differences in student perceptions about blended learning across various academic disciplines in single university settings. This is problematic because the scarcity of knowledge about the differences in student perceptions can limit teachers' understanding of providing consistent and equitable learning experiences to students. This can further yield student and teacher anxiety and frusturations, and can induce low levels of adoption.

Understanding students' perceptions about BL is important as students' attitudes toward technology-integrated learning often effect their uptake (Sanchez-Prieto, Huang, Olmos-Miguelanez, Garcia-Penalvo, & Teo, 2019). Even though teachers expect to obtain better academic results in blended teaching, without high uptake by students, it may not be straightforward for them to achieve this goal. Research shows users' positive perceptions about technology significantly influence their decisions of adoption and continued usage (Anthony Jnr et al., 2020; Gao, Jiang, & Tang, 2020). Therefore, it is vital for teachers to understand differences in student perceptions about BL to design tailored learning programs for students of different academic disciplines, and to better facilitate adoption of university-wide blended learning. However, the current literature sheds a little light on this aspect of blended learning. This research addresses this gap, with the aim of understanding differences in student perceptions about blended learning across a university. The research can help teachers to better understand students and can help them to design differentiated blended interactions across various subjects. It also can help university administrators to facilitate institutional adoption and diffusion of blended learning and can assist to increase sustainability of the pedagogic practice within universities. In the following sections, a review of literature about blended learning, methods, findings, discussion, and conclusion are presented.

BACKGROUND

Blended Learning in Higher Education

Blended learning is a pedagogic approach that involves purposeful integration of face-to-face (f2f) and technology-mediated instructions (Brown, 2016; Bruggeman et al., 2021). The nature of this interation can be varied. However, often it involves f2f lectures followed by online asynchronous learning, or online lectures with in-person tutorials, or a mix of both the approaches (Anthony Jr et al., 2019; Dey & Bandyopadhyay, 2019). The aim of blended learning is to enhance learning outcomes, and improving learner success and teaching delivery (Anthony Jnr, 2021). Whilst blended learning has grown exponentially in recent years and has attracted teachers and higher education providers across the globe (e.g., Ibrahim & Nat, 2019; Jowsey, Foster, Cooper-Ioelu, & Jacobs, 2020; Zibin & Altakhaineh, 2018), some aspects of the learning method such as proportion of the seating time, and methods to integrate f2f and online instructions are still in need of further discussions (Boelens et al., 2017; Thai et al., 2017). Taking student perceptions into account is vital because they are the recipients of any learning environment, and without understanding student perceptions and their learning needs, teachers cannot provide them with tailored and rich learning experiences (Chizhik & Chizhik, 2018).

Blended learning has been used in higher education in various academic disciplines. Owston et al. (2013), for example, investigated some subjects of health and liberal arts, and fine arts to explore relationship between student perceptions and their course achievements in a Canadian university. Pinto-Llorente, Sanchez-Gomez, Garcia-Penalvo, and Casillas-Martin (2017) explored student perceptions in an English language course in a Spanish university. Posey and Pintz (2017) examined undergraduate nursing students' success and challenges in transitioning from regular f2f learning to blended learning in a U.S university. In a more recent study, in another U.S university, Zhang and Dang (2020) investigated a computer science course to explore factors that influence successful blended learning. Furthermore, Mestan (2019) examined how an Australian university facilitated transitioning from f2f to blended learning that had a target for offering 60% of all its subjects in blended mode by 2017. Except for Mestan (2019), all these studies focused on specific subject areas and none of them explored students' perceptions across disciplines. Even though Mestan's study included students from various disciplines, it also did not compare differences in perceptions among students across disciplines. Therefore, more research is needed to compare the differences in student perceptions across subject disciplines to better understand blended learning.

Understanding students' values and beliefs across disciplines is important because approaches to learning and teaching are often affected by subject disciplines and the teaching context (Lindblom-Ylanne, Trigwell, Nevgi, & Ashwin, 2006). Therefore, for university-wide blended learning adoption, one-size-fit approach may not be suitable as teachers and students of various disciplines (i.e., physical sciences, engineering, and medicine) may prefer more teacher-centred and f2f interactions (Lindblom-Ylanne et al., 2006). This study addresses this gap, aiming to understand differences in perceptions among students of various academic disciplines in university-wide adoption and diffusion of blended learning.

Affordances of Blended Learning

Blended learning offers several affordances for students and teachers. Firstly, it can provide increased access to learning, specifically for students who are unable to attend regular f2f classes. For example, Dziuban, Graham, Moskal, Norberg, and Sicilia (2018) investigated student access, success and withdrawal rates in blended programs over an extended period of time by comparing them with fully online and fully f2f programs in a U.S university. Results of this study indicated that blended approach could increase or maintain learner access for various student cohorts (i.e., minority and non-minority), and can improve student academic success rates. In another study, Wang and Huang (2018) experimented a blended synchronous learning environment to explore how blended learning can allow students to access learning from multiple locations without physically attending classes. In this study in which 24 full-time schoolteachers and adult learners participated, results show blended learning can be a feasible and practical method that can increase learner access and can provide equivalent learning experience compared to regular f2f teaching.

Blended learning can provide students and teachers with increased flexibility. Lightner and Lightner-Laws (2016), for example, investigated blended learning in a U.S university and found that flexibility afforded by the pedagogic approach can cater learning needs of a diverse student group. In a more recent study, Thai et al. (2020) compared students' learning interactions and performance in regular f2f, blended, flipped, and fully online learning in a Vietnamese university. Results of this study showed blended learning can provide students with more flexibility compared to the other modes of instructions. Some other recent studies (e.g., Miguez-Alvarez, Crespo, Arce, Cuevas, & Regueiro, 2020; Vanslambrouck et al., 2019) have also reported similar findings suggesting that blended approach can increase learner flexibility in terms of time, effort, and learning environment, specifically for those who may want to study while having responsibilities such as fulltime employment and family.

Research shows blended learning can also enhance learner engagement. For example, Mestan (2019) examined how an Australian university made transitions to blended learning from f2f teaching, and found blended learning can provide more avenues for learners to engage with course materials and can enhance students' overall learning engagement. In another recent study, Zimba, Khosa, and Pillay (2021) investigated use of blended learning among social work educators in various South African universities in order to increase learner engagement. This study found blended learning can be effective to enhance learning engagement in and outside the classroom. Other scholars also have acknowledged how blended learning can promote students' active engagement in various learning contexts and have identified enhanced engagement as one of the key affordances of blended learning (e.g., Posey & Pintz, 2017; Wanner & Palmer, 2015; Xu, Yau, & Reich, 2020).

User Perceptions and Technology Adoption

Technology is often considered a problem-solver in many aspects of daily life including science, business, health, communication, and education, to name a few. However, in most of these areas, technology adoption may not be straightforward as adoption is often influenced by several factors. These factors can be classified as three main groups: (a) user (e.g., Hsu, 2016; Sanchez-Prieto, Huang, Olmos-Miguelanez, Garcia-Penalvo, & Teo, 2019; Wilson, Raish, & Carr-Chellman, 2017), (b) technology itself (e.g., Pereira & Wahi, 2017; Y. Xu et al., 2020), and (c) organization where technology is adopted at (e.g., Chang, 2015; Porter, Graham, Bodily, & Sandberg, 2016; Singh & Hardaker, 2017). Of these broad areas, user is given a considerable attention, and user perceptions is often considered as one of the key factors that can influence technology uptake (Edmunds, Thorpe, & Conole, 2012; Razmak & Belanger, 2018), specifically in relation to technology-integrated pedagogic practices such as blended learning.

Sumak et al. (2017), for example, examined factors that affect teachers' perceptions about adoption of interactive whiteboard in Slovenia. The results showed that teacher perception can impact adoption, and their perceptions are affected by the system interface quality, teacher innovativeness, and perceived impact. In another study in which 301 Brazilian university students participated, Cidrala, Oliveirab, Felicea, and Apariciob (2018) investigated e-learning success determinants. This study showed, students' perceived satisfaction had significant effect on adoption, and factors such as system quality and learners' perceived

interaction with peers can explain their satisfaction about the course. Similar finding were reported in a more recent study, investigated Chinese university students' perceptions about using a blended learning platform, and how perceptions affect learner engagement and satisfaction (Gao et al., 2020). Whilst most of these studies are about the use of general technology in the classroom, it is reasonable to relate them to blended learning. Blended learning involves integration of online and f2f instructions and requires use of digital technology in teaching and learning (Anthony Jnr et al., 2020; Brown, 2016). These studies shed some light on the role of user and user perceptions in technology adoption. However, still there are many unanswered questions in relation to the differences in student perceptions about blended learning, specifically the extent to which the differences are among students, and the common factors that contribute to their diverse thinking.

Technology Acceptance Model (TAM)

TAM is a theoretical model proposed by Davis (1989) that explains factors that influence users' behavior of using technological innovations. According to TAM, user's actual use of a technology is directly affected by their behavioral intention (user's willingness to use technology), and the behavioral intention is determined by two key factors: (a) perceived usefulness, and (b) perceived ease of use. Perceived usefulness is, according to Davis (1989), the extent to which a user believes use of a technology will improve their job productivity, while perceived ease of use is the extent to which a user thinks using a technology is free of efforts (Davis, 1989).

TAM is widely used to predict users' voluntary behavior of using digital technology in various contexts (i.e., Dumpit & Fernandez, 2017; Razmak & Belanger, 2018; Villani et al., 2018). It is also one of the commonly used tools to understand and explain users' intentions of adopting technology integrated learning practices such as blended learning. For example, Martin-Garcia, Martinez-Abad, and Reyes-Gonzalez (2019) used TAM to identify stages of adoption of blended learning, and how these stages can relate to users' personal and professional characteristics and attributes in which about 980 academic staff from 43 Spanish public universities participated. Huang and Teo (2021) applied TAM in another study to investigate how policy and teacher beliefs influence on their use of technology in which 696 English teachers from 59 Chinese universities participated. Further, Gao et al. (2020) also used TAM to explore relationship between students' perceptions about a blended learning platform and their course satisfaction based on learner engagement. These studies indicate that the two elements of TAM: perceived usefulness, and perceived usefulness are considered as two key factors that significantly influence teachers and students' behavioral intentions of adopting blended learning. They also suggest that TAM is a robust model to explain user intensions of using technology and can be used to explore users' behavioral intention of using blended learning. Therefore, TAM is adopted in this study to explore students' perceptions about university-wide blended learning adoption. The aim is to investigate students' perceptions about use of blended learning in a university, and to compare the differences in student perceptions across various study disciplines. The study is guided by the following questions:

1. What are students' overall perceptions about the use of blended learning?
2. What are the differences in perceptions among students across disciplines?
2. What barriers can inhibit student adoption of blended learning?

METHODS

Research Context and Participants

This study was conducted in a dual-mode university in the Maldives. The country is an archipelago that consists of total 185 inhibited islands. Population of these islands can be ranged from 200 to 10000. Higher education activities are thus predominantly carried out in Male', the Capital of the nation, along with some regional campuses. Despite the dispersion and the small population of the islands, there is no regular public transportation system for travelling between the islands. Consequently, accessing higher education is very difficult for the island community. The university, therefore, offers several courses using alternative delivery

methods (i.e., blended learning), to reach the remote communities of the nation. To facilitate this better, blended learning was officially adopted by the university in 2019 for its flexible delivery courses, despite the pedagogic approach had been used by some faculties since 2010. Blended learning was implemented across the university, by almost all the faculties, within 6-7 months after the adoption decision was made. The f2f component of blended learning is predominantly held in Male' even though the outreach centers (ORCs) are used by some faculties. The ORCs are an administrative arrangement made by the university in collaboration with some local island/atoll councils to allow students of near-by-islands to gather for their compulsory f2f component. Typically, it is a classroom from the island school, thus, no ORC is owned by the university. Typically, the f2f component is held 3-4 times a semester, over some selected weekends (e.g., weeks 3, 6, 9, and 11), and throughout the semester, students complete the rest of their coursework through Moodle, whilst living in remote islands. However, in the end of the semester, students are required to physically attend their preferred ORCs for the final exams, if any of the subjects involve a written exam.

Participants were 407 students enrolled in blended learning courses in second semester 2019. Of these students, 69.2% live on remote islands, while the remaining 30.8% live in Male' the capital city. Majority of these students (67.3%) were female while male students were about a third of the sample (32.7%). Students' age ranged from 20 – 50 years, whereas 29% students were below 25 years, 43.2% were between 25 and 35 years of age, 20.8% were 36-45, and 6.9% above 45 years of age. At the time of data collection, 84.1% were full-time, and 4.1% were part-time employed while 11.8% were not employed.

Students were from eight different subject disciplines that included education, health sciences, nursing, liberal arts, tourism studies, law and Islamic studies, engineering and science, and business. Majority of the students (65.1%) were enrolled in bachelor's degree courses and 23.8% were master's degree students. The remaining students belonged to diploma (6.4%), and certificate four level (4.7%) courses.

Instruments and Procedure

For data collection, a questionnaire was developed based on Owston et al. (2013) and Wanner and Palmer (2015). Questions were adapted from the existing surveys, and few new questions were added to fit the local context. Questionnaire consisted of total 19 items in four main areas: overall perceptions, affordances of blended learning, seeking technical support, and challenges students face in engaging with blended learning. All the questions were on a 5-point Likert-scale (Strongly Disagree to Strongly Agree), with 1 representing Strongly Disagree and 5 representing Strongly Agree.

The questionnaire was piloted prior to data collection in a similar university context with 17 students. For the questionnaire reliability testing, Cronbach's alpha coefficient was calculated. The Cronbach's alpha for the 19 items for plotting was 0.91 suggesting very high reliability. However, given the small number of students participated in the pilot study, Cronbach's alpha coefficient was recalculated with 407 participants after collection of data. The recalculated Cronbach's alpha for the same 19 items was 0.86, again, indicating high reliability.

Data were analyzed using SPSS. Descriptive statistics (frequencies, ranges, means, and standard deviations) were calculated for individual items, and group means were also compared using ANOVA. For comparisons of multiple groups, post-hoc test was performed. All the mean differences were set to be significant at the 0.05 level. According to Emerson (2018), ANOVA is an appropriate test to compare means from multiple groups of scores and the variances among the scores, to explore if the group mean differences are statistically meaningful.

RESULTS

Questionnaire items were grouped and analyzed based on the research questions. The following sections present results of the analysis.

Students' Overall Perceptions

Results showed, overall, students had positive perception about blended learning. Students were asked how happy they are of using digital technology in learning, as blended learning involves integration of digital technology. Results revealed that a large majority of the students were receptive to the use technology for learning. Of the 407 students, 93.1% (n=378) felt they are happy to use digital technology in learning.

Students believed blended learning provided them with multiple affordances. One of the perceived affordances was increased access to learning. Results show 81.6% students believed blended learning allows them to participate in university learning while they live at remote location of the nation. Further, more than two-third of the students (68.3%) felt if they did not have blended learning option, it would have been very difficult for them to pursue higher education. These figures can explain the reason why 74.9% of students believed blended learning is a useful method for learning.

Increased flexibility was also perceived a valuable affordance for students. Large majority (84.1%) of the students were fulltime employed at the time of data collection. Students believed blended learning allows them to study in their own time after employment/family commitments (81.8%), and it also provides flexibility for them to study at their own speed (65.8%). This flexibility afforded by blended learning appeared making learning easier for students. Majority of the students (63.6%) believed flexibility afforded by blended learning makes learning easier compared to regular f2f learning.

Despite the positive views about increased access and increased flexibility, students had mixed perceptions about enhanced learner engagement. Just over one-third (33.8%) of the students felt they get more engaged with learning compared to regular f2f learning. On the other hand, 41.4% (n = 168) students believed blended learning does not provide them with more learner engagement, while the remaining 14.9% (n = 101) responded as 'undecided'. Despite the mixed views about learner engagement, results show overall, students were happy about blended learning. In fact, majority students (58.6%) felt they would take another blended learning course in future instead of a regular f2f course. Of the remaining, 25.6% responded the question with 'undecided', while 15.8% students believed they would prefer f2f learning over blended learning.

Differences in Perceptions

ANOVA was performed to compare means in relation to students' perceptions about blended learning. Results showed, overall, students studying science and engineering, and law and Islamic studies had higher positive views respectively compared to the rest of the cohorts in the study. On the other hand, students studying subjects related to tourism and hospitality, and business had the lowest mean average, respectively.

Overall results showed, blended learning was perceived as a teaching method that can provide increased learner access to students, specifically for those who live on the remote islands. Post-hoc analysis was, therefore, performed to compare if there were differences between the faculties. Table 1 shows the results, indicating the significant differences are between the Faculty of Hospitality and Tourism Studies (FHTS) and the rest of the university except MNU Business School (MNU BS). In addition, significant differences are noted between MNU BS and the remaining faculties, except FHTS, and Faculty of Health Sciences (FHS). [Table 1 near here]

Table 1. Differences in perceptions in relation to increased access

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FHTS (M = 3.14)	FEST	4.67	-1.52905*	.50	0.003
	FA	4.18	-1.03739*	1.22	0.000
	FLIS	4.35	-1.21239*	.95	0.000
	MNU BS	3.16	-.02148	1.16	1.000
	FHS	4.11	-.96765*	1.10	0.015
	FE	4.31	-1.17667*	.94	0.000
	MNU SN	4.34	-1.20485*	1.08	0.000
MNU BS (M = 3.16)	FEST	4.67	-1.50758*	.50	0.008
	FA	4.18	-1.01591*	1.22	0.001
	FLIS	4.35	-1.19091*	.95	0.000
	FHTS	3.14	.02148	1.32	1.000
	FHS	4.11	-.94617	1.10	0.051
	FE	4.31	-1.15519*	.94	0.000
	MNU SN	4.34	-1.18337*	1.08	0.000

*Note. *p< 0.05

Table 1 shows, FHTS and MNU BS had the lowest mean scores with 3.14 and 3.16 respectively, consequently, are significantly different from most of the faculties. Overall, no significant difference was noted within the rest of the faculties in relation to increased access to learning.

Student perceptions about increased flexibility were also compared between the faculties. Results showed, again, FHTS had the lowest mean and was different from four other faculties: Faculty of Arts (FA), Faculty of Law and Islamic Studies (FLIS), Faculty of Education (FE), and MNU School of Nursing (MNU SN). No significant difference was recorded within the rest of the university. Table 2 shows the differences in students' perceptions about increased flexibility. [Table 2 near here]

Table 2. Differences in perception about increased flexibility

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FHTS (M = 3.63)	FEST	4.40	-.76697	.52	.207
	FA	4.25	-.61697*	.95	.010
	FLIS	4.33	-.69197*	.80	.002
	MNU BS	3.80	-.16243	.98	.978
	FHS	4.00	-.36697	.75	.764
	FE	4.39	-.76134*	.73	.000
	MNU SN	4.39	-.75886*	.81	.000

*Note. *p< 0.05

Overall, results show majority of the students (58.6%) would opt a blended learning course in future instead of regular f2f once. Students' perceptions were therefore compared between the faculties to explore if this was the case across the board. Figure 1 shows the mean score of individual faculties. [Figure 1 near here]
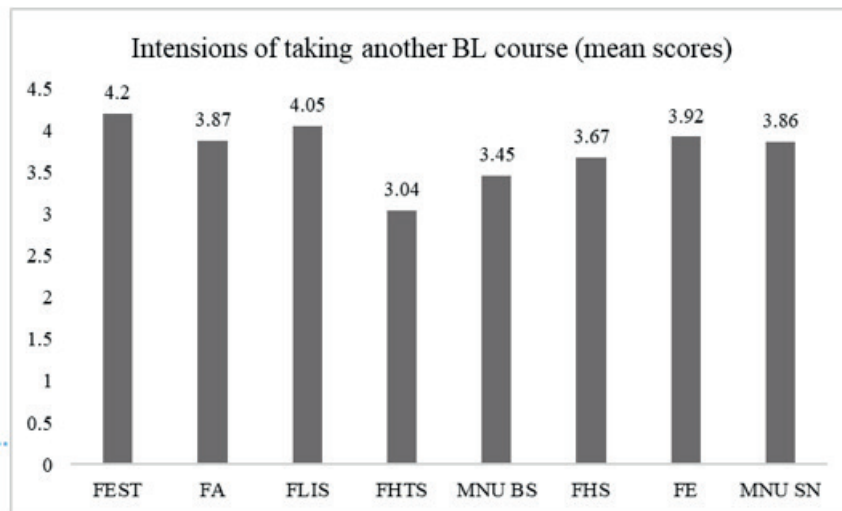
Figure 1. Differences in students' perceptions about taking another BL course

Figure 1 shows, students were generally willing to take another blended learning course in future instead of a f2f one. However, it shows students of FHTS and MNU BS held more negative views compared to the remaining faculties. On the other hand, students of FEST and FLIS were more positive compared to the rest of the university with mean scores, 4.2 and 4.05, respectively.

Students' perceptions were compared between those who live on the islands and Male', the Capital city. ANOVA results show there was no significant difference between the two groups in terms of perceived usefulness (α = .93). However, a small difference (α = .030) was recorded between these two cohorts in relation to perceived ease of use. Results show students who live on the islands had higher positive perceptions (M = 3.65, SD = 1.09), compared to their counterparts who live in Male' (M = 3.47, SD = 1.21).

Students who live on the remote locations also had more positive perceptions about perceived increased access to learning. Results show, these students believed blended learning can allow them to carry on higher education while they live on the islands (α = .000, M = 4.23, SD = 0.93), and it would be very difficult to for them to participated in university leaning if they did not have blended learning (α = .001, M = 4.01, SD = 1.21). These results explain why this student group had more positive perceptions overall (M = 3.76, SD = 1.13), compared to their peers who live in the city (M = 3.33, SD = 1.29), and the difference was significant (α = .001).

In terms of differences in perceptions of students who are employed and not working, results show these two groups had quite similar perceptions except increased learner access. There was no significant difference between these two groups in most of the areas. The alphas were for perceived ease of use (α = .767), perceived usefulness (α = .428), perceived flexibility: studying while living far from university campus (α = .302), studying in spare time after work/family commitments (α = .104), and intentions of future use (α = .108). However, for increased learner access, employed students believed if they did not have blended learning it would have been very difficult for them to participate in higher studies, and the difference between the groups was significant (α = .000).

Students' perceptions were also compared based on their level of studies: masters, bachelor, and diploma and below. Overall, results show diploma and below students had more positive views in relation to ease of use (M = 4.04, SD = 0.90, α = .011), usefulness (M = 4.26, SD = 0.83, α = .022), intensions for future use (M = 4.04, SD = 1.06, α = .035), compared to bachelor's groups. There was no significant difference between bachelor's and master's students in terms of ease of use (α = .764), usefulness (α = .376), and intention of future use (α = .941). These results suggest, perceptions of both bachelor's and master's students are quite similar, but different from diploma and below student cohort.

Overall, this study showed, students studying subjects related to hospitality, tourism, and business had lower positive perceptions compared to the rest of the university while students studying science and engineering,

law and Islamic studies subjects had higher positive views compared to the remaining faculties. Results also showed, generally students living in the islands had higher positive views about blended learning compared to those who live in the city and were more willing to take another blended learning course in future. In terms of the differences, between employed and unemployed students, except for increased access to learning, there was no significant difference. The results further revealed, there was no significant difference in perception among bachelor's and master's students, despite the differences between bachelor's and diploma and below were significant.

Barriers for Adoption

Results showed students face multiple barriers in relation to use of blended learning. Barriers included insufficient internet infrastructure, issues related to technical support, and high cost that involve with traveling for f2f classes.

Questionnaire results showed, students had mixed views about the quality of the internet and were somewhat unhappy about the internet facilities available to them. 46.7% students felt they are satisfied with the bandwidth while 39.8% were unsatisfied. The remaining students (13.5%) responded the question with 'undecided'.

In terms of technical support, students were asked about how easy support seeking is, and how timely are support provided when they need it. Overall, students had mixed perceptions for technical support. Only 37.6% students believed it is easy to get support. Of the remaining, 35.6% felt it is not easy while 26.8% students responded the question with "undecided". In relation to timely support, students had somewhat similar beliefs. 41% students believed the university provide them timely support when they need it and 33.6% felt they do not receive timely support. The remaining 25.3% students responded the question with "undecided".

Another challenge for students was significant expenses that involve with travelling for f2f classes. Results show for majority of the students (53%), commuting between the islands for f2f classes is too expensive while 29.3% student believed travelling is not expensive for them. The remaining 17.8% responded "undecided".

Barriers faced by students in engaging with blended learning were compared between the faculties. In terms of the internet bandwidth, results show FHTS had the lowest mean score, and the differences at significant level are between FHTS and five other faculties. Table 3 shows the differences in student perceptions about the internet quality. [Table 3 near here]

Table 3. Differences in perception about internet bandwidth

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
	FEST	3.70	-1.25963*	1.70	.038
	FA	3.63	-1.18463*	1.21	.000
FHTS	FLIS	3.25	-.80963*	1.26	.008
(M = 2.44)	MNU BS	2.84	-.40054	1.22	.588
	FHS	2.89	-.45437	0.94	.804
	FE	3.59	-1.15118*	1.18	.000
	MNU SN	3.24	-.80288*	1.21	.000

*Note. *$p< 0.05$

As Table 3 shows, students of FEST, and FA had highest mean scores respectively about the internet quality while FHTS, and MNU BS had the lowest scores, respectively. The results also show the differences at significant level were between FHTS and five other faculties that are FEST, FA, FLIS, FE, and MNU SN.

In terms of differences in relation to technical support, results were quite similar for both the questions: easiness to get support, and timely support. For easiness of support, differences at significant level were between FHTS (M=2.66), and FEST (M=3.80, α = .014), FHTS and FA (M=3.48, α = .000). For timely support, the differences at significant level were between FHTS (M=2.63) and FEST (M=3.80, α = .031), FHTS and FA (M=3.58, α = .000), and FHTS FE (M=3.18, α = .025), suggesting that overall, students belonged to FHTS had lower positive perceptions about technical support they received from the university.

In relation to travel expenses, students were asked if travelling to participate in f2f classes is too expensive for them. Post-hoc test results show there are significant differences between the faculties. Table 4 show results of comparisons of multiple groups. [Table 4 near here]

Table 4. Differences in perceptions about travel expense

Faculty		Mean	Mean Difference	Std. Deviation	Sig.
FE	FEST	4.30	.00986	1.16	1.00
(M = 4.31)	FA	3.50	.80986*	1.40	0.02
	FLIS	4.13	.18165	1.20	1.00
	FHTS	2.76	1.54571*	1.27	0.00
	MNU BS	3.02	1.28713*	1.21	0.00
	FHS	3.39	.92097	1.14	0.08
	MNU SN	3.40	.90708*	1.31	0.00

*Note. *p< 0.05*

As table 4 shows, students of Faculty of Education (FE) had highest mean, indicating they spend more on traveling compared to the rest of the university while students of FHTS were least concerned about the travel expenses. Results also show between FE and other four faculties. They were FA, FHTS, MNU BS, and MNU SN.

Overall, results showed, three main barriers can inhibit use of blended learning in the Maldivian context. These were, issues related to internet bandwidth, in adequate technical support, and high expenses that involve with travelling for f2f classes. Results further showed, perceptions about these barriers were somewhat similar among students of various disciplines and significant differences were noted between some faculties.

DISCUSSION

The aim was to investigate students' perceptions about use of blended learning in a university, and to compare the differences in student perceptions across various study disciplines. The study was guided by three research questions that are about (a) students' overall perceptions about blended learning, (b) differences in perception among students, and (c) inhibitors for adoption of blended learning.

In relation to overall perceptions, students were generally happy about the use of digital technology in learning. This finding resembles of the findings of the previous research that show students were receptive to use of technology in and outside classrooms. For example, in their study in which 25 students from a U.S university participated, Adedokun, Henke, Parker, and Burgess (2017) found students held overall positive perceptions about use of technology, and students believed technology had positive impact on their learning climate and motivation. Similar findings were also reported in other studies that show, students generally value integration of digital technology in learning (e.g., Al Zumor, Al Refaai, Eddin, & Al-Rahman, 2013; Amanda, Emily, Kate, & Kathryn, 2019).

Results showed that increased access to learning and increased flexibility were perceived by students as key affordances of blended learning. These affordances are so important because increased access to learning

often makes blended learning useful for learners (Martin-Garcia et al., 2019) whilst increased flexibility can make the learning method easy to use (Wang & Huang, 2018). In the context of the Maldives, these affordances are more significant, because most of the students in blended learning courses live on remote islands (69.2%) and were employed fulltime (84.1%). Therefore, accessing education is a significant issue for these students as it is almost impossible for them to attend regular f2f teaching held on campus, in the city. This finding is in line with the literature that has shown increased access to learning and increased flexibility as key affordances of blended learning (e.g., Dziuban et al., 2018; Lightner & Lightner-Laws, 2016; Thai et al., 2020; Wang & Huang, 2018). Another significance of this finding is related to perceived usefulness and perceived ease of use – the two key elements of TAM. According to TAM, users' behavioral intentions of adopting technology and technology enhanced learning such as blended learning are predicted by their perceptions about usefulness, and easy to use (Gao et al., 2020; Martin-Garcia et al., 2019). The TAM postulates that the more a technology is useful and easier to use, the higher likelihood of adoption by potential users. This suggests that when blended learning is implemented, the student uptake will likely be high, and as a result, the implementation can be relatively faster and smooth. For successful and smoother implementation of institutional blended learning, individual teacher and student adoption is essential (Anthony Jnr et al., 2020).

Despite increased flexibility and enhanced learner engagement were perceived by the students as key affordances of blended learning, they had mixed views about the third affordance – enhanced learner engagement. One possible explanation of this results can be students were accustomed to regular f2f learning, and many students and teachers had just one semester of blended learning experience at the time of data collection. Not having enough time to learn blended learning can significantly impact students' general self-efficacy that can negatively impact students perceived achievement goals and satisfaction. Research show students' general self-efficacy is a factor that explains their achievement goals and satisfaction (Diep, Zhu, Struyven, & Blieck, 2017). Lack of teacher experiences also may have hindered integration of online and f2f instructions, consequently can yield low levels learner engagement within the blended learning environment. Bruggeman et al. (2021) found, insufficient teacher knowledge and experience of blended learning is one of the main barriers to successfully implement blended learning.

As expounded in the previous section, students were generally positive about blended learning and happy to take another blended learning course in future. This can be an enabler for the university to implement blended learning across various subject disciplines as often users' positive perceptions propel high rates of adoption. Research show users' adoption of technology is influenced by their attitudes and perceptions about technology (e.g., Lancelot Miltgen, Popovic, & Oliveira, 2013; Park, Nam, & Cha, 2012). In a more recent study in Brazil in which 381 students from 24 higher education institutions participated, Cidrala et al. (2018) also found students positive perceptions and satisfaction explain their willingness of up-taking e-learning courses.

The current study revealed, overall, students studying in tourism and hospitality courses had lowest positive perceptions about blended learning, following business/accounting students. One explanation for this can be most of the tourism studies subjects involve substantial practical components that need direct guidance and supervision of teachers in class. However, with blended learning f2f instructions are significantly reduced, consequently, students may be anxious of not having sufficient learning opportunities with blended approach. Another possible explanation can be blended learning was introduced in an immediate fashion within the university and was entirely new to the students and teachers of both the faculties. Despite a flexible learning method called "block-mode" was used for these students prior to blended learning, they never had online component incorporated in their courses before blended learning. Research indicate users are often resistant to technology that are unfamiliar to them, consequently the likelihood of adoption can be low (Armstrong, 2019; Sanchez-Prieto et al., 2019).

Previous research has reported similar findings in relation to students' perceptions about online instruction in tourism and accounting courses. For example, a study that involved 113 hospitality students in a Chinese university, Pang, Penfold, and Wong (2010) found despite students had moderately positive views about blended learning, in order to become blended learning accepted by students, it needs to be introduced overtime to let users to be familiar with the teaching method. In another study in which 29 accounting students of a U.K university participated, Osgerby (2013) found students opted regular lecturers and step-

by-step in-class instructions over blended learning, despite they appeared having initial positive attitude about blended learning.

Results also revealed overall, students belonged to engineering and science courses had higher positive views about blended learning compared to the rest of the university. This finding is in line with the previous research such as Martinez-Caro and Campuzano-Bolarin (2011). This study in which 2658 students from 21 engineering courses in a Spanish university participated, the authors found blended learning students' satisfaction was greater and students were more positive compared to those enrolled in regular f2f courses.

This study showed students who live on remote islands were more receptive to blended learning and were more willing to take another blended learning course in future compared to those who live in the city. There may be several reasons for this. As mentioned before, the islands of the Maldives are geographically dispersed, and students located at remote locations and there is no reliable public transportation system for students to travel between the islands. Further, most of these students are fulltime employed in the islands therefore, attending daily f2f teaching is nearly impossible for these students. For these reasons, students may perceive blended learning as the only feasible option for them to have flexibility and access higher education as it does not require them to attend daily f2f classes. Research show blended learning often provides students with increased flexibility (e.g., Lightner & Lightner-Laws, 2016; Thai et al., 2020), and increased access to learning (e.g., Dziuban et al., 2018; Wang & Huang, 2018).

Results revealed students face several barriers in relation to use of blended learning. One of the barriers is issues related to the internet facilities which can be one of the common inhibitors for embracing technology integrated teaching. Previous studies have also shown issues related to students' access to technology infrastructure such as internet and the internet-based learning tools can inhibit use of blended learning among students (Ocak, 2011). Another barrier for students was issues related to technical support, specifically Moodle-related support. This finding also resembles of those in the previous studies. For example, Bower, Dalgarno, Kennedy, Lee, and Kenney (2015) found in blended learning, it is critical for students to be provided with sufficient advice and support on how best leverage technology. Porter and Graham (2016) also highlighted the same issue and found technical and pedagogical support are vital for institutional adoption of blended learning.

Another inhibitor for blended learning was high expenses that involve with travelling for f2f classes, which can be somewhat a unique matter for the country. One explanation for this issue can be, as expounded previously, students live on remote islands and there is no regular public transport system for commuting between the islands. Therefore, students need to make their own travel arrangements, often hiring a private speedboat or traveling by a plane. Some students may need to use both sea and air travelling to attend their f2f classes. Travelling thus, can be significantly expensive for many students in addition to the logistical complications that they ecounter. As a result, the use of blended learning would likely be difficult for these students. This can have substantial implications for students' adoption of blended learning. Research indicate that ease of use is a factor that explains users' decisions of adoption of technology (Gao et al., 2020; Park et al., 2012), suggesting, students would likely be avoiding technology-integrated instructions such as blended learning if they think they are difficult to use.

LIMITATIONS AND FURTHER RESEARCH

This study reveals some insights about student perceptions in institutional implementation of blended learning, specifically, the differences between academic disciplines. However, it does not probe into the reasons why these differences exist between the faculties. In addition, whilst this study investigates institutional implementation of blended learning and teachers are those who take the key responsibilities of the implementation, it does not include them in this study which limits our understanding of how the institutional efforts were perceived across various level of the university. Further research, therefore, can explore user perceptions across the three levels of the university – students, teachers, and the executives, to better understand the effect of perceptions of all the stakeholder groups for institutional implementation. In addition, to understand the reasons why perceptions are different between the faculties, a mixed method approach with in-depth interviews can be helpful to investigate the actual reasons why a certain practice is accepted or not by the users throughout the implementation process, across the board.

CONCLUSION

The aim of this study was to investigate students' perceptions about use of blended learning in a university, and compare the differences in student perceptions across academic disciplines. Results showed, overall students were positive about use of digital technology and blended learning. Students believed blended learning provides them with increased access to learning and increased flexibility, despite they had mixed views about enhanced learner engagement. In terms of differences in student perception across various subject disciplines, results showed students studying in tourism/hospitality, and business faculties had more negative perceptions compared to the rest of the university. On the other hand, students of the faculties science and engineering, and law and Islamic study had more positive attitude toward blended learning compared to their counterparts studying in other subject disciplines. Further, results revealed, students face three main challenges that can potentially inhibit use of blended learning. These include insufficient internet infrastructure, technical support, and high expenses that involve with travelling for f2f classes. Overall, results of this study showed while students' positive perceptions about blended learning can be an enabler for adoption of blended learning, barriers that are faced by students can inhibit adoption and implementation of the learning approach within the university. This suggests that institutional implementation efforts need to be well planned and appropriate measures must be undertaken by university leaders to minimize potential barriers so the implementation can be smooth and sustainable.

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TOO MUCH SCREEN? AN EXPLORATORY EXAMINATION OF DIGITAL EXHAUSTION OF EDUCATORS IN TURKIYE

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ABSTRACT

Screen time is now widely available and due to the increasing use of these technologies in school and home, it is important to consider teacher views about their use and possible results. The purpose of this study is to analyze the digital exhaustion of educators in Turkiye and its proposed antecedents. 570 educators who live in Turkiye participated in this study. Mixed-methods research was conducted to analyze the survey results. The data obtained were analyzed using descriptive analysis, regression analysis, and thematic content analysis. Key findings were that educators had digital exhaustion and there were three main types of exhaustion (emotional, social, and physical). Educators offered some practical solutions for digital exhaustion.

Keywords: Screen fatigue, teacher motivation, teacher burnout, post-covid era, teachers' opinions.

INTRODUCTION

Due to the COVID-19 pandemic that came out in March 2020, there has been a shift from face-to-face instruction to online instruction all around the world to prevent the spread of the virus in educational institutions. Educators have worked hard to ensure learning consistency throughout this transition process and students have had to continue learning remotely through their devices such as television, radio, and mostly online learning platforms and tools such as synchronous virtual meeting software and asynchronous educational content materials. They have been used in almost all OECD and partner countries to reach the greatest number of students in this process (OECD, 2020). With the closure of educational institutions and interruption of face-to-face education, the education of 1.6 billion students, which corresponds to approximately half of the student population of all educational levels, has been interrupted (UNICEF, 2020). During this period, video conferencing has become vital to conduct online lessons (Lowenthal et al., 2020) as it helps with online learning and teaching by allowing users to support, track, and communicate with teachers and students from anywhere both formally and informally (Themelis & Sime, 2020). Because of this tremendous shift, schools have changed the way they think and started to search for alternative and practical ways to provide instruction, ensuring that learning will take place remotely as a result of closures. To maintain effective learning environments, people have had to adapt themselves to these new technologies and cope with numerous challenges such as mechanical and network issues. Additionally, they have started to experience the side-effects of those challenges and also excessive use of video conferencing platforms (Epstein, 2020; Riedl, 2021; Wiederhold, 2020; Williams, 2021). Overuse of those virtual conferencing programs led to the emergence of a new term called "Zoom fatigue" by many researchers (Brenda & Wiederhold, 2020;

Epstein, 2020; Riedl, 2021; Wiederhold, 2020) which means "a feeling of exhaustion from participating in video conference calls." (Fauville et al., 2021, p.2).

In this context, this study aims to describe the impact of giving online classes on teachers in Turkiye through video conferencing during the Covid-19 pandemic. The understanding of the online learning environment is becoming more crucial as more students attend online classes (Kauffman, 2015). Although there is a growing body of study in the literature that focuses on designing interactive and effective online classes and also increasing student participation in online classes, the number of the research addresses teachers' feelings and opinions in this process is limited. For this reason, this study may contribute to the literature by presenting how teachers in Turkiye feel while giving online classes using video conference platforms. Furthermore, it may provide suggestions to teachers to overcome the challenges they face in this process. The study addresses the following research questions:

1. How do teachers in Turkiye feel after teaching online through video conferencing during the Covid-19 pandemic?
2. Does digital exhaustion differ according to variables (such as experience, the time spent etc.)?
3. How do teachers in Turkiye cope with teaching online through video conferencing during the Covid-19 pandemic?

LITERATURE REVIEW

Post-COVID Teaching Analysis

With the Covid-19 pandemic, the existing education systems in the world and Turkiye have been unprepared to ensure the continuity of education under all circumstances. It has been observed that learners are physically separated from their schools, teachers, and other learners (Bozkurt & Sharma, 2020). Students' lives have been affected in various ways as a result of the COVID-19 epidemic, depending not just on their level and field of study, but also on where they are in their grades (Daniel, 2020). As the COVID-19 epidemic spread across the globe, most governments took the precaution of closing schools to try to stop the virus from spreading further. In Turkiye, each week of school closures equates to roughly 23 hours of mandatory face-to-face instruction time. Schools were compelled to substitute this duration with e-learning and homeschooling (OECD, 2020).

This emergency has sparked new developments in the field of education. From radio to television and the Internet, inventive techniques have started to be used to enhance learning continuity. A great number of studies have recently been conducted on the move from face-to-face instruction to substitute delivering in all settings of education and learning (Howe & Watson, 2021). Education has undergone significant transformations, with the growth of e-learning, wherein instruction is done remotely via online platforms. According to Li & Lalani (2020), education technology was seeing rapid expansion and adoption before COVID-19, with worldwide educational technology investments reaching US$18.66 billion in 2019 and the whole industry for online education expected to reach $350 billion by 2025. Since the pandemic, there has been a considerable increase in the utilization of language learning applications, video conferencing tools, and e-learning software. However, most of the education systems in the world were not equipped for e-learning opportunities when the pandemic arose (Schleicher, 2020). During the outbreak, almost all OECD and partner countries utilized digital platforms. Students have used online learning tools to access educational content at their leisure, formalized learning programs that they could complete at their own pace, and real-time courses conducted by their instructors via video conference systems (Schleicher, 2020). When it comes to the future of learning after Covid-19, it has been revealed that there are clear advantages for students in being able to extend their study time and opportunities outside the classroom door by using several distance learning alternatives (OECD, 2020). According to Daniel (2020), the development of online learning in tertiary education may probably continue, and education institutions will arrange themselves more carefully to follow tech-enhanced learning. To conclude, with the help of COVID19 pandemic educators and learners all around the world had a chance to try and see possible results of distance education.

Teachers' Well-being during Covid-19 Pandemic

Teacher well-being leads to job satisfaction and productivity, but most significantly, it has a beneficial impact on student well-being and academic performance (Spilt et al., 2011). Teachers were faced with integrating distance learning modes almost shortly after the epidemic broke out, frequently without adequate supervision, training, or equipment during the pandemic (United Nations, 2020). Teacher professional development activities have been conducted online or shared via mobile and video applications. Furthermore, online class interviews and texting apps have become important tools and innovative methods for educators to interact with their students, colleagues, and all stakeholders. However, teachers all around the world were mostly not ready to promote learning continuity and adapt to new instructional modes in this period (United Nations, 2020). According to UNESCO (2020), millions of teachers, administrators, and other professionals have served as frontline workers, and they have exhibited great levels of dedication and inventiveness during the pandemic which has impacted at least 63 million primary and secondary school teachers.

UNESCO Covid-19 Education Response Report (2020) emphasized that it is highly critical to promote teachers' well-being, social-emotional skills, and endurance during crises. The current research conducted on the educators who experienced crises shows that there is a need for teachers to develop their social-emotional skills and resilience in hard times. The report also highlighted that a human-centered approach is a need for students and teachers because physical distance makes it more difficult for teachers to establish close relationships with learners during Covid-19. In this sense, teacher well-being is vital because instructors who are demotivated or anxious are less successful at promoting student well-being. Even though the teaching profession already experiences some obstacles and demands from students, families, and a continuously changing system, the epidemic is probably to add to the profession's stress and fatigue (Brenda & Wiederhold, 2020; Dabrowski, 2020; Epstein, 2020; Riedl, 2021; Wiederhold, 2020). To sum up, spending hours in front of a screen influences the well-being of educators.

Video Conferencing after COVID-19 Pandemic

Numerous educators all around the world had to change from face-to-face to distance education because of the COVID-19 pandemic. Not only educators, but students are also facing unprecedented challenges and psychological challenges due to the exclusive online education which became the new norm. For example, in one investigation around 80% out of 350 students revealed that during Zoom simultaneous lessons not just have they experienced issues centering and remaining present, yet additionally experienced more disengagement, uneasiness, and depression contrasted with up face-to-face lessons (Peper, 2021). As to encounters, COVID-19 has inspired extensive sensations of anxiety while adjusting to web-based instruction and learning (Besser et al., 2020). Regardless of whether these encounters sway faculty prosperity, rely upon their interpretation of this trouble (Sabagh et al., 2018). Accomplishment objectives and mentalities can be viewed as assets or determinants of people's essential and auxiliary evaluations of stressors, and accordingly, matter for the sign of pressure (Daumiller & Dresel, 2020). According to Bailenson (2021), nonverbal overload and numerous elements of the present video conferencing tools interface, have led to psychological effects. The researchers also identify four primary causes of exhaustion: excessive close-up stare, cognitive overload, increased self-evaluation as a result of watching a video of oneself, and physical mobility restrictions (Bailenson, 2021). One study found that the frequency, length, and burstiness (periods of high activity followed by periods of little to none) of Zoom meetings resulted in higher levels of fatigue among teachers. Not surprisingly, fatigue then caused negative attitudes towards video conferencing in general (Fauville et al., 2021; Kara, Dilek, & Liman-Kaban, 2022; Riedl, 2021; Wiederhold, 2020).

When educators all around the world start to work from home and try to remotely conduct their teaching responsibilities through digital devices (Liman-Kaban & Asci, 2021), video conferencing tools have become a vital tool for education (Lowenthal et al., 2020). Video conferencing is a technology that allows users in various locations to have face-to-face sessions without having to move to a single location together. Especially after covid19 struck the world, video conferencing tools became trending. Video conferencing statistics and studies on remote work in 2019 show that the global remote workforce has increased by 140% since 2005 (Stone, 2020). Zoom is a video-conferencing application that can be given as an example of the rapid increase in the use from approximately 10 million daily Zoom meeting participants in December 2019

to 200 million in March 2020 and 300 million in April 2020 (Iqbal, 2020; Chawla, 2020). Educators all around the world start to cry out their extended workloads as a result of long hours of teaching in front of the screen. When the literature is analyzed, there are limited numbers of studies examining the psychological effects of teaching through video conferencing tools. Hinds (1999) illustrated that video conferencing increases the cognitive load when it is compared to voice calls. Furthermore, Bailenson (2021) draws four explanations for the causes of Zoom Fatigue and they are the extraordinary amount of eye gaze at a close distance, limited physical mobility, constant viewing of self-video, and increased cognitive load for senders and receivers. The current study aims to understand educators' digital exhaustion and look for solutions to it.

Effects of Excessive Use of Screen

There are some results of excessive screen use. In this part, the negative results of excessive screen use are explained. According to Nielsen Company Audience Report (2016), adults log a total of 11 hours of screen time a day can influence their life negatively such as eye diseases, sleep disorders, addiction, reward seeking, weight gain, and health problems such as obesity, heart disease, type 2 diabetes, and some types of cancer.

Eye diseases are one of the common results of excessive screen use. Asthenopia is a condition that occurs when your eyes become exhausted as a result of prolonged use. Long periods of staring at a computer screen or straining to see in dim light are two prominent causes. Symptoms of asthenopia are pain around the eyes, a headache that may be aggravated by using your eyes, dry or watery eyes, blurred vision, burning, sore, or tired eyes, sensitivity to light, difficulty keeping your eyes open, and vertigo. Long-term computer and digital devices use has been called "computer vision syndrome" or "digital eye strain" since it is such a common cause of asthenopia. Reading for long periods, exposure to bright light or glare, activities requiring intense focus, being stressed or fatigued, exposure to dry moving air, such as air conditioning or heater, and underlying eye conditions, such as dry eye or uncorrected vision, are all causes of asthenopia.

Humans sleep roughly one-third of the day, making sleep a crucial health behavior (Irish et al., 2014). Excessive screen time is linked to poor sleep via a number of processes, including nocturnal exposure to bright lights, which may decrease melatonin production, and the displacement of other sleep-promoting activities like physical activity (Ghekiere et al., 2018; Lissak, 2018; Strasburger & Hogan, 2013). A link between screen time (a common form of sedentary behavior) and sleep problems can be explained in part by exposure to blue light, which enhances alertness and can make it difficult to fall asleep (Boniel-Nissim et al., 2015; Nuutinen et al., 2013).

As stated by World Health Organization (WHO, 2021), screen time has been related to an increased risk of obesity, which in turn increases the risk of diabetes. Obesity and diabetes rates have risen dramatically in recent years. Burnout is classified as an occupational phenomenon in the 11th Revision of the International Classification of Diseases (ICD-11), rather than a medical illness (WHO, 2019). According to ICD-1, burn-out is defined as follows: "Burn-out is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It has three dimensions: emotions of tiredness or depletion of energy; increasing mental distance from one's employment, or thoughts of negativism or cynicism about one's career; and decreased professional efficacy. Although there is no particular study on teachers' excessive screen use, when the literature is analyzed there are various studies on working in front of the screen. The results of those studies were discussed in this part.

METHOD

Research Design

The methodology of the study was designed regarding the purpose of the study and research questions. The study briefly aims to describe how teachers feel while teaching through video conferencing in the Covid-19 pandemic and provide suggestions to help them overcome the challenges they face in this process. The study employed convergent mixed methods design. Implementing a convergent mixed method design allows researchers to collect quantitative and qualitative data simultaneously and it enables researchers to reach an overall understanding of the research problem by collecting qualitative data and merging the results

of qualitative data with quantitative data collection methods to provide a deeper analysis of the research problem (Creswell, 2011). Convergent mixed method design is vital when an investigator is interested in using multiple data sources to examine similar issues at the same time points (Onwuegbuzie & Teddlie, 2003; Teddlie & Tashakkori, 2009).

Setting

The context of this study is teachers in K12 and university instructors in Turkiye. As the sampling method of the study is random, many teachers from various K-12 schools and universities around Turkiye participated in the study. For this study, various K-12 schools and universities around Turkiye are sampled, including public and foundational ones. Although there are slight differences in their program, there is something in common; all schools offer online education because of covid19. The data collection tool, which was a questionnaire, was sent to instructors online through social media (Twitter, Instagram, WhatsApp). Participation was voluntary. The participants did the questionnaire online and sent it through Google Forms.

Participants

This part presents the demographics of the participants of the quantitative phase and qualitative phase of the study. The participants of the study included 570 teachers from both public and private schools who have been teaching online since the pandemic started in Turkiye (N=570). There were 210 foundation school educators and 360 state school educators. 184 of the participants had 15 years and more of teaching experience. Only 36 of the participants had 3 years and less teaching experience. In table 1, the teaching experience of the participant educators can be found.

Table 1. Teachers' demographic information

		Frequency	Percent
Teaching Experience	1-3	40	7,0
(years)	4-5	56	9,8
	6-10	141	24,7
	11-15	136	23,9
	15+	197	34,6
Devices	Notebook	471	82,6
	Tablet Computer	55	9,6
	Desktop PC	30	5,3
	Mobile Phone	14	2,5
School Type	Foundation	210	36,8
	State	360	63,2

In table 1, the devices that teachers use while giving video conferencing sessions can be found. 442 of the educators claimed that they were using notebooks while teaching video-conferencing lessons and only two of the participants were using notebooks, tablets, and computers at the same time. Participant educators' grade-level teaching information can be found in table 2.

Table 2. Grade Levels

Grade Levels	Number of teachers in each group
Preschool	79
Preschool & Primary School	6
Preschool, Secondary School &High School	1
Preschool & Primary School & Secondary School	7
Primary School	124
Primary School &Secondary School	17
Primary School & Secondary School & Adult Education	3
Primary School & Secondary School & High School	3
Primary School & Adult Education	2
Secondary School	120
Secondary School & High School	7
High School	94
Preparatory Level	33
Preparatory Level & Bachelor	7
Bachelor	25
Bachelor & Adult Education	4
Adult Education	2

Procedure

To participate the questionnaire, participants were supposed to use video conferencing tools while teaching. After participants accepted to take part in the questionnaire, they were initially asked some demographic questions. Participants were then introduced to the 16 items digital exhaustion questionnaire in Turkish and asked to indicate their level of exhaustion on a five-point Likert-type scale from 1 = "absolutely disagree" to 5 = "absolutely agree". At the end of the questionnaire, there were two open-ended questions.

Instrument

The first stage in developing a questionnaire is to identify a topic of focus and create items that measure various features of that domain. This step was intended to develop a vast and diverse set of prospective items for the Digital Exhaustion Questionnaire that address various aspects of digital fatigue of educators. To do this, we used a combination of deductive and inductive methods, drawing on theoretical insights from a literature study and semi-structured interviews to investigate people's experiences with digital fatigue. To measure the level of general digital exhaustion in educators, an instrument was designed utilizing a five-point Likert questionnaire. Researchers created the digital exhaustion scale in Turkish and feedback was taken from six field experts. As a result of the feedback some of the items were excluded and some of the items were edited. The final instrument contained a total of 34 items. 16 items' purpose was to understand the demographic information of the participant educators. They participated in a questionnaire which included 16 demographic questions about age, experience, and screen time. 16 of the items were related to digital exhaustion. There were two open-ended questions.

Data Analysis

All responses of the participants were exported via Google Forms for the quantitative part. Quantitative data items were analyzed in the form of descriptive statistics with means, percentages, and standard deviation. The data obtained from Google Forms were transferred to SPSS and tables and trends will be given through demographics and digital exhaustion. The data obtained from were used to perform confirmatory factor analysis and to estimate Cronbach's alpha internal consistency coefficients, composite reliability (CR), average variance extracted (AVE), maximum shared variance (MSV), and average shared variance (ASV). For quantitative analysis, descriptive statistics and ANOVA were conducted. For qualitative data analysis, answers to open-ended questions were downloaded. The analysis was done as thematic content analysis by hand. According to Miles et al., (1994), content analysis is a research technique that identifies the presence of specific words, topics, or concepts in qualitative research. Researchers may benefit from content analysis to measure and evaluate the presence, interpretations, and relationships of specific words, themes, or concepts. After the participants' responses were examined in general terms, codes were created in chunks, and categories and themes were created based on these codes. Interpretation of the created theme and important codes has been made in the further sections. For the reliability of the created themes and codes, a cross-check was made by the researchers, and the results obtained were compared. The interpretation of all the information obtained from data analysis is available in the findings and discussion sections.

FINDINGS

This section shows the findings based on the research questions. Findings are presented as both quantitative (Questionnaire) and Qualitative (open-ended questions) data. While the first research question focuses on teachers' experiences of online education, the second research question targets the findings of teachers' screen fatigue in online education. On the other hand, the third question aimed to reveal teachers' experiences in online education.

Quantitative Findings

Content Validity based on the ratings of three subject-matter experts, the content validity ratio (CVR) for each of the 30 items was calculated. The CVRs for 16 items were equal to 1, indicating perfect agreement. On the other hand, the CVRs for 6 items were equal to -0.2, for 8 items equal to 0.2. Thus, these 14 items (6+8) with CVRs less than .99 were excluded from the scale. That left 16 items remaining, which included: 5 in the emotional exhaustion (EE) subscale; 7 in the physical exhaustion (PE) subscale; 4 in the social exhaustion (SE) subscale. Since all components of the digital exhaustion survey (DES) were represented in these remaining 16 items, content validity was not impaired by the removal. In addition, the content validity index (CVI) value was equal to 1 for each subscale and overall scale. Thus, it can be said that the content validity of the DES was statistically significant (Lawshe, 1975).

The construct validity of the DES was initially tested using EFA in the SPSS Statistics 20 program (Hair, Black, Babin, Anderson, & Tatham, 2014; Tabachnick & Fidell, 2013). Before the analysis, the data set was checked to meet the assumptions of EFA. To this end, first, both univariate and multivariate normality assumptions for the data set for 570 participants were tested. To test univariate normality, cases with z scores exceeding ± 3.29 (p <.001) were considered outliers (Tabachnick & Fidell, 2013). Also, skewness and kurtosis values for all items were calculated and found to be between ±1 (skewness = -.800 to .693; kurtosis = -.882 to .293). To test multivariate normality, Mahalanobis distances were calculated, and a total of 60 outliers were detected for p < .001 significance level (Tabachnick & Fidell, 2013). After deleting these outliers, the data set was reduced to n = 463. Next, the missing values, not exceeding 1.1% for any item, were replaced using the series mean technique. The correlation matrix for all items was examined and coefficients were found above. 30 for all variable pairs. Also, all correlation coefficients were lower than .90, indicating no multicollinearity problem between variables.

Table 3. Factor Analysis of Digital Exhaustion Questionnaire

		Factor Loads			% of Variance
		1. Factor	2. Factor	3. Factor	
VKS10	,863				
VKS11	,859				
VKS9	,704				
VKS12	,665				50,4
VKS8	,617				
VKS3	,612				
VKS1	,574				
VKS5		,876			
VKS6		,835			
VKS4		,795			10,3
VKS7		,783			
VKS2		,598			
VKS16			,820		7,8
VKS13			,737		

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	,904

Bartlett's Test of Sphericity: Sig: 0,00 df: 120 Chi-Square: 5567

Reliability Statistics: Cronbach's Alpha: ,920; N of Items: 14

Results of the Bartlett Sphericity test [$X2 = 0.00$; df=120, $p<0.01$]. The significance value was found lower than 0.05, which means factor analysis can be conducted. and KMO statistics (KMO = .904) indicated the sampling adequacy of the whole data set, while anti-image correlation coefficients for each item (r =.657 to.983) were adequate for sampling adequacy of individual items. In the 16-item factor analysis (items 14 and 15 were removed during the analysis), it was seen that the items formed 3 factors. The first of these factors account for 50.4% of the total variance; the second 10.3%; the third covers 7.8%. A detailed table will be given in the following sections. The construct validity of the digital exhaustion questionnaire was determined by using principal component analysis. A factor load must be at least 0.30. In addition, the difference between the factor loads given by a variable to more than one factor should be at least 0.1 (Stevens, 2002). According to Tabachnick and Fidell (2013), the factor load of an item on a factor should be at least 0.32. In this study, it was decided that the minimum factor load should be 0.30 and the factor number should consist of at least 2 items. Factor extraction methods were compared according to the number of factors removed, the size of factor loadings, and the percentages of variance explained. As a result of the EFA, item 14 and item 15 in the draft scale were removed because they had close loadings (<.10) in two factors. In table 3, the factor analysis results of the digital exhaustion questionnaire can be found.

Table 4. Results of Reliability Analysis

Factors	Cronbach's alpha
EE	.94
PE	.92
SE	.93

Note. EE = emotional exhaustion; PE = physical exhaustion; SE = social exhaustion

To test the reliability of scores obtained from the DES, Cronbach's alpha internal consistency and test-retest temporal reliability coefficients were estimated. The results are shown in Table 4. Estimated Cronbach's alpha coefficients for all factors were .92 and above, which indicates very good or perfect reliability (Kline, 2011, p. 70).

Table 5. ANOVA Results Examining General Digital Exhaustion and other predictors

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	65,799	10	6,580	7,214	,000b
	Residual	509,876	559	,912		
	Total	575,675	569			

Table 6 shows a one-way ANOVA comparing the means of teachers by lenght of one lesson, course breaks, number of lessons, and time spent. No significant difference was found. The impact of individual variables on general digital exhaustion can be viewed in table 5.

Table 6. The Impact of Individual Variables on General Digital Exhaustion

Model		B	Std. Error	Beta		
1	(Constant)	2,407	,212		11,368	,000
	Length of one lesson in face-to-face education	,086	,040	,099	2,129	,034
	Length of one lesson in distance education	-,007	,042	-,008	-,165	,869
	Length of course breaks in face-to-face education	-,055	,059	-,046	-,937	,349
	Length of course breaks in distance education	,066	,051	,058	1,297	,195
	The number of face-to-face lessons are taught in a day	-,019	,017	-,047	-1,097	,273
	The number of online synchronous lessons taught in a day	,072	,026	,152	2,727	,007
	Duration of job-related meetings excluding the course given	,031	,029	,051	1,045	,296
	Time spent on the lesson plan other than the lesson given	-,001	,033	-,002	-,040	,968
	Time spent on weekly in-class assessments other than the given course	,008	,027	,014	,287	,774
	The number of hours a day is on screen for work	,106	,024	,222	4,323	,000

a. Dependent Variable: general digital exhaustion

Whether the variables affect general digital exhaustion is determined by looking at the significance value (sig.<0.05). It is possible to say that variables with values less than 0.05 affect GDE: In face-to-face education, the length of one class hour has a statistically significant effect on general digital exhaustion (0,034<0,05).

Effect size is 0,099. The length of one class hour in an online synchronous lesson has no statistically significant effect on general digital exhaustion (0,896>0,05). In face-to-face education, the length of the lesson breaks has no statistically significant effect on general digital exhaustion (0,349>0,05).

In distance education, the length of the lessons has no statistically significant effect on general digital exhaustion (0,195>0,05). According to findings, the number of face-to-face lessons are taught in a day has no statistically significant influence on general digital exhaustion (0,273>0,05). On the other hand, the number of video conferencing lessons a day has a statistically significant influence on general digital exhaustion (0,007<0,05). Effect size is 0,152.

Educators who have more synchronous online lessons to cover tend to feel more exhausted than those with fewer lessons. Furthermore, instructors who are tired after a video conference lesson are more likely to have a negative opinion regarding it. The duration of job-related meetings, except for the online synchronous lessons, has statistically no significant influence on general digital exhaustion (0,296>0,05). The time spent on the lesson plan other than the online synchronous lessons given has a statistically significant influence on general digital exhaustion (0,968>0,05).

The time spent on weekly in-class assessments other than the lecture given has statistically no significant influence on general digital exhaustion (0,774>0,05). The number of hours spent in front of the screen per day for work has a statistically significant influence on general digital exhaustion (0,000<0,05). Effect size is 0,222.

Table 7. Correlation between General Digital Exhaustion and Teaching Experience

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,806	,133		28,678	,000
	Teaching experience	-,054	,034	-,067	-1,590	,112

Table 7 shows a one-way ANOVA comparing the means of years of teaching experience for respondents who completed the survey. One-way analysis of variance (ANOVA) was conducted to examine whether general digital exhaustion differs significantly. A significant difference was not found between general digital exhaustion and teaching experience. The impact of teaching experience on general digital exhaustion can be viewed in table 6.

Qualitative Findings

To collect qualitative data for the study, the educators were asked to answer the open-ended questions via Google Forms. The results were analyzed using the content analysis method creating themes, categories, codes and four key themes emerged. The themes are provided below:

- Teachers' feelings after teaching online through video conferencing
- Teachers' coping strategies during the Covid-19 Pandemic /Teachers' self-motivation strategies
- Teachers' strategies to promote student motivation
- Teachers' opinions about the effects of distance education on their professional development

Theme 1. Teachers' Feelings after Teaching Online through Video Conferencing

Most of the participants stated that they felt the negative effects of teaching online via video conferencing on their physical and mental health. It can be concluded that most of the teachers in this research try to cope with *"screen fatigue"* while teaching online through video conferencing. They are not pleased with long teaching hours and work conditions. The majority of the teachers who participated in the study stated that they did not feel well enough after online classes and that they were trying to cope with serious health problems. Teachers also said that they felt mentally exhausted and cannot spend time with their families. Whereas some teachers highlighted that they felt energetic and happy after video conferencing, the rest of the participants expressed that they have mostly negative experiences and they feel highly exhausted after online classes. Especially, *"burnout"* (52) and *"fatigue"* (80) are the most frequently mentioned feelings according to the qualitative results. Furthermore, the participants pointed out the physical side effects that they felt after online classes such as headache, backache, low back pain, and eye pain. For example, one of the teachers said *"I feel like all my energy has been depleted. I have a terrible headache after video conferencing."* The teachers who participated in this research also pointed out their exhaustion. One of them said: *"I feel exhausted, I do not feel good enough to talk to anyone after online classes."* Another teacher complained about her concentration problems and she said: *"I can't concentrate on any other work. If I have a meeting longer than 1 hour in the evening, I have difficulty falling asleep at night. Even though I can sleep, I wake up tired in the morning. My neck and shoulder pain are increasing."* On the other hand, some teachers addressed how they are pleased with giving online classes during the pandemic: *"We are able to educate students in this challenging process. I am happy to be able to reach my students via online classes."*
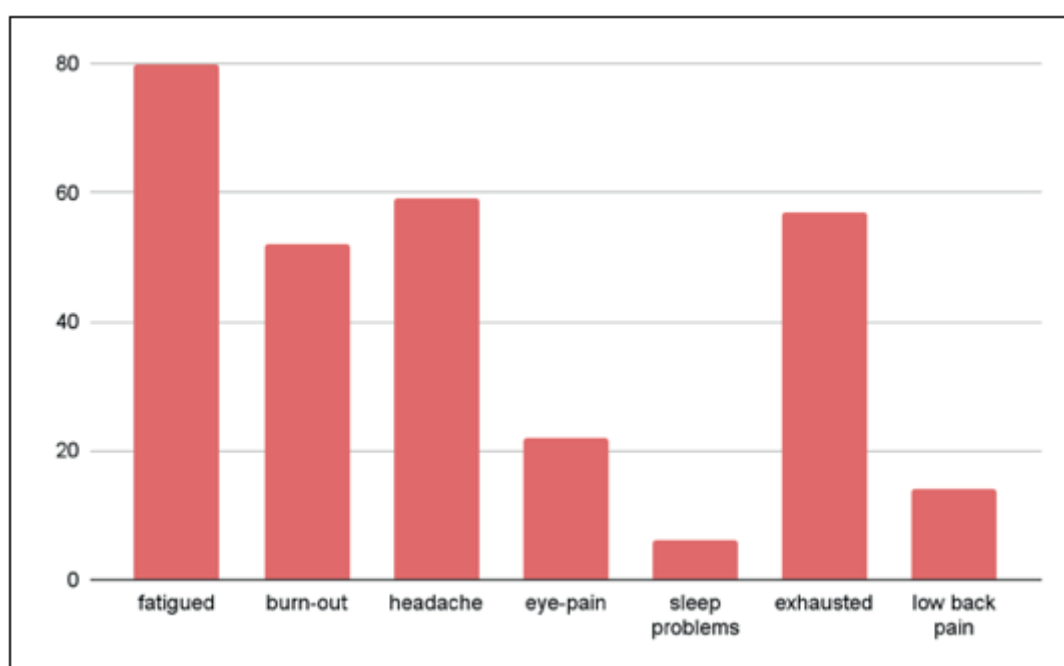
Figure 1. Teachers' Feelings after Teaching Online through Video Conferencing

Theme 2. How do Teachers cope with Teaching Online during the Pandemic? *Self-Motivation Strategies

When the teachers were asked how they struggle with teaching online for long hours, most teachers stated that they had difficulties in this regard, whereas some of them stated that they use various strategies, which makes this process more manageable for them. Although most teachers participating in this study explained their various coping strategies, 39 teachers stated that they cannot handle long online teaching hours during covid-19 pandemic. The results of the study also indicate that the teachers prefer mostly physical relaxing methods such as walking or resting after giving online classes through video conferencing. The results of the study also show that the teachers who participated in this research prefer being isolated as they spend too

much working on computers (35). Teachers also stated that they do not want to use technological tools such as tablets, computers, or mobile phones for a long time because they feel mentally very tired after online synchronous online classes.

Some of the participants described how teachers face additional challenges when they attempt to collaborate on Zoom for class projects. *"Zoom has time limit if you don't have premium,"* she explained. *"You cannot have a lesson more than 40 minutes. Sometimes I give 8 classes to one class. We had to do eight separate Zoom calls, 40 minutes a piece for it."* Teachers' struggles with technology and its needs for proper operation are a major source of worry. Access to adequate technology or challenges with inconsistent internet can make it difficult to engage in video conferences, according to the teachers who responded. According to the instructor responders, these technical concerns must be solved.

Furthermore, most teachers prefer spending their time with their family members or kids when online classes are over. One of the teachers complained about her workload and said: *"I try to spend time with my family. There is a never-ending workload and if I cannot decide when to take a break, I feel like I will lose my mental and physical health due to this workload. So, I am trying to create time to stay away from the computer screen for a while, especially in the evenings."* In addition, research results also show that most teachers consume too many caffeine-containing beverages, such as tea (12) and coffee (67), during and after online classes whereas some teachers eat chocolate to motivate themselves during their break time. One of the teachers pointed out her workload and said: *"I feel tired because I work a lot. I want to sleep for a couple of hours to refresh my brain. However, I often do not have time to sleep after class. I have to check homework, prepare lessons, and reply to student emails."* The participants also explained the self-motivation strategies that they use on these difficult days. The results of the study show that teachers feel better when they think of their students although they have long working hours online during the covid-19 pandemic. 85 teachers stated that the biggest motivation source is their students. One of them said*: "A nice lesson I spent with my students is my biggest motivation."* Another teacher commented on how she feels when she thinks of her students and said: *"I think of my students, very young learners… I try to be as positive as possible. I know that a negative statement I make or any word I say can affect their whole lives. This motivates me. I forget everything in front of them."*

The teachers also addressed that lesson planning activities makes them feel more motivated. Most teachers prepare online games, discussions, or interactive activities to engage their students. One of them said:

> *"I am getting prepared before my lesson. I try to get feedback from students during the lesson. After the lesson, I check whether I use my materials effectively or not. Another teacher gave details about her routine before the online lesson and said: I have snacks. Sometimes I drink coffee, change my outfit, and put on perfume. Then, I start my online class. I ask how my students are feeling and try to motivate them with hopeful words."*

The majority of educators participate in the survey claimed that students who participate in videoconference classes with their cameras turned off, and the student respondents provided numerous reasons for their camera shyness. When students switch on the camera, they often feel more anxious because they are aware that others are seeing them, and they often admit to using the self-feedback screen to self-monitor themselves. Some educators additionally emphasize that students can multitask during class sessions by working on other projects, driving, or sleeping. Students may not be comfortable discussing their private lives with their friends on Screen, especially if it is recorded, because the camera exposes their private environment, whether at home or in a dorm. For students in videoconference classrooms, the camera, which is an intrusive component of videoconferencing, becomes a subject of controversy.

Theme 3. Teachers' Strategies to Promote Student Motivation

When the teachers were asked what they do before, during, and after online classes, they explained the ways to increase their students' motivation. The results of the research revealed that most teachers use similar strategies to increase students' participation and motivation in online classes. For example, the most frequently mentioned strategy by the teachers is *"using online games."* 120 teachers highlighted that online games are powerful tools to engage students in online classes. One of the teachers said: *"I usually start the lesson with some interesting activities. At the end of the day, we play various games related to the topic of the day."*

Another teacher added: *"I design online games for them! I try to give them enjoyable assignments on the subjects they have learned. It is important for me to spend a good time with my students during class hours. In addition, I try to be positive, friendly, and accessible in this regard."*

In addition to the online games that the teachers used, the research revealed that starting a random conversation is one of the motivation-enhancing strategies which was frequently mentioned by the teachers. 77 teachers stated that off-topic conversations with students during online classes are effective in promoting students' motivation. Some teachers also said that they ask some random questions which are not related to the lesson topic when students' attention is distracted. They think that those random questions are highly effective in attracting students' attention, especially in online classes. One of the teachers said: *"Before I start the lesson, I talk to my students. At the end of each lesson, I try to create free time to talk to my students before saying goodbye."* One of the teachers gave an example from her online class*: "I try to talk about extracurricular topics. We talk about movies, books, etc... I try to establish a dialogue without drawing a pessimistic picture of how they feel. I am trying to make them feel good."* One of the teachers shared her observations that her students feel much better while talking and playing games: *"I talk to them and expect them to share their feelings in the individual interviews. Also, I have observed that we can play games easily via synchronous teaching, which makes them very happy."*

Another strategy which the teachers frequently used is *"music."* 86 teachers stated that they use music to motivate students in online classes. Most of them highlighted that music is a great tool to start online classes. Especially the teachers who teach English to young learners stated that they highly benefit from the video clips and songs in the online classes.

Some teachers also stated that they use music and dance together to increase their students' energy:

"I start my lesson with a song from YouTube. My students and I stand up, dance, and clap!"

Another teacher pointed out that videos or songs related to the lesson topics work well to internalize what they learn in online classes:

"Sometimes I try to find music videos for students and link them to the topic."

This research also revealed that the teachers' design creative content to make the online classes more enjoyable for their students. The teachers commonly use web 0.2 tools such as Kahoot, Wallword, and Jeopardy to promote motivation in their classes (24). One of the teachers said*: "I plan great online activities for them, I add color to the lesson using web 0.2 tools. I always get prepared for my students and online classes."* Furthermore, the teachers also use *"WhatsApp"* to communicate with their students. Some teachers believe that students enjoy when teachers share content, class material via Whatsapp: *"I share my movie and article suggestions with them and send some interesting random questions through WhatsApp. If they give the correct answers for the questions, I give extra points, which motivates them."* Also, some teachers stated that they use the Whatsapp voice message feature to make announcements, give feedback for student performance or motivate their students:

> *"I remind those who do not send their homework from the WhatsApp group of the class so that they send their homework immediately. I know that they feel unhappy those days because of the pandemic. I am trying to motivate them by saying that I am hopeful for them. I answer their questions as soon as possible during the day and night, and when they hand in their assignments individually, I thank them by saying "well done, you are a diligent, smart girl."*

Theme 4. Teachers' Opinions about the Effects of Distance Education on their Professional Development

The teachers participating in the study were asked whether their experiences during distance education contributed to their professional development or not. While most of the teachers stated that this period contributed to their professional development, some teachers stated that it placed a great burden on teachers rather than contributing, and as a result, it was a very intense and difficult period for them. 449 (%84.4) teachers underlined that they found this period very helpful for their professional development. One of the teachers said:

> *"Certainly. Although I think that it is quite demanding, I also believe that the experience I have gained since March is very valuable. I learned how to become more flexible and open to new*

developments. I have improved myself professionally and technologically. Now, I am more confident and I feel that I can help my students everywhere in any way!"

Another teacher commented on the positive effects of distance education on her career and also her personality: *"Definitely yes! I feel more creative and organized. I have learned new techniques and programs. I can criticize myself more."* One of the teachers also pointed out the power of online training she attended this year and also underlined how collaborative learning created an impact on her mood: *"Yes. I learned a lot of new things. I attended many online training sessions. I learned new programs and applications and even had many teacher friends from social media from cities far away. Learning and developing together with them was good for my soul."*

On the other hand, some teachers think that the distance education process has no benefits for their professional development. Moreover, the teachers believe that this period is more harmful than beneficial and that it affects teachers' mental and physical health negatively. For this reason, 68 (%12.8) teachers answered *"absolutely no"* to this question. Some teachers who participated in the study also compared traditional (face-to-face) education with distance education and they think that distance education is much less efficient for students and teachers. For example, one of the teachers said: *"No. The knowledge gained through face-to-face experience and education can never be obtained remotely."* Some teachers referred to their digital skills: *"I already had digital skills before the pandemic. This period didn't help me much."* Another teacher gave a similar answer and said: "No. I had already experienced it, my experience guided me in this period. Learning about Zoom did not make me more patient or thoughtful.
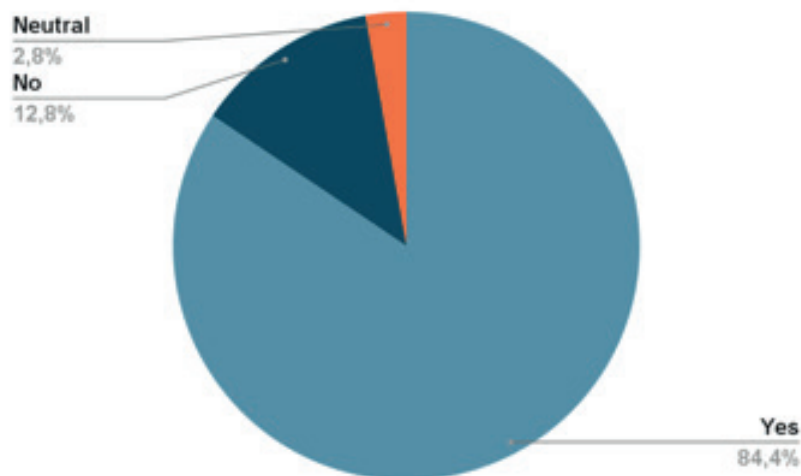
Figure 2. Teachers' Opinions about the Effects of Distance Education on their Professional Development.

DISCUSSION

This study aimed to investigate the relations between teachers' digital exhaustion and working conditions. It also examined the interactions between the above factors in their relation to teachers' digital exhaustion. Researchers often consider workload, time allocation, and self-esteem to be part of a teacher's managerial competence or to be related to the quality or efficacy of teaching (Zydziunaite et al., 2020). In our study, we could not find any correlation between experience and digital exhaustion. It is possible to state that both experienced and inexperienced educators are vulnerable when the topic is screen time.

Due to a lack of feedback on leadership from fellow instructors and school management, teachers feel stressed when working on school initiatives (Gordon & Solis, 2018). Educators claim that they were alone in this process so coaching programs need to be started and they should spread the process throughout the year. Because of the effects of the Covid-19 epidemic that the globe is currently facing, a large number of instructors are facing difficulties as they are unprepared for this unprecedented scenario. Around the world, there has been a trend away from face-to-face education and toward remote learning and this transition

has also had an impact on the field of teacher professional development. As a result, online professional development programs have lately gained popularity (Karchmer-Klein & Pytash, 2020). In Turkiye, there are several main issues with teacher education and the solutions given to address those issues are not effective enough (Bellibas & Gumus, 2016). Although teacher professional development programs on the subject, pedagogy, and teaching practice were offered to %76 of Turkish teachers, several professional fields such as ICT and teaching in multicultural contexts are still absent from those training programs (OECD TALIS Report, 2018). In this sense, based on the answers given by the teachers, it can be deduced that online teacher professional development programs can be helpful for the teachers who need training and support, especially during the pandemic.

It is critical to consider the teacher's workload as a whole, as it consists of formal not only *"visible"* but also *"invisible"* components (Lieberman & Miller, 2005). The invisible component of teaching usually entails more work completed as a matter of duty and dedication, boosting the teacher's self-esteem by proving their expertise. As a result, the teacher's workload and the time he or she devotes to various targeted or purposeful tasks are important aspects of their position, but they are not self-evident and difficult to achieve. The teacher's capacity to implement the workload in a meaningful and purposeful manner, as well as allocate time to key activities that are both professionally required and complementary, demonstrates his or her leadership (Ballet & Kelchtermans, 2009).

Furthermore, the findings support prior research that indicated communication through videoconferencing violates several conversational norms, including turn-taking and nonverbal cues (Ferran & Watts, 2008; Storck & Sproull, 1995). Participant educators explained that the video conferencing environment prevented them from giving direct feedback during lessons because students did not want to disrupt the lecturers or talking over their classmates. Instead, students kept their microphones muted and took a passive role in the discussion.

The current study's findings reveal that teacher workload is strongly linked to stress. This link is critical because it may imply that the most draining and buffering component of teaching is the workload, as well as the quality of relationships formed at school with kids and their parents, fellow teachers, and school management. Excessive paperwork and high-stakes accountability expectations are two non-teaching-related workloads that pose significant challenges to teacher leadership and can contribute to stress (Van Droogenbroeck et al., 2014). Our findings reveal that a teacher's workload has a direct impact on their stress levels; a higher workload predicts higher teacher stress. Any amount of teacher workload that is overlooked has a negative influence on both teacher and student performance, which are both indicators of teacher leadership (Liman-Kaban, 2021; Wakoli, 2015).

A research study from Huang (2019) comparing the teachers' role in face-to-face and online environments by examining the learners' perceptions of the teachers' roles has found that according to the learners, the primary role of teachers in face-to-face context was cognitive whereas the primary role of teachers in online context was manager and affective. The learners also reported that they valued learning in the classroom setting more than the online because they believed that the teacher was better at giving immediate feedback in the classroom. Moreover, it is worth mentioning that the researcher in this study tracked the interaction and communication between learners and learners and teachers by logging on to their online programs and found little communication. The researchers concluded that if the teachers devote much of their time only to one mode of online learning program, it will probably cause a sense of dissatisfaction among learners and rigorously weaken the effectiveness of learning outcomes.

CONCLUSION

The following are the recommendations based on the study's findings: Teachers' workloads should be lowered because an increase in workload may lead to burnout. Given that nearly all the instructors experience digital exhaustion, it is critical to investigate why teachers experience digital exhaustion and then devise preventive ways to alleviate the problem. When the characteristics of the working environment were examined simultaneously, they were found to be strongly connected to teachers' digital exhaustion: student self-regulated skills, teacher cooperation, and teacher workload. This is consistent with the earlier study, which indicates that social working circumstances are more essential to instructors than physical ones

(Johnson et al., 2012). This should not be read as a denial of the importance of well-maintained school facilities, adequate workspace, teaching and learning resources, but rather as a recognition that these aspects pale in comparison to relationships with students and colleagues. International research could point to ways to avoid digital weariness. Investigating why instructors at the Covid19 Pandemic report more digital exhaustion than before is also critical to identifying solutions.

Some changes that may help prevent digital exhaustion and are suggested below:

- Choosing the right eyewear might relieve your eyes. If you have eye disorders, you might consider investing in glasses or contact lenses designed specifically for computer work.
- The brightness of your display should not be left at the default setting but it needs to be adjusted according to the brightness of the room where it's installed. This can greatly reduce the strain on your eyes.
- Reducing the amount of blue light on your screen can be another solution. It's become increasingly common to hear blue light mentioned as a cause of eye fatigue. This is light that is visible to humans (visible light) and has a wavelength that is similar to UV rays. It is commonly stated that it strains the eyes due to its high degree of energy.
- Checking computer work environment. If the lights are near the center of the room and your PC is set up with you facing the wall, you may notice something that looks like sunlight shining on your screen from behind you. If that's the case, think about switching around the arrangement.
- To improve the quality of the air in the room, a humidifier can be used to change the temperature to lessen blowing air, and avoiding smoke are some modifications that may help prevent dry eyes. Moving your chair to a new location can assist to lessen the quantity of dry air that gets in your eyes and face.
- Perceived gaze, self-presentation concerns, and immobility can be the reason for eye fatigue. For future studies, the reasons for eye fatigue can be examined. Future research might look into how different contexts (e.g., work vs. socializing, video conferencing size) and individual variables (e.g., gender, personalities) affect how people experience digital weariness. Give your eyes a break by gazing away from your monitor throughout the day. Try the 20-20-20 rule: stare at anything 20 feet away for at least 20 seconds every 20 minutes.
- An ophthalmologist should be consulted as soon as possible. If you've tried everything above and your eye fatigue hasn't improved or there are indicators that it's becoming worse, you should see an ophthalmologist. Not only will you receive expert guidance on your symptoms, but it could also lead to the early diagnosis of previously undiagnosed eye illnesses such as glaucoma.

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THE EFFECT OF CORRECTIVE FEEDBACK VIA A COMPUTERIZED COURSE ON OMANI EFL LEARNERS` WRITING PERFORMANCE

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ABSTRACT

The present research investigates the efficiency of corrective feedback on learners` writing performance through electronic platforms. 94 Omani English as a Foreign Language (EFL) learners were selected based on their assessment results. They were randomly assigned into one experimental group and one control group, including 47 students. Both groups were pretested by a writing test to collect the required data. The experimental group then received the treatment using corrective feedback, whereas the control group received only corrective input on the forms and structures of the final draft. A survey was distributed among the experimental group's participants to elicit the students' attitudes toward corrective feedback. The Mann-Whitney U test for comparing the control and experimental groups showed a significant difference between the mean scores of the two groups. Corrective feedback had a statistically significant effect on EFL learners' writing performance. Besides, the survey findings showed that participants emphasized the importance of receiving corrective feedback from their teachers. The current study results can have implications for teachers to implement more feedback sessions on students' writing tasks and other skills equally.

Keywords: Corrective feedback, computerized course, writing, EFL performance.

INTRODUCTION

Writing skill as a process motivates the learners to think, manage, and then generate ideas in the shape of a writing composition for the interactional purposes between the reader and the writer. Thus, a text writer should be able to produce the language correctly, organize the created writing well, and deduct the errors to avoid misunderstanding by the reader (Bitchener & Ferris, 2012; Khadawardi, 2020). Some researchers (e.g., Banaruee, 2016; Richards & Renandya, 2002) have clearly stated that writing skills can be considered one of the most challenging language learning and teaching areas. They also noted that the skills dealing with writing tasks are highly complicated if the learner's level of proficiency is not high. Therefore, the most crucial challenge is whether the errors or mistakes in the writing should be ignored or corrected. Banaruee and Askari (2016) stated that there is no guarantee of the effectiveness of existing feedback strategies on the learners' skills. They believe that the available literature and findings are not conclusive. The precise point is that the written correction feedback has recently received attention from many scholars (Bitchener & Storch, 2016; Papi et al., 2020). Mendez and Cruz (2012) stated that errors are considered something that must be

avoided or prevented. Based on Han's (2008) words, although correcting errors needs some types of direct and evident feedback, corrective feedback is a broad term that provides some general clues and corrections.

Leki (2001) asserted that implementing corrective feedback on the learners writing by teachers and students to fix the issues is a painstaking task in a foreign language (FL) context. One of the reasons for such a problem is selecting appropriate strategies for error feedback on writing skills. Most researchers have tried to provide and familiarize teachers with suitable existing strategies for giving feedback on learners' writing. The teachers are encouraged to practice the best technique of giving feedback, which helps learners practically implement, revise and edit their manuscripts. The learning environment can be considered an important factor in selecting the best corrective feedback strategies.

Whether the role of corrective feedback is discussed theoretically or empirically, the major issue is to understand the processes and procedures in a real FL learning class and how these theories are implemented authentically on the tasks (Mendez & Cruz, 2012). They also stated that the corrective feedback problems are categorized as follows: Firstly, the strategies used for the corrective feedback are inconsistent, ambiguous, or ineffective from the teacher's side (Allwright, 1975; Chaudron, 1977; Long, 1977). Secondly, teachers may provide non-systematic random feedback on the tasks (Lyster & Mori, 2006). Thirdly, error acceptance may hinder the communication process. Finally, various types of errors made by learners should be marked in corrective feedback (Lyster & Ranta, 1997).

Nassaji (2009) believed that corrective feedback is one of the second language acquisition (SLA) facilitators. Thus, corrective feedback has received the attention of various scholars in the past decades. One of the significant theories claims that second language (L2) learning happens by providing comprehensible input (Panova & Lyster, 2002). According to Ellis (1994), some factors help learners produce native-like utterances in learning. They are as follows: firstly, the noticeableness of the type of feedback (Alavi, Voon Foo, Amini, 2015). Secondly, the noticeable terms of the previous statement must be adequate to assist learners in understanding the interlanguage structures of target language features (Schmidt & Frota, 1986).

LITERATURE REVIEW

An overview of the correction strategies for learners' writing during an EFL course reveals an evident change during the last thirty years. During the 1970s, behaviorism theory was the dominant educational context (Brown, 2007). The theory focused on immediate feedback and considered the teachers as those who can prevent the occurrences of errors. Lately, the attention to such types of error correction and the related ideology of such a matter has been reduced (Ferris, 2003). Lee (1997, 2004) believe that teachers are decision-makers to correct errors or not, identify the types of errors, and locate the errors directly or indirectly. However, some other scholars (Banaruee & Askari, 2016; Rueg, 2010, 2017, 2018) argue that the implementation of direct or indirect feedback from peers or teachers could effectively improve language components' performance. The controversial issue of written feedback has been at the center of arguments for the recent 30 years in second language acquisition (SLA) (Reinders & Mohebbi, 2018). Rouhi et al. (2020) stated that there is no apparent reason to show an efficient feedback strategy to improve the writing performance of language learners.

Corrective Feedback (CF)

Chaudron (1977) believed that corrective feedback is "any reaction of the teacher which transforms, disapprovingly refers to, or demands improvement of the learner utterance" (p. 31). He also stated that CF occurs in both comprehension and incomprehension situations. Teachers are beneficial in helping the learners understand the meaning and the form of the language through CF. Every teacher can have their way of CF, depending on academic qualifications, professional experience, etc. This also causes a diversity of CF approaches, either being totally against errors or seeing errors as part of the learning process, which is a matter of controversy. Previous studies differ in their conclusion about CF, i.e., some see it as an inefficient process (Chun et al., 1982; Chaudron, 1977), while others see it as a very effective one in language learning (Asassfeh, 2013; Carroll & Swain, 1993; Ferris, 1997; Ellis et al., 2001a, 2001b; Sampson, 2012). These studies find CF as a way to enhance language learning and enrich their interlanguage system.

Theoretically, many studies proved the effectiveness of CF in SLA. Schmidt (1990, 2001) proposed the Noticing Hypothesis, in which the learners of an L2 should pay full attention to be successful in the learning process. This hypothesis favors the role of CF in helping learners become conscious of forms and guiding them to pinpoint the differences between L1 and L2. Moreover, Long (1996) updated the Interaction Hypothesis and stated that CF plays a role in direct and indirect grammar teaching. This interaction and ordinary meaning negotiation patterns from the teacher to the learner and vice versa improve the learners` attention to the language input and the production of language output. In addition, Swain (1985, 1995) proposed the Output Hypothesis, in which students can learn through CF to produce accurate outcomes. CF can highlight related input and turn learners' attention towards it.

Rashtchi and Abu Bakar (2019) did a study on some ESL students. They found out that students are interested in direct, explicit feedback and expect the teacher to correct as many errors as possible.

The modification of the learner's output plays a significant role in SLA. As Swain (1995) highlighted, a modified outcome, which represents the model language for the learner's interlanguage, is achieved through convenient peer feedback. Lightbown and Spada (1999) discussed that CF is "any indication to the learners that their use of the target language is incorrect" (p. 171), which is a type of modified input. External feedback or peer feedback, implied or overt feedback, can help learners be aware of the problems they face in their language. In the absence of external feedback, learners lose this precious opportunity to test their language progress (Swain, 1995).

Swain (1997) suggested that no feedback means that learners may keep incorrect information and have unsolved problems in the language. This does not mean learning will not occur but will be inaccurate. Various research studies by some scholars (Boggs, 2019; Hadiyanto, 2019) revealed that exposing students to corrective feedback improves writing skills.

Carroll et al. (1992) tried to distinguish the results of explicit CF on learning morphological generalizations in an experimental context. Their study confirmed the effectiveness of the feedback in immensely improving learners' performance in acquiring the language. Carroll and Swain (1993) measured the effects of the various kinds of feedback on language acquisition of English learners, and all types of feedback were proven to lead to language learning. Overt or direct feedback had the most impact among all the other types of feedback.

Feedback can positively affect both content and form, as stated by Ferris (1997). She noticed that giving feedback on grammar helped learners write more competently. Moreover, in a study carried out by Ferris (2002), it was revealed that corrective feedback improved learners' accuracy in the short run. Participants were also found to have a better attitude toward the benefit of input to the extent they sought to review their writing independently. Adding to this, Ferris and Roberts (2001) suggested that beginner language learners profit from being corrected by their teacher, being guided toward their errors, and being prevented from feeling frustrated. They also indicated that indirect feedback incites the learners' sense of reflection, makes them more attentive to the errors they commit, and leads to language retention in the long run. Chandler (2003) explains why direct feedback is more efficient in language learning, saying that it is not confusing to learners but is more informational and instant. Direct corrective feedback is thus widely seen as the most proper type of feedback given to language learners.

Electronic Feedback (E-Feedback)

At the beginning of the Covid19 pandemic, most institutions shifted their teaching and learning to online platforms. The corrective feedback had happened, but in the electronic format, so it can be practical to talk about electronic feedback concisely.

One of the ordinary and familiar types of electronic feedback (e-feedback) is asynchronous feedback. It refers to the implementation of online and offline tools, including review features. MS Word, emails, Google Docs, and blogs are familiar among all the available platforms. It has been observed that e-feedback positively influenced the learners' perceptions and led to performance improvement (Chang et al., 2018). Some scholars (Guardado & Shi, 2007; Razi, 2016) reported that the anonymity feature of some platforms during peer feedback was positively analyzed by the students, resulting in honest, critical, and direct feedback. Studies regarding peer feedback through online platforms showed improvements in accuracy in grammar

(Van Beuningen et al., 2012), students became familiar with various written styles (Ho & Savignon, 2007), and it was predicted that global revisions would be provided (Yang, 2011; Guardado & Shi, 2007), critical thinking potentials would be promoted (Wu et al., 2015).

Writing teachers have been using e-feedback asynchronously and synchronously for quite a long time (Shintani, 2016; Ene & Upton, 2018). In the synchronous mode, there is immediate feedback when both parties are online (Kim, 2010). Concurrently, as the students produce their texts online, the teacher monitors them and prepares immediate feedback for the students (Chong, 2019). However, in the case of asynchronous feedback, students receive the teacher's comments after submitting their writing assignments. Shang (2017) stated that asynchronous feedback is more effective than the other one (synchronous) in facilitating the writing process of complex sentences by an EFL learner. In addition, Ene and Upton (2018) confirmed the same statement and believed that asynchronous is more beneficial because of the positive reinforcement it reveals.

Cho (2017) approved that voice chat allowed students to read and engage during the editing and revision sessions. Odo and Yi (2014) conducted a case study on using Skype to give feedback. They reported that despite the connection problems, students could negotiate and clarify their feedback with the tutor through video-conferencing, text messaging, and screen sharing. This type of collaboration engages the students more in their work, giving them a sense of agency toward it.

Some researchers (Gass, 2003; Long, 1996) have focused on feedback in recent years. They have stated that the corrective feedback strategies can facilitate the development of L2.

Omani students have been engaged in online learning and teaching since the beginning of COVID-19. They have been participating in online teaching and assessment. One of those modules was writing. Since the mode of the assessment and giving feedback transferred to online platforms, it is worth investigating the effect of providing corrective feedback to measure its effectiveness in Omani EFL learning and teaching contexts.

To find out the role of corrective feedback in an EFL context, this study aims to answer the following research questions:

RQ1: Does using the corrective feedback have any statistically significant effect on Omani EFL learners' writing performance?

RQ2: What are the perceptions of Omani EFL learners toward the implementation of corrective feedback?

Based on the first research question, the null hypothesis was formulated:

H0: Corrective feedback does not significantly affect Omani EFL learners' writing performance.

METHODOLOGY

This study investigated if corrective feedback significantly affects Omani EFL learners` writing skills. This section explains the comprehensive procedure, including sampling, instrumentation, data collection, and analysis, to find the solution to the research questions.

Participants

A number of 94 Omani EFL students studying at the Foundation Department in an Omani institution was the target population of the current study. Depending on the institution's policy, Omani students have to spend approximately one year and a half improving basic knowledge of English, IT, Math, Sciences, etc., to move to higher education and start their specialty. This is called Foundation Studies in Oman, and those students studying there are called Foundation Students. They spoke Arabic as their first language, and their ages ranged from 18 to 19 years old. These students were placed at a pre-intermediate level of proficiency based on two methods. The first method was through the college's placement test, so their results revealed that they belonged to the pre-intermediate level. The other way was placing the students who finished the elementary level successfully and progressed to the pre-intermediate level based on the required assessments. They were randomly divided into experimental and control groups, each including 47 participants.

Design of the Study

This study enjoys two types of research design. To answer the first research question, experimental research was designed in which the population of the study was randomly assigned into two groups: control and experimental. Then one pre-post-test research design was carried out. To answer the second research question, a qualitative study was implemented to analyze the items of the perception questionnaire. It is worth mentioning that the experimental group received feedback weekly-wise on their writing.

Instruments

Microsoft Teams

To provide feedback for the learners, language teachers use various tools such as Google Docs, Microsoft Word, and other online platforms to give video feedback (Chang et al., 2018). Since the beginning of April 2020, and due to the breakout of COVID-19, Microsoft Teams, as the primary electronic platform, has been used to conduct learning and teaching. Microsoft Teams has plenty of practical options, allowing teachers and students to give and receive instruction, video, feedback, etc. One of these options is SharePoint. Students of the experimental group needed to upload their writing papers on SharePoint, and the teacher gave them feedback individually and in the group.

Writing Test as the Pre/Posttests

Before implementing the treatment, a writing pretest was administered to the experimental and control groups to assess the students' initial knowledge of writing skills. The students were instructed to write a 250-word essay on the topic provided by the teacher-researcher. To assess the effectiveness of the treatment, a 250-word essay was administered as the posttest by the same teacher-researcher. To ensure the validity of these questions to be written by the students, two EFL teachers were selected, one internally and the other as an external reviewer outside of the current academic institution. They were both locals and ELT professionals, so they dominated the cultural concerns that might hinder the students from writing on the selected topics.

Perception Questionnaire

A questionnaire designed by Leki (1991, cited in Ishii, 2011) was used to determine the participants' perceptions of corrective feedback (see Appendix 1). The original questionnaire had three sections: language ability, students' awareness of feedback importance, and finally, students' preferences about the teachers' feedback. However, in this study, the section that included 9 questions through a five-point Likert scale (Not important at all, not important, neither, important, very important) was adopted from Ishii (2011). It should be mentioned that before administering the questionnaire in the main study, a pilot study was carried out to find any possible problematic items and estimate the time required to complete the questionnaire. Students were given unlimited time, but most completed the questionnaire in less than 15 minutes.

Google Form

Due to the COVID-19 pandemic and to take precautionary measures, all the classes were online, so the questionnaire was designed on a Google Form in Google Drive, and the link was sent to the students through Microsoft Teams.

Correction Rubrics

Rubrics are a type of educational tool to assess the weaknesses and strengths of the students, and they ensure the objectivity of the marks. Writing rubrics were used in this research to mark the students' writing. Task Achievement, Organization, Grammar, Punctuation/Spelling/Mechanics, and Vocabulary were five measurements in which students` papers were marked accordingly. This marking measurement has been internally designed, piloted, validated, and implemented officially by the authorities of the aforementioned college where the study was run.

Procedure

The current research was done during the writing module of the fall semester in 2020-2021 for 12 weeks, which equals an entire semester at the college. The primary interaction of the class was from the teacher to the learners.

Prior to the study, a writing test was administered as the pretest for the experimental and control groups to ensure the proficiency homogeneity of participants in writing skills. The participants in both groups were asked to write a 250-word essay consisting of introductory, body, and concluding paragraphs based on a given topic.

The teacher was responsible for describing the types of writing, the planning stage, and the way to design and write paragraphs, topic sentences, and supporting ideas. In the experimental group, these explanations were supported by some on-the-spot examples for the students, and later on, the students were given time to ask their questions for further clarification.

The writing at the pre-intermediate level of the college should include five body paragraphs. Therefore, after the instructions, students of the experimental group had one week to design the related paragraph of that session and upload it on SharePoint. Meanwhile, students could ask questions, check their problems, and request further academic support from the teacher by communicating through accessible electronic platforms. On the other hand, the control group participants were told to submit their writing as a whole draft initially, and they received general feedback on form and structure later.

During the weekend, the students in the experimental group received feedback on every piece of writing individually. In this case, the teacher could enter the students' shared folder, open the Word Document file of the student, and write his feedback either inside the text or on the right side. Feedback was given based on the rubrics, which were in use to mark the students' papers. On the other hand, in the control group, students did not receive individual and specific feedback but general comments on the form and structure at the end of the draft.

As was mentioned earlier, two types of feedback were implemented for this module. The first type was individual feedback, where the teacher gave general feedback to the students individually, which motivated the participants to look for a solution to their problems. The second type of feedback was within-the-group feedback. In this case, the teacher ran an online session through Microsoft Teams. The teacher collected all tasks, for example, introductory paragraphs of the uploaded writing in one file, and shared it with the students in an online session. In this stage, the teacher gave the participants detailed and explicit feedback. The teacher tried to read the paragraphs one by one and analyze the sentences comprehensively based on meaning, lexicons, and grammar. The papers were presented anonymously. In this case, some extra time was given to the participants to share their ideas and correct existing mistakes or errors cooperatively. The logic behind giving online feedback was to provide further explanations for the student's errors, to give the opportunity to the students to reflect more on the errors and ask a question if they could not understand the point of error, and it would help the other students to stop similar errors in their future during writing sessions. Due to the existing limitations implemented by the institution's policies, the teacher of the class, one of the current study's researchers, gave feedback on the student's writing pieces. The second researcher was added to the class and also monitored the whole process.

The students received two types of feedback, individual and within-the-group feedback, and were given one more week to correct the errors and re-submit the related paragraphs. For comparison of the two drafts, students were not allowed to delete or replace the previously uploaded materials, but they should write the new paragraph under the previous one. This cycle of correction of errors and mistakes is repeated two times. After the experiment, another writing test was administered as the posttest. The participants in both groups were asked to write a 250-word essay entailing introductory, body, and concluding paragraphs different from one in the pretest. To guarantee the objectivity of scoring, a Ph.D. holder in Applied Linguistics was invited to mark the writing of students against the rubrics. He was an external marker and did not have any information about the students. Papers were given a code, so the marker measured them blindly.

DATA ANALYSIS AND FINDINGS

In the current section, the investigation and the explication of the data collected for a period of 12 weeks are presented.

The research's first question was to find whether corrective feedback had any statistically remarkable effect on EFL learners` writing performance.

Table 1 reveals the descriptive statistics of the pretests and posttests of both groups.

Table 1. The Descriptive Statistics for the Writing Pre-tests and Post-tests Scores

	N	Min	Max	Mean	SD
Pre_Exp	47	0	16	12.21	2.702
Post_Exp	47	10	23	18.51	2.789
Pre_Con	47	0	17	12.09	2.992
Post_Con	47	3	19	13.17	2.657
Valid N (listwise)	47				

As shown in Table 1, the mean scores of the experimental group are 12.21 and 18.51in pre-post tests, while the mean scores for the pretest and posttest of the control group are 12.09 and 13.17, respectively.

Since the assumption of normality of the data distribution was not met, the gain score comparison was run to check the difference between the posttest and pretest administration.

Table 2. The Result of the Test of Normality for Checking the Normal Data Distribution Assumption

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre_Exp	.157	47	.006	.835	47	.000
Post_Exp	.110	47	.200	.950	47	.043
Pre_Con	.148	47	.011	.898	47	.001
Post_Con	.155	47	.006	.923	47	.004

The Kolmogoro-Smirnov and Shapiro-Wilk tests of normality show the abnormal distribution of the data for the two groups (P <.05). Therefore, as mentioned above, the gain score comparison, which is the difference between the posttest and the pretest, was taken into account and is shown in Table 3.

Table 3. Descriptive Statistics for the Gain Scores of the Control and Experimental Groups

	N	Min	Max	Mean	SD	V
Con_Gainscores	47	-1.00	3.00	1.085	.802	.645
Exp_Gainscore	47	.00	15.00	6.297	3.236	10.475
Valid N (listwise)	47					

The mean and standard deviation of the control and the experimental groups are 1.08, .80, and 6.29, 3.23, respectively. Table 4 below shows the result of normality testing for selecting the appropriate inferential test.

Table 4. The Results of Normality Test the Control and Experimental Groups

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Con_Gainscores	.288	47	.000	.850	47	.000
Exp_Gainscore	.165	47	.002	.947	47	.032

The Kolmogorov-Smirnov and Shapiro-Wilk tests of normality show the abnormal distribution of the data for the two sets (P < .05). Thus, the Mann-Whitney U test can be a suitable option to compare the means of both groups. The result of this test is released in Table 5.

Table 5. The Result of the Mann-Whitney U Test for the Comparison of the Control and Experimental Groups

	Scores
Mann-Whitney U	200.000
Z	-6.957
Asymp. Sig. (2-tailed)	.000

As Table 5 above shows, there was a notable distinction between the mean scores of the two groups, U = 200, p < .05. Therefore, the researchers confidentially rejected the null hypothesis, i.e., using the corrective feedback had a statistically remarkable impact on Omani EFL learners` writing performance.

Table 6. The Reliability between the Pretest and Posttest of Writing

Cronbach's Alpha	N of Items
.77	2

The reliability of the pretest and the posttest was checked for 47 participants by calculating the Cronbach's Alpha. As can be seen in Table 6, the test enjoyed a high-reliability index (R= .77).

In order to find whether there was an agreement between the two raters, the inter-rater reliability was calculated.

Table 7. The Inter-Rater Reliability for the Two Raters in a Pilot Study

Title	N of Raters	N of Participants	R	Sig
Writing	2	47	.89	.000

Table 7 above shows the result of the inter-rater reliability between the two raters and 47 participants in a pilot study. As can be seen, there was a perfect agreement, based on Landis and Koch's (1977) classification, between the two raters of the research, R = .89, P < .01.

To find the participants` perceptions toward the implementation of the written feedback in second research question, a questionnaire was distributed, and the following results were revealed respectively:

The first question investigated the percentage of students reading and checking their writing after the teacher gave it back to them. 44.4 % of the participants stated that they always checked it. 33.3% of students selected the option sometimes, and 22.2% of students chose usually. In this question, two options of not very often and never, were not selected by any of the participants. It means that most of the students reflect on their writings after receiving feedback.

The second question sought to find more details about the participants` intentions in checking teacher's feedback and correction. 77.8% of the participants selected the option always. 11.1% selected usually and the same percentage for sometimes. The answers show that almost all students carefully check the teacher's comments and corrections.

For the third question, which measured the importance of having few errors in English learning written work, 66.7% stated that it was very important, while 33.3% said it was important. The findings indicate that all students like to write as correctly as possible.

The fourth question dealt with the importance of highlighting the grammatical errors by teachers regarding the students' point of view. 66.7% selected very important, 22.2% important, and 11.1% selected the option neither. It means that most students need to have correction feedback dealing with their grammatical errors.

The fifth question elicited the participants` responses based on highlighting spelling errors by the teacher. 66.7% considered it as very important, 22.2% said neither of them, and 11.1% selected the option important. The answers show that for most students, it was important to receive comments about the spelling errors in their writings.

The sixth question investigated the importance of vocabulary errors given by the teacher. 55.6% of the participants considered it as very important, 22.2% selected important, and 11.1% chose the options neither and not important. It means that most students enjoy receiving corrective feedback on vocabulary errors.

In the seventh question, the responses of the students on punctuation errors given by the teacher were elicited accordingly. 55.6% of the participants stated that it was very important. 33.3% selected important, and 11.1% chose the option neither. The answers indicate the importance of punctuation errors and their effect on the students' writing.

The eighth research question concerned the structural errors, which the teacher highlighted. 66.7% of the participants stated the importance of it. 22.2% said it was important, while 11.1% selected neither. The students' opinions about this question show that structural errors play a significant role in students ` writing.

Finally, question nine focused on the importance of receiving feedback based on the writing content. 44.4% considered it as very important, 33.3% important, and 22.2% stated neither. More than two-thirds of the students considered the errors in the content of their written work.

DISCUSSION

The current study aimed to determine the effect of corrective feedback on Omani EFL students' writing performance via electronic platforms.

The results of the first research question are consistent with the results of some studies (Bitchener & Knoch, 2008; Chandler, 2003; Ferris, 1995, 2003; Ferris & Roberts, 2001; Khoshsima & Banaruee, 2017; Lalande, 1982; Ruegg, 2010, 2017) which revealed positive effects of corrective feedback on learners' performance. Banaruee and Askari (2016) stated that every corrective strategy is considered essential and can be implemented simultaneously. In another study, Maleki and Eslami (2013) found that the employment of corrective feedback effectively reduces morphological errors in students' writing. These findings are in line with the study carried out by Chandler (2003), who confirmed the positive effect of corrective feedback during learning.

However, the current study results are against the findings of Ghasemi et al. (2021). They were working on the writing performance of some Iranian EFL learners in the presence and absence of feedback and found out that there is no advantage in giving immediate feedback on writing or marking errors. Lee (2019) also stated that less corrective feedback outweighs more exposure to it.

After participating in the survey regarding the students' perception of corrective feedback, participants showed that such feedback was essential and fundamental for their learning and will help them improve their performance in a writing course and in all other skills they claimed.

The results above are in line with some other studies. For example, Loewen et al. (2009) stated that Arabic and Chinese learners had positive attitudes toward error correction. Schulz (1996) also stated that most participants had a positive attitude toward implementing corrective feedback. Listiani's (2017) findings showed that 94% of the learners had positive perceptions of corrective feedback.

CONCLUSION

Based on the results, the posttest scores of the students in the experimental group were positively and remarkably distinguishable from their pretest scores. On the other hand, the control group results in the pretest and posttest did not reveal any notable differences. Therefore, it can be stated that corrective feedback can play a vital role in writing tasks.

The study can have some implications for language teachers. As observed in the result section of the current study, the learners benefited from implementing corrective feedback, so teachers are encouraged to use similar strategies more often.

Considering this study, some suggestions can be made for other researchers to study this area further.

- To generalize the findings of this study, further research should be carried out with a bigger sample population in Oman by targeting various academic institutions and the students who are studying at Foundation Departments.
- The focus of the study was on writing skills, while further research can be conducted with the other receptive and productive main skills as well as subskills because students experienced online learning on all the modules, so it will be interesting if the investigation on all the skills could be implemented.
- The target community of this study was pre-intermediate students, while more studies can be conducted with various levels of language proficiency from elementary to advanced students.
- Since the number of students is increasing in online classes, there might not be enough time for the teacher to explain every paper of the student in detail. In this case, a study can be conducted to measure the level of students' autonomy after the treatment.
- Since the study focused on the impact of teacher's feedback on the writing performance of Omani EFL students, then further research could be more insightful if the effects of peer feedback could be measured accordingly.

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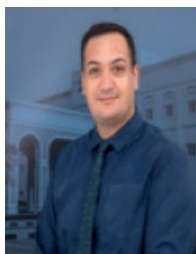
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APPENDIX

How often do you read over your composition again when your teacher returns it to you?

Do you check your teacher's comments and corrections carefully?

How important is it to you to have as few errors in English as possible in your written work?

How important is it to you for your English teacher to point out grammatical errors in your written work?

How important is it to you for your English teacher to point out your spelling errors in your written work?

How important is it to you for your English teacher to point out errors in vocabulary choice in your written work?

How important is it to you for your English teacher to point out punctuation errors in your written work?

How important is it to you for your English teacher to point out your errors in structure in your written work?

How important is it to you for your English teacher to point out your errors in content in your written work?

AN ANALYSIS OF PERSONAL FACTORS AFFECTING LEARNING MOTIVATION: A RESEARCH ON THE ONLINE EDUCATION PROCESS DURING COVID-19 PERIOD IN TURKIYE

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ABSTRACT

In 2019 Covid-19 appeared and spread quickly all over the world, affecting every structure of society, as well as the education system. One of the measures taken to prevent the further spread of the disease was mandatory online education at universities in Turkiye. This sudden change has significantly affected students' learning motivations for face-to-face education. In this context, this study aims to determine the factors of arousal, beliefs, goals, and needs that affect the students' learning motivations as personal factors during online education in Turkiye during the Covid-19 pandemic. For this aim, a semi-structured interview technique was used on a sample of 34 students. According to the findings, the internal factors on arousals were; mainly interest/curiosity/attention and the external factors on arousals were mainly; compulsory attendance requirements. Also, the internal factors on success beliefs were mainly; determination, and the external factors mainly include motivational speeches. Besides, the internal factors on goals were mainly; the need to learn for the future and the external factors on goals were mainly; homework and studies. Lastly, findings indicated that the internal needs of the students were mainly; success, and the external needs were mainly; communication.

INTRODUCTION

The new coronavirus disease (Covid-19), which first appeared in China in December 2019, then spread rapidly worldwide and was declared a pandemic by the World Health Organization (WHO). Pandemics, which can be defined as infectious diseases that spread to very large areas such as the whole world or the continent, can spread very quickly among people, and the consequences can go up to death. In Turkiye, the T.C. Ministry of Health declared the first case of Covid-19 in March 2020, and the disease began to spread to the whole country. To prevent the further spread of the disease in Turkiye, many significant restrictions have started to be applied, starting from wearing masks everywhere and ending with the curfew in April 2020. Covid-19 has affected every

field in the public sector and the field of education. Council of Higher Education decided that universities must switch online from face-to-face education by using digital formats until the danger is reduced. The execution of online education in universities ended in the academic year of 2021-2022.

This compulsory online education process has been a factor affecting the learning motivation of its students'. Motivation is expressed as the readiness and willingness of a person to learn within the scope of behavioral sciences and educational processes. Motivation is considered concerning such concepts as need, motive, desire, and hope (Kesici et al., 2008). Motivation reflects in students' persistence on learning tasks and in their coping with the obstacles, the encounters in the learning process and the choices of learning tasks, and the time and effort they devote to them (Bakar, 2014, p. 723). Learning motivation is the most important driving force of learning behavior that facilitates students to actively engage with the learning content. Additionally, learning motivation guides students grasping the learning direction as well as continuously engaging in a learning activity to complete tasks and achieve the preset learning objectives (Zhang & Chen, 2021, p. 2). Learning motivation can be divided into intrinsic and extrinsic. For students to be active in the learning process, understand the courses, and achieve the requirements of their studies, learning motivation is highly needed. There are psychological, social, and cultural factors that affect internal and external learning motivations, and personal factors are one of them. Arousal, beliefs, goals, and needs are the prominent individual factors essential in forming motivation to learn.

A gap in the literature was found. There wasn't any research in the literature about the internal and external factors affecting the learning motivations of Turkish students during the Covid-19 period that examines 4 dimensions (arousal, beliefs, goals, needs). Based on this gap in the literature the aim of the study was created.

This study aims to determine the internal and external factors on arousal, beliefs, goals, and needs that affect the students' learning motivations as personal factors during online education in Turkiye during the Covid-19 pandemic. Based on this aim, 4 different research questions were created that are identified to reveal the internal and external factors affecting students' arousals, beliefs, goals, and internal/external needs during the Covid-19 online education process. Within the scope of the aim and research questions, a semi-structured interview technique was used on a sample of 34 students. The questionnaire consisted of 4 parts and 8 questions about the factors of arousal, beliefs, goals, and needs of the students' in the online education process. The data obtained were subjected to descriptive analysis, and in the findings, similar parts of answers from the students were compiled, and the others were tabulated. Additionally, the statements that are different and noteworthy are quoted.

THE FACTORS AFFECTING LEARNING MOTIVATIONS

It is a well-known fact that motivation is an essential factor affecting success in educational processes. The motivation was inspired by the Latin term 'move,' which means movement. Motivation is a force that causes people to behave particularly. Predominantly, motivation is the driver of control, guidance, and persistence in human behavior (Tohidi & Jabbari-Mohammad, 2012, p. 820-821). Also, motivation, defined by needs, is high impulses, such as the desire to achieve. The more the individual wants and considers his needs and desires necessary, the more the motivation is formed. According to Gerrig & Zimbardo, motivation is (2012); all kinds of processes that involve starting, managing and continuing physical and psychological activities. Motivation includes the processes that energize and guide behavior, and there are different approaches to explaining the concept. (Santrock, 2018, p. 438). Each of the approaches treated motivation from a different aspect; hence all concluded that motivation is an important factor influencing learning processes. These approaches are divided into behavioral, humane, and cognitive processes. The behavioral approach focuses on the extrinsic motivation of students. Behavioral learning emphasizes concepts such as reinforcement, conditioning, and alternatives to punishment, and using reinforcement to increase behavior and removing reinforcement to extinguish behavior can be applied to motivation. In addition, humanitarian approaches focus on the intrinsic motivation of students, and they were developed as a reaction to behaviorism. These approaches take into account important affective characteristics of students and how they feel about themselves and others. In the education field, the humanitarian approach emphasizes the human side of learning and the teacher`s need to consider students` personal choices, needs, and growth. One of the

most influential theories reflecting the humanistic approach to motivation is Maslow`s need theory, which emphasizes positive qualities like the student's capacity for self-development, orientation to one's destiny, and being more sensitive to others. On the other hand, cognitive approaches are based on the assumption that students` perceptions and thoughts about activities and events, or intrinsic sources, influence the way in which they respond. They also suggest that students can be motivated to perform well, not only because of rewards such as grades or praise but also because of the need to obtain information or solve a problem, which can help them to understand (Hodo, 2016, p. 23-24). These behavioral, humane, and cognitive approaches are essential at showing the importance of learning motivation.

Learning motivation is the most important driving force of learning behavior. It guides students to understand the learning direction and continuously engages in learning activities for completing tasks and achieving the preset learning objectives. Learning behaviors and motivation are the main factors in learning effectiveness; education could induce students' innovation capability and enhance educational effectiveness (Brinkman, 2010; Brettel & Cleven, 2011). In other words, learning motivation is one of the factors that determine the effectiveness of learning, and students will learn well if there is a driving factor, namely learning motivation (Lao, 2021, p. 461). Many factors affect the learning motivation of a student. It is significantly essential for a student to believe that he can succeed in his motivation. Additionally, if a learning activity or a course is beneficial to the student, then the student may consider this activity or course valuable and make efforts to achieve it. Besides, if the teacher who guides the student in the learning process is also willing, makes an effort, is energetic, and enthusiastic. He can increase the motivation of the student. And not only a student-centered education increases motivation, but also the positive classroom atmosphere contributes to this process (Ergun et al., 2002, p. 102). In twenty-first-century education, student-centered education have gained weight instead of teacher-centered approaches to create a learner-centered learning environment for increased student motivation (Zeybek, 2021, p. 17). In this context, the student's belief to succeed and learn, the attitudes of the teacher, the classroom climate, and a student-centered education based on students' needs can be listed as the main factors that increase motivation.

Motivation is divided into 2 different groups; internal and external motivation. Internal motivation is an individual's motivation to accomplish goals from within them, whereas external motivation is an individual's motivation to attain his goal from a source outside himself. From the learning perspective, intrinsically motivated students' study because they want to understand the content and view learning as worthwhile, whereas extrinsically motivated students may study for a test because they believe studying will lead to a good grade (Eggen & Kauchak, 1994). There is no need to use external motivation for learning processes that students consider interesting and meaningful. In this context, the teacher must know the needs of the students and use external motivation in the right place.

According to Gopalan et al. (2017) internal motivation depicts an activity done only for own contentment without any external anticipation. The challenge, curiosity, control, and fantasy are the key factors to trigger internal motivation. In education, lots of willpower and a positive attitude are required to sustain motivation. Additionally, internal motivation and academic achievement share significant and positive bonding. Internal motivation directs a student to participate in educational activities only to experience fun, challenge, and uniqueness without any external pressure or compulsion rather than expecting external rewards, gifts, or under any compulsion or pressure. Attitude in learning is considered prominent, and it influences academic achievement. Internal motivation can spread positivity and sustain the gained knowledge for a long time. Conversely, external motivation depicts external activities such as reward, compulsion, and punishment. Students are extrinsically motivated if they receive any reward or under any pressure or compulsion. The motivation can be cultivated extrinsically at the initial stage and transformed into intrinsic motivation in the learning process as it goes deeper. This kind of motivation provides a high level of willpower and engagement, yet it would not be able to sustain longer than intrinsic motivation can do. If they are continuously motivated through external rewards or compliments, it could be habitual for students to perform only to gain the rewards and not for their own sake or mastery of skills or knowledge.

Additionally, when a student cannot perform either intrinsically motivated or extrinsically motivated, then amotivation occurs. Amotivation is a state where intrinsic motivation and extrinsic motivation no longer exist. Both intrinsic and extrinsic motivation have unique features to motivate students, and both intrinsic and extrinsic motivation are needed in a learning process.

Similar to internal and external motivation that affects learning motivation, personal factors like; arousal, beliefs, goals, and needs also have an essential role in forming motivation to learn (Eggen & Kauchak, 1994). These 4 personal factors are influenced by internal and external conditions and directly affect the individual's learning level. Since this study's main subject, it is essential to examine these factors in detail.

Motivation and Arousal

According to Berlyne (1960), arousal is a motivational state pertaining to an individual's level of alertness or activation, ranging from extreme drowsiness to extreme wakefulness. Besides, arousal is the basis of emotions, motivation, information processing, and behavioral reactions (Groeppel-Klein, 2005, p. 428). Motivational arousal can decrease and increase with its level of intensity being guided by how a person perceives a task. If the task is expected to be easy, then the motivational arousal will decrease. On the contrary, if the task is expected to be difficult, the need for motivational arousal will increase. Arousal is highly related to learning motivations. If the student has a deficient level of arousal, like thinking about something else or sleeping, he will learn very little. To resolve this, the teacher should do things likely to increase the arousal level. The learning outcome will again be the same if the student has a very high level of arousal, like panicking, and to resolve this problem, the teacher should do things that are likely to reduce arousal. In this context, it is safe to say that the students tend to learn best at a medium arousal level. According to Eggen & Kauchak (1994), arousal is a physical and psychological reaction to the environment, including anxiety and curiosity motivation. If a teacher hands out a test, the students are sitting nervously and curious about the content of the test, which increases blood pressure and creates fast breathing and sweaty hands. This situation means that the students are aroused, and their motivation is high. So, an optimal level of arousal is needed for the peak students' performances. Also (Pluck & Johnson, 2011, p. 24) curiosity is an essential aspect of intrinsic motivation that has excellent potential to enhance student learning; if the teacher gives importance to students' curiosity, then the desired level of arousal can be formed. In this context, contents, and activities that may cause curiosity can be considered the main parameters in creating motivation for learning.

Motivation and Beliefs

Beliefs are about ability as individuals evaluate their competence in different areas. In the expectancy-value model, ability beliefs are conceived as broad beliefs about competence in a given domain, contrary to one's expectancies for success on a specific upcoming task (Eccles et al., 1983). According to Zimmerman (2000) and Pintrich (2000), motivational beliefs have their roots in self-regulation, which can be defined as a process where the learner undertakes an active and constructive mission through which he blends internal and external components. He constitutes their own goals and strategies. Also, the self-regulation process consists of planned and circular thoughts, feelings, and behaviors, and during this process, the individual uses the feedback taken from previous performances as a component to regulate new learning attempts (Nasser, 2015, p. 2510). In this context, self-regulation can be seen as a process of constantly monitoring the progress towards a goal, checking the results and redirecting unsuccessful efforts.

A student's optimistic belief about one's ability in learning can help increase motivation. In an incremental view of the beliefs about ability, individuals can hold the beliefs that ability can be improved with effort. Although students tend to be influenced by teachers' evaluation of their ability in participating activities, they have an optimistic view of their ability to a certain extent which causes their self-confidence originally. They also react strongly to failure and self-doubt. A linking theory is attribution theory (Kong, 2009, p. 147), and according to Weiner (2005), attributions are perceptions about the causes of success and failure. If a student gets a low mark on a test and wonders what caused the low mark, he can construct various explanations/attributions for this failure. Studying was not very hard; the test itself was difficult; being unlucky could be an example of these explanations, and each explanation attributes the failure to a different factor. The explanations that the students settle upon could reflect the truth accurately or not. But it is important about attributions is that they reflect personal beliefs about the sources or causes of success and failure and tend to affect motivation in various ways, depending on the nature of the attribution (Weiner, 2005). So, teachers can help students attribute their successes to ability and effort while failure, bad luck,

and task difficulty and provide them more opportunities to experience success to set an optimal belief of the learning ability and enhance learning motivation. (Kong, 2009, p. 147). In this context, it may be the responsibility of teachers to provide an environment that best suits the learning abilities of the students and to provide more opportunities to increase their learning motivation and mobilize internal factors. This situation will have a significant impact on students' motivation to learn.

Motivation and Goals

Goals are defined as what an individual is planning to accomplish, and they are the aim or the object of an individual's actions (Brown & Harvey, 2006). According to Weiner (1986), the type of academic goals students pursue is one of the essential variables in motivational research in educational contexts. A goal may be defined as a model or integrated pattern of beliefs, attributions, and affects/feelings that guide behavioral intentions (Valle et al., 2003). Also student motivation as goal-directed behavior which involves different ways of thinking and is elicited under various internal and external conditions and also indicates that motivational goals provide the mechanism for filtering perceptions and other cognitive processes (Ames, 1992). In this context goal can be defined as a model of beliefs and feelings that guide behavioral intentions, is the most basic parameter that provides goal-oriented behavior.

There are four different mechanisms of how goals affect students' performances. Firstly, goals lead students to focus on goal-relevant activities, and secondly, students adjust their effort level according to task difficulty when they have goals. Thirdly, students become more persistent in achieving the tasks thanks to goals, and lastly, students pursue appropriate strategies to achieve their goals (Dornyei, 2001). The learning goals of students affect their motivation levels, but many students fail to create effective goals. Sometimes students set very easy, sometimes very difficult goals, and these situations negatively affect their level of motivation. An effective learning goal should be short-termed and specifically related to the subject to be learned. By looking at the students' goals, teachers can make assessments about their motivation levels and the level of realization of their goals, and they can help them create effective goals (Akbaba, 2006, p. 352). In this context, it can be said that this situation provides support in creating students' goals and contributes to their learning motivation.

Motivation and Needs

Seward & Seward (1937) defined drive as "an activity of the total organism resulting from a persistent disequilibrium," with a disequilibrium usually created by an insufficiency of certain things like; water, food, and rest. Thus, a drive reflects a 'need' that arises from the lack of some particular thing, such that a 'need' can be characterized by, and defined as, a lack of something essential to a person's existence or well-being. (Taormina & Gao, 2013, p. 156). Abraham Maslow developed a psychological model to identify what motivates people and assumed that people are motivated by various needs. Maslow's Hierarchy of Needs is organized as a pyramid, grouping human needs into five categories: physiological, safety, love/belongingness, esteem, and self-actualization (Lester, 2013, p. 15). For students to succeed in the classroom, they must be motivated to learn, and Maslow's model is directly related to learning through motivation. When all levels of Maslow's Hierarchy of Needs are met, students are at their full learning potential. Each student has needs that must be met to maximize learning, and the higher up in the hierarchy a student is, the better the motivation and learning that the student will have.

In classrooms, students who are threatened by potential embarrassment are less motivated to learn; until they study in a secure and relaxed environment, they will move to the need for competence that is related to competence motivation which is an innate need in individuals that energizes them to master tasks and skills. The need for achievement drives students to fulfill their goals. Students with a high need for achievement tend to be motivated by challenging assignments, high grading standards, explicit feedback, and the opportunity to try again. On the contrary, students who need to avoid failure avoid challenging tasks and experience anxiety in testing situations. If the teachers are aware of these differences, then they can respond to different students with different needs and, as a result, teach all students more effectively (Kong, 2009, p. 147). According to Akbaba (2006, p. 352), belongingness need, approval need, reducing

anxiety need, autonomy need, and need for achievement, which are from social and emotional needs, are essential for learning motivation. Firstly, the belongingness needs of students are significant for learning motivation. If students sense being accepted, valued, and included by teachers and peers in the classroom setting and feel they are an important part of the class, this would positively affect their learning motivation (Goodenow, 1993). Approval need is a critical factor for developing academic motivation. The quality of interaction between teachers and their students and between classmates is balanced by many dimensions of extrinsic motivations. In this context, approval motivation is one with a big impact (because of the teacher - a figure with authority at an early age of the pupil and, secondly, because of evaluation necessity through a person's evaluation of adolescent or young adult/social evaluation. These can influence positively or, in contrast, destabilize academic motivation (Panisora et al., 2015, p. 1216). Additionally, reducing anxiety is one of the crucial need since it can negatively affect academic performance. Eccles & Wigfield (2002) and Eysenck et al. (2007) indicated that anxiety impairs the effective functioning of students' attention systems and increases the degree to which processing efficiency depends on attention control. This explains the effect of anxiety on students' attention processes and cognitive functions. In this context, anxiety can reduce academic performance. Feelings (affective) and anxieties (cognitive) are sources of decreased student performance. Students' achievements can be improved by educating them on how to deal with stressful situations in academic life. If students can cope with their emotional anxiety, it can help them achieve better results (as cited in Majali, 2020, p. 976). Also, autonomy is the need of an individual to manage himself and his environment by controlling them. Teachers can increase the sense of autonomy by shifting the responsibility to the student and enabling him to make decisions (Akbaba, 2006, p. 353). Finally, the need for achievement is behavior directed toward competition with a standard of excellence. McClelland (1961) found that people with a high need for achievement perform better than those with a moderate or low need. Sardiman (2000) states that several factors to successful learning achievement. Giving grades in the form of learning outcome grades, teachers giving gifts such as morality and materiality, competition between students, ego-involvement, giving tests frequently, students knowing the results immediately after the exams, praising students, and punishment can provide students a force to be more active in studying, desire to learn and lastly student interest in certain subjects is needed in fostering achievement motivation.

Some recent literature studies reveal the relationship between the conditions that emerged during the Covid-19 pandemic period and students' motivation. Ozel et. al. (2021) studied whether the anxiety experienced/felt by university students towards the COVID-19 epidemic has any effect on their motivation is, the main purpose of the study. According to their study, the coronavirus anxiety levels of the students were not very high, but their general motivation was quite high, except for their external motivation. Also, it was seen that the coronavirus disease concerns certainly did not affect their motivation. Another study (Tekin, 2020) aimed to investigate the effect of anxiety that developed due to the Covid-19 pandemic on the motivation of Generation Z youth. According to Tekin (2020)'s research results, socialization anxiety caused by the Covid-19 pandemic is higher than individual anxiety, and intrinsic motivation is lower than extrinsic motivation. In addition, it was concluded that socialization anxiety arising from the epidemic in generation Z negatively affects both internal and external motivation. Also, another study by Camacho et. al. (2021) investigated whether anxiety and perceived social support from teachers and classmates were predictive of changes in students' academic motivation during the first wave of the COVID-19. Their study showed that students' anxiety and teachers' social support were important predictors of academic motivation changes. One of the similar researches by Sabanci & Yilmaz (2021) investigated the effects of distance education on teachers' motivation in the Covid-19 period. Their results have shown that distance education negatively affected the motivation of students and teachers. Also, the study revealed that distance education was more inefficient than face-to-face education for the teachers. Cetinel & Gurcuoglu's (2022) research determined the academic motivation levels of university students in terms of demographic factors during the pandemic period. According to the research data, the level of academic motivation differs in terms of demographic factors. It was found that there was a gap in the literature from Turkiye. There wasn't any research in the literature about the internal and external factors affecting students' learning motivations during the Covid-19 period that examines 4 dimensions (arousal, beliefs, goals, and needs). Based on this literature gap, the study's aim was created. The fact that the internal and external factors affecting students' learning motivations during the pandemic period have not been discussed in any previous study in Turkiye shows the importance of this study.

AIM OF THE STUDY

The main aim of this research to fill the gap in the literature was to determine the internal and external factors on arousal, beliefs, goals, and needs that affect the students' learning motivations as personal factors during online education in Turkiye during the Covid-19 pandemic.

4 research questions were created for the aim of the study

1. What Are the Internal and External Factors Affecting Students' Arousals during Covid-19 Online Education Process?
2. What Are the Internal and External Factors Affecting Students' Beliefs on Success during Covid-19 Online Education Process?
3. What Are the Internal and External Factors Affecting Students' Goals during Covid-19 Online Education Process?
4. What are Students' Internal and External Needs during the Covid-19 Online Education Process?

METHOD

The research was based on a methodology in which a qualitative research method was used to achieve the aim of determining the learning motivations of university students in the Covid-19 days' compulsory online education process. The qualitative research method, which was used in the study, is a type in which qualitative data collection methods such as observation, interview, and document analysis are used as a research approach to the interpretive paradigm, in other words, the understanding of epistemology. Qualitative research aims to provide a realistic and holistic presentation of perceptions and events in the natural environment. Qualitative researchers also use various tools to serve this purpose, as it puts interpretation and deciphering in front when explaining the relationships between events and phenomena. Interview forms, observation forms, audio recorders, analyzer, paper, pen, various documents, written materials, etc., are the tools that will make it easier to interpret and make sense of this method (Yildirim & Simsek, 2005). Additionally, according to Merriam (2013, p.14), qualitative research aims to understand how people make sense of their lives and describe how people interpret their experiences. Therefore, this study was also conducted for this purpose.

In this study, a semi-structured interview technique was used. According to Ekiz (2009), in the semi-structured interview technique, the researcher prepares the interview questions in advance but gives partial flexibility to the participants during the interview, allowing the created questions to be rearranged, and discussed.

Data Collection and Analysis

There are 8 questions prepared based on research questions in the interview form. In devising the questionnaire, existing scale items of learning motivations and personal factors (Deci & Ryan, 1985; Deci & Ryan, 1991; Martin, 2001; Malone et al., 2021; Vallerand, 1992) were examined, and appropriate items were modified to suit the context of this research. Since the validity and reliability of these scales are high in the literature, the use of the scales in the creation of the questionnaire form contributed to the validity and reliability of the study. 3 experts examined the semi-structured questionnaire in the specific field, and the final version was given. According to Aung et al. (2021) it is safe to implement a questionnaire with the qualitative experts' suggestions on paraphrasing unclear questions and eliciting redundant information and pilot interview. So, this process also contributes to increasing the reliability of the study. Then, the pilot interview was conducted with 4 participants, and the confusion of meanings and wordings was organized. The data of the study were collected between 15.09.2021 and 10.11.2021. The semi-structured questionnaire was audio recorded with the participant's permission during the face-to-face interview. The interviews lasted between 25-30 minutes. The participants' statements were transferred as they are, and the data were then deciphered. By evaluating the interview texts, it was ensured that there is a common language between the texts.

The data obtained through face-to-face interviews were subjected to descriptive analysis based on the purpose of this study. According to Yildirim & Simsek (2005); descriptive analysis is an approach to summarizing and interpreting the obtained data according to previously determined themes. This approach, where direct quotations are often included, is aimed to reflect the views of the participants in a striking way. Besides, the

descriptive data analysis was examined with the model of Miles & Huberman (1994), which consists of data reduction, data presentation, and inference. Also, the data were categorized and revealed based on personal factors affecting learning motivation (Eggen & Kauchak, 1994).

Participants

Unlike quantitative research, the sampling methods used in qualitative research have great flexibility. In this study, purposive sampling, one of the qualitative research methods, was used. Purposive sampling is a method designed to represent some special groups for a purpose, and in this study, the participants were determined based on this method. In this context, 34 participants studying at Sakarya University Faculty of Communication were selected. The genders of these participants were determined to be equal, and the prerequisite for participation was identified as 'having received online education during the Covid-19 process'. Table 1. given below, shows the characteristics of the participants.

Table 1. Characteristics of participants

PARTICIPANTS	SEX	AGE
P1	Male	22
P2	Female	21
P3	Female	19
P4	Male	20
P5	Male	20
P6	Female	21
P7	Female	24
P8	Male	21
P9	Female	22
P10	Male	21
P11	Female	22
P12	Male	20
P13	Female	21
P14	Male	21
P15	Male	22
P16	Male	22
P17	Male	22
P18	Male	20
P19	Female	20
P20	Female	19
P21	Female	20
P22	Female	33
P23	Male	23
P24	Female	22
P25	Male	22
P26	Male	32
P27	Female	22
P28	Male	20
P29	Female	21
P30	Female	19
P31	Male	21
P32	Male	22
P33	Female	23
P34	Female	19
TOTAL:34	17F+17M	

FINDINGS

To ensure the anonymity of the answers given by the participants, the names were placed in the form of "Participant 1, Participant 2 ...". Each participant answered all 8 questions in the questionnaire. However, the similar and repetitive answers of the participants were compiled and put together, and the others were tabulated. In addition, statements that are different and noteworthy are quoted. Hence the questionnaire contains open-ended questions; the answers have more than one expression. Therefore, the total number of statements is more than the number of participants. Additionally, personal factors like; arousal, beliefs, goals, and needs that affect learning motivation are grouped in this section.

Arousal

Research Question 1. What are the Internal and External Factors Affecting Students' Arousals during Covid-19 Online Education Process?

The responses on internal factors affecting arousal, which have an essential place in learning motivation, are presented in detail below in Table 2 and the texts.

Table 2. Internal Factors on Arousal

	Number
Interest/curiosity/attention	19
Responsibility	11
Wanting to learn new things	9
Wanting to be successful	3
Boredom	3

The majority of the students stated that one of the important elements that stimulated them to participate in online courses was their curiosity, interest and attention about/to the course's subject. The statement of P5 in this regard is noteworthy.

> *"I was so curious about some courses; they took my attention and interest, I was looking forward to them every week." (P5)*

Most of the students stated that as a student, they felt responsible for joining the courses and learning from them, as represented in P11's statement below.

> *"...even though we were in the Covid-19 period, my academic life was going on, I had to take classes, learn. We switched to online education doesn't mean that the education is over. After all, isn't it the responsibility of a student to take classes..." (P11)*

Interestingly, few participants stated that the absence of any other activity and boredom in Covid-19 made them join the courses. The statement of P31 in this regard can represent this noteworthy factor.

> *"....there was nothing to do during the Covid period, we couldn't get out, so I was bored, so I joined the lessons." (P31)*

The responses on external factors affecting arousal, which have an essential place in learning motivation, are presented in detail in Table 3 and the texts.

Table 3. External Factors on Arousal

	Number
Attendance requirements	18
Homework/quizzes	16
Announcements	9
Uploaded documents	9
Creating interest/curiosity/attention	8
Examples from real life	6
Flexibility	4
Teachers' way of lecture	3

The participants identified the factors listed above as external stimuli coming from the teachers that affect their arousal. The majority of the participants stated that they felt they had to attain online classes because the courses had compulsory attendance requirements.

> *"...of course, the content of the course was important, but I attained because the course had a requirement of attendance, so I was obligated" (P12)*

Another visible external arousal factor is the homework and exams given by the teacher. It can be said that homework and exams are among the main arousal factors that motivate the student to study in the online process. Regarding this, P31 makes the following statement:

> *"Normally, I never liked homework, but in the online process, homework, quizzes connected me to the lesson; I felt connected to the school as I made the homework/quizzes and got feedback in return (P31)*

In addition to homework and quizzes, the activities that the teacher does to increase the interest and curiosity and attention levels of the students in the lesson are also influential in arousal formation. The statement of the P30 is of interest at this point.

> *"The teacher often increased our curiosity about the lesson's subjects, attracted us to the lesson with videos and photos, and showed remarkable examples. These always made me alert to class."*

Among the stimuli used by the teacher, few participants stated that the teacher's energetic and enthusiastic way of the lecture was effective in arousal. The next statement can represent their opinion:

> *"...we had a few teachers who turned on the camera and conducted the courses energetically… I and a lot of my friends loved going to those classes; online was already boring; we weren't bored when that happened". (P2)*

Beliefs

Research Question 2. What are the Internal and External Factors Affecting Students' Beliefs on Success during Covid-19 Online Education Process?

Student responses on internal factors affecting their beliefs that have an essential role in learning motivation are presented in detail below in Table 4 and the texts.

Table 4. Internal Factors on Beliefs

	Number
Determination	15
Safety and comfort of homes	12
Loneliness	11
Trust on online format on exams	6
Anxiety of technical problems	6

In the online education process, it was seen that the comfort and the safety of the home environment increased the students' beliefs that they could succeed and most of the students shared that. The statement of P34 in this regard can represent this noteworthy factor.

> *"I was very afraid of contracting the coronavirus and getting sick. If there were face-to-face education in the Covid period, I would have dropped out of school, but I was very relieved when I had online education; I felt safe at home… Well, the teacher talked, I listened in my comfortable seat… When a person is safe and comfortable, I found out he understands the lesson better". (P34)*

Participants are more confident in themselves that they will succeed in the exams held online. Because they could look at the course notes online during the exam, which creates a belief that the exam will be easier than a face-to-face exam; in other words, it can be said that; the ability to open course documents in an online exam reduces exam anxiety and increased success beliefs among students.

> *"...I mean, it's not like cheating, but when I opened the course notes in the exams, it seemed to me that I answered more comfortably; the answers were easier, and that was what made me believe in myself that I could succeed in online exams…" (P31)*

Also, the fear caused by the feeling of loneliness was prominent in students' beliefs that they could succeed in courses. Regarding this, P19 makes the following statement:

> *"...not being able to meet with teachers and friends made me feel very lonely spiritually as if I was left without support, which reduced my sense of accomplishment, not being able to communicate comfortably, not being able to talk about class with friends made me feel very lonely, it feels like I can't do it" (P19)*

Student responses to external factors affecting their beliefs are presented in detail below in Table 5 and the texts.

Table 5. External Factors on Beliefs

	Number
Motivational speeches 20	20
Appreciation 10	10
Encouragement 9	9
No support 2	2

Teachers encouraging feedback and appreciation of homework, showing the students that she confides in them, directly contribute to the students' beliefs positively as positive reinforcers. The following P3's statement is a good representation of the participants who mentioned other similar factors too;

> *"...our teachers were saying that we were good at the end of our projects and presentations. There were positive conversations about how we could get to better points. When that happens, I feel that teachers trust us, and this feels very good, so I believe in myself more…" (P3)*

On the other hand, statement of P18 has previously stated that the online education process makes him feel very lonely. Unlike many participants, P18's statement shows that he seemed unenthusiastic about the entire online education process. It is obvious that the online education process was a mandatory process that was not in demand, and the adverse climate of the Covid-19 era had its share in this. His statement can be seen below:

> *"In the online process, our teachers and we were unhappy, and I didn't get anything from the teachers that guided my belief that I would succeed" (P18).*

Goals

Research Question 3. What are the Internal and External Factors Affecting Students' Goals during Covid-19 Online Education Process?

Student responses on internal factors affecting their goals that have an important role in learning motivation are presented in detail below in Table 6 and the texts.

Table 6. Internal Factors on Goals

	Number
To learn for the future	18
To pass the courses	12
To get high grades by online exams	8
To reinforce the knowledge	6

It is determined that the most prominent internal factors that affect the goals in the online educational process is that the students want to learn the course to build their careers. P9's statement is a good representation of the participants who mentioned this is in below:

> "...during this period, I tried to understand the lessons in depth because I aimed to create a solid foundation for myself."

On the contrary, it is also identified that most of the students were result-oriented, and they just aimed to pass the courses. Regarding this, P2 makes the following statement:

> "passing the courses was my only goal; I didn't need high grades; it was enough to pass."

Students considered taking the exams online attractive during the online education process because there was a perception that online exams are easier than face-to-face. Therefore, students consider online exams an opportunity to keep their grades high. The statement of P10 in this regard can represent this noteworthy factor.

> "I decided to get high grades while the exams were online because I didn't know what I would face after Covid period; I wanted to pass with the best grades" (P10)

Student responses to external factors affecting their goals that have an essential role in learning motivation are presented in detail below in Table 7 and the texts.

Table 7. External Factors on Goals

	Number
Homework/studies	16
Clues on future	6
Being active during courses	6
Communicative support	5
No support	2

Research data indicates that teachers giving homework and studies was important for the students to reach their goals. The homework given by the teachers has largely provided interaction that has not been established to a sufficient degree because of online education. The following statement by P11 can represent most of the students' opinions:

> "...my teachers gave me a lot of homework by offering various resources, which always kept me interested in the lesson. If it weren't for the homework, I would not have felt connected to the lesson " (P11).

Besides, some of the students mentioned being active during classes. Accordingly, turning on the microphone and talking, asking questions, and commenting on the lesson are desirable situations for students to achieve their goals. The statement of P9 in this regard can represent this noteworthy aspect.

> "….Isn't it our primary goal to be able to learn in lessons? being able to actively participate in classes and sharing my ideas has helped me achieve my goal of success a lot, sometimes I turned on my voice or wrote a comment, and I really enjoyed it"(P9)

Although very few participants stated that they did not see any contribution from their teachers in achieving or setting their goals. P34's statement can be a good representation of their opinion.

> "It was my first year, and I had no idea what kind of goal I should have. I expected the teachers to help me more with this, but I've never seen anything like it. I can say that my online education period was aimless" (P34).

Needs

Research Question 4. What are the Internal and External Needs of Students' during Covid-19 Online Education Process?

Student responses on internal needs, which have an essential role in learning motivation, are presented in detail below in Table 8 and the texts.

Table 8. Internal Needs

	Number
Success	18
Belongingness	16
Reducing anxiety	10
Approval	9

Among the needs of the participants in the online education process, the need to be successful is mostly expressed, and this condition is represented in P15's statement below:

> "...the pandemic had already scared me a lot, an unknown online education had also worried me, at least I wanted to succeed in my classes, get over with this semester…"(P15)

In addition to the need for success in the online education process, the students' need to feel like they belong to the class and belong to the group they are studying with have come forward in the study. The concept of 'loneliness,' which has previously appeared in the 'belief' section, is also at the forefront of the needs section. The emergence of 'loneliness' again in this section and the need for belongingness caused by this concept confirms the data integrity of the research. In this context, the statements of P22 and P33 are noteworthy.

> "...I was trying to learn a topic from the screen with friends I don't know enough, I felt alienated and distant, I didn't feel we were a class. I thought if something happened and I couldn't connect to the lesson or if I missed something, no one could help, I knew nobody, I was worried that I was learning alone…"(P 22), "…it is complicated to feel like a class member online because there is no interaction with your friends, there is no sound coming immediately, so little written from the chat is the screen, over time I felt part of the class …(P33)

On the other hand, some students have expressed that they needed approval and praise. The need for support was greater in in-course activities. The statement of P11 can represent these students;

> "… normally I become very worried talking in front of people and then if the teacher heard me, I would feel approved then and enjoyed the process more" (P11)

Student responses to external needs that have an important role in learning motivation are presented in detail in Table 9 and the texts.

Table 9. External Needs

	Number
Communication	14
Reducing anxiety	10
Seeing understanding	9
Meets were not met	3

Considering the external needs of the students met by the teacher, it has been revealed that the communication channels should be open in the teacher-student relationship was the most desirable situation. Students consider that effective and close teacher-student communication in the online process is the main factor in meeting the needs of learning the course and being successful. In addition, it has been identified that students also request close and friendly communication with their teachers outside the course. P33's statement can be a good representation of the student's communication needs:

> "…when I emailed the teacher and when the teacher answered me then my expectations and enthusiasm for the lesson increased, even more, comfortable communication was the most supportive thing in this process… " (P33)

In addition, reducing the needs of the in-course and out-of-course concerns and anxiety are also included in the scope of teacher-student communication and interaction. The statement of P23 can represent these students' opinions;

> "Even when I explained my anxiety about the pandemic, the teacher was very understanding and helpful. She listened to me, said she understood, told me to be patient; it was very good to see empathy from the teacher" (P34)

On the other hand, few of the students stated that their needs were not met during the online education process, and P18's can be a good representation of these students. The same participant has previously stated that he completed the process unhappily and could not take any behavior from the teachers that guided his beliefs in success. (See Table 5).

> "…I didn't mention any of my needs, no one asked me about my needs either, my need for the class was also not met, we entered, left, did homework, and that was basically it…" (P18)

DISCUSSION AND CONCLUSION

In 2019 coronavirus disease (Covid19) appeared and spread rapidly to the world. The education system had also been affected as every structure of the societies had been. In Turkiye, universities executed online education from 2019 to the academic year of 2021-2022 by necessity. This period of online education, where everyone from teachers to students is affected, has affected learning and teaching motivations. But this study was especially interested in the learning motivation part to determine the internal and external factors on arousal, beliefs, goals, and needs that affect the students' learning motivations during online education while Covid-19 pandemic.

The concept of motivation which can be explained as the processes that include starting, managing, and continuing physical and psychological activities, is a significant factor affecting students' successes in educational processes. Although there are a lot of factors that affect a students' learning motivations, this study reveals the distinctiveness of personal factors like; arousal, beliefs, goals, and needs in students' learning motivations during online education. 34 students who had received online education during the Covid-19 process were interviewed to achieve the aim of the study. A semi-structured interview technique was used in the research, and the data obtained through face-to-face interviews were subjected to descriptive analysis. The findings were given in 4 parts; arousal, beliefs, goals, and needs.

To answer research question 1, the results have shown that the internal factors that affect students' arousals were; interest/curiosity/attention, wanting to learn new things, feeling responsible, wanting to be successful, and boredom. As stated in the literature review, according to Pluck & Johnson (2011), curiosity is an

essential factor in arousal and intrinsic motivation, which leads to enhancing a student's learning. So, based on the data, it is safe to say that students' interest and curiosity in the online education process could have increased their learning motivations. According to Blotenberg & Schmidt-Atzert (2019) attention allowed students to persistently focus on a task and maintain effort over extended periods of time. This study found that the majority of the students stated that one of the substantial elements that contributed them to participate in online courses was their attention to the course's subject. In this manner it can be said that the online courses and materials that took students' attention made them focus more on the tasks and maintain their effort longer. Additionally this study found that most of the students felt responsible to join the courses and learn from them. Based on Sapan & Mede's (2022) research; if the students felt responsible for their learning then their motivation also increased. In this context, it is safe to say that most of the students' feeling of responsibility contributed to increased learning motivations. Also, the research has shown that; the external factors that affect students' arousals were; compulsory attendance requirements, homework/quizzes, announcements, creating interest/curiosity/attention, examples from real life, uploaded documents, passing the lessons, easy access to documents, recorded courses, flexibility, teachers' way of lecture. As mentioned in the literature, according to Eggen & Kauchak (1994), the role of teachers in creating arousal externally in students is very important. The more the teacher gives importance to students' arousals, the more the student's motivation for learning will increase. So, based on the data, it is safe to say that the teachers aroused students more with homework and exams, creating interest/curiosity/attention in the course by using content according to, making attendance compulsory, giving the lectures energetically despite the structurally boring nature of online education. According to Hofer et. al. (2021) teachers' use of digital technology on their courses could create valuable learning opportunities and motivate their students. Similarly to Hofer et. al. (2021), Yu (2022) found that online learning platforms could allow teachers to supervise students' learning progress and learning behaviors such as attendance, time span, discussion, interactions, question answers, and completion of assignment. In addition, the learning achievements could then be enhanced due to teachers' supervision. This study found that the students are motivated because of their teachers' uploaded their documents/courses to online system and way of lecture in the online education platform. In this context, it can be said that Covid-19 as a negative period, had created also positive outcomes because it made education move to digital and the teachers had contributed to students' learning motivations by using the digital environment effectively. In addition, it can be said that the teachers' interest, feedback, discussions, etc. course processing techniques had also contributed to students' motivation to learn online.

To answer research question 2, the results have shown that the internal factors that affect students' success beliefs were; determination, safety, the comfort of homes, and online formats of the exams. Also, this question resulted in some answers about ideas in failure. Although positive answers were received about the success beliefs in the pilot interviews conducted, it was found that some of the answers focused on failure at the end of the study. The majority of the participants felt alone and thought that this feeling would decrease their success beliefs. Besides, the anxiety about having technical problems during the courses made them feel insecure and decreased their success beliefs. According to Reinhold et.al's (2021) research, students with higher anxiety were less intrinsically motivated in the Covid-19 period. From this point, it can be said that most students' anxiety about being alone or technical problems during the online courses made them less intrinsically motivated. Additionally, Mubita (2021) stated that if the students felt safe and secure, they would more likely focus on their academic activities. In this context it can be said that most of the students felt safe in online education process it would lead them to focus more and gain learning motivation. As mentioned in the literature, according to Kong (2009), students have optimistic beliefs about their abilities that cause their self-confidence originally. Similar to the literature, participants described more positive internal factors which affect their learning motivations. Also, literature has indicated that students can hold the beliefs that ability can be improved with effort. Congruently, the participants indicated that they would believe more in themselves if they were determined to be successful. Additionally, Weiner's Attribution Theory (2005) and the theory's explanation of how attributions reflected individuals' beliefs about the causes of success and failure were mentioned in the literature of the study. In this context, it can be said that students attribute their belief that they will fail to feel lonely and their fear that they will have technical problems in the online education process. As a result, these attributions can affect the students' learning motivations. The research has also shown that the external factors affecting students' success beliefs include; the motivational speeches made by the teacher, appreciation, and encouragement, which tend to increase

the students' belief that they can succeed in the course. As mentioned in the literature, according to Kong (2009) if the teachers help students attribute their successes to ability and provide them more opportunities to experience success for the sake of setting an optimal belief of their learning ability, then this could enhance their learning motivations. Also, Huber and Helm (2020) indicated that teaching quality was essential during online education. Establishing or maintaining close contact with the students, including regular and timely feedback, was particularly important to help students learn and gain motivation (Hofer et. al. 2022). In this context, it can be said that during the online education process, the teachers' motivational speeches, feedback, encouragements, and appreciation positively impacted the students' beliefs about themselves and their learning motivations.

To answer research question 3, the research results indicated that the internal factors affecting students' goals were; the need to learn for the future, pass the courses, get high grades in online exams, and reinforce their knowledge. As mentioned in the literature, according to Akbaba (2006) if students' goals are very easy or very difficult, these goals negatively affect their level of motivation. Also, an effective learning goal should be specifically related to the subject to be learned. In this context, it can be said from the data; students need to learn for their future careers and reinforce their knowledge to create effective learning goals. Additionally, Guerrero-Roldan, et. al. (2021)'s data indicates that if the students felt insecure about passing the online courses, then their learning motivation decreases. This research results have shown that most students wanted to pass the courses and believed in themselves on this subject. In this context, it can be said that the goal of passing the courses contributed to the students' learning motivation. Also, the research results showed that the external factors affecting students' goals were; homework and studies, clues, being active during courses, communicative support, and care. Also, data showed that few but there were teachers lack of assistance/help in achieving students' goals. According to Wigfeld & Eccles (2000) if the teacher overwhelms the students during instruction, their negative evaluations of their capacity to handle the learning situation might result in lower motivation. In this case, it can be safely said that if the homework and assignment capacity is excessive, then the students' motivation can decline in online education process. Additionally, as stated before, teachers could assess the students' motivation levels and the level of realization of their goals by looking at their goals. Also, the teachers could help their students in creating effective goals. In this context, it is safe to say that the teachers helped their students achieve their goals and, in this way, benefited their learning motivations.

To answer research question 4, the research results indicated that the internal needs of students were; success, belongingness, reducing anxiety, and approval. Also, the research data showed that the external needs of the students were; communication, reducing anxiety and seeing understanding. Considering internal and external needs, some common needs have appeared in the research. The common needs determined internally and satisfied externally will be discussed here. As stated before, belongingness need, approval need, reducing anxiety need, autonomy need, and need for achievement are essential for students' learning motivations. Similarly, with the literature, these needs have also been revealed in the research results. According to Ryan & Deci's (2020) research data, if the students entered the course with satisfied autonomy needs, then they had more positive experiences in the course, as indexed by higher perceived competence and interest/enjoyment and by lower anxiety. In this case, it can be said that students have positive experiences in courses and gain learning motivation; the teachers can increase the sense of autonomy and satisfy the need for autonomy by shifting the responsibility to students and enabling them to make decisions themselves. Also, Reinhold et al.'s (2021) data showed that students with higher anxiety were less motivated. Additionally, Kuhfeld et. al.'s (2020) research has shown that if the students worry and have anxiety about health issues related to the virus and have psychological stresses, then it would affect their academic growth and learning motivation. In this context, it can be said that the teachers who help ease the anxiety of their students would help their learning motivation. Additionally, as Goodenow (1993) indicated that if a student felt included by teachers in the classroom setting, this would positively affect his learning motivation. The research showed that; due to the structure of online education systems-which can't provide face-to-face communication and interaction-students have felt lonely and felt like they didn't belong to the class. Also, they did not express that either teachers or friends did something to meet their belongingness needs. Additionally, similarly to Panisora et al., (2015) the approval needs of the students emerged in the research. According to the data, the students felt their need for approval was met by their teachers; thus, their learning and academic motivation could be influenced positively. As well to belongingness and approval needs, reducing anxiety needs was revealed in

the research results, similarly to the literature. The students emphasized this need in the internal and external needs sections of the study, and they indicated that their teachers' efforts met the need for anxiety reduction. Because anxieties are sources of decreased student performances and learning motivations, in this context, it can be said that the teachers' helped their students' learning motivations by listening to them, showing empathy, and teaching them how to cope with their feelings in a global pandemic environment.

The findings should be interpreted within limitations. The fact that the research had to be limited to only one university and faculty-led to many different opinions that could not be reached. In addition, it is a fact that a theoretically oriented faculty such as the faculty of communication cannot represent the students of all faculties during the online education period.

The impact of the mandatory changes in the education system during the Covid-19 period was reflected in both students and teachers. The present study's findings suggest that personal factors on learning motivations have had their share from this period because almost all the answers contained the impact of the pandemic. For further research, it can be suggested that qualitative research can be done on the teachers' teaching motivations during the Covid-19 online education process to understand the other side of the mirror. Also, it can be suggested that quantitative research would represent more students than qualitative research and with that more. In addition, a different type of faculty students can be the new sample to understand if the course types affect the learning motivations in the Covid-19 environment.

The findings provide theoretical and practical implications for researchers and universities/teachers. Covid-19, which has affected the whole world, has also led to many changes in the education system. Students and teachers have had their share of this change and have tried to keep up with the changing situation. They had to adapt to the online education system suddenly, and it affected students' learning motivation. This study focused on internal and external motivation that affects learning motivation and personal factors like; arousal, beliefs, goals, and needs that have an important role in forming learning motivation during the Covid-19 pandemic in Turkiye. For the learning motivation to be formed with whole meaning, it must be realized both internally and externally, and they must be mutually supportive. Students can be motivated both internally and externally by many personal factors. Teachers and educational staff need to know that they are students' social support and the students' arousal, beliefs, goals, and needs are essential for their learning motivation. This study can guide universities and teachers to update and redesign their teaching plans according to the new norms faced by students and teachers during other crisis periods such as the Covid-19 pandemic. The teachers should motivate their students to improve their self-esteem and think creative and flexible about any problems they face when dealing with online learning platforms. They also have to consider that motivating their students with their course contents and maintaining their interest and curiosity contributes to their learning motivation. Teachers can offer coping strategies for their students to cope with pandemic anxiety and this will allow them to promote the psychological well-being of students and their motivation to learn. It is important that students are supported by their teachers in providing materials and resources to motivate them to continue working even when schools are closed. The contact established with the teacher through direct or indirect communication can positively affect students' perceived motivation and success. Also, it is important for university infrastructure employees to focus more on the interaction function of educational software, ease of use, and quality of the online learning platform to increase their motivation to learn.

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MINORITY EDUCATION DURING THE PANDEMIC: THE CASE OF THE SLOVENE MINORITY IN ITALY

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ABSTRACT

Much research has been done on the first quarantine period in 2020, however little is known for what it concerns remote emergency teaching and learning in Italian schools with Slovene as language of instruction. No extensive research explored teachers' and students' perceptions of this remote learning period, nor analyzed their opinion about positive and negative aspects of online learning, especially those related to the teaching material in Slovene language, which should address the Italian program. The present article presents the analysis of online semi-structured interviews that involved 15 high school teachers and 15 students who teach or attend Italian high schools with Slovene as teaching language, and it aims to answer these questions. We found that teachers and students preferred face-to-face classes, since they faced several issues connected with remote learning, such as a lack of interaction during remote learning, technology and connection problem, health issues and psychological distress. High school teachers and students faced less problems than those reported by primary schools' pupils and teachers, since they are older and more independent than primary school pupils. High school students also communicated through several social applications and peers might have helped them to overcome the language obstacles.

Keywords: Remote teaching and learning, quarantine, COVID-19, Italy, Slovenian minority education, qualitative research.

INTRODUCTION

In Italy, high school students experienced two quarantines because of the national sanitary emergency connected to the spread of the COVID-19 infection. The first one started at the end of February 2020 (DPCM, 2020a; 2020b) and lasted until the end of the school year, i.e. June 2020. During that time, when emergency plans have been adopted by the government, elementary, middle, and high schools, as well as universities, had to close; students and teachers needed to adopt the so-called remote teaching and learning (Quattrone et al., 2020). Teachers used different learning and teaching approaches, among which online lessons were the most popular (Tejedor et al., 2020; Pellegrini & Maltinti, 2020). The Decrees of the Italian Prime Minister (DPCM, 2020a; 2020b) stated that teachers had to adapt their teaching method to remote learning, as well as their assessing methods.

The second lockdown, this time only for high schools, started at the end of October 2020 (DPCM, 2020c). The Ordinance from the Ministry of Health from the 24th December 2020 stated that high school might open at the end of the winter vacations (MS, 2020). Hence, high school students carried out remote teaching and learning for two months.

Italian researchers reported an increase in mental health issues, such as depression and anxiety, among the adult population (Rossi et al., 2020). Giovannella and colleagues (2020) are one of the first to have studied the effects of the COVID-19 pandemic on teachers' feelings, reporting that most teachers involved in their study would prefer face-to-face classes. Little research has however focused on psychological distress, increased anxiety, and stress levels both among teachers and students, nor has considered students' opinions about remote teaching. Furthermore, current studies have generally covered undergraduate and graduate level university students and teachers, but little focus has been put on high school students (cf. Hebebci et al., 2020).

In addition to common rapid changes and challenges within the European context and the specific Italian contest, the Slovenian minority in Italy was also faced with additional challenges and difficulties regarding education. In particular, due to the specificity of the education in Slovene language in Italy, teachers and students faced some fundamental issues with the availability of the teaching and learning material in Slovene language.

This is why we address the question about how teachers and students from Italian high schools with Slovene as teaching language perceived remote teaching during the second quarantine period because of the COVID-19 pandemic, with a particular focus on positive and negative issues that were exposed by teachers and students.

TEACHING AND LEARNING DURING THE COVID-19 PANDEMIC

During the COVID-19 pandemic, the learning process shifted from face-to-face to online instruction, which had different impacts on the quality of teaching and learning (Sahu, 2020; Adnan & Anwar, 2020; Alhumaid et al., 2020). The term "(emergency) remote teaching and learning" indicates a temprorary solution to an immediate problem, such as the COVID-19 pandemic (Bozkurt & Sharma, 2020; Hodges et al., 2020).

In general, remote teaching and learning meant a greater change in the way lessons were organized. Students reported they have had clarification sessions, videolessons, materials in text format, group work, individual work, group discussion and other (Goncalves et al., 2020). Also, different evaluation models were used, such as face-to-face assessing, online individual work, online group work, online tests, and others. (Pellegrini & Maltinti, 2020; cf. Basilaia & Kvavadze, 2020; Upoalkpajor & Upoalkpajor, 2020; Kim, 2020).

Also, students (Goncalves et al., 2020; Giatman et al., 2020) felt that their institutions and teachers were not prepared to organize online lessons or did not adapt their teaching methods fast enough. Students faced several problems with internet connection and technological equipment issues, (Adnan & Anwar, 2020) as well as with digital communication (Adnan & Anwar, 2020; Coman et al., 2020). Overall, research shows students were not satisfied remote teaching and learning (Goncalves et al., 2020; Coman et al., 2020) and their learning has worsened (Chen et al., 2020).

Higher level of anxiety among teachers and students was detected (Ardan et al., 2020; Husky et al., 2020; Cao et al., 2020; Gritsenko et al., 2020), as well as other physical distress (Huseyin, 2020; Bhattacharya et al., 2020; Leiros-Rodriguez et al., 2020; Majumdar et al., 2020; North et al., 2020; Karvounides et al., 2021).

Students argued that there was a lack of concentration (Goncalves et al., 2020), a lack of students' interaction (Coman et al., 2020; Goncalves et al., 2020), difficulties in time management (Goncalves et al., 2020) and lack of motivation and effort (Adnan & Anwar, 2020; Goncalves et al., 2020), they reported that processing information in remote teaching was harder and they indicated that the online environment is not suitable for learning (Coman et al., 2020). Moreover, an increased workload has also been reported as a limitation of remote teaching and learning (Wang et al., 2020).

On the other hand, students reported a higher time and location flexibility (Goncalves et al., 2020) and better academic results (Gonzales et al. 2020; Goncalves et al., 2020). Some students reported that working from home was more flexible and comfortable and there was no need to have cameras and microphones on (Serhan, 2020) and that perceived that remote teaching and learning benefits them (Surani & Hamidah, 2020).

During the COVID-19 pandemic, many teachers experienced higher levels of anxiety and psychological distress (Li et al., 2020; Akour et al., 2020), also due to a higher workload (Lepp et al., 2021) and bureaucracy work. The latter is one of the factors that led some teachers to burnout during the COVID-19 pandemic (Sokal et al., 2020a; Sokal et al., 2020b; Pressley, 2021). The teachers believe that online are less effective,

however more convenient than face-to-face classes, and were unsatisfied with the online teaching (Fauzi & Khsuma, 2020).

Thy also felt there was a lack of teacher-student interaction in online classes and engaging students in online activities was more difficult than in class. Teachers did not find online teaching as motivating for them as face-to-face classes. Moreover, teachers felt that students did not take online classes seriously and make lot more excuses for not attending online classes. Teachers also felt that there was a lack of interest and involvement during online classes. (Nambiar 2020; Rasmitadila et al., 2020).

Also, teachers (Fauzi & Khsuma, 2020) reported a poor facilities availability, while more than a third of the teachers reported internet connection problems or too expensive internet quota fees. Internet and infrastructure problems were also reported in other studies (Hebebci et al. 2020)

Some research (Alea et al., 2020; Mailizar et al., 2020; Cuder et al., 2020), point to the teachers' lack of knowledge and skills in e-learning use, the usage of technology for educational purposes. Teachers were not ready to transit from face-to-face to online teaching, since they did not have enough experience and skills.

Concerning Italy, some researchers found that the majority of the teachers still prefer face-to-face instruction, while some of them would prefer a blended education (Giovannella et al., 2020). Only a minority of the teachers prefer online lessons. Moreover, some teachers reported they did not have enough knowledge and skills to deliver online lessons and to prepare the digital learning material (Cuder et al., 2020).

THE SLOVENE MINORITY IN ITALY AND THE COVID-19 PANDEMIC

All these abovementioned issues proved to be common in the way how the educational institutions, teachers and students were faced with the situation of organizing and delivering remote teaching. However, minorities were generally more affected by the coronavirus pandemic in social and economic aspects of their life, including health and schooling (Eurac, 2020). In this paper we focus on one of the numerous minorities in Europe, the Slovenian minority in Italy.

The Slovene community in Friuli-Venezia Giulia is one of the national minorities living along the Slovene-Italian border. The Slovene community in Italy represents a well-integrated community, both from a social and economic point of view (Brezigar, 2020).

The Italian Republic recognizes the rights of Italian citizens that are part of the Slovene minority in the Trieste, Gorizia and Udine provinces, in particular those rights are guaranteed by the 2nd, 3rd and 6th article of the Italian Constitution, as well as by the 3rd article of the Constitutional law of the 31st January 1963 number 1 (Legge 38/2001). Those citizens, as well as other Italian citizens that are not part of the Slovene minority, have the right of attending schools in Slovene language (Legge 1012/1961), which are recognized as equivalent to Italian schools. Moreover, the school programs are the same as those present in Italian schools, where the subject of Slovenian language is added, as well as some topics in history and geography (Bogatec, 2015). Nevertheless, schools with Slovene as teaching language or bilingual instruction have some specificities and thus require a specific consideration, since they face specific issues (Baloh, 2012; Brezigar & Zver, 2019; Strani, 2011). For instance, in those schools, students would need textbooks in Slovene language, but still including the topics from the Italian curriculum. Furthermore, students would need specific didactical materials for the teaching of Slovene in Slovene language (Grgic, 2017; 2019). Students attending schools with Slovene teaching language have different language competencies and knowledge of the Slovene language, thus teachers need to adapt their strategies to the students' language skills (Brezigar & Zver, 2019; Baloh, 2004). Among those, there are also some students that use the Slovene language exclusively at school (Bogatec, 2015), since in at home they use mainly Italian language or other language.

Italian schools with Slovene as language of instruction have some specifics that distinguish them from the majoritarian Italian schools, consequently being both more flexible and fragile. The specificity of those schools is the teaching language, the linguistic competencies and knowledge of the students and their families, the peculiarity of the program and the learning material (Brezigar & Zver, 2019; Brezigar, 2020; Grgic, 2017; Melinc Mlekuz, 2019). The differences between majority and minority schools also concern the instruction and training of prospective teachers, which is required by the reform of the educational system "Buona Scuola" from the year 2015 (Sternad, 2016). The Republic of Slovenia has organized some

summer and autumn seminars, consultations with principals and other kind of seminars, which are specifically designed for teachers of minority schools (Sternad, 2016). Moreover, the teaching and learning material, also the digital one, in the minority language represents a non-neglectable issue (Grgic, 2019). Thus, on one hand, the online material that can be used by students and teachers from Italian schools, might not fit the interests of minority schools because of the language differences. On the other hand, online material produced by teachers and institutions in Slovenia, does not perfectly fit the request of the similarity of the teaching programs.

In addition to common rapid changes and challenges due to the COVID-19 pandemic, the Slovenian minority in Italy was also faced with additional challenges and difficulties. Concerning primary schools, sissues such as lack of teaching and learning material, textbooks and digital material in Slovene language, as well as the problem of communicating with students from families that do not speak Slovene, were present even before the national sanitary emergency and they presented even a greater obstacle during remote teaching and learning. Remote teaching represented an impediment for teachers to reinforce the knowledge of Slovene language in those students, who struggle with it. Also to some students, remote teaching and learning represented the only time when they heard and could use the Slovene language. However, such contact with the Slovene language was possible exclusively through videolessons, registered material and written digital material. Some parents were, due to the lack of knowledge of the teaching language, unable to help their children to overcome some possible difficulties (Bogatec, Brezigar & Mezgec, 2021).

For the Slovene minority in Italy, the pandemic initiated a process towards a life devoid of community interaction, including cultural and sports events and other activities that have been crucial for the maintenance and reproduction of the community itself for decades. Such activities, combined with schooling in Slovene, represent the cornerstone of the linguistic reproduction of the minority. For a considerable number of children, home schooling curtailed the opportunities to hear and speak the minority language, therefore weakening their linguistic skills and rendering the minority more vulnerable to processes of linguistic assimilation (Bogatec, Brezigar & Mezgec, 2021). The media of the Slovene minority in Italy provided additional educational materials and programs as did other media in Italy and abroad (Bogatec, Brezigar & Mezgec, 2021). The outbreak revealed in its crudest form the challenges of the educational system of the Slovene community in Italy and exposed its structural failings to a greater degree than ever before. This experience should serve as a final call to rethink the role of schools with Slovene as language of instruction and to invest a major effort into diminishing their marginalization and strengthening their added-value in this environment (Brezigar, 2020).

In the present paper, we aim to examine the perceptions of Slovenian students and teachers about remote teaching and learning during the second COVID-19 lockdown in Italy. We extend previous knowledge by investigating students' and teachers' opinions about the second quarantine period via an online semi-structured interviews.

PURPOSE OF THE STUDY

The literature review highlighted students' and teachers' aspects concernng remote teaching and learning. Moreover, little research has been done to verify the quality of remote teaching during the COVID-19 in the context of Slovenian minority in Italy or the specifity ot the Italian high schools. Hence, the questions about how these specific groups of students and teachers felt about remote teachign in that period remains unanswered by previous research. In the present study, we aimed to determine the perceptions of students and teachers in Slovenian schools in Italy on remote education during the second emergency remote teaching and learning period due to the COVID-19 pandemic. Specifically, we addressed the following aims:

RQ1: Which are the positive aspects of remote teaching and learning?

RQ2: Which are the negative aspects of remote teaching and learning?

METHOD

As we were interested in exploring and understanding the individual's perspectives on remote teaching and learning during the COVID-19 period, we decided to use a qualitative approach, which derives form the idea

that individuals can help to understand the world in which they live and work (Creswell, 2014). In particular, we used the semi-structured online interview method (Janghorban et al., 2014; Qu & Dumay, 2011).

Participants

Participants were students and teachers from 5 Italian high schools with Slovene as language of instruction in the Trieste and Gorizia provinces in North-Eastern Italy. The inclusion criteria for participation in the study were: (1) being a teacher or a student of an Italian high school with Slovene as language of instruction; (2) voluntary participation in the study.

From the population, we took a purposive sampling, which is common in qualitative research, and allowed us to produce maximum variation within the sample (Anderson, 2010). Teachers and students that fit the inclusion criteria, were contacted via email. Participants of the research were 15 high school students and 15 high school teachers.

Among students' participants, 7 were females (46.7%) and 8 were males (53.3%). Two students (13.3%) were 1st year students, 4 were 2nd year students (26.7%), 3 were 3rd year students (20.0%), 4 were 4th year students (26.6%) and 2 (13.3%) 5th year high school students. The average age of students was 16.1 (min=14, max=18) years.

Among teachers' participants, 3 were males (20.0%), while 12 were females (80.0%). Five teachers (33.3%) taught only to 1st and 2nd year students, 5 teachers (33.3%) taught solely to 3rd, 4th and 5th year students, while 5 teachers (33.3%) taught students from the 1st to 5th year. The average age of teachers was 38.8 (min=25, max=56) years. There were 3 mathematics and physics teachers (20.0%), 2 history and philosophy teachers (13.3%), 1 science teacher (6.7%), 1 art teacher (6.7%), 1 physical education teacher (6.7%), 2 English teachers (13.3%), 2 Italian teachers (13.3%) and 3 Slovenian, Latin, history and geography teachers (20.0%).

Data Collection and Analysis

Data was collected through semi-structured online interview forms. This form allowed fast coding and analysis of data, easy measurement, and comparison with the scope of the research. Two different interview forms were designed for teachers and for students. The first part of the interview consisted of collecting demographic data, such as gender and age. The second part of the interview included 4 open-ended questions. The initial draft of 6 questions, related to the literature review, was reviewed by two experts. The final edits were made in line with the experts' reviews of the draft and two questions were consequently removed.

Semi-structured interviews were prepared and, after obtaining the participants' (or their parents', if participants were minors) informed consent, an invitation to Google Meet was sent to them. Participants were informed that the interviews would be anonymous, and their data would have been protected. Moreover, the fact that there were no correct answers was stressed. Also, participants were informed that their answers would have only be used for scientific purposes. In the present paper, we identify students with S1, S2, …, S15, while teachers with T1, T2, …, T15. All interviews were recorded after having obtained participants' (or their parents', if participants were minors) written content; the average length of interview was M=41.2 minutes (min=12.3; max=73.5) for students and M=48.6 minutes (min=15.0; max=85.8) for teachers. Access to research data was guaranteed only to the researchers.

The collected data were analyzed with the content analysis method. Participants' answers were transcribed and analyzed in detail by the researcher. Codes reflecting participants' opinions were created. Such codes were grouped, and themes and sub-themes were introduced. The process was concluded by interpretating themes and codes associated with each other (Linneberg & Korsgaard, 2019). Data were analyzed with the aid of ATLAS.ti 9 (Friese et al., 2018).

Member checking (i.e. respondents' validation) has been done to ensure the reliability and validity of the presented results (Noble & Smith, 2015; Liao & Hitchcock, 2018). Member check of synthesized analyzed data a month after the data collection event was applied (Birt et al., 2016). Direct opinions of the participants were used to support the findings.

FINDINGS

Students' Perception of Positive Aspects of Remote Teaching and Learning

The content analysis showed that two students felt relaxed during remote education, since they could work at the comfort of their homes, there was no need to take the bus in the early morning, they sometimes had breakfast during online lessons or listened to the first hour of lessons from their beds. They had more free time, could eat lunch before and start writing their assignments even two hours earlier Students felt that waking up later in the morning and aking tests from home helped to reduce their stress and their concentration was higher. They also reported that tests are easier because they could cheat without being caught. As quoted by two students:

> I feel more relaxed at home, I'm here, in my bedroom, I don't need to wake up so early […] I wake up just few minutes before the lesson and I eat my breakfast during the first lesson […] I keep my camera closed, so teachers can't see me […] also during tests, so I can look up in the book or text my friends, who will eventually help me (S6).

> When I finish classes, I exit the online lesson and go to the kitchen, where I can start eating lunch that my mother prepared. This means I get rid of almost an hour to come back home from school, and I have more free time (S12).

In addition, one student (S6), who has experienced hihg anxiety level during face-to-face lessons, reported that working from home reduced high anxiety to meet his classmates and teachers, moreover he worked in a domestic, friendly, and protected environment and that working from home reduced the probabilities of getting the novel coronavirus infection.

Additionally, four students added that they enjoyed the usage of computers for education purposes. Teachers used virtual classrooms, where all the material was uploaded, so they were a click away from course notes. Moreover, all homework was uploaded on these platforms, which automatically created a "due-to" calendar, which is seen as useful from the students. For instance:

> Teachers put all homework on Google Classroom, I check it every day, to know which are the upcoming assignments and which have the priority. I think it is very useful and I would like to use it also the next year, because I can organize my time more efficiently (S1).

Students added that they like spending time on the computer, especially playing games, thus they are comfortable with technology. They also liked that teachers shared several YouTube videos, so they could enjoy a different lesson format, where technology was involved. Moreover, students reported that they have learnt to use the computer much better. Before the quarantine, they only had a basic knowledge of the computer, while especially during the second quarantine, students learnt how to convert a Word document in PDF, scan documents (to send them to their teachers), properly write an email etc.

Students' Perception of Negative Aspects of Remote Teaching and Learning

Most of the students also detected negative aspects of remote teaching and learning. They reported they had excesive workload and spent a lot of time, they even worked for school after midnight. They felt they had more homework during remote learning than when at school. Linked to spednig a lot of time working on computer they felt tired and under a lot of pressure and the fact that they could not have any social interaction with classmates and friends additionally stressed them additionally. Student S4 and S3 stated:

> When we were at school, we knew that at 1:30 PM everything was over, we went home. Yes, we did our homework, but that was it. Now, I'm working for school the whole day. I don't have a personal life anymore. I start school when I wake up and finish it when I go to bed. […] Yesterday, a teacher gave us homework at 10:30 PM […] When we were at school, if a teacher forgot to give homework during our class, that was it, no homework. But now, they send us materials and homework also by night (S4).

> During this period, I'm super stressed. I have a lot of homework to do, I need to study for tests, because I want to do well, despite the fact we are at home. I sometimes feel anxious, but I never felt this way before. It is a new kind of anxiety […] I'm anxious because I don't know if I will manage to do everything I need to (S3).

Nine students reported an increase in their anxiety levels. The uncertainty about the pandemic and the government restrictions caused higher anxiety in students, which was furthermore worsened by the excessive working load, tiredness, and stress. Furthermore, some students thought their families were also causing them higher stress. For instance:

> *Having my mother around the whole day makes me really stressed. She observes me, comments the lessons […] When I was at school, I could finally change the environment (S11).*

Some students reported to feel sadness, since they realized they cannot see their friends and classmates. The lack of socialization led one student to feel depressed and needs to take specific medication. Socialization was also mentioned as something students missed from face-to-face lessons. Students missed seeing their classmates, chatting with them, exchanging opinions, and having fun. Similarly, some students missed also seeing their teachers and debating with them about several topics. Student S15 stated:

> *I really miss seeing my classmates and friends. Going to school was also interesting because of the bus drive, where I saw my friends. I also miss teachers, because we have some very interesting debates in class and, of course, face-to-face explanations are better (S15).*

Two students also reported that they missed interatction with their classmates during lessons. They stated that during online lessons their classmates mostly have closed cameras and microphones, thus their participation in class is low or absent. These two students felt that an active involvement of all students was important, both socially and educationally. Students also missed communication with teachers. The communication between teacehers and students was reduced, which resulted in lower level of interaction and exchanging opinions with their classmates and friends, whichh would make learning more efficient, relaxed, and active. Furthermore, students felt they learn better from school, because the teaching quality is better, the teaching methodologies are more adequate (e.g. using the blackboard, solving exercises in front of the blackboard, watching a clip on YouTube) are the environment permits them to be more focused, concentrated on the studied topics. As it has been expressed by a student:

> *At home I can't fully concentrate. I'm distracted by my little brothers, who also have online lessons. Sometimes my parents are home, so they are watching me, which makes me anxious. I prefer going to school […] I feel I learn better and more; I need to be concentrated on the studied topics and the overall quality is better […] Teachers are also more relaxed […] when we are online I feel teachers are uncomfortable, hence their explanations are worse, more confused and less efficient (S7).*

Students noticed that teachers are not prepared to teach online, and they are lacking technological competencies. Teachers struggled with sending material, and explanations without the aid of the blackboard. Students also felt that explanations in class were better. Most of the students thought that lessons online are lacking proper explanations and there are too many PDFs being showed, or PowerPoints. Moreover, students stated they miss the exercises done in class, for instance with the aid of the blackboard. For example, we present the statement of student S10:

> *Our math teacher always used the blackboard and asked for volunteers to solve an exercise. I miss that a lot, because I think it is useful to try to practice by ourselves (S10).*

Students also missed taking excursions. They used to visit a lot of museums, art expositions, listen to several scientific symposia. Moreover, once a year, students went to a foreign European country and visit it. Most students missed those excursions, both because they represented a good opportunity for bonding and a good educational activity. Similarly, practical exercises and project works are less common during remote teaching and learning. Students stated they miss working on a project for a longer time, especially with a classmate. Student S7 stated:

> *Usually, we went to the school laboratory to make some chemistry and physics experiments. Now it is impossible to go to school. Once the teacher showed us a virtual experiment, and a video of a demonstration, but it is not the same. I miss when we had projects and experiments to do, I think I've learnt more through project work than in class (S7).*

A student (S9) added that remote learning permitted them to close their cameras and microphones, so they could do something else. For instance, he admitted he did other homework and assignments during other lessons. He added that during online tests, he and other schoolmates started a parallel online videocall, where

they could exchange information and help each other. He said that WhatsApp online was used by most of his schoolmates to cheat during online tests, alongside with some Skype chat groups or meetings. Moreover, the student added that sometimes he does not listen to lessons, because he is playing online with his friends and classmates. Regarding the question whether the lack of attentiton during on-line lessons impacted the grades, students reported that the grades did not change, mainly due to the that tests were easier and they had more opportunites to cheat.

> Sometimes when teachers ask a question, we don't hear it, because we are playing online, and we are connected through Discord. […] Discord is like WhatsApp, but for gamers. I get an invitation to join a game, so I just mute my microphone and close the camera, then I start playing. The problem is when the teachers ask us to interact. We need to pause the game and answer to the question. Sometimes my friends tell me the teacher is asking me something on our Discord chat. […] Yes, sometimes I feel bad for the teacher, but it is inevitable that when boys are left alone, we do something else (S9).

All but one student also stated they experienced more or less severe technical problems. Instable internet connection was reported by all 14 participants. Sometimes students had a misfunctioning microphone or camera. Students added that they had the possibility to borrow some pieces of technology from the school, however most of them did not ask for help.

For what it concerns physical changes experienced during remote teaching, five students reported no changes. Two students affirmed they had sleeping difficulties, since they had to stay up late to finish their homework and complete their assignments. Computer fatigue was identified as one of the greatest physical problems they experienced. Students reported to have sight problems; thus, they need more little pauses between one online lesson and the next one. Students reported to have some back pains and an incorrect posture, due to prolonged hours in front of the screen. Headaches also represented a greater issue; students were unable to listen to the lessons.

Teachers' Perception of Positive Aspects of Remote Teaching and Learning

Concerning positive feelings, some teachers felt remote teaching and learning as more relaxing than face-to-face learning. Working from home has been mentioned by some teachers as a positive factor, since a calm and domestic environment make them work better:

> I can work from a more relaxed environment, such as my bedroom, there is no need to wake up early and drive to school. I'm particularly stressed when I need to change classroom every single school hour, while at home I feel more […] relaxed, and if I need anything, I can just go to the kitchen, take a glass of water. I have all my books on my desk, I work quietly, I have less distractions. Also, I'm less stressed by the city traffic, parking the car. (T4)

Two teachers also felt hopeful and think of the quarantine as a strengthening opportunity. In particular, not only they believe that remote teaching is a challenge, which requires creativity, since every lesson needs to be different, appealing for students and of high quality, but they also feel that the COVID-19 remote education will eventually lead to a change in education. Some teachers mentioned that the COVID-19 pandemic will and has already increased the usage of technology in education. New programs have been used, teachers experimented new teaching methods and platforms.

> [T]he COVID-19 will finish, sooner or later, and I feel that remote teaching will make me stronger. Yes, I believe I will be stronger after this period. I will consider [this period] as a chance of personal growth […] I hope that all the troubles we are facing now will eventually lead to a reconsideration of education. [S]tudents often feel school as something negative, while during the COVID students are willing to go back to school. So, the situation has changed. Now students and parents do not feel school as a 'hell' and I hope they will start to appreciate more our job […] and value education (T1).
>
> I have never used GeoGebra before, but the COVID made me try to use it, to show students some geometry construction. I feel students were very motivated and liked using it (T12),

Teacher T5 stated that using some technological tools might be useful also during regular lessons, for instance:

> *We use Google Classroom and I think it is amazing. Last year we didn't have it […] I will use it even when we go back to school. I can assign homework, correct it online, no need to make photocopies, or take students' notebooks home (T5).*

Some teachers felt that remote education has also changed parents' views on school and understood that teaching is not an easy job. Since some parents were also working from home, they realized how hard are teachers working.

For what it concerns students' wellbeing, some teacher remarked that they feel that students are less stressed, since they are home, in a more relaxing and comfortable environment. Teacher also felt that students had less homework than when they were at school. For instance:

> *[…] they [the students] told me that they feel more relaxed now. They don't need to take the bus in early morning, they can arrange their schedule consequently […] I mean, if they don't need to spend one hour on the bus, this means that they can do something else during that time (T15).*

Teachers' Perception of Negative Aspects of Remote Teaching and Learning

Most teachers' opinions and feelings are negative. Many teachers felt bored, due to the daily routine. Since teachers spent the whole morning in front of a computer, with limited human contact, they felt that remote education has led them to a standardization of daily routine. Furthermore, spending a lot of time in front of a computer or other technological device has increased the stress levels in teachers and some of them felt they had too much work. Preparing lessons in a format they are not used to, took them a lot of time, which they do not spend with their families anymore, but rather invest in correcting assignments and preparing future lessons. Furthermore, some teachers felt an increase of stress levels also because the school principal used to send them several e-mail communications every day, which required additional bureaucracy, such as writing reports, programs, and assessment of the quality of remote teaching. As illustrated by teacher T13:

> *I have too much work. I work in the morning, in the afternoon, in the evening. I have no more schedule, I need to work, correct homework, prepare the lessons. We [the teachers] don't have any free time, because when we do not work, we must correct homework. I feel I can't manage my time anymore. Before the quarantine I had time for my children, but now […] I need to work late. […] Furthermore, sometimes I get three, four or even five emails every day from our principal, who wants us to write extensive reports about the quality of the internet connection of our students, and how are they learning now. This is so stressful (T13).*

Along with stress and boredom, an overall feeling of sadness and depression was also reported from the teachers. Teachers felt that the lack of social interactions with students and colleagues made them unhappy and they felt alone. A teacher stated:

> *I am home alone, since my husband is working, I'm feeling lonely, […] no colleagues to interact with […] I'm all by myself, nobody to talk to, no students. I feel alone (T11).*

A feeling of resignation has also been found among some participants, who have felt unable to control the situation. Some teachers also felt they had been left alone, abandoned by their principals and other school authorities. Three teachers emphasized that principals do not understand their and students' pain and, conversely, require more work and bureaucracy. With some teachers the feeling of being abandoned is linked to an overall feeling of anger:

> *The principal does not understand our struggles, the concrete problems we are facing right now. There is no support from him, but only additional work, such as writing reports. He completely abandoned us and is in his ivory tower, writing regulations that […] nobody cares about. The Ministry is writing some laws and decrees that are impossible to follow. For instance, the Matura [Final State Exam]: they gave us blurry information about how it is going to be. How can we prepare our students for something that we don't know? They don't care about us. I'm furious that our principal cares more about following every single rule that the Ministry sends him, than about our wellbeing. The situation is falling apart. Schools need to reopen, because if they don't do, the whole population will start a revolution. And I will be in the very front line (T12).*

When participants were asked to identify which aspects of face-to-face learning they missed the most, two major issues have emerged. On one hand, many teachers missed a physical and intellectual contact with the students. Greetings, eye contact, visual expressions and communication have been mentioned as important factors of the face-to-face learning, which have almost disappeared with remote teaching. Teachers felt that with no eye-contact or other communication, lessons are becoming boring and less effective than in-class lessons. At this point, many teachers mentioned that they are facing greater problems with students having their cameras and microphones constantly closed. Not seeing the students lead teachers to think that they are doing something else and are not focused on the topics that are presented. Furthermore, when teachers call their students, some of them do not even answer, hence the lessons are overall slower and assessing, whether did students understand the covered material, becomes harder:

> *Eye contact, seeing my students, is what I miss the most. Now almost everybody has a closed camera. I don't even recognize my students. I can't see my students now because some of them don't want to open their cameras. I miss their physical presence, when I could see them in class […] When we were in class, we [the teacher and the students] always talked, had interesting conversations about several topics, like politics, ethics. Now this is gone, because nobody wants to open their microphones and talk to me […] I miss talking to my students, having a real conversation with them. Now everything seems so mechanic, so dehumanized (T7).*

On the other hand, issues with teaching methodologies have been highlighted. Teachers missed regular, in-class lessons mainly because online students are not as collaborative and participative as they were during face-to-face instruction. Teachers noticed that students do not ask as many questions as they did in class, thus active participation during online lessons is seen as an additional greater deal that needs to be clarified by principals and authorities. We present the following statement:

> *When I taught in class, students were very active, they participated a lot. They asked questions if they didn't understand something […] they asked. I could tell if students understood the material. Now I can't say it anymore. There are few students that have their microphone constantly active, so they are answering me, if I ask something […] but most of the students are quiet. They don't say anything. So, I don't get if they understand [the lesson] or not. I miss when my students were actively involved during my lessons. Now everybody has a closed microphone, so the conversation is absent (T10).*

Closed microphones and a lack of communication with students eventually led teachers to miss traditional evaluation and test-taking. Teachers feel that many students lie about the actual working of their electronic devices, for example by saying that their microphone is not working, or their camera is broken. Teachers feel impotent in front of such affirmations since they cannot check whether students really face some technological issues. Thus, teachers feel that online lessons cannot lead to an objective measuring of students' real competencies, abilities, and knowledge, since many of them have been caught cheating with the aid of parents, WhatsApp groups with friends and classmates, books and notebooks. As an example, we present the following statement:

> *We all know students' grades are now unobjective. They cheat, I'm aware of that. So, I must say that I miss a concrete, real evaluation of their knowledge. I feel that they get false information about their real knowledge […] I miss when students came in front of the blackboard and did some exercises on it, and so I could assess if he or she understood the covered material. […] Now parents are solving their homework […] During an online test I distinctly heard a mother dictating a whole exercise to her daughter. You can also hear their phones vibrating all the time during tests and assignments, I can hear the sound of the WhatsApp Web application (T2).*

Most of the teachers report that they work better at school. Teachers feel that having face-to-face lessons is better and more efficient. They stated that they feel more distracted at home, because the domestic environment leads them to concentrate on other things, such as preparing lunch, cleaning the house etc. The scholastic environment, on the other hand, helps teacher to maintain their concentration high and the quality of their teaching is better. Teaching online meant for many teachers a transition from the blackboard to other programs, such as Paint or Inkodo, which are used to show students how to solve exercises. Teachers also shared their screen, used PowerPoint presentations or other PDFs:

> *At home I'm very distracted, maybe because I have other thoughts, while at school I'm more concentrated [...] I know I'm at work, so I need to be prepared, I teach better [...] I concentrate more at school, so teaching at school is of course better [...] At school I can write on the blackboard, while at home I need to use Paint on the computer [...] my handwriting on Paint is terrible, I can't teach well online (T11).*

Teachers found socialization as another important factor that needs to be considered. Working at school meant a continuous exchange of information, both regarding students, teaching methods, projects and other learning activities. Moreover, a social component plays an important role, since many teachers mentioned that remote teaching meant an impossibility of gathering with other teachers, socialize and discuss teaching ideas. Teacher T3 stated:

> *When we are in the [teachers'] lounge, I exchange my opinions with my colleagues: this is very important, and now I can't do it anymore [...] Taking a coffee with my colleagues is also an important part of my day, since some of them are my close friends (T3).*

Not only did teachers feel that they their teaching was better at school, but it also was highlighted that students learn better from school, making it better to work at school. Teachers perceived that face-to-face lessons were more efficient than online ones since students are more concentrated and consequently learn more. Also, teachers found that they covered more material at school than online. This fact is also connected to the teachers' levels of concentration. For instance, some teachers highlighted that working from home make them more easily distracted. Teacher T2 affirmed:

> *At home I cannot concentrate. I have a young daughter [who was then also learning online] and it is impossible to work if she's around. I then need to stop the lesson, go to fix her connection [problems] and then go back to work. I need to be at school, otherwise I cannot do anything (T2).*

Teachers identified some other disadvantages of remote teaching. Technical problems have been reported to be the one of the biggest difficulties of remote teaching, since slow internet connection, old or slow computers, and malfunctioning electronic equipment lead to lower quality teaching and, consequently, learning. Many teachers reported major difficulties with their internet provider, or living in some areas, where there is no optical fiber, thus their internet is slower. Some teachers added that they cannot afford better internet or new computer, nor better microphones and cameras. Additionally, some teachers stated they bought by their own graphical tablets, to make it easier to write formulas and draw pictures. A lack of technical assistance has also been reported by several teachers, who faced greater issues with connection, computers, and online learning platforms. For instance, teacher T11 reported:

> *I don't have a good internet connection at my home, since where I live [...] there is very bad internet [...] Our school does not have a technician, so I don't know who to call. Sometimes my husband helps me, sometimes my older son. But it is impossible to work is such conditions (T11).*

Besides having some problems with technology, some teachers stated that they have an excessive working load. Teachers are convinced that remote teaching and learning requires long lessons planning, preparations of the material, selection of the material they are going to show or send students, as well as correcting assignments online. The working load is furthermore increased, since many parents and students contact their educator in the afternoon or evening hours, that is after lessons. Some teachers reported that they have been contacted by several parents that wanted an online teacher-parents meeting. Parents also requested teachers' telephone numbers to contact them, thus invading teachers' privacy. Teacher T1 affirmed:

> *Some parents wanted a teacher-parent meeting in the afternoon. In normal conditions, I ask them to come by at school in the morning hours, however now I need to be ready, 24 hours a day, to answer to an email [...] Sometimes students contact me through WhatsApp in the evenings, to ask me how a certain exercise should be done (T1).*

The already mentioned topic of students' unobjective assessment has also been emphasized by several teachers, who think assessing students' knowledge in remote learning conditions is impossible. Teachers stated they do not get feedback information from students, mainly because of a lack of communication and interaction during online lessons; moreover, several students cheat on assignments and other written tests. A teacher affirmed to use a specific online plagiarism-detector, to avoid unnecessary correcting of copy-pasted assignments. In particular:

> *It is impossible to assess students' knowledge. I don't know if my students understand the covered material. I believe they don't, but they all have splendid homework and perfect tests. Sure, they just copy-past some Wikipedia entries and that's all. I decided to use an online plagiarism detector, to avoid correcting Wikipedia (T12),*

and:

> *Remote teaching doesn't allow me to verify, whether my students understood the lesson. I ask them: 'Did you understand? Do you have any question?', but they don't answer me. In class it would be different, since I could see the expressions on their faces, now they just say 'yes' or don't answer (T3).*

Some teachers experienced some physical changes, alongside with physiological distress. Two teachers experienced sleeping problems and disturbed sleep. Those teachers could not get asleep due to the stress related to remote teaching. A teacher reported that before sleeping she thinks about the next day and, since the quarantine began, could not get asleep before 1 AM. Computer fatigue represented the most common topic of physical consequences of remote teaching. The majority of teacher reported to have sight problems or eye soreness. Teachers feel that a prolonged usage of the computer caused some sigh issues. One teacher mentioned that her sight dropped from 1.25 diopters to 2.0 diopters. Several teachers mentioned to have an incorrect posture, which eventually leads to pains in their necks and backs. Headaches are also seen as a major byproduct of remote teaching, since unusually long periods in front of the computer cause hemicrania, which consequently lowers the productivity and efficacy of the teacher.

DISCUSSIONS AND CONCLUSION

The COVID-19 pandemic caused a transition from traditional face-to-face education to remote teaching and learning. Some studies proved that both students and teachers felt that remote teaching and learning was less effective than traditional face-to-face instruction. Both, positive and negative aspects of remote teaching and learning have been identified in previous research, however little effort has been made to understand better the situation during the second COVID-19 emergency remote education period, particularly for minority students and teachers. Our research aimed to explore students' and teachers' perceptions about remote teaching and learning learning in Italian schools with Slovene as language of instruction.

Findings showed both teachers and students pointed positive as well as negative aspects of remote teacning and learning during Covid. Students reported feeling more anxious and stressed than while at school, confirming results from previous quantitative studies (Ardan et al.2020; Husky et al., 2020; Cao et al., 2020; Gritsenko et al., 2020). The main reported contributors to increased feelings of anxiety and stress were excessive working load and a lack of socialization. Moreover, students felt more tired, which was the result of working for prolonged hours in front of the computer screen, but also being awake until late hours to finish their homework. Students and teachers also faced with saddnes as a consequence of the uncertainty of the situation and social distancing. The feeling of sadness due to social distancing has also been reported in research concerning the general population (Cerbara et al., 2020). On the other hand, two students reported feeling more relaxed, since they were working from home, a more comfortable and domestic environment (Goncalves et al., 2020). Literature reported cases of some students working better from home, due to the flexibility of remote learning, such as more flexible scheduling of the activities, the comfort of one's home, the possibility of having their cameras closed etc. (Serhan, 2020; Surani & Hamidah, 2020).

Three teachers felt they had more energy, since they were working from a less stressful environment. On the other hand, some teachers expressed that working from home was more boring, since every day they did the same things. These results are in concordance with those found for the general population (cf. Chao et al., 2020; Liang et al., 2020). Boredom could eventually cause other psychological distress, such as sadness, stress, anxiety, and depression (cf. Droit-Volet et al., 2020; Chao et al., 2020). Indeed, the majority of teachers reported to feel more stressed than before, confirming the findings of Li and colleagues (2020), and Akour and colleagues (2020). The participants argued that an increased working load was making them struggle with higher anxiety and stress, as well as more bureaucratic work and prolonged usage of computers made them more stressed than before the quarantine. Thus, increased stress levels were present both among teachers and students are mostly the consequence of social distancing, isolation and feeling of uncertainty,

however they are moreover related to an overall feeling of resignation and anger (cf. MacIntyre et al., 2020). We address the problem of increased stress and sadness levels among teachers as a greater issue that needs immediate attention from legislators, who could decide to provide additional professional psychological help.

Both, teachers and students missed a more active involvement of students and classmates during online lessons, which confirms the results of some previously mentioned researches (Nasution & Ahmad, 2020; Adnan & Anwar, 2020; Goncalves et al., 2020; Rasmitadila et al., 2020; Nambiar, 2020; Alea et al., 2020). They reported that many students had their cameras and microphones off: teacher-student interaction was thus negatively impacted. Moreover, some students reported that they were not listening to the teachers' explanations, since they were playing online videogames with their friends and classmates. A lack of communication was considered to lower the learning and teaching efficacy, since less questions are made and assessing students is more difficult. Teachers reported that they struggled to understand whether students mastered the program also due to the presence of cheating. Teachers' worries have been confirmed by students stating that during tests they communicate through the class' WhatsApp groups. Our findings are thus coherent with some earlier studies (Bilen & Matros, 2020; Nguyen et al., 2020).

Moreover, students missed teachers' face-to-face explanations and solving exercises on the blackboard, which was partially confirmed also by teachers, who felt the lesson format significatively changed. Students missed also project works and excursions, both learning activities that also involved socialization. Furthermore, seeing classmates and teachers was also seen as an important part of the face-to-face instruction (cf. Putri et al., 2020; Adnan & Anwar, 2020).

The minority of the participants reported they worked better from home, since the environment was more relaxed and comfortable. On the other hand, most of the participants feels the opposite. Teachers and students preferred working and learning at school, because of socialization, that is confronting and exchanging information with their friends, colleagues, and classmates, but also because learning and teaching were of higher quality. Concentration was mentioned as a greater issue both by teachers and students. Participants reported that their concentration levels during remote teaching and learning are lower than during face-to-face classes, thus confirming earlier findings (Goncalves et al., 2020). Teachers and students felt that the environment represented a limitation to their concentration levels. Working from home represented bigger distractions, such as dealing with families. Surprisingly, teachers nor students mentioned motivation, which literature identified as one of the leading factors that was impacted by the COVID-19 remote teaching and learning, and lower levels of motivation have been reported (Adnan & Anwar; 2020; Goncalves et al., 2020; Coman et al., 2020; Nambiar, 2020).

For what it concerns the positive aspects of COVID-19 remote teaching and learning, contrarty to findings about hihger level of stress, in some situations students reported they felt less stressed. Waking up just before the lessons, no need to take the bus or drive to school, as well as no need to spend a lot of time to return back home has all been seen as a positive consequence of remote learning. For what we know, at the moment no extensive research has been made to explore the abovementioned facts, thus making our research one of the first to report these factors. Additional research is thus needed to deeply understand the described results. As a second positive aspect of remote teaching and learning, both teachers and students mentioned the using technology in education. Some tools for virtual classes have been mentioned to greatly help both students and teachers to organize assignments. Students and teachers expressed the opinion they wanted to continue using such online tools even after the quarantine (cf. Goh & Sandars, 2020).

As for what it concerns the negative aspects of remote teaching and learning, some similarities among teachers' and students' answers have been found. Both categories of participants agreed that technical problems represented a major issue. Instable internet connections and technical difficulties with electronic devices have been mentioned as a big limitation of remote teaching and learning, which furthermore negatively impacted the quality of teaching and learning. Our research support previous findings, which identified internet and technical problems as non-neglectable issues of remote education (Adnan & Anwar, 2020; Coman et al., 2020; Surani & Hamidah, 2020; Giatman et al., 2020; Fauzi & Khusuma, 2020; Hebebci et al., 2020; Alea et al., 2020) Thus, policymakers need to consider such issue when planning future actions in remote teaching and learning, more stable and cheaper internet connections need to be provided (Rasmitadila et al., 2020; Fauzi & Khusuma, 2020), as well as technical support to students and

teachers (Putri et al., 2020). Secondly, working load has been mentioned as a greater impediment caused by remote teaching and learning. Students feel they have too many assignments, which are delivered also during afternoons and evenings. Findings are supported by the research of Wang and colleagues (2020), who detected that students' class workload increased. During face-to-face learning, teachers could assign homework only during their lessons, while students noticed that during remote learning the situation has changed. Teachers also complained about excessive work, indeed they faced an increased bureaucratic load and needed to prepare lessons or adapt materials for online classes. Such work increased their stress levels, confirming the findings of Lepp and colleagues (2021). We suggest school administrators and policymakers to consider teachers' wellbeing and possible burnout during COVID-19 (Sokal et al., 2020a; Sokal et al., 2020b; Pressley, 2021) as additional risk factors, thus decreasing the overall workload.

Both teachers and students reported a lack of communication: due to social distancing, technical problems and other issues related to online learning, student-teacher communication has drastically changed, which negatively impacted students' learning and teachers' work (cf. Nambiar, 2020; Coman et al., 2020; Hebebci et al., 2020; Alea et al., 2020). Furthermore, the quality of teaching and learning decreased. Students felt their teachers were not teaching as well as they did in class (cf. Goncalves et al., 2020); this fact was confirmed by teachers themselves, who felt that remote teaching and learning is overall worse than face-to-face instruction. Hence, our results support the existing literature (Goncalves et al., 2020; Chen et al., 2020; Coman et al., 2020).

We also found that the majority of the participants stated that they experienced some physical distress. Both teachers and students said they had some difficulties related to sleeping. Late night hours to finish assignments and preparing lessons, jointly with higher stress levels, caused sleeping disturbs, such as difficulties to get asleep or disturbed sleep. The problem has been investigated also by some other works, who analyzed the problem from a medical point of view and concluded that several factors, among which higher levels of stress, impacted sleeping and, consequently, people's wellbeing (Casagrande et al., 2020; Huang & Zhao, 2020; Marelli et al., 2020). For instance, lack of sleep due to stress caused by remote teaching and learning could eventually lead to more severe psychological problems. Thus, we recommend policymakers to address the question about students' and teachers' wellbeing connected to sleep as soon as possible, since both individual health and learning process might be negatively impacted by sleeping issues. Additionally, both teachers and students mentioned sight problems, due to a prolonged exposure of the computer-screen light. The problem of eye soreness and sight problems has been already addressed by ophthalmologists, who found deteriorating eye-health (Huseyin, 2020) and suggested immediate action to avoid major conditions (Bhattacharya et al., 2020). An additional problem represents the incorrect teachers' and students' posture in front of the computer, since prolonged hours in unhealthy sitting conditions might lead to neck and back pains. Our research confirms the findings of several other researches (Leiros-Rodriguez et al., 2020; Majumdar et al., 2020; North et al., 2020). Furthermore, we found that many teachers and students stated they had headaches, which caused them several issues with their work and studying, thus affecting both the quality and efficacy of teaching and learning. The results are supported also by earlier research (Karvounides et al., 2021).

An additional important result regards the teachers' and students' perception that educators were not ready to shift from face-to-face classes to remote teaching and learning. Teachers did not get any specific training on how to deliver lessons in an online format, thus making their teaching less efficient. Moreover, teachers had several problems with technology and received little or no technical assistance, which is in line with previous research (Alea et al., 2020; Mailizar et al., 2020; Cuder et al., 2020).

With the present research we have shown that students and teachers from the Slovene minority in Italy faced similar problems as the majority students' and teachers' population and our findings are in agreement with some previously found results. On the contrary of what it was expected, high school students and teachers faced less language-related issues than primary school pupils and teachers (Bogatec, Brezigar & Mezgec, 2021). Such results might be the related to students' age. In primary schools' pupils, especially those who face some troubles with the Slovene language, need more help from their parents and teachers. Parents, however, might have been busy with their work, thus making it hard to help their sons to overcome the language difficulties and help them with their homework or other assignments. On the other hand, high school students, who were involved in the present study, are older and presumably more independent, thus decreasing their language obstacles. Furthermore, as we have shown in this work, students were sometimes

communicating through several social applications, where they have received help from peers, thus limiting even further their difficulties with communication in Slovene language.

Our work confirmed many students and teachers are unsatisfied with remote education (Goncalves et al., 2020; Giatman et al., 2020; Fauzi & Khusuma, 2020; Hebebci et al., 2020; Giovannella et al., 2020), especially for what it concerns various internet problems, stress and anxiety. Our research identified some novel threats that were not previously mentioned by other literature, such as students playing video games during online lectures, and cheating through the class' WhatsApp group. We gathered information not only about students' and teachers' issues with remote teaching and learning, but also about their psychological and physical distress. We thus suggest legislators and other school authorities to act as soon as possible to protect teachers' and students' health and wellbeing, as well as preserving the overall teaching and learning quality.

We suggest school principals and other school authorities to reduce the duration of online lessons, to allow both teachers and students to take frequent shorter pauses, relax eyes, and do stretching (cf. Shariat et al., 2020). We also suggest educators not to underestimate the role that anxiety and stress play in the learning process. We emphasize the importance of lowering students' stress levels by reducing the working load and make lessons even more entertaining and joyful (Aliyyah et al., 2020) and, whenever possible, provide professional psychological help (Irawan et al., 2020).

Regarding teachers' lack of technological knowledge and skills, we suggest policymakers to rapidly evaluate the possibility of introducing specific courses about remote teaching for pre-service and prospective teachers, in order to be prepared for a possible new sanitary or other emergency. We suggest introducing basic information and communication technologies courses, as well as specific remote-learning-oriented courses, in order to maximize the efficiency of remote teaching formats.

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HOW ATTITUDES TOWARDS E-LEARNING AFFECTED THE ACADEMIC ACHIEVEMENT DURING THE COVID-19 PANDEMIC: AN EXAMPLE OF A NURSING SKILLS TEACHING

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ABSTRACT

It is known that the students' attitudes toward e-learning are an important factor in achieving the targeted learning achievement. The aim of the study was to determine the relationship between attitudes toward e-learning and the academic achievements. This cross-sectional and correlational study was conducted with a total of 135 first-year nursing students. Data were collected via Student Information Form, General Attitudes toward E-Learning Scale, Vital Signs Skills Laboratory Practice Assessment Videos. Two-Way ANOVA, Pearson correlation analysis, multiple linear regression analysis were used to analyze the data. The total mean score of the first-year NSs' general attitude scale toward e-learning was found to be 52.58±15.93. A statistically negative correlation was found between the "avoidance of e-learning" factor and the NSs' vital signs skills general achievement scores (r= -0.185; p= .035). Gender (β1= 5.399, p= 0.001), receiving adequate counseling and help on using the e-learning platform (β1= 4.895, p= 0.022) and avoidance of e-learning (β1= -0.222 p= 0.046) explained 20.9% of the variance in vital signs overall achievement score. The results showed that negative attitudes and negative satisfaction with e-learning may lead to a decrease in e-learning academic achievement.

Keywords: Academic achievement, attitude, emergency remote learning, e-learning, nursing skill education.

INTRODUCTION

Nursing education is a critical component in the preparation of nursing students (NSs) for the profession by having a level of cognitive, affective, psychomotor competence and confidence necessary for them to practice independent nursing roles (McDonald, Boulton & Davis, 2018). This is also a necessary element for achieving safer and better quality patient care results with nurses who have the desired level of competence in nursing practice standards, along with changing health care needs (Chen, Liu & Chao, 2021; Fukada, 2018; Nashwan, Mohamed & Kelly, 2020).

The rising number of cases of COVID-19, which first appeared in Wuhan, China in December 2019 and soon affected the whole world, has led to many negative consequences, such as economic problems, isolation in social life and especially healthcare-related processes (Elbogen, Lanier, Blakey, Wagner & Tsai, 2021; Moradi, Mollazadeh, Karimi, Hosseingholipour & Baghaei, 2021). One of the areas where the alarming effects of the pandemic have been observed and have disrupted the most is the education process (Kutah, 2021). As a global public health problem, many educational institutions have been closed due to the measures taken by governments to control the spread of COVID-19 and the transition was done quickly for the education to be carried out online (Lovri´c, Farci´c, Miksi´c & Vcev, 2020). Similar to the rest of the world, following the detection of the first case of COVID-19 in Turkiye, it was decided to suspend education also in higher education as of March 16, 2020 (Council of Higher Education, 2020). NSs are one of the groups that have been most affected by the impact of the COVID-19 pandemic on their education process (Michel et al., 2021). In nursing education, where theoretical and clinical education forms very important elements by complementing each other, the use of online teaching methods, which has been considered a supportive element until now, has become a necessity rather than an option (Nashwan et al., 2020; Park, Moon & Oh, 2022).

E-learning is a concept within distance education. Distance education is an institutional training activity in which learners, teachers, and teaching materials in different places are brought together through information and communication technologies in cases where it is not possible to implement physical classroom teaching (Cevik & Bakiogli, 2021). The concept of e-learning is a learning method that can is an interaction with the visual and auditory responses provided by computer technology, which is realized by the individual learning by himself and at his own pace over the internet/intranet or a computer network, there is no time and place limitation in accessing information, and which connects the learners and the teacher with synchronous or asynchronous methods (Harerimana & Mtshali, 2021; Logan, Johnson & Worsham, 2021). E-learning can also be defined as the use of information and communication technologies to improve web-based, computer-assisted, digital or online learning (Kim and Park, 2021). Given the contributions of technology to our lives nowadays, e-learning has become an important tool that is of great interest globally, including the academic learning process of students (Suliman, Abu-Moghli, Khalaf, Zumot & Nabolsi, 2021). While e-learning offers learners the opportunity to support the development of their independent skills at an effective and individual learning pace, with repetitions appropriate to their needs, it also provides contributions for educators, such as conducting the course at any time and in any environment, sharing the educational materials updated in line with the needs quickly with the learners, and using different educational technologies (Javadi-Pashaki, Ghazanfari & Karkhah, 2021; Logan et al., 2021; Singh et al., 2021; Urstad et al., 2021).

Given the negative results that may be encountered related to patient safety, effective teaching of basic nursing skills and the ability of students to apply these skills in patient care is one of the critical priorities in nursing education. In this context, the fundamentals of nursing course is a basic course in which students learn and experience the practice of basic nursing skills in patient care for the first time (Sheikhaboumasoudi, Bagheri, Hosseini, Ashouri & Elahi, 2018). Furthermore, the use of teaching methods that not only facilitate students' level of learning basic skills but also make learning permanent is an important consideration in the teaching of the fundamentals of nursing course (McCutcheon, Lohan, Traynor & Martin, 2015). It is a well-known fact that the supportive use of e-learning, together with theoretical and practical education, contributes positively to the teaching of nursing skills (Keefe &Wharrad, 2012; Sheikhaboumasoudi et al., 2018; Voutilainen et al., 2017). However, during the pandemic when face-to-face education was not possible, e-learning was the only element ensuring the continuity of nursing education. This also brought up many concerns such as the failure to achieve the targeted learning outcomes, especially at the point of teaching basic nursing skills due to the interruption of laboratory and clinical practice training for both nursing educators and nursing students, the inability to provide interaction between students and instructors and the inadequacy of students' access to e-learning technologies (Ard, Beasley, Nunn-Ellison & Farmer, 2021; Kalanlar, 2022; Michel et al., 2021; Suliman et al., 2021; Terzi et al., 2021).

With the increasing use of e-learning technologies during the pandemic, another point that studies in the literature have drawn attention to is that either positive or negative perceptions and attitudes of learners toward e-learning are an important factor in achieving the targeted learning achievement (Cevik & Bakiogli, 2021; Guillasper, Soriano & Oducado, 2020; Park, Lee & Bae, 2010; Kim, Hong & Song, 2019). In a study,

indicated that NSs' expectations play a role in their readiness for online learning (Oducado & Estoque, 2021). Although there are various studies examining the attitudes of NSs toward e-learning both internationally (Oducado & Soriano, 2021; Olum et al., 2020; Thapa, Bhandar & Pathak, 2021) and nationally (Keskin & Kurtgoz, 2020; Ozdemir & Sonmez, 2020; Terzi et al., 2021) the number of studies focusing on how attitudes toward e-learning affect the academic achievements of NSs during the pandemic is limited. This study, planned based on this need, is thought to contribute to the limited literature on the subject and will provide guidance to nursing educators in the planning of efficient and effective use of e-learning.

PURPOSE OF THE STUDY

This study was carried out to determine the characteristics and attitudes of first-year NSs, who have experienced the learning of basic nursing skills through distance learning, toward e-learning, and to examine the relationship between NSs' attitudes toward e-learning and the achievement of learning the skill, through the example of vital signs skills teaching.

METHOD

This cross-sectional and correlational design study was carried out in the Nursing Department of a Health Sciences Faculty in the Aegean Region between 15.03.2021 and 15.06.2021.

Participants

The sample of the study consisted of 130 first-year NSs, out of 135 first-year NSs enrolling in the fundamentals of nursing course in the above-mentioned educational institution in the 2020-2021 academic year, who attended the online course conducted synchronously, submitted the vital signs skill practice video recordings requested for the laboratory practice assessment of the course at the end of the term, answered the questions fully in the online survey link shared with the students, and volunteered to participate in the study. The minimum sample size in the study was calculated as 101 among 135 first-year NSs with a 0.05 margin of error, according to the n= Nt²pq/d²(N-1)+t²pq formula (Basturk & Tastepe 2013), which is used when the number of individuals in the population is known. The NSs to be sampled were invited to study by using a simple random sampling method. The participation rate in the study was 96.2%.

Data Collection and Analysis

Student Information Form, General Attitudes toward E-Learning Scale, Vital Signs Skills Laboratory Practice Assessment Videos, Vital Signs Skills Assessment Checklist were used to obtain study data. While the data from the Student Information Form and the General Attitudes toward E-Learning Scale were collected with the online questionnaire created using the Google forms, data on the achievement scores of first year NSs on vital signs skills were obtained from the scores that observers gave on skill practice videos prepared by the NSs.

Student Information Form

This form includes a total of 15 questions, prepared by the researchers based on the literature review (Chan et al., 2021; Ozdemir & Sonmez, 2020; Park et al., 2022; Sasmal & Roy, 2021), which aim to determine the individual (6 questions) and e-learning related characteristics (9 questions) of the first-year NSs participating in the study.

General Attitudes toward E-Learning Scale

The General Attitudes toward E-Learning Scale was developed by Wilkinson, Roberts & While in 2010 to determine students' attitudes toward e-learning. The validity and reliability study of the scale in Turkish was

conducted by Haznedar and Baran in 2012. The General Attitudes toward E-Learning Scale is a 5-point Likert-type scale consisting of a total of 20 items scored as "Strongly Disagree" (1) and "Strongly Agree" (5). The scale can be used as one factor in the form of the general attitude toward e-learning, as well as two-factor in the form of "tendency to e-learning" and "avoidance of e-learning". Ten items (2, 3, 4, 8, 10, 11, 13, 14, 18, 19) under the avoidance of e-learning factor are reverse scored. While the score range that can be obtained from the scale is between 20-100, the high score obtained from the scale is interpreted as a positive attitude toward e-learning (Haznedar & Baran, 2012). The Cronbach's alpha coefficient was found as 0.93 by Haznedar and Baran (2012) in the validity and reliability study of the scale. In this study, Cronbach's alpha coefficient was found to be 0.85 for the General Attitudes toward E-Learning Scale.

Vital Signs Skills Laboratory Practice Assessment Videos

It constitutes a part of the practices that are requested to be submitted at the end of the semester for the laboratory practices assessment of the course from the NSs who took the fundamentals of nursing course online synchronously in the 2020-2021 academic year. Students were asked to practice their radial pulse assessment-respiration assessment, apical pulse assessment, arterial blood pressure measurement skills as per the steps in the skills checklist sent to them as part of the Vital Signs Skills Laboratory Practice Assessment Videos. Within the scope of this study, video recordings related to vital signs skills were used for the assessment of the achievement of first-year NSs in self-learning and applying the skill. Theoretical teaching of these skills, which were requested from the students for laboratory practice assessment, was given online synchronously by the responsible lecturer of the course during the distance education process. For the laboratory practice of the skill, demonstration videos of the skill were prepared by the responsible lecturer of the course to show how to perform each skill as per the steps in the checklist. These video recordings were shared with NSs in order to reinforce the learning of the relevant skill through e-learning and to allow students to watch the skill repeatedly. At the end of the term, NSs were requested to prepare video recordings of how they applied the same skills as per the steps in the skills checklist sent to them, and share these video recordings via the YouTube link by giving access only to the course instructors and the student who sent the video. After the assessment of Vital Signs Skills through the video recordings of the Laboratory Practice, online feedback sessions were held with the NSs.

Vital Signs Skills Assessment Checklist

It includes the steps of the process aimed at the NSs' correct application of radial pulse assessment-respiration assessment (20 items), apical pulse assessment (23 items), arterial blood pressure measurement (32 items) skills, which are prepared as per the expected learning outcomes related to the teaching of vital signs skills. The video recordings prepared and sent by the NSs were assessed by two independent lecturers, who were experts in the field of fundamentals of nursing, per the steps in the Vital Signs Skills Assessment Checklist. When each step specified in the steps related to the skill in the Checklist is performed correctly by the student, it is scored as "1" point, and when not, as "0" point, and for each skill, an achievement score was obtained for each student out of 100 points. The general achievement scores of vital signs skills were calculated by taking the mean of the achievement scores obtained by NSs regarding these skills. Cohen's kappa coefficient related to reliability among the observers who assessed the videos was calculated as 0.87.

All statistical analyses of the data obtained in the study were performed with the SPSS version 22.0 (Armonk, NY: IBM Corp) package program. Categorical data were shown as numbers and percentages, while continuous variables data as mean and standard deviation. The main effects of NSs' characteristics on their vital signs skills general achievement scores were analyzed with Two-Way ANOVA. Pearson correlation analysis was used to analyze the relationship between NSs' attitudes toward e-learning and their vital signs skills general achievement scores. A multiple linear regression model was used to determine the predictors of NSs' vital signs skills general achievement scores. Before multiple linear regression was performed, the assumptions of normality, covariance and multicollinearity were confirmed. $P<0.05$ was considered for the level of statistical significance in all analyses.

Ethical Considerations

Written permission (2021-E.23663) from the Faculty of Health Sciences administration, where the research was carried out, and the ethical approval (2021/380) from the Non-Interventional Clinical Research Ethics Committee of the relevant university were obtained. Also, on the first page of the online survey link shared with the NSs invited to the study, the purpose of the study was explained and it was stated that the participation was voluntary. After the consent of the students, who prepared the videos, were obtained on the fact that the video recordings prepared by them could be accessed only by the lecturers in charge of the course and the NSs to whom the video belongs, privacy settings were applied for video access.

FINDINGS

Characteristics of the First-Year NSs

The mean age of the NSs participating in the study was 19.60±1.24 years, 82.3% of them were female, and 73.8% of them were graduates of Anatolian high school. While only 59.2% of the NSs had a computer of their own, 30.8% of the NSs were found to have a weekly internet usage time of 21 hours or more (Table 1).

Table 1. Characteristics of the First-year Nursing Students (N= 130)

Characteristics	Mean±SD	
Age (Year)	19.60±1.24	
Gender	n	%
Female	107	82.3
Male	23	17.7
Type of Graduated High School		
Vocational School of Health Services	18	13.8
Regular High School	5	3.8
Anatolian High School	96	73.8
Science High School	11	8.5
Having a smartphone of their own		
Yes	130	100.0
No	-	-
Having a computer of their own		
Yes	77	59.2
No	53	40.8
Weekly internet usage time		
1-5 hours	15	11.5
6-10 hours	27	20.8
11-15 hours	26	20.0
16-20 hours	22	16.9
21 hours or more	40	30.8

Characteristics Related to E-ILearning of the First-Year NSs

While 71.5% of the NSs did not have e-learning experience and 31.5% did not have unlimited internet access, more than half of them (56.2%) were found to have difficulty in accessing the internet and 44.6% in using the technological infrastructure. The majority of the NSs (92.3%) stated that they thought that they were able to get enough counseling on using the e-learning platform. More than half of the NSs (52.3 %) reported that they prefer only face-to-face classes for nursing skills teaching. Furthermore, 83.1% of them stated that skill teaching videos and laboratory practice assessment videos, requested from them, contributed to their understanding and learning of the skills (Table 2).

Table 2. Characteristics related to E-learning of the First-year Nursing Students (N= 130)

Characteristics	n	%
Experience with e-learning		
Yes	37	28.5
No	93	71.5
Tools used to access e-learning		
With their own mobile phone	54	41.5
With their own laptop/desktop	66	50.8
With someone else's mobile phone	2	1.5
With someone else's laptop/desktop	8	6.2
Having unlimited internet during the distance education		
Yes	89	68.5
No	41	31.5
Having difficulties with internet access during the distance education		
Yes	73	56.2
No	57	43.8
Having difficulties using the technological infrastructure in the e-learning platform		
Yes	58	44.6
No	72	55.4
Receiving adequate counseling and help on using the e-learning platform		
Yes	120	92.3
No	10	7.7
Preferred learning method		
Both face-to-face classroom lessons and e-learning	74	56.9
Only face-to-face class lessons	50	38.5
Only e-learning	6	4.6
The preferred learning method for learning nursing skills		
Both classroom lessons and e-learning	59	45.4
Only classroom lessons	68	52.3
Only e-learning	3	2.3
The contribution of skill teaching videos and laboratory practice assessment videos, which are used in teaching nursing skills, to understanding and learning the skill		
Yes	108	83.1
No	23	17.0

First-Year NSs' Attitudes toward E-Learning

The total mean score of the NSs' general attitude scale toward e-learning was found to be 52.58±15.93. When the mean attitude score of the students of the sub-factors of the scale was examined, the mean scores of the tendency to e-learning and avoidance of e-learning factors were 25.60±8.77 and 26.98±7.90, respectively.

First-Year NSs' Vital Signs Skills Achievement Scores

The achievement scores of the vital signs skills of the NSs, which were obtained from the assessment of two independent observers, were found to be 89.78±8.65, 89.69±6.09, and 87.28±7.25 respectively for radial pulse assessment-respiration assessment, apical pulse assessment, and arterial blood pressure measurement. The mean general achievement score of the NSs regarding these skills was 88.92±6.55. When the results of the two-way ANOVA analysis conducted to determine the main effects on the NSs' vital signs skills general achievement scores were examined, only the main effects of "gender" and "receiving adequate counseling and help on using the e-learning platform" were significant on achievement scores (p= 0.007; p= 0.047, Table

3, respectively). Accordingly, when female students (89.91±0.54) were compared with males (84.29±1.77), it was found that students who stated that they could get adequate counseling and help (89.36±0.56) were found to have significantly higher overall achievement scores than those who stated that they could not (83.15±2.97). On the other hand, other characteristics of the students did not significantly affect the general achievement scores of vital signs skills ($p>0.05$; Table 3).

Table 3. Comparison of First-year Nursing Students Vital Signs Skills Achievement Scores according to their characteristics (N= 130)

	Sums of squares	df	mean square	F	p*	partial eta square (ηp2)
Gender	257.628	1	257.628	7.704	0.007	0.072
Type of graduated high school	129.394	3	43.131	1.290	0.282	0.038
Weekly internet usage time	174.797	4	43.699	1.307	0.273	0.050
Having unlimited internet during the distance education	11.932	1	11.932	0.357	0.552	0.004
Having difficulties with internet access during the distance education	0.181	1	0.181	0.005	0.941	0.000
E-learning Experience	0.840	1	0.840	0.025	0.874	0.000
Having difficulties in accessing course materials in the e-learning platform	23.484	1	23.484	0.702	0.404	0.007
Having difficulties in using the technological infrastructure to prepare, upload and send assignments in the e-learning platform	27.591	1	27.591	0.825	0.366	0.008
Receiving adequate counseling and help on using the e-learning platform	210.486	2	105.243	3.147	0.047	0.060
Error	3310.643	99	33.441			
Total	1033314.778	130				

Note. R Squared = 0.403 (Adjusted R Squared = 0.222) *$p<0.05$ Two-way ANOVA.

Correlation Between First-Year NSs' Attitudes toward E-Learning and Vital Signs Skills Achievement Scores

There was no significant correlation between NSs' general attitudes toward e-learning and their vital signs skills general achievement scores (r= 0.135; p= 0.126). In the relational analysis for the sub-factors of the scale, while no significant correlation was found for the "tendency to e-learning" factor (r= 0.104; p= 0.239), there was a weak negative significant correlation between the "avoidance of e-learning" factor and the NSs' vital signs skills general achievement scores (r= 0.185; p= 0.035).

Predictors of Vital Signs Skills Achievement Scores

The regression model created with the independent variables included in the model was found to be statistically significant (F= 3.130, p<0.001) and these variables explained 20.9% of the model. According to the results of the multiple linear regression analysis, while "gender", "receiving adequate counseling and help on using the e-learning platform", which were accepted as dependent variables on the vital signs skills of NSs, and "avoidance of e-learning" factor were found to be statistically significant explanatory variables ($\beta1=$ 5.399 p= 0.001; $\beta1$=4.895 p= 0.022; $\beta1$= -0.222 p= 0.046 respectively), other variables in the model did not have a predictive effect (p>0.05; Table 4). According to the findings, while the female gender contributed to an increase of 5.399 in the vital signs overall achievement score, there was an increase of 4.895 in the general achievement score of the NSs who stated that they could receive adequate counseling and help on using the e-learning platform. A one-unit increase in "avoidance of e-learning score, another significant variable in the model, was found to result in a 0.222 decrease in the general achievement scores of NSs' vital signs skills (Table 4).

Table 4. Predictors of First-Year Nursing Students' Vital Signs Skills Achievement Scores (N= 130)

Enter Method	β1 (95% CI)	SE	β2	t	p	95% Confidence Interval		Zero	Partial	Part	VIF
						Lower	Upper				
(Constant)	77.355	3.360		23.021	0.000	70.699	84.010				
Gender	5.399	1.526	0.316	3.539	0.001	2.378	8.421	0.328	0.312	0.281	1.259
Type of graduated high school											
Regular High School	-4.796	3.331	-0.141	-1.440	0.153	-11.396	1.804	-0.328	-0.134	-0.113	0.637
Anatolian High School	2.416	1.629	0.163	1.484	0.141	-0.810	5.643	0.215	0.138	0.116	0.510
Science High School	2.321	2.341	0.099	0.991	0.324	-2.318	6.960	0.046	0.093	0.078	0.616
Weekly internet usage time											
6-10 hours	-0.039	2.038	-0.002	-0.019	0.985	-4.078	3.999	-0.186	-0.0002	-0.002	0.382
11-15 hours	0.632	1.996	0.039	0.317	0.752	-3.322	4.587	0.002	0.030	0.025	0.410
16-20 hours	3.524	2.019	0.202	1.746	0.084	-0.476	7.525	0.156	0.162	0.137	0.456
21 hours or more	0.616	1.895	0.044	0.325	0.746	-3.137	4.370	0.065	0.031	0.025	0.342
Those who have unlimited internet during the distance education	1.245	1.431	0.089	0.870	0.386	-1.589	4.080	0.223	0.082	0.068	0.591
Those who do not experience difficulties with internet access during the distance education	0.208	1.229	0,016	0,169	0.866	-2.226	2.642	0,167	0,016	0,013	0.703
Those who do not have difficulties in using the technological infrastructure in the e-learning platform	0.196	1.228	0.015	0.160	0.874	-2.236	2.628	0.136	0.015	0.012	0.702
Those who could receive adequate counseling and help on using the e-learning platform	4.895	2.110	0.200	2.321	0.022	0.716	9.075	0.238	0.213	0.182	0.827
Those with E-learning Experience	-0.075	1.249	-0.005	-0.060	0.952	-2.549	2.398	0.072	-0.006	-0.005	0.823
Avoidance of e-learning	-0.222	0.110	-0.298	-2.016	0.046	-0.440	-0.004	0.012	-0.183	-0.161	-0.222

F= 3.130; p<0.001; Adj.R2= 0.209; SEE= 5.829; Durbin-Watson= 2.118 β1 Unstandardized beta coefficients; β2 Standardized beta coefficients

Note. The categorical variables in the model were coded as follows: Female= 1, Male= 0 for gender; Vocational School of Health Services=0, Regular High School=1, Anatolian High School= 1, Science High School= 1 for the type of graduated high school; 1-5 hours= 0, 6-10 hours= 1; 11-15 hours=1; 16-20 hours= 1; 21 hours or more= 1 for the weekly internet usage time; Yes= 1; No= 0 for having unlimited internet during the distance education; Yes= 1; No= 0 for having difficulties with internet access during the distance education; Yes= 0; No= 1 for having difficulties in using the technological infrastructure in the e-learning platform; Yes= 1; No= 0 for receiving adequate counseling and help on using the e-learning platform; and Yes= 1; No= 0 for having e-learning experience.

DISCUSSIONS AND CONCLUSION

It is a known fact that e-learning enhances learning experiences by promoting communication and collaboration between educators and learners. However, evaluating the reflections of e-learning on nursing education, used as a compulsory and only option due to the pandemic conditions, is important in terms of ensuring the correct and effective integration of web-based learning technologies, which is believed to form an important part of the education-teaching process in the near future, into the nursing education curriculum. In this study, we aimed to evaluate the effects of e-learning characteristics and attitudes of first-year NSs on their success in distance learning, through a skills teaching model.

Although e-learning paves the way for students to access the educational environment and materials with their peers during the pandemic, the fact that the use of this technology, in providing online communication, requires features such as internet access and technological infrastructure has brought many challenges especially for students (Divya & Binil, 2021; Kutah, 2021; Suliman et al., 2021). In nursing education, e-learning success has been reported to be associated with the adequacy of available resources and the ability of both students and educators to use information and communication tools (Harerimana & Mtshali, 2021; Divya & Binil, 2021). However, the results of both international (Gharehbagh, Seifi & Moeini, 2021; Kutah, 2021; Subedi, Nayaju, Subedi, Shah, & Mathias, 2020; Suliman et al., 2021; Thapa et al., 2021; Yekefallah, Namdar, Panahi & Dehghankar, 2021) and national (Eren, Korkmaz, Yildirim & Avci, 2021; Terke & Yamac, 2021) studies indicated that infrastructure and technology-related issues constitute a significant part of the negative experiences encountered in the e-learning process. In this study also, NSs were observed to have issues related to access to the Internet, technological infrastructure of the e-learning platforms, and having difficulty using it, which were similar to the literature. In a study conducted with NSs in Jordan, issues such as internet access due to poor connection and lack of computer literacy were emphasized to be the important issues that hinder the distance learning process of nursing education (Kutah, 2021). Yekefallah et al., (2021) pointed out that issues related to the use of e-learning technology may be associated with hardware deficiencies, limitations in computer and internet access, and students' negative satisfaction with e-learning. Harerimana and Mtshali (2021) indicated the importance of adequate educational preparation and hardware competence for information and communication technologies for both educational institutions and learners among the facilitating conditions of e-learning in nursing education. Olum et al., (2021) reported that the increase in internet connection quality and having a computer of their own were associated with more positive attitudes of nursing and medical students toward e-learning. These findings draw attention to the need for a structure with equal opportunities, adequate technological resources and readiness for both educators and learners for the efficient use of e-learning and achieving the desired success.

In this study, more than half of the first-year NSs were found to prefer both classroom and e-learning, and half of the participants preferred only face-to-face classroom courses when this preference was questioned for teaching nursing skills. There are different studies reporting that NSs have negative thoughts about using only distance learning technologies, especially for practical nursing courses (Olum et al., 2020, Suliman et al., 2021). In nursing education, where practical teaching forms an important part, the mandatory interruption due to pandemic conditions, especially the disruption of the teaching process of clinical nursing skills, where face-to-face interaction is very important, has led to concerns and worries in NSs that may arise from feeling inadequate about their education. A study, evaluating NSs' perceptions of e-learning, reported that e-learning sessions mostly helped students understand theoretical knowledge, however, the interaction regarding learning in the e-learning process could not be achieved at the desired level compared to the classroom environment (Sasmal

& Roy, 2021). Only 20.4% of the students were found to believe that e-learning could replace traditional teaching in another study conducted with nursing and medical students during the pandemic (Singh et al., 2021). Suliman et al., (2021) reported that almost all NSs believe that it is not possible to learn clinical skills through online teaching methods. Therefore, it is very important to use innovative teaching methods that would interest students in the integration of e-learning into nursing education to achieve the desired learning achievements, increase understanding and permanence of learning. Logan et al., (2021) reported that an e-learning module, which supports NSs to be better involved with the course content and participate more actively in their learning, positively affects student achievement and results. Chen et al., (2021) indicated that the development of students' ability to actively participate in their learning is positively associated with their academic achievement. Park et al., (2022) stated that participation in learning is an important mediating factor in achieving high academic success in the distance education process. In this study, the majority of NSs reported that the demonstration videos, which are prepared by the responsible lecturer, used in skill teaching, laboratory practice assessment videos requested to support NSs' participation in their own learning and online feedback sessions facilitate their learning. Similarly, Sasmal and Roy (2021) reported that e-demonstration sessions help NSs understand the procedures related to the practice.

The success of e-learning is known to be related to the readiness and attitudes of both educators and students toward adopting this approach (Elbasuony et al., 2018). In this study, it can be stated that first-year NSs had a moderate attitude toward e-learning. Furthermore, the scores of the NSs in the tendency to e-learning and avoidance of e-learning factors were observed to be close to each other. In their study, conducted using the same measurement tool, Ozdemir and Sonmez (2020) reported that Turkish NSs have a tendency to avoid e-learning. It is also possible to come across different studies, conducted both in the pre-COVID-19 pandemic period and during the pandemic period, showing NSs have neutral or negative perceptions and attitudes toward e-learning (Elbasuony et al., 2018; Gaur, Mudgal, Kaur, & Sharma, 2020; Lovric et al., 2020; Oducado & Soriano, 2021; Singh et al., 2021). These findings may be related to the fact that e-learning limits the teaching of nursing skills and clinical practice training when used as the only option. Different studies have shown that e-learning can only be used as an alternative method rather than being the only option for nursing education and that e-learning can create a superior learning style when used in conjunction with traditional teaching methods (McDonald et al., 2018; Lahti, Hatonenet & Valimaki, 2014). However, there are also studies in the literature showing that e-learning methods can perform as well as traditional methods with the use of appropriate learning design and strategies that will maximize the learner's benefit, and e-learning may support the improvement of learning outcomes through practical exercises, repetition and feedback especially in the field of health (Sheikhaboumasoudi et al., 2018; McCutcheon et al., 2015).

It is a known fact that academic success is affected by the characteristics of students, their motivation, or situations such as anxiety (Hauze & Marshall, 2020, Park et al., 2022). In the use of e-learning technologies, many factors that can affect students' attitudes such as the design of the course or the methods and techniques used in the teaching of the course, the adequacy of the interaction between the student and the educator, and the quality of the teaching have been stated to play an important role in the academic success of the students (Al-Abdullatif & Gameil, 2021; Singh et al., 2021; Li et al., 2021,). The results of a qualitative study showed that concerns of NSs' toward e-learning differ according to the years of education, and the concern and worry of the students in the first year of their education are mostly associated with the changes in the learning strategies to be used and the fears of failure that this may lead to (Suliman et al., 2021). In this study, the attitude score toward avoidance of e-learning was identified as an important factor associated with a decrease in NSs' vital sign skills general achievement scores. This result supports the fact that negative attitudes toward e-learning can lead to a deterioration in academic performance. Thapa et al., (2021) have reported that situations that negatively affect the practicality of e-learning, ease of use for learners and increase stress in learning are also associated with attitudes that are more negative toward e-learning. When the results of different studies are examined, the importance of regulations focusing on students' motivation and satisfaction has been emphasized to improve the quality and suitability of e-learning in nursing education (Harerimana & Mtshali 2021; Suliman et al., 2021). Furthermore, it has been emphasized that the academic performance of the students is positively related to their academic motivation, participation in learning and readiness, and individuals with higher academic motivation will also have more positive attitudes toward learning (Park et al., 2010; Khalaila, 2015). Therefore, keeping the situations that may be associated with negative attitudes under control should be considered as a key factor in increasing the success of e-learning in nursing education.

Our study findings indicated that receiving adequate counseling and help on using the e-learning platform is an important factor contributing to the increase in NSs' achievement scores. This finding also suggests that adequate technical support in the e-learning process and supporting students' adaptation to online learning can be a critical component in achieving educational goals by indirectly increasing student satisfaction. In fact, different studies indicated that infrastructure and technological problems in the use of e-learning platforms are associated with a decrease in student satisfaction and reluctance to participate in the course (Yekefallah et al., 2021; Suliman et al., 2021; Kutah, 2021; Gharehbagh et al., 2021; Subedi et al., 2020). Moreover, it is also a well-known fact that perceived learning satisfaction positively affects the participation in the course and the success levels of the students. Li et al. (2021) noted adequate support and assistance among the factors that are effective in facilitating success in online learning. Park et al. (2010) reported that the learning satisfaction of NSs is an important factor associated with e-learning success. While Chan et al. (2021) showed that the increase in the learning satisfaction of NSs was associated with higher learning and course participation, participation in learning was stated as a predictor of academic success in a different study (Park et al., 2022). These results also showed the necessity for user-friendly digital technologies that encourage participation and satisfaction in learning in order to use e-learning as an alternative teaching method in nursing and aiming of improving academic performance.

Another finding we obtained in this study was that the female gender was the most important variable predicting the skill performance of first-year NSs. There are various studies supporting the fact that female NSs have higher academic performance and achievement than males (Wan Chik et al., 2012; Khalaila, 2015). Vizeshfar and Torabizadeh (2018) pointed out that the learning styles of female and male NSs are different from one another and the importance of education based on learning styles to support the academic success of students. It is possible to come across different results in some studies examining the effects of gender in the distance learning process in nursing education. Park et al. (2022) reported that gender is not a factor affecting academic achievement in distance learning. Chan et al. (2021) has shown that there is no significant relationship between gender and higher participation in learning, known to be an important factor for e-learning success. The fact that NSs' skill achievement scores were higher in female students in this study, as reported in some studies in the literature, may be related to female students having a more positive attitude and satisfaction toward e-learning, which is known to be associated with the efficiency and success of e-learning (Yekefallah et al., 2021; Gharehbagh et al., 2021; Gaur et al., 2020). These variables are known to contribute also to the increase in academic success by supporting academic motivation and participation in learning.

This study aimed to evaluate the relationship between first-year NSs' attitudes toward e-learning and their success in learning nursing skills from distance learning, through a skills teaching model. The study results showed that NSs have a moderate attitude toward e-learning, however negative attitudes toward "avoidance of e-learning" may lead to a decrease in NSs' academic achievement. Furthermore, the use of teaching techniques that encourage NSs' participation in their own learning in the e-learning process has been seen to possibly contribute to the teaching of clinical nursing skills. In addition, adequate support and guidance for the solution of issues that may be encountered in the e-learning process and female gender have been determined to positively affect e-learning success.

Limitations

The findings of this study presented a perspective on how attitudes toward e-learning, which has been the only option in ensuring the continuity of nursing education during the COVID-19 pandemic, affect the success of distance learning of nursing skills and contributed to the limited literature in this field. However, this study has some limitations. The examination of the skill learning achievements of the first-year NSs has been limited only to the radial pulse assessment-respiration assessment, apical pulse assessment, and arterial blood pressure measurement skills, which are within the scope of the evaluation of vital signs. Due to both the concerns about the safety of the students and the limited opportunities they have in the home environment, how the attitudes of the students related to e-learning affect the distance learning success of the skills related to invasive interventions could not be examined. Another limitation is that the findings of this study are limited to this sample only. Therefore, the study results cannot be generalized to students in other nursing programs or other higher education institutions.

Practice Implications

Along with the social distancing effects of the COVID-19 pandemic, e-learning has become an element that makes a rapid and compulsory entry into nursing education. In line with the study findings, negative attitudes toward e-learning should be bettered and the factors related to negative satisfaction with e-learning should be controlled to achieve the learning goals in nursing education. Given the integrative importance of theoretical and practical teaching in nursing education, online teaching methods that encourage learning participation and learning should be used in distance education of nursing skills. However, strategies that take into account the differences associated with the characteristics of students, such as gender, known to affect academic achievement, should also be considered in the use of e-learning.

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A PARTICIPATORY PEDAGOGICAL MODEL FOR
ONLINE DISTANCE LEARNING: IDEATION AND IMPLEMENTATION

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ABSTRACT

In spite of its increasing popularity, distance education faces challenges – levels of digital literacy, access to technology, workload and time management, students' feelings of isolation and disconnection – that can have a significant impact on the experience of the learners. In addressing these issues, we propose a pedagogical model for distance learning which promotes the synergy of eight ingredients – Community, Openness, Multimodality, Participation, Personalisation, Learning, Experience, Technological-Enhancement, with their initial letters generating the acronym COMP-PLETE – for the shaping of a highly participatory online learning experience and the creation of an active and cohesive community characterised by a strong sense of commitment towards the learning of the individuals and that of the group. This paper presents the theoretical rationale for and implementation of COMP-PLETE. It also provides recommendations for researchers and practitioners interested in cultivating an online learning community which responds well to the aforementioned challenges posed by distance education.

INTRODUCTION

When in early 2020 COVID-19 lockdown measures were announced to the world, Education, as many other areas of life, was not spared by the necessity to transitioning to the online environment. Emergency Remote Teaching (ERT) (Hodges et al., 2020) – the quick impromptu response to the lockdown – became the new norm in many parts of the globe to ensure continuation of learning at all educational levels. In this context, pedagogical considerations were ousted by technical and technological emergency solutions, corroborating the claim that ERT is not comparable to planned and purposely designed remote learning (Hodges et al., 2020), i.e. distance learning in the true sense.

With this in mind, it must be recognized that the ground onto which ERT solutions rapidly grew had been ready for a while. Before the 2020 global disruption, online and distance learning had increasingly become a popular learning paradigm, in Higher Education, challenging educators to confront existing assumptions of teaching and find new ways to engage students in the learning process. Indeed, online educational programmes have mushroomed over the last two decades - approximately 80% of higher education institutions in Europe and the USA offer online learning courses (Bichsel, 2013; Gaebel et al., 2014). In a rapidly increasing digital and interconnected world the turn from traditional to online forms of education is far from surprising. First, online learning gives access to education to people living in remote and/or rural areas (Bichsel, 2013). Second, online learning boasts more flexibility compared to learning within the four-

walled classroom, offering greater control over when and where to study and therefore accommodating the needs of professionals (Horspool & Yang, 2010), people who are place-bound (Schwartzman, 2007), and anyone wishing to undertake a study programme regardless of whether their preferred choice is offered by a nearby or far-away institution.

Nevertheless, online learning faces some challenges, which, ironically, stem from the same reasons that make it an attractive option. Studying from a distance often creates feelings of disconnection and isolation leading to lower engagement with learning and lower student retention. In addition, it has been reported that students perceive that, compared to face-to-face courses, online learning offers lower levels of interaction amongst teachers and peers (An & Frick, 2006; LaPointe & Reisetter, 2008). Furthermore, as distance learning courses are a popular solution for professional development, the tension between the students' personal and professional commitments and course requirements may lead to significant procrastination and drop out. Finally, a tension has been identified between institutional regulations affecting private courses and the benefits of open learning supported by social technologies.

The model for distance learning presented here, called COMP-PLETE, an acronym formed with the initial letters of the components of the model (see below), is an attempt to address these challenges by taking the learners' experience not as the outcome, but as the starting point for the overall pedagogical design and the driver of teaching and learning practices.

In the continuing COVID-19 scenario, the move from ERT to a pedagogically though-through and researched model for distance learning is essential to ensure that the turbulence provoked by the pandemic was not in vain. Instead, it is important to build on its unintended legacy to shape the new distance education norm during and beyond COVID-19.

The Context

The tangible context within which COMP-PLETE was developed is the Master of Arts in Digital Technologies for Language Teaching (MA in DTLT) offered by the University of Nottingham since 2013. The MA in DTLT is a part-time professional development programme offered to language teachers around the world, wishing to improve their understanding of the theoretical and practical aspects of Educational Technology, with a specific focus on Language Learning and Teaching. It boasts a varied students' body in terms of professional context, geographical location, academic profile, ambitions and expectations.

There is one annual in-take and the teaching follows the university calendar, framing a cohort-based model which contributes to achieving pedagogical goals around the shaping of a community of learners that progress together through the different phases of the programme (see section 2.1).

The MA in DTLT was designed with two sets of course design in mind, namely the cognitive approach and the experiential approach (Toohey, 1999). The former is influenced by social constructivism and highlights the significance of knowledge construction in a shared environment, through social interaction. The role of the teacher is to elicit and facilitate this process and the role of the learner is to collaborate and take ownership of his/her learning. The latter, is based on the belief that effective learning is personally relevant and is dependent upon the students' experience. The role of the teacher is to provide guidance and the role of the learners is to bring their life experiences into their educational path and the community.

The result is a participatory pedagogy that relies on a community for participation to take place, making Community and Participation central features of COMP-PLETE (see sections 2.1 and 2.4 respectively).

Purpose and Architecture of this Work

The purpose of this paper is to introduce COMP-PLETE as a theoretical framework for designing learning in the online environment. In the light of the educational changes caused by COVID-19, a consequential goal of this discussion is to support the transition from ERT to purposely designed distance learning, to recognize the important of seizing the moment and build on the positive legacy on the pandemic.

Section 2 presents the features COMP-PLETE and their relations with the relevant literature. The empirical contribution is provided by the implementation of the framework in section 3. Section 4 concludes the paper by briefly outlining the paths for future research.

COMP-PLETE

COMP-PLETE is the conceptualization of a model for distance learning by which eight ingredients (Community, Openness, Multimodality, Participation, Personalization, Learning, Experience, Technological-Enhancement) have been identified as fundamental to provide distance learners with a learning experience that is motivational and empowering. The focus is on the design of a programme structure and content that nurture a learning community and allow flexibility for the learners' voice to be heard and acted upon. The rationale behind COMP-PLETE is the attempt to address and resolve the issues common to distance learning mentioned earlier by capitalizing on participatory pedagogies in motivating students and strengthening their commitment to their learning. In the next eight sections, the components of COMP-PLETE are explained.

Community

When considering the community of practice, there are two theoretical cornerstones relevant to this study, both concerned with online community development and with the process of learning in online communities. The first, the Community of Inquiry framework (CoI) (Garrison, Anderson, & Archer, 1999), provides order and guidance into the foundational concepts of online learning communities, the second, the Community Indicators Framework (CIF) (Galley et al., 2014) maps transactions and patterns of activity that emerge in online communities.

The CoI model is built on the premise that higher-order learning is best supported in a community of learners engaged in critical reflection and discourse, it is entrenched in collaborative constructivism and conceptually grounded in research on deep and meaningful approaches to learning. The CoI identifies three core interrelated, interdependent, and overlapping elements required to create and sustain an online learning community: *teaching*, *social*, and *cognitive presence*.

Cognitive presence is broadly defined as the extent to which the participants are in a position to construct meaning through communication in an online community. It is grounded in critical thinking and is seen as developing through the learners' process of practical inquiry and investigation. *Teaching presence*, refers to: (a) instructional design and organization of learning; (b) facilitation of discourse, and (c) direct instruction (Garrison & Arbaugh, 2007). *Social presence* is a mediating variable between the other two elements; it is a responsibility of *teaching presence* and a prerequisite for *cognitive presence* (Garrison et al., 2010). It is manifested through the ability of participants to: (a) project their individual personalities into the community, (b) identify with the community, (c) communicate into the community, and (d) develop interpersonal relationships (Garrison et al., 2010).

More recently, Armellini and De Stefani (2016, p. 1212) proposed a revised structure of CoI in which *social presence* becomes "bigger and more pervasive" affecting directly *cognitive* and *teaching presence*. This view is in line with the feature Community of COMP-PLETE and is reflected in the encircling and encompassing role of Personal Learning Environments and Networks (see Fig. 1) as vehicle to expand *social presence* beyond the confines of the original CoI model.

Alongside the CoI model, Galley et al.'s CIF (2014) played a significant role in the conceptualization of our learning community. The CIF identifies four fundamental aspects of the online learning experience – *cohesion, identity, creative capability,* and *participation*.

Cohesion relates to community members' perception of the ties between each other and is demonstrated by language use, willingness to listen and learn, responsiveness and turn-taking, adoption of leadership roles. *Identity* is related to the perceptions that community members nurture about the community itself and their place within it. It is manifested by establishing the limits, boundaries, purpose, and expectations of the group, by referring to shared experiences or knowledge, by using language which refers to the group as a group, and by using a shared vocabulary. *Creative capability* refers to the community's ability to create shared artifacts, knowledge, and understanding. A creative community demonstrates discussion skills, accommodates differences in experience, encourages multiple points of view to be expressed, and identifies links between member's knowledge and experience. Finally, *participation* refers to the ways in which individuals engage in community activities, e.g. patterns of rapid and energized engagement and longevity, the members' ability to move between social and productive activities within the community, to develop a social structure and adopt social and facilitative roles.

It is proposed here that the two frameworks outlined above complement each other. In fact, CoI focuses on the foundation components of online communities and CIF addresses online community patterns of activities. However, it is also acknowledged, that while CoI supports communities in closed educational experiences, CIF supports the development of online dynamics based on principles of open education. This provides a valid ground for combining the two models in the MA in DTLT, as, though implemented in a closed online context, it employs open pedagogies, building on the learners' wider social web connections.

In reconciling CoI and CIF, our framework (Fig. 1) places *identity* inside the sphere of *social presence* as it narrowly relates to the social dynamics of the community. *Cohesion* is placed in *teaching presence* as it rests in the hands of the teacher, or of students when acting as teachers by leading learning activities (Garrison et al., 1999), to establish and maintain these ties. *Creative capability* is in *cognitive presence*, since it is related to the motivation and ability of the community to engage in productive activities. *Participation* is placed at the centre of the diagram (Fig. 1) to emphasise the participatory nature of the educational experience.
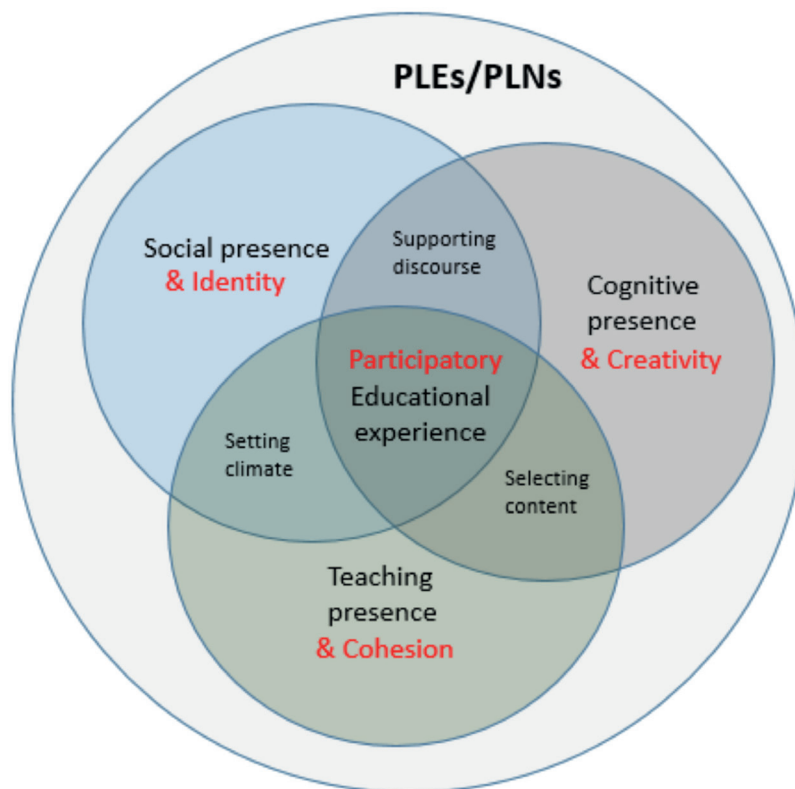
Figure 1. "Learning in online communities" framework adapted from the CoI and the CIF (Konstantinidis & Goria, 2016).

Lastly, a distinctive feature of our model is the integration of Personal Learning Environments (PLEs) and Networks (PLNs). As discussed in sections 2.2 and 2.5, these function as the programme's gateway to Openness (Goria & Konstantinidis, 2017), the second component of COMP-PLETE, which is addressed in the next section.

Openness

Openness is an umbrella term (Weller, 2012) to refer to: open admissions, i.e. no required prerequisites; open or free access to education; open content as in Open Educational Resources (OERs) (Paskevicius et al., 2018); open curricula coupled with the notion of community-as-curriculum (Cormier, 2008); open connections (Cormier & Siemens, 2010); open accreditation, i.e. academic credits obtained from taking OERs courses; open, as in transparent, teaching and dialogue; open scholarship; open source (Weller, 2012).

Most relevant to the present work is the pedagogical interpretation of Openness provided by Dalsgaard and Thestrup (2015), who view Openness as articulated over three pedagogical dimensions, namely *transparency*, *communication* and *engagement*.

Transparency refers to the practice of opening up activities to students across cohorts or institutions, in order for learners to reflect on their own work by gaining insight into their peers' activities. In COMP-PLETE *transparency* is applied to all activities, including assessed work – pedagogical aims and objectives are made explicit and shared with the students, and students are encouraged to share the preparation phases of their assignments as well as the final products.

The second pedagogical dimension of Openness is *communication*, intended as communication with affinity groups (Gee, 2012), i.e. a surrounding society of "non-students" who share a field of interest (Dalsgaard & Thestrup, 2015, p. 85). In COMP-PLETE this is achieved through the use of social media interwoven with the notion and practice around PLEs/PLNs (see below and section 2.5).

Engagement refers to activities by which students and tutors become partners in problem solving practices with other partners, for instance other institutions. In COMP-PLETE, this dimension surfaces with Experience (section 2.7) by which the students are guided, in all learning activities, to address themes that are specific to their own professional contexts, outside of the programme's boundaries.

Furthermore, COMP-PLETE's Openness is fostered through practice around the notion of PLEs/PLNs (section 2.5), i.e. people, communities, organizations, digital tools and any other tool, artifact, or object with which the learners interact to generate knowledge (Dabbagh & Kitsantas, 2012; Goria et al., 2019).

Strongly supported by social media, in the MA in DTLT, PLEs/PLNs ensure that *transparency, communication* and *engagement* take a globally open social dimension and support continuous exchanges of information across the boundaries of the programme, providing an open ground for knowledge building and shared experiences. Different facets of Openness are implemented via PLEs/PLNs: they encourage the creation of new connections inside and outside the programme's learning community (open connections - *communication*); they empower our learners to bring into the programme their experiences from their own diverse teaching contexts, contributing to and enriching the content and structure of the learning experience of the whole community (open teaching and open curricula - *engagement*); they also encourage the use, creation and dissemination of open resources (open content) and, facilitated by social media, have proven to be conducive of non-hierarchical tutor-student dialogue (open dialogue - *transparency*).

The next section explores Multimodality and its role as the third component of COM-PLETE.

Multimodality

Multimodality is the practice of using different representations of content knowledge, typically *verbal* (printed, spoken words) and *non-verbal* (illustrations, photos, videos, and animation) (Moreno & Mayer, 2007). It is an interdisciplinary approach that takes into account semiotic resources other than language (Jewitt, 2013) for the construction of meaning; it focuses on the role of modes such as words, sound, images, animation, colors as well as gestures, space, facial expressions in social interactions and peoples' meaning making process.

Multimodality also entails establishing interactivity (Guichon & McLornan, 2008); interactive multimodal learning environments are those in which, during the learning, the learner is able to interact with the content that is presented, e.g. play/pause/forward while watching a narrated animation; click on hyperlinks to get additional information (Moreno & Mayer, 2007).

In COMP-PLETE Multimodality is promoted as a pedagogical tool to foster the construction of knowledge (Moreno & Mayer, 2007), to encourage personal meaning making (Kress, 2012), to enhance motivation and engagement, to assist comprehension and retention (Sankey et al., 2010), and, coupled with interactivity, to make instructional design conducive to deep learning (Moreno & Mayer 2007). Furthermore, building on the evidence that multimodal learning is beneficial for second language acquisition (Gilakjani et al., 2011; Guichon & McLornan, 2008; Price, 2013), Multimodality is promoted in the MA in DTLT to ensure that our students will adopt multimodal pedagogies in their own language teaching contexts, benefiting their own learners' learning.

In COMP-PLETE Multimodality is nurtured in a variety of ways; not only are the students provided with multimodal study content, they are also required to create and share multimodal learning artifacts and are exposed to multimodal learning experiences, for instance, through the use of 3D virtual world environments (Konstantinidis, 2017).

Participation

It was mentioned earlier that in the model presented here the feature Participation is central to the learning experience, in agreement with the overarching pedagogical approach introduced in section 2.1. A participatory pedagogy is an approach to learning which puts the learners at the centre of the experience enabling them to contribute to the creation of content and the shaping of the structure of their learning paths and experiences (Andersen & Ponti, 2014).

In COMP-PLETE, the shift from consumer to prosumer of knowledge does not happen in isolation; the learners become co-producers as members of the learning community (McLoughlin & Lee, 2007, 2008). Thus, at the heart of social constructivism and connectivism for learning, Participation is heavily reliant of the use of participatory technologies (Siemens, 2008) in support of collaboration, shared construction of knowledge, making connections. Accordingly, in COMP-PLETE Participation is supported by the use of social media as a requisite for the practical implementation of our PLE/PLN-based approach (see section 2.5).

Personalisation

In COMP-PLETE, Personalisation surfaces in conjuctions with other features of the model, i.e. Participation and Experience, as well as a feature in its own right through PLEs/PLNs. More precisely, Personalisation is a built-in element of the student-centred nature of Participation with its emphasis on students' individual choices and ownership of learning. Similarly, it is a desired result of Experience given the significance that is placed on the personal experiences of our learners and their impact on the learning of the community as a whole (see section 2.7).

In addition, Personalisation takes the form of personalised learning spaces and networks, i.e. PLEs/PLNs, which, in discussing Openness (see section 2.2), were introduced as playing a central role in ensuring that the wider social web community becomes the ground for *communication*, *engagement* and *transparency*.

Typically built on resources selected by the users and located outside institutional domains (Johnson, 2016), PLEs aggregate the tools, the communities and the services that learners use to determine their learning goals and direct their learning to achieve these goals (Dabbagh & Kitsantas, 2012). PLNs are the network of people and resources that support ongoing learning (Trust et al., 2016). Thus, the distinction between PLEs and PLNs rests on the emphasis that is put on the spaces (PLEs) within which learning takes place, and the human factor (PLNs) inside that spaces, in the sense that the former provide the structure for the human connections to take shape (Goria et al., 2019).

The notion of and practice around PLEs/PLNs tally fully with the pedagogical principles underpinning COMP-PLETE. Consistent with Community, Openness, Participation, PLEs/PLNs foster the construction of knowledge (Downes, 2007) through social connections (Laakkonen, 2011), support autonomous and self-regulated learning, empower students to own their learning (Dabbagh & Kitsantas, 2012), promote student-centred learning (Kravcik & Klamma, 2012) and bring together formal and informal learning, learning from the home, and learning from the profession (Attwell, 2007).

Learning

As claimed earlier, COMP-PLETE focuses on the nature and quality of the experience in the digital learning context, while keeping firm sight of the cognitive process of learning. Thus, the model is strengthened by the way it interfaces with the typology of ways of learning advocated by the well-established Conversational Framework (Laurillard, 2012).

The Conversational Framework pivots around the idea that in formal learning teacher-student dialogue fuels the cyclic modulation and generation of concepts, practice and actions. Included in the framework is the claim that learning happens through six types of learning activities. Namely (adapted from Laurillard, 2012, p. 96 and Laurillard, 2016):

Acquisition: learners read book and online, listen to lectures/podcasts, watch demonstration master classes/animation/videos.

Inquiry: learners formulate questions and actively look for answers, by consulting teachers, libraries, study guides, online advice services, by selecting tools to evaluate information and ideas, by using data collection services.

Production: learners produce essays/reports/animations/digital stories/e-portfolios for the teacher to evaluate or for public display of their learning.

Collaboration: learners work together and produce a shared output, through negotiation of ideas and practice, by challenging each other ideas and agreeing on the output.

Discussion: learners exchange ideas and challenge each other arguments and develop concepts through responding to each other while articulating an argument.

Practice: learners take action in response to tasks set by the teacher and responding to feedback, they are involved in project-based learning.

With this in mind, COMP-PLETE provides the principled structure for the six ways of learning to happen. In particular, the principles around Community, Openness and Participation are consistent with the dialogic nature of Laurillard's proposal.

Framed by COMP-PLETE, the MA in DTLT provides different locations for learning to take place; learning is distributed not only geographically but also across different channels. The channel for formal learning is the institutionally controlled Virtual Learning Environment (VLE) which provides the students with reading materials, search guidance, teacher-directed shared tasks, structured forum discussions, fostering Acquisition, Inquiry, Practice and Production, Discussion respectively. Another channel is provided by the synchronous online tutorials which support mainly Discussion, but also Production and Collaboration depending on the tasks brought into the online meetings. Chat-like exchanges provide the channel for informal learning which happens through Discussion and Collaboration, and, as seen earlier, engagement with PLEs/PLNs widens the scope of Inquiry beyond the confines of the programme.

A more detailed mapping of the most prominent activities featuring in the programme, the way they serve COMP-PLETE and the six ways of learning is illustrated in section 3.

Experience

Kolb's Experiential Learning Theory (1984) maintains that learning is generated through the transformation of experiences. Knowledge is not the outcome of the process of learning, but the process itself. For learning to happen, learners engage in a transformative cycle that includes concrete experience, reflective observation, abstract conceptualization, and active experimentation (McCarthy, 2016).

In COMP-PLETE, Experience is multifaceted. First, in alignment with Kolb's theory, it refers to the experiential approach that underpins the task-based and reflective design of the learning activities. This is Experience as 'learning by doing' – consistent with learning by Production and Practice seen in the previous section. The students are actively engaged in concrete experiences through which they are encouraged to bridge the gap between theory and practice and link what they study with their professional contexts.

The second facet of Experience is reflected in the emphasis put on the individual experiences of the students, on the significance of bringing them into the community and use them as the foundation to create new shared experiences (Girvan et al., 2016), accentuating the relation between Experience and the student-centred nature of Participation and Personalisation. Experience as 'shared experience building' makes learning personally relevant and frames the learners' contributions to the content and structure of their learning (see examples in section 3.1).

The third facet of Experience is reflected in our 'participation as learners' approach (Girvan et al., 2016) by which teachers undertaking a professional development programme are given the opportunity to learn how to learn and experience as learners the impact of their learning.

Technological-Enhancement

The last feature of COMP-PLETE to be outlined is Technological-Enhancement. The principles buttressing this feature are borrowed from the SAMR framework by Puentedura (2006) who identifies Substitution, Augmentation, Modification and Redefinition, as the four levels of integration of technology in educational activities. In Substitution technology acts as the direct substitute for more conventionally designed tasks with no functional change; in Augmentation technology adds functional improvement; in Modification it provides opportunities for redesigning tasks; and in Redefinition, technology transforms educational tasks in ways previously inconceivable.

Characterized by an overarching critical stance in addressing the integration of technology in teaching, Technological-Enhancement aims at Redefinition and explores new ways of teaching and learning that would not be possible without technology. As a start, Redefinition is paramount, dictated by the fully online learning nature of the context within which COMP-PLETE was developed. Furthermore, Technological-Enhancement as Redefinition surfaces in Community, Participation and Personalisation, given the central role of social media in shaping connections and communication across the globe – the extent to which these features are implemented in COMP-PLETE is not achievable without technology. Furthermore, Technological-Enhancement emerges as a by-product of Multimodality as technology widens the opportunity for multimodal representations of content knowledge.

The remaining sections of this paper provide the empirical support for COMP-PLETE by illustrating examples of activities integral to the design of the MA in DTLT.

IMPLEMENTATION OF THE FRAMEWORK

Highlighting the empirical implications of COMP-PLETE, this section presents examples of the different methods employed to implement the framework, including the design of the assessment procedure which given its crucial role is presented separately in section 3.2.

It is worth clarifying that the features of COMP-PLETE are intertwined and therefore it is not possible to provide discrete examples for each feature of the model. This is particularly true for Technological-Enhancement, Learning, and Multimodality which pervade all activities. While Technological-Enhancement and Learning will feature separately in Table 1, Multimodality should be seen as an overarching attribute of the programme's approach to teaching and learning by which students are presented with multimodal materials and are tasked with generating and sharing multimodal content of their own, e.g. images, animation, spoken and written language, graphics as well as sensory experiences, such as the use of 3D avatars.

COMP-PLETE in Practice

As mentioned in section 1.1 our postgraduate programme is structured around the academic calendar. Thus, during the teaching weeks each student cohort progress together, providing the structural frame for the development of a sense of belonging; students are encouraged to establish their Social Presence as individuals while also developing their *identity* as participating members of the Community. Community and Participation are the focal features that ground the programme's participatory pedagogical approach.

From the start of the course, emphasis is put on building students' sense of group identity; they are addressed as a group to cultivate a culture of shared responsibilities. Everyone's contribution is promoted as essential for a fruitful common and individual learning experience, contributing to the realisation of Community and Participation as well as Personalisation and Experience.

Group tasks are assigned for the building of common learning objectives, cultivating Community as group *identity*, *cohesion*, and *Social Presence*. As an example, the students on the course Integrating Technology in

Course Design and Assessment create a collaborative poster on a specific topic and engage in a collaborative presentation of their outcome. As the students are located around the world, communication takes place online, generally outside the control of the teacher; the students self-organise, work together towards a common goal by building on their own individual experiences, implementing several features of COMP-PLETE. Namely, Community: in particular *Social Presence/identity* and *Cognitive Presence/creativity*; Participation: as the students act as co-producers; Multimodality: as the students engage with verbal (text or recordings) and non-verbal (images and graphics) modes; Openness: as *communication* and *engagement*; Experience: as 'learning by doing'.

Formal and informal communication platforms are established to support group exchanges. Besides the more formal Moodle Forum functionality, Microsoft Teams (MS-Teams) is employed as the collaborative space with social network, chat-like features to frame the development of CoI's *presences* featured in our Community model (Fig. 1) (Goria & Hanford, 2019). It is worth noticing that MS-Teams allows the students to create channels of communication outside the control of the tutor, a functionality that has been welcomed as a way to reinforce the student-student sense of community.

Asynchronous teaching is heavily complemented by synchronous meetings in which the students are encouraged to use the web camera as an effective way to add bodily presence to the distance learning experience, with a remarkable impact on CoI's online *presences* and ultimately on the implementation of Community and Participation of COMP-PLETE.

CoI's *teaching presence* may include student-tutor role shifting. In COMP-PLETE this is nurtured by promoting peer-feedback as a way to increase students' sense of interdependence and subsequently the cohesion of the community. An example is provided by an activity in the course Telecollaboration for Language Learning in which the students engage in group tasks and provide peer-feedback, including grades, across the groups. In addition to Community and Participation, other features of COMP-PLETE are put into practice through this task, in particular, Openness as *engagement* and *transparency*.

Opportunities for our students to project themselves socially and emotionally as 'real' people and develop their sense of community identity are maximized in the MA in DTLT by celebrating social events, e.g. birthdays, Christmas, weddings, graduation, to mention a few, with the use of selected online tools. Although these events have no explicitly stated learning aims, they offer ample opportunities to expand students' PLEs, to acquire hands-on experience with digital tools and virtual worlds for learning, and to access and create multimodal artifacts – Experience as 'learning by doing'.

Open events with more explicit learning objectives are organized as publicly advertised and attended Twitter chats and Dissertation Talks. The Twitter chats provide first-hand experience of how social media can be used for teaching, further contributing to Experience as 'learning by doing'. They also foster Openness, as students across all cohorts, graduates, tutors, and people outside the course interact and discuss educational topics in the open. Furthermore, they generate role shifting of *teaching presence* of Community as it is observed that, in these chats, the participants are willing to learn from each other and engage in a peer tutoring process without being explicitly instructed to do so. Similarly, the openly attended Dissertation Talks enable Openness and student-held *teaching presence* as in these talks, graduates present a synopsis of their thesis, describe their experience, providing support to peers working on their dissertation.

Openness as *transparency* is further nurtured by the teacher-led practice of uploading selected students' works (with their consent) on openly accessible websites (see http://telecollaboration20.pbworks.com/; Konstantinidis, 2020), contributing also to the 'go public' phase of our PLE/PLN approach.

In fact, in this and the previous examples, the role of PLEs/PLNs as vehicles for information exchanges and knowledge building in the open surfaces explicitly. Learners enter the programme with their own individual PLEs/PLNs built from previous experiences and continue developing their spaces, tools and connections throughout the duration of their studies. They reflect regularly on their PLEs/PLNs and graphically represent their spaces positioning themselves inside them as users as well as contributors, bringing Personalisation of learning to the fore.

In practical terms, students' PLEs/PLNs are developed in phases (Dabbagh & Kitsantas, 2012). In phase one, the students use the tools of their PLEs to develop self-regulated learning and enhance personal productivity. In phase two, they make their PLEs/PLNs social by adding connections and engaging in collaborative activities. In the third phase, they reflect on the previous phases and customise their spaces to serve their

own personal learning goals. In the fourth phase (Goria, 2018), the students 'go public' and engage in activities which include links and connections beyond the confines of the programme. The ongoing ties created between the personal and the social spheres of this approach not only is coherent with the goal of implementing all three dimensions of Openness, it also ensures that Personalisation, Participation and Experience are put into practice.

As claimed in section 2.7, Experience as 'learning by doing' merges in COMP-PLETE as a by-product of the applied nature of the programme. Throughout the MA in DTLT, students apply the theoretical paradigms considered in their studies to their own teaching. In addition, they reflect on their practice and report back to the group, generating personally relevant learning – another example of Personalisation – and shared experiences at the same time, implementing Experience as 'shared experience building'. Note that this practice also strengthens Participation – by building knowledge around their individual experiences, our students are empowered to co-create unique learning paths.

As for Experience as 'participation as learners', it was said in section 2.7 that our students are engaged in activities that provide them with the opportunity to experience learning from the perspective of their learners. Although this aspect applies to most activities in our programme, a remarkable example is provided by the course Game-Based Learning which, designed to include game-like features, engages students in playing a game and offer them the necessary first-hand experience to develop the ability to critically evaluate gamification and the use of games for language education.

Based on the empirical implications of COMP-PLETE presented in the previous paragraphs, Table 1 offers a summary of practical recommendations. In the first column a typology of activities that support COMP-PLETE is offered; the second column provides broad suggestions as to the technologies to be used for each activity; the third column maps each activity with the most prominent features of COMP-PLETE, while Learning is treated separately in the fourth column to highlight that Learning pervades all activities and to indicate more explicitly the types of learning that are supported by each activity.

Table 1. Practical recommendation for implementing COMP-PLETE

Typology of activities	Technological-Enhancement	Prominent features of COMP-PLETE in addition to Technological-Enhancement (left) and Learning (right)	Learning
Shared tasks	Online boards, online mindmaps	**Community**: social presence/identity; cognitive presence/creativity **Participation** **Multimodality**	Production Collaboration
Readings, Set Tasks, Controlled forum discussions	VLE (e.g. Moodle)	**Community**: teaching presence/instructional design **Participation**	Acquisition Discussion
Webinars	Video conference platforms	**Community**: social presence/identity; teaching presence/cohesion **Participation** **Experience**	Discussion Enquiry Practice
Informal chats	IM platforms (e.g. MS-Teams)	**Community**: social presence/identity; teaching presence/cohesion; cognitive presence/creativity **Openness** **Participation** **Personalisation** **Experience**	Discussion Collaboration
Social events/parties	Online boards, 3D virtual worlds	**Community**: social presence/identity **Multimodality**	Discussion

Formal open chats	Social media (e.g. Twitter)	**Community**: social presence/identity **Openness** **Participation** **Personalisation** **Experience**	Discussion Enquiry
Dissertation Talks	Online presentations via video conferencing platforms	**Community**: social presence/identity; teaching presence/cohesion; cognitive presence/creativity **Openness** **Participation** **Experience**	Acquisition Discussion
Group work (posters; videos; presentations)	Virtual video conference rooms, chat platforms	**Community**: social presence/identity; cognitive presence/creativity **Participation** **Multimodality** **Experience**	Production Collaboration
Peer feedback	VLE	**Community**: teaching presence/cohesion; cognitive presence/creativity **Experience**	Production Collaboration
Gamified activities	VLE	**Community**: teaching presence/cohesion; social presence/identity; cognitive presence/creativity **Participation** **Experience**	Acquisition Practice

Assessment

Acknowledging that assessment directs students' efforts and significantly impacts their learning, assessment in COMP-PLETE not only endeavours to put the features of the framework into practice, it is also firmly grounded on the principles and strategies of assessment for learning. Three main theoretical approaches frame the practice.

The first one is *constructive alignment* (Biggs, 2003) which starts by setting learning outcomes that include content and students' level of understanding. Activities are then set to empower learners to achieve those outcomes and assessment is designed to ensure and evaluate attainment of those outcomes. As an example, one of the learning outcomes of the course Research Methods for Language Professionals is to acquire the ability to design research instruments. Thus, early in the course the students are engaged in a formative task by which they develop and run mock questionnaires and interviews with their peers or members of their own professional community. After receiving feedforward from tutor and peers, the outcomes of the practice are later included in the individual three-part summative assessment procedure for the course. This example also illustrates how Openness as *transparency*, Personalisation, Participation and Experience as 'learning by doing' are put into practice, in addition to Learning by Collaboration and Discussion.

The second approach is *learning oriented assessment* (Carless, 2007) by which assessment tasks are seen as learning tasks; they are constructively aligned with learning content and objectives, are relevant to the real world and spread throughout the course, e.g. the semester-long assessed portfolio – Learning by Production – that the students compile throughout the duration of the course Technology-Enhanced Creative Writing in a Foreign Language. Furthermore, according to *learning oriented assessment*, the students are involved in the assessment procedure by engaging in drafting assessment criteria. As an example, the students taking Introduction to Digital Technologies for Language Teaching nominate assessment criteria toward which they wish to be assessed, fostering COMP-PLETE's Personalisation and Participation.

In addition, in *learning oriented assessment* students are involved in self and peer evaluation. To exemplify, one of the assignments in the course Telecollaboration for Language Learning requires that the students collaborate to add content to Wikipedia and that they self-assess their work (Konstantinidis, 2020). Through their engagement with this assignment, students build stronger bonds with their peers, enhancing different aspects of COMP-PLETE's Community, while the globally open trait of the final outcome in Wikipedia fulfills aspects of Openness.

Finally, in *learning oriented assessment* feedback takes the shape of feedforward, i.e. relevant for future work. An example is again provided by Introduction to Digital Technologies for Language Teaching for which the students keep a blog reflecting their development as learners during the course. Halfway through the duration of the course, the blogs are opened to the tutor and optionally to peers and the public for receiving feedforward to be implemented in the final submission. For the final submission, the students select which posts they wish to be assessed – an example of Personalisation – and are encouraged to explore different modes of representation of content (i.e. text, audio, video, animation), benefiting from Multimodality and Technological-Enhancement.

The third approach to assessment is *sustainable assessment* by which tasks are designed to encompass "the knowledge, skills and predispositions required to underpin lifelong learning activities" (Boud, 2000, p. 151). The outcomes of *sustainable assessment* extend beyond the goals of the course, e.g. in the course Integrating Technologies to Course Design and Assessment, the students are asked to design and write the rational for a digital course to be delivered in their institution, fostering COMP-PLETE's Technological-Enhancement, Personalisation and Experience, together with Learning by Production and Practice.

Clearly, assessment in the MA in DTLT is conceived at programme level, witnessed by the tight connection between course specific assessment activities and the overarching COMP-PLETE approach. Table 2 below lists several types of assignments and states their relation to the model's features.

Table 2. Examples of assessment activities in COMP-PLETE

Module	Assignment description	Most prominent features of COMP-PLETE
Introduction to Digital Technology for Language Teaching	Students keep a reflective blog. At the end of the module they select the posts they wish to submit as assessment	Multimodality, Personalisation, Learning, Experience, Technological-Enhancement
	Students propose a topic and mode of delivery for the final assignment, and nominate two assessment criteria	Openness, Multimodality, Participation, Personalisation, Learning, Experience, Technological-Enhancement
Integrating Technology in Course Design and Assessment	Students design and develop an online course of their choice – emphasis is put on the relevance of creating a digital artefact that is personally relevant	Multimodality, Personalisation, Participation, Learning by Production, Experience, Technological-Enhancement
	Students write a rationale for their course design	Learning by Acquisition, by Inquiry and by Production
Telecollaboration for Language Learning	Students collaborate to add content in Wikipedia and self-assess their work	Community, Openness, Participation, Learning by Production and Collaboration, Experience
	Students select a case-study to review in collaboration with their peers	Community, Personalisation, Learning by Inquiry and by Discussion, Experience, Technological-Enhancement
	Students can propose a topic for their last assignment	Multimodality, Participation, Personalisation, Learning, Experience, Technological-Enhancement

	Students maintain a reflective journal on their experience as gamers	Personalisation, Learning by Production and Practice, Experience, Technological-Enhancement
Game-Based Learning	Students design a game-enhanced scenario and they can build on this scenario for future work	Multimodality, Personalisation, Learning, Experience, Technological-Enhancement
Technology-Enhanced Creative Writing in a Foreign Language	A creative writing portfolio and related reflective short essay	Personalisation, Learning by Production, Technological-Enhancement
	Students select the topic and mode of delivery for the final assignment in which they demonstrate the ability to apply theories to their teaching	Personalisation, Multimodality, Learning by Inquiry and by Production
Second Language Acquisition	Students write a review of a text book of their choice	Personalisation, Learning by Inquiry and by Production, Experience
	Students create and present a (blended) classroom learning event	Personalisation, Learning by Practice and by Production, Participation, Experience, Technological-Enhancement

CONCLUSION

Prior to COVID-19, distance learning had gained popularity as a modality for academic studies that allows for the degree of flexibility particularly welcomed by people at difference stages in their professional development. However, distance learning is also notoriously affected by a high drop-out rate related to the students' feeling of isolation and disconnection, by the challenges that distance learners face when managing the academic demands, while still attending those imposed by their professional and personal lives, and more recently, by the need to redefined institution-based courses to satisfy the appetite for the socially interactive open pedagogies that have emerged in the last two decades.

With the rise of COVID-19 what was earlier a popular educational choice became a necessity. COVID-19 forced face-to-face teaching around the globe to move to the online environment, changing drastically the shape of education. Pedagogically weak ERT, during which technical and technological considerations were prioritized over pedagogy, became the fasted and safest solution to allow teaching and learning to continue (Hodges et al 2020). However, as the effect of COVID-19 lingered beyond expectations, it seems reasonable to aspire to replace ERT's pedagogical weaknesses with planned and purposely designed online teaching and learning. COMP-PLETE fits this purpose.

COMP-PLETE, which was developed to respond to the challenges of distance education, focuses on the nature and quality of the students' experience in the online environment. Surfacing as the outcome of several years of pedagogical ideation and experimentation within the postgraduate professional development MA in DTLT, it offers the guidelines for creating distance learning courses that generate a sense of community belonging to fight isolation. It also promotes a participatory learning experience that empowers the students to build personally relevant learning trajectories to strengthen their commitment to their studies. Finally, it embraces multimodal open teaching, stretching the realm of learning beyond the boundaries of the institution, to foster the construction of knowledge through social interaction and networked relations.

This paper has introduced the features of COMP-PLETE, it has endorsed COMP-PLETE theoretically by solidly embedding each of its traits in the relevant literature and has corroborated the model empirically by providing several examples of its implementation.

Our conversation around COMP-PLETE aims to be part of a wider study which in addition to the theoretical conceptualisation and the practical implementation of the framework, also addresses the response of the students to the pedagogical approach that it generates. Although the framework has been tested empirically, future research will endeavor to gather intelligence on students' perception and to deepen further our understanding of the impact of COMP-PLETE on learning. Future work on COMP-PLETE will also

aim to provide step-by-step support for distance learning designers and instructors interested in achieving pedagogical goals that straddle between closed institutional requirements and the dynamics of open social engagement, that address feeling of isolation and endangered commitment to studying that are commonly attested in distance learning.

Ultimately, in these turbulent times of COVID-19, COMP-PLETE provides the framework to shape the future of teaching practices that moves forward from ERT to endorse effective and pedagogically sound online education.

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DETERMINANTS OF DISTANCE EDUCATION DROPOUT: EVIDENCE FOR OPEN UNIVERSITY OF BRAZIL/FEDERAL UNIVERSITY OF SANTA MARIA COURSES

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ABSTRACT

This research seeks to understand the determinants of student dropout in the courses offered at the Open University of Brazil system at the Federal University of Santa Maria. The research used the following methods: survival function, factorial analysis, and logistic function. Results indicated that male students, with higher levels of income, who live a greater distance from the pole and who travel to it more frequently have a higher probability to drop out. Conversely, greater agreement with the adequacy of academic aspects and lower technological difficulties reduce the chance of dropout. Contrary to the evidence, the adequacy of the non-academic aspects, which refer to the infrastructure, equipment, and functioning of the hubs, increases the likelihood of dropout. However, e variation in the dropout due to the non-academic aspects of the pole is much smaller than the distance and frequency of going to the pole. Therefore, we suggested that the increase in face-to-face activities has a greater impact on the probability of dropout than the physical conditions of the pole.

Keywords: Student dropout, distance education, graduated and postgraduate courses, Open University of Brazil, Federal University of Santa Maria.

INTRODUCTION

Recently, distance education has grown systematically; however, this education modality has faced contradicts, such as the perceived quality of education (Behr et al., 2020, Gunduz & Karaman, 2020) and limits, such as the high dropout rates (Bittencourt & Mercado, 2014, Sousa & Maciel, 2016, Mouton, Zhang & Ertl, 2020). This, at the same time that higher institutions seek to expand opportunities, work with the need for pedagogical and technological adaptations and innovations for the creation and management of distance courses that produce effective results.

However, the dropout is a problem of concern to educational institutions (Lu, 2019, Radovan, 2019), as it means the interruption of the study cycle and cause aggravated social, academic, and economic problems, both for institutions, and students (Schmitt et al., 2020, Kilinc & Okur, 2021, Greenland & Moore, 2021). It is a failure of the higher education system to generate results after a significant volume of resources has been invested (Organization for Economic Co-operation and Development, 2012). Such impacts are even greater in the distance education because dropout reaches expressive numbers. According to the Brazilian Association of Distance Education [ABED] (2019), about 40% of institutions with fully remotely regulated courses recorded dropout rates between 21% and 50%.

The term dropout has several meanings, which indicate dropouts, removals, and transfers. It is a complex phenomenon a with a natural heterogeneity of definitions (Grau-Valldosera & Minguillion, 2014). Therefore, Silva & Mariano (2021) highlighted that the success of diagnostic depends, among other things, on an adequate definition of the phenomenon to be addressed. Santos and Oliveira (2009), indicated that dropout refers to the student who gives up permanently at any stage of the course. For Schmitt et al. (2020) dropout is the student's decision to drop out of the course for any reason. In distance education, dropout also includes students who enrolled and never presented themselves in the virtual environment to mediators or colleagues or who did not perform activities (Favero, 2006) or those who just voluntarily give up (Levy, 2007).

In the public distance education system, which has in the Open University of Brazil (OUB) system its structure of offering courses, dropout is also among the priorities, since the high rates determine, in a certain way, a measure of the inefficiency of public policy, since they necessarily imply in idleness in the system and higher expenses per student. In this sense, reducing dropout rates should be more than an institutional commitment, because as a public educational program, OUB courses represent the possibility of access to public higher education. In this perspective, understanding the determinants of dropout becomes essential for public institutions to promote changes in the distance education system, both in terms of management and supply. These changes will make it possible to reduce the dropout rates; and consequently, increase efficiency in the students training.

Thus, in the search for the causes of dropout, several studies identified different factors and models. Rovai (2003) initially presented four fundamental dimensions to the analysis of dropout: Socio-demographic situation, skills, and previous experiences, the situation of students that vary in course and interaction, participation, and performance. Ramos, Bicalho and Sousa (2014) expanded these dimensions, and added course and university management. Silva, Martins and Maciel (2017) subdivided the relevant factors into four categories: those related to students; the institution, teachers/tutors, and external factors. To Behr et al. (2020), the determinants can be categorized into the demographic and family background, the financial situation of students, their prior education, institutional determinants, as well as motivation and satisfaction with study.

Empirical evidence, based on different models of analysis, has in common several determinants of dropout. The three main factors, in order of importance: lack of time, financial and wrong choice (ABED, 2016).

Silva, Martins and Maciel (2017) identified that the main factors for the student's abandonment of the course are (i) low academic performance, (ii) lack of time, (iii) inexperience in distance education (lack of discipline), autonomy, maturity, among others, (iv) lack of motivation and (v) the lack of interaction and participation in the virtual learning environment. Already Vieira et al. (2020) founded two dimensions, one relating to support to learning, and the other to personal conditions during study.

The Federal University of Santa Maria (UFSM), has been offering Open University of Brazil (OUB) courses since the structuring of the system in 2005, presuming that dropout is approximately of 44% for graduation courses and 38% for postgraduate courses (Saldanha & Bender, 2020). As the was not analyzed in the institution, the UFSM does not have studies that assess the reasons for dropping out of distance learning courses. This information gap makes it impossible for the students to have adequate knowledge of their conditions; and consequently, for the production of effective policies to combat dropout and non-completion of courses.

A Condition that causes the need for the institutions to find possible strategies to increase the percentage of graduating students; and, consequently, reduce the expenditure per student trained in the distance learning system. Based on these discussions, this study determined factors of student dropout in the Open University of Brazil system of the Federal University of Santa Maria (OUB/UFSM).

Supporting this, the research explained in more detail the conditioning factors of the development and conclusion of the courses in this teaching modality, as well as the importance of educational tools in this process. Thereby, the study will subsidize the institution's managers and the coordinators of distance education courses in the formulation of educational policies on the use of technological resources selectively and directed toward effectiveness. The knowledge of the probability of a student escaping allow the institution to take differentiated and specific strategies for students who are more likely to drop out of the courses.

METHOD

To achieve the objective of this study, descriptive research was conducted using the quantitative method and applying the survey design. Descriptive research analyzed a certain problem or situation to provide greater familiarity with the theme (Hair et al. 2010). About the research design, the study is characterized as a case study (Creswell, 2014). As a research strategy, a survey was used, as this is highlighted t by Hair et al. (2010), as being the most appropriate in studies involving a sample of many individuals.

Population and Sample

Are part of the population of all students who enrolled in graduated and postgraduate courses offered by OUB/UFSM, from 2005 to 2018, totaling 18,025 enrollments. The research instrument was sent by e-mail, at the Data Processing Center of UFSM, to the entire population and was available online, for 15 days. After this period, 859 valid instruments were obtained, of which 364 were regularly enrolled and 495 were evaded students. The research was approved by the Research Ethics Committee (CAAE: 00982218.0.0000.5346).

Instrument

The questionnaire was divided into three parts. The first identifies the student profile and the enrolled course. The second refers to the extent of the dropout, including the reasons that would take to the course abandonment. The third analyzes the quality of the OUB course from the dimensions of the HEdPERF scale, proposed by Abdullah (2006) to assess the quality of services in higher education institutions. HEdPERF (*Higher Education Performance-only*) captures the quality of service in higher education from six dimensions: non-academic aspects, academic aspects, reputation, access, program issues and understanding. The research questionnaire applied to Bahia professionals contemplated a 5-point Likert scale [1 to 5], corresponding to the following statements: I fully disagree 1, I partially disagree 2, I am indifferent 3, I partially agree 4 and I fully agree 5. For all items, except those related to difficulties, the higher the agreement, the higher the quality of the course.

The instrument was submitted to three specialists to assess the adequacy of the items and to a pre-test with ten students from different distance education courses at OUB/UFSM for evaluating semantics. Table 1 presents the blocks, variables and number of questions of the research instrument.

Table 1. Variables and dimensions of the research instrument

Block	Variables/Dimension	Number of questions in instrument
Profile and course	Gender, age, income, course, pole, year of entry, etc.	Questions 1 to 5
Dropout	Distance from the pole, Reason for dropout, dedication to the course, etc.	Questions 6 to 17
The quality of the course	Non-academic aspects Academic aspects Reputation Access Program Knowledge	Questions 18 to 59

Data analysis involved three other techniques in addition to descriptive statistics: Exploratory factor analysis, hypothesis tests and logistic regression, which are described in the following sections.

Survival Function

The nonparametric method proposed by Kaplan-Meier (1958) was used to estimate the survival function. The survival function $S(t)$ (probability that the student will remain on the course for a longer period than the semester t) is given by the following:

$$\hat{S}(t) = \prod_{i:t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$$

with t_i time (semester) in which at least one event (dropout) happened, d_i the number of events (dropout) that occurred in the semester t_i and n_i the students who remain in the course in the semester t_i.

Factorial Analysis

The choice for exploratory factor analysis is justified by the fact that the dimensions of Abdullah (2006) were built and applied to Malaysian students, still needing exploratory analyzes to verify the maintenance of their dimensionality in other countries. In order to verify whether factor analysis was appropriate for the sample, Barlett's check and Kaiser-Meyer-Olkin test (KMO) were applied. To choose the variables that would remain in the factor analysis, the commonality criterion was used, in which variables with commonalities extracted equal to or less than 0.5 were excluded.

The principal component method was chosen to estimate the factor loads, and for the choice of the number of factors, the criteria of eigenvalues greater than one, the percentage of the explained variance and graph *screeplot* were used. The use of the recast technique meets the objective of better lawmaking. To evaluate the level of reliability of the factors, *Cronbach's Alpha,* was used, which verifies the internal consistency of a scale and values greater than 0.7 have been considered satisfactory for general research. For exploratory research, values over 0.6 are considered acceptable (Hair et al., 2010). After estimating factor analysis, factors related to the course quality scale were formed, based on the means weighted by factor loads.

Hypothesis Tests

The chi-square and Fisher exact tests were used to identify possible associations between covariates and main outcomes "death" versus "hospital discharge," and odds ratios ORs were used as measures of association. This test has the null hypothesis that the variables are independent and the alternative hypothesis that there is an association between the variables (Pestana & Gageiro, 2008).

To verify whether there are differences in perception regarding the factors related to drop out between the assets and evaded, t test of mean difference was applied. The v test has as null hypothesis the equality of means between assets and evaded. Additionally, to identify whether the t test should be homoscedastic or heteroscedastic, Levene's test for the equality of variances was previously applied.

Logistic Regression

The logistic function consists of regression over *dummy* variables. The singular characteristic of this model is that the dependent variable extracts a response of a dichotomous nature (1 or 0). Behr et al. (2020) to study the determinants of dropout have already used this method. According to Cameron and Trivedi (2009), the Logit model can be defined as the following:

$$Y_i = X_i \beta + \varepsilon_i$$

with $Y_i = \{1\ 0$ *with prob. with prob.* $p\ 1 - p$; where Y_i represents the dependent variable (binary), X_i the vector of explanatory variables, and ε_i the error term that presents normal distribution with zero mean and variance equal to $1/[N_i P_i(1 - P_i)]$, being the probability of $P(Y = 1)$ defined as the following:

$$P_i = P(Y\_i = 1 | X_i) = F(x_i'\beta)$$

where $F(.)$ is a function of $x_i'\beta$, usually a cumulative probability distribution function to ensure that $0 \leq P_i \leq 1$. The *odds ratios* (or the odds ratio) can be calculated as:

$$L_i = \left(\frac{P_i}{1-P_i}\right) = X_i$$

being L_i the logarithm of the chance ratio, the $\frac{P_i}{1-P_i}$ the chance ratio and X_i the array of exogenous variables (explanatory).

The Logit model is estimated using the maximum likelihood method, since the vector coefficients β do not have the usual interpretation of linear regression models. Thus, it is necessary to calculate the Marginal Effects (*EM*) to analyze the results more adequately. Specifically, the *EM* of an explanatory variable measures the impact on $P(Y = 1)$ that corresponds to the probability of the event occurring, of a variation in the explanatory variable (s). In turn, the effects on continuous variables are obtained by the derivatives of the function in relation to the variable:

$$\frac{\partial P_i}{\partial X_j} = f(X_i\hat{\beta}_J)\hat{\beta}_J$$

For binary variables the *EM* is the change in $P(Y = 1)$ when D_j goes from 0 to 1. So, $EM_j = P(Y = 1) - P(Y = 1 \mid D = 0)$. In terms of analysis, *EM* is interpreted as the varying impact of a unit on the variable, at the point considered (mean), on the probability of $Y = 1$, keeping the other variables constant.

Data, Variables and Analytical Model

The data and variables used to estimate the Logit model as well as the expected relationships, are presented in Table 2.

Table 2. Description of the variables used to pet the Logit model

Variable	Definitions	Categories	Expected ratio
Gender	Generate student gender ratio	Male 1 Female	<
Age	Age range of students	0 - 30 years old 1 - between 31 and 40 years 2 - Over 40 years	>
D1_income	Students' income	0 - otherwise 1 - up to 2 minimum wages	<
D2_income	Students' income	0 - otherwise 1 - greater than 5 minimum wages	>
ens_med	School where he attended high school	1 - public 2 - private	>
course_level	What is the level of the course	1 - graduation 2 – postgraduate	<

distance_pole	Approximate distance from where you live to the pole	1 - up to 30 km away 2 - over 30 km away	>
Activity time	Weekly time dedicated to course activities	1 - up to 10 hours per week 2 - over 10 hours per week	<
D1_freq	The frequency with which the student goes to the pole	1 - less than 1 time a month 2 - 1 time or more	>
D2_freq	The frequency with which the student goes to the pole	1 - less than 1 time every three months 2 - 1 time between 4 to 6 months	<

Considering the logistic regression modeling and the set of variables obtained from the instrument applied to students who evaded the courses offered by OUB/UFSM, the analytical model was defined, according to the equation in (6):

$$Y_e = \delta_0 + \beta_1 gender_i + \beta_2 age_i + \beta_3 D1\_income_i + \beta_4 D2\_income_i +$$
$$+ \beta_5 ens\_med_i + \beta_6 course\_level_i + \beta_7 dist\_pole_i +$$
$$+ \beta_8 temp\_ativ_i + \beta_9 D1\_freq_i + \beta_{10} D2\_freq_i + \beta_{11} \sum_1^n FAT_i + \beta_{12} \varepsilon_i \quad (6)$$

in which Y_o refers to the dropout of OUB/UFSM students; δ to the intercept; β to angular coefficients; $\sum_1^n FAT_i$ to the factors generated by factor analysis and ε to the error term.

To verify the suitability of the model, the diagnostic tests were performed: Wald and LR tests to test whether the coefficients of each forecaster are significantly different from zero;. If this occurs, it can be assumed that the forecaster is contributing significantly to the prediction of the output variable (Field, 2009). Wald and LR tests were used for comparison of variables, to test whether the combinations between variables are different from zero. Hausman and Small-Hsiao tests assessed the Independence of Irrelevant Alternatives (IIA). To test the suitability of the model, the Hosmer-Lemeshow test was used, which relates the data to its estimated probabilities from lowest to highest. A chi-square test determined whether the observed frequencies are close to the expected frequencies; having as a null hypothesis the appropriate adjustment of the model (Archer, Lemeshow & Hosmer, 2007).

RESULTS

Following the methodological proposal, the analysis of results was developed in two stages. In the first, based on the data of the 18,025 students entering the OUB/UFSM, between 2005 and 2018, survival functions were created. In the second, from the responses of the 859 research instruments, descriptive statistics, factor analysis, and logistic regression were applied to the analysis of the determinants of dropout.

Results of Survival Function

The analysis of survival function was divided according to the level of the OUB/UFSM courses. Of the 18,025 entrants, 8,571 (47.6%) enrollments sat in graduated courses and 9,454 (52.4%) in postgraduate courses. Figure 1 and Table 3 present the results of graduated courses.
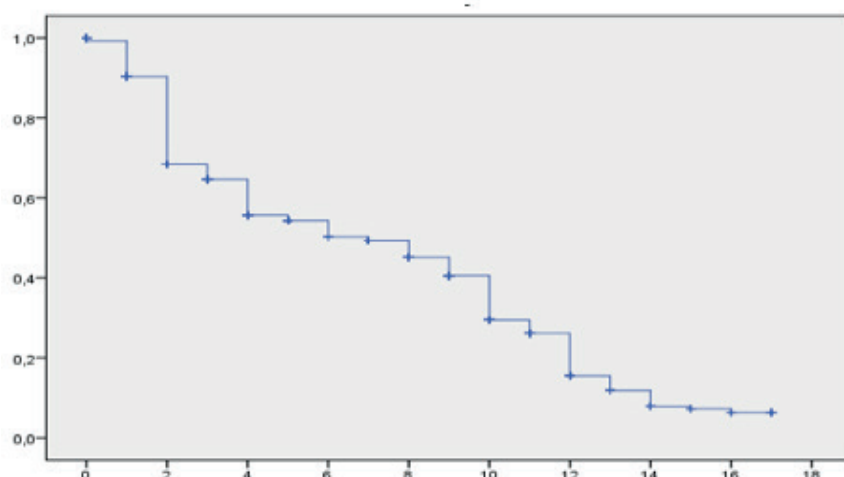
Figure 1. Results of the survival function for undergraduate courses OUB/UFSM, in semesters.

We observed that the risk of dropout of OUB/UFSM graduated course is higher at the beginning of the period and reduces over the semesters. The steps presented result from the use of the academic semester as a unit of time, so the risk remains constant during the semester, varying when the semester changes. Variations are greater in the initial periods, and over the course, the risk systematically reduces to lower rates as the periods eat. Therefore, the chances of dropout are higher when entering the institution and decrease according to the student advances. After 12 semesters, the survival function indicates that 15.5% of the students remain enrolled. These results corroborated studies that indicated that the risk of dropout is higher in the first semesters (Oliveira et al., 2018, Utami et al., 2020).

Table 3. Results of dropout for graduated courses OUB/UFSM, in %

Graduated Course	Dropout
Physics	76.9%
Spanish Letters - Literatures (REGESD)	67.0%
Letters Portuguese and Literatures	59.3%
Agric. Tec. Family Sustainability - Technologist	58.3%
Spanish Language – Literatures	57.6%
Geography	55.2%
Public Administration - Bachelor's Degree	51.3%
Sociology	50.0%
Education	44.5%
Field Education	39.7%
Computing	39.6%
Teacher Training Course for Professional Education	37.8%
Special Education - Bachelor's Degree	36.3%
in Religion Sciences	33.3%
Average	50.49%

Note: OUB/UFSM graduated courses include bachelor's degree, degree, technologist, and pedagogical training.

However, as indicated by the percentages of dropout in Table 4, the risks are substantially higher in some courses. In eight of the 14 undergraduate courses offered by OUB/UFSM, dropout is greater than or equal to 50%, reaching more than two-thirds in physics and literature-Spanish courses. The respective analyses for the postgraduate courses are reported in Figure 2 and Table 4.
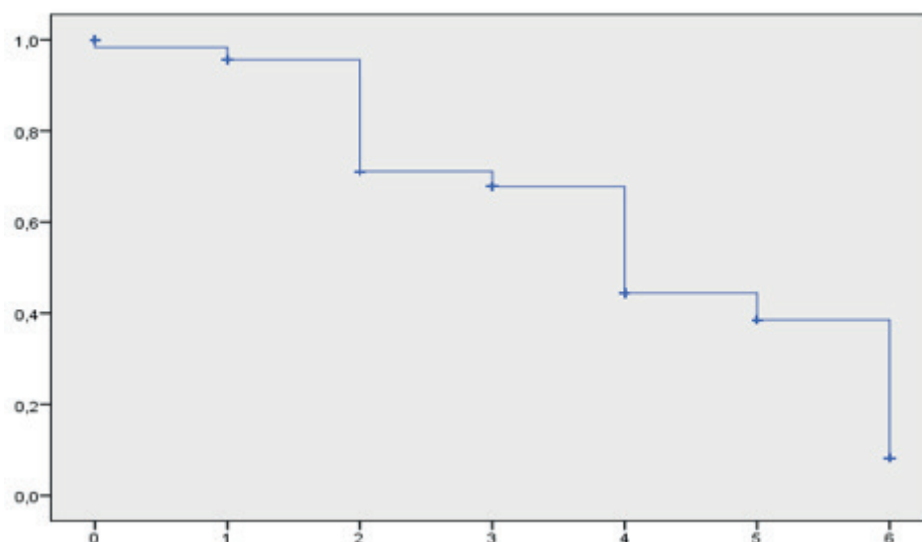
Figure 2. Result of survival function for postgraduate courses OUB/UFSM, in semesters

Dropout in postgraduate courses happens mainly, at the end of the first year (second semester of the course). Notably, for these courses, the subjects are offered in the first two semesters, being the third for the student to develop the final research. If the student has not completed the course in the three semesters, the institutional rules allow the request for an extension for one more semester. Therefore, what observed is that most students give up in the stage of the realization of the disciplines. It is also observed that most students who do not complete the course within the ideal period (three semesters) and, even requesting an extension of the deadline, about 40% do not complete it until the end of the second year.

Comparatively, the indicators of postgraduate dropout are lower than those of graduated; however, there is a high percentage of non-graduates, mainly in the courses of Energy Efficiency Applied to Productive Processes, Teaching philosophy in high school, Management in Archives and Media in Education, in which more than half of the students drop out.

Table 4. Results of dropout for postgraduate courses OUB/UFSM

Postgraduate Course	Dropout
Energy Efficiency Applied to Production Processes	57.1%
Teaching Philosophy in High School	56.0%
File Management	54.1%
Media in Education	51.2%
Special Education Cognitive Impairment and Deaf Education	47.7%
Management of Public Health Organization	44.4%
Environmental Education	42.3%
Educational Management	41.6%
Municipal Public Management	40.8%
Public Management	39.6%
Com Tec. and Com. Applied to Education	37.2%
Teaching Mathematics in High School	36.9%
Teaching Sociology in High School	34.1%
Early Childhood Physical Education and Early Years	25.2%
Average	43.44%

The mean dropout in the OUB/UFSM courses was 46.97%, and the average graduation (50.49%) higher than postgraduate studies (43.44%). According to the coordinator of the Coordination of Technology in Distance Education (CTED) of Higher Education Personnel Improvement Coordination [Capes] (2018), in general, only one out of every three students of the OUB system successfully completes the courses offered. Therefore, compared to the national dropout rate (66.66%), OUB/UFSM has trained, on average, more students than other courses at both levels of education (undergraduate and graduate).

Profile of Active and Evaded Students

In this stage, analyses characterized the interviewee's profile, the choice and dedication to the course, the use of the pole and the dropout decision. These analyses are based on the sample of 859 interviewees, of whom 364 instruments were answered by students who continue to attend some OUB/UFSM course, called 'active,' while 495 were answered by students who abandoned the courses, identified as 'dropped out.' Table 5 presents the profile of the interviewees of the two groups, which are tested by χ^2, which tests the hypothesis of independence between the variable under analysis and the group.

Table 5. Frequency, percentage of answers and χ^2 to the profile variables of the interviewees of the active and evaded groups

Variable	Categories	Assets		Dropouts		Chi-Square
		Frequency	%	Frequency	%	Value (sig)
Gender	Male	83	22.8	180	36.4	18.16
	Female	281	77.2	315	63.6	(0.000)
Age	up to 20	6	1.6	2	0.4	
	From 21 to 30 years	109	29.9	91	18.4	20.32
	31 to 40	142	39.0	221	44.6	(0.000)
	Over 40	107	29.4	181	36.6	
Income	Up to 1 minimum wage	58	15.9	23	4.6	
	Family income was between one or two minimum wages.	75	20.6	115	23.2	
	Between three and five minimum wages	172	47.3	203	41.0	49.66 (0.000)
	More than 5 times the minimum wage	59	16.2	154	31.1	
High school	Only in public school	274	75.3	357	72.1	
	All or mostly public school	27	7.4	39	7.9	1.30
	Private school only	44	12.1	72	14.5	(0.729)
	All or mostly private school	19	5.2	27	5.5	

Most are female and studied only in public school. Family income ranged predominantly from 3 to 5 minimum wages in 11 36.6% of the patients in the sample. The χ^2 test indicates an association between the group and the variables gender, age and income. In the group of dropouts, there is a higher percentage of men, older individuals with higher incomes when compared to the group of students who remain in the course (active). Then, the distance and frequency to the pole were analyzed (Table 6).

Table 6. Frequency, percentage of responses and χ^2 to pole variables for active and dropout groups

Variable	Categories	Assets		Dropouts		Chi-Square
		Frequency	%	Frequency	%	Value (sig)
Distance to Pole	Up to 3 km	77	21.2	70	14.1	11.86 (0.037)
	From 3 to 10 km	40	11.0	72	14.5	
	From 11 to 20 km	29	8.0	39	7.9	
	From 21 to 30 km	27	7.4	28	5.7	
	From 31 to 50 km	40	11.0	75	15.2	
	More than 50 km	151	41.5	211	42.6	
Frequency to Pole	Once a month	123	33.8	263	53.1	260.12 (0.000)
	Once every two months	75	20.6	55	11.1	
	once every three months	54	14.8	32	6.5	
	once every 4 months	19	5.2	7	1.4	
	Once every five months	10	2.7	3	0.6	
	Once every 6 months	62	17.0	44	8.9	
	Once per year	14	3.8			
	Annually	7	1.9	2	0.4	
	Never			89	18.0	

The majority of active students and dropouts declared to live at a distance above 30 km from the pole. Regarding the majority (53.3%) of the dropouts indicated that they went at least once a month, whereas the active workers stated that they go once a month (33.8%) or once every two months (20.6 %). The interviewees were asked about the level, choice, hours of dedication, and work concomitantly with the course (Table 7).

Table 7. Frequency, percentage of responses and χ^2 to course variables for active and dropout groups

Variable	Categories	Active		Dropouts		Chi-Square
		Frequency	%	Frequency	%	Value (sig)
Course	Degree	186	51.1	265	53.5	0.499 (0.480)
	Postgraduate Degree	178	48.9	230	46.5	
Course Selection	Career Opportunities	172	47.3	180	36.5	13.42 (0.02)
	Peers and parental influence	3	.8	7	1.4	
	Likes the area in which the course is inserted	163	44.8	246	49.9	
	Course information: media or lectures	8	2.2	16	3.2	
	Professions Fair			1	.2	
	Other	18	4.9	43	8.7	
Doubts in the Choice	Yes	53	14.6	67	13.6	23.96 (0.000)
	No	294	80.8	426	86.4	
	Maybe	17	4.7			
Weekly Hours Dedicated to the Course	Up to 10 hours*	202	55.5	321	65.1	12.71 (0.005)
	From 11 to 15 hours	90	24.7	112	22.7	
	From 16 to 20 hours	50	13.7	36	7.3	
	More than 20 hours	22	6.0	24	4.9	
During the course	Yes, and that tends to influence my possible decision to drop out	52	14.3	198	40.2	70.34 (0.000)
	Yes, but that would not influence my decision to drop out	274	75.3	246	49.9	
	No	38	10.4	49	9.9	

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The choice was motivated mainly by job and career opportunities and by the interest in the area in which the course is inserted, being dedication up to 10 hours a week. The professional expectation is an important factor in prevention dropout. About this, Gunduz & Karaman (2020) showed that students' low career expectations and academic failure in the process of education resulted in both loss of motivation and consequently dropout.

Around 90% of students work; however, among those who continue to attend the course, 75.3% reported that work would not influence the decision to leave, while 49.9% of those who dropped out, indicated that work influenced the decision. For a more detailed analysis of the decision to abandon the course, Table 8 is presented.

Table 8. Frequency, percentage of responses and χ^2 to the dropout variables for active and dropout groups

Variable	Categories	Active		Dropouts		Chi-Square
		Frequency	%	Frequency	%	Value (sig)
Decision to Leave the Course	No. I decide alone	77	21.2	263	53.3	100.86 (0.000)
	Yes. Chat with friends and/or family	194	53.3	128	26.0	
	Yes. Talk to other classmates	32	8.8	25	5.1	
	Yes. I talk to the tutor and/or teachers of the course	61	16.8	77	15.6	
Factors influencing evasion	Dissatisfaction with the chosen course	85	23.4	56	11.3	223.37 (0.000)
	Dissatisfaction with the teacher/ tutor	31	8.5	42	8.5	
	Family Issues	32	8.8	38	7.7	
	Paternity or maternity	6	1.6	32	6.5	
	Financial difficulties	23	6.3	15	3.0	
	Change City Base	8	2.2	1	.2	
	House far from the pole	49	13.5	39	7.9	
	Disease	91	25.0	19	3.8	
	Other	39	10.7	253	51.1	
Reasons for Leaving the Course	Program Structure	27	7.4	17	3.4	74.45 (0.000)
	Poor teaching infrastructure	27	7.4	16	3.2	
	Lack of support	71	19.5	55	11.1	
	Premium features do not meet my expectation	46	12.6	38	7.7	
	Difficulty adapting to the pace of the University	26	7.1	69	13.9	
	Not satisfied with my academic performance	68	18.7	87	17.6	
	Dissatisfaction with the teacher and class method	36	9.9	26	5.3	
	Other	63	17.3	187	37.8	

Among those who abandoned, 53.3% stated that they made the decision alone, while among the active ones, the majority stated that they would talk to friends and family. Notably, 51.1% of those who abandoned the course marked the option "others" when asked about the dropout influencers. This indicated that the dropout decision t involved reasons of different natures; however, the decision involved not only one, but a set of them.

Conversely, the factors most referred by the literature, such as limited financial resources and difficulty in reconciling the course with professional activity, did not stand out among the dropouts from the OUB/ UFSM courses (ABRAEAD, 2007; Rossi, 2008). Conversely the assets indicated dissatisfaction with the course and illness as the factors that would most influence the dropout. These results are in agreement with Suhlmann et al. (2018) and Behr et al. (2020), which find that satisfaction with study affect the risk of dropping out, while Aydin et al. (2019) reported health problems as one of the reasons for dropout.

Factorial Analysis

Then, the exploratory factor analysis was estimated with the objective of obtaining the determinants of evasion. In this process, six items were successively excluded from the analysis because they presented commonality below 0.5. After that, the KMO (0.953) and Barlett's sphericity tests (value 18.328,42 and *sig.* 0.000) indicated the factability of the data. This was followed by the definition of the number of factors, for which the criteria of eigenvalues greater than one, percentage of variance and the scree plot were considered. Figure 3 shows the compressive strengths obtained with these mortars.
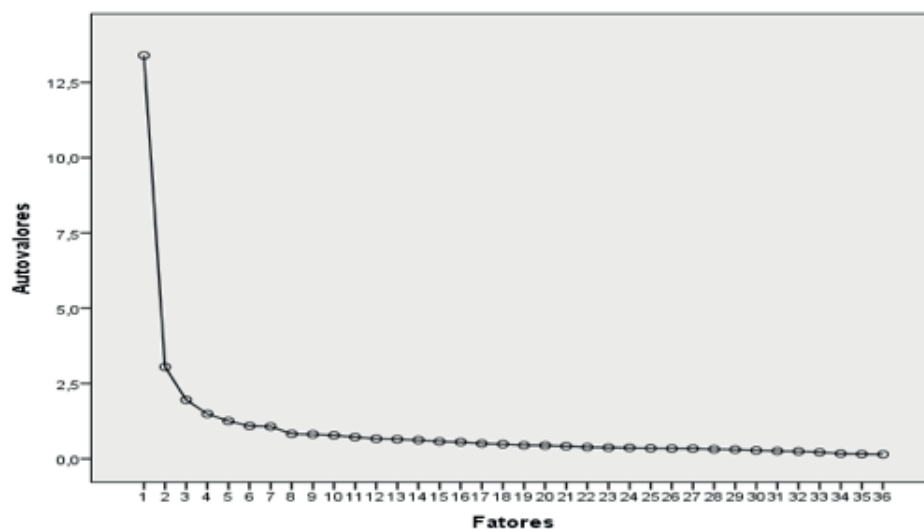

Figure 3. Scree plot graph of the factorial analysis

Seven factors had eigenvalues greater than one. The scree-plot curve corroborated with the indication that the seven factors could be extracted. In addition, the seven factors together explain 64.72% of the data variance. From these results, we chose to extract seven factors (Table 9).

Table 9. Factor loads, explained variance and Cronbach's alpha of the factors

Factors/Variables	Loads Factorial	Variance Explained	Alpha of Cronbach
Factor 1 - Academic Aspects			
I had easy access to the teachers and tutors of the course in order to help me with my doubts regarding the course	0.770		
When there were difficulties, the teachers showed a sincere interest in solving it	0.760		
Teachers and tutors were sensitive to meeting the student's needs	0.711		
Was free to ask questions of teachers and tutors.	0.710		
The teachers' time devoted to solving students' doubts was adequate	0.703	37.214	0.925
The teachers favored my best performance during the semester	0.670		
I had easy access and return from UFSM servers regarding my doubts in general	0.666		
Students came to the teacher when they needed help.	0.580		
The course had tutors in adequate quantity	0.521		
The pole manager was easily contacted and helped me whenever I needed to	0.462		
Factor 2 – Reputation			
I would recommend EaD / UFSM courses to friends to attend undergraduate or graduate courses	0.719		
UFSM has a professional image	0.699		
The teaching material was updated and of good quality	0.687		
Compared with other public higher education institutions, the distance education courses / UFSM had higher quality	0.663	8.470	0.904
The course meets/met my expectations	0.645		
The teachers showed a positive attitude in the classroom	0.603		
UFSM offered flexible and adequate teaching plans	0.582		
The course had tutors in adequate quantity	0.553		
The teachers had experience and extensive knowledge in their area	0.540		
Factor 3 - Non-Academic Aspects			
At the pole, the facilities adequately met the requirements for cleanliness, lighting, acoustics, ventilation, safety, conservation, and comfort necessary for the proposed activity	0.852		
The pole had appropriate building structure conditions for classes	0.849		
I believe that the pole's infrastructure was suitable for Distance Education. (living room, table, chair, projectors, etc.)	0.786		
The sanitary facilities adequately met the requirements for physical space, lighting, ventilation and cleaning	0.782	5.428	0.917
The pole provided up-to-date computer resources, with internet access, in quantity and quality compatible with the needs of the proposed activities and adequately attended to the individual demands of the students	0.757		
The pole had a library and computer lab suited to the needs of the students	0.745		
The pole had administrative professionals in adequate numbers	0.668		
Factor 4 - Technological Difficulties			
I had difficulties using the Moodle / UFSM system	0.879		0.771
I had difficulties with basic informatics (Excel, Word and PowerPoint)	0.868	4.137	
Factor 5 - Student Reception			
When I started the course, I participated in the reception day, an event where general information of interest to the public, as information about the city, UFSM, and distance learning are passed on	0.724		
Upon entering the course, I received instructions from the course and from UFSM	0.586	3.479	0.762
At the beginning of the course, the teaching program was presented	0.551		

Factor 6 - Disclosure and Service			
UFSM should make more frequent use of the city communication and dissemination channels	0.737		
I believe that it would be very important to have psychosocial assistance in distance education courses at OUB/UFSM aiming to face and resolve psychological, social, interpersonal, academic, and institutional conflicts	0.732	3.022	0.441
Factor 7 – Understanding			
EaD/UFSM provided, for low-income students social assistance, transportation, oral health, and meals	0.745		
I would like to have visited UFSM - campus Santa Maria/RS	0.500	2.971	0.293
I felt that I was part of UFSM	0.438		

The first factor, academic aspects, assesses different aspects of the student's relationship with the institution's teachers, tutors and servants. The factor is the one with the highest explained variance (37.21%) and internal consistency (alpha=0.925). The second, reputation (explained variance=8,470) analyzes the image of the institution, the conditions of the course and the teaching capacity.

The third, non-academic aspects (explained variance=5.428) assessed the degree of agreement regarding the pole, with regard to the adequacy of physical infrastructure, laboratories, libraries, computer resources, among others. The fourth, Technological Difficulties (explained variance=4,137) has two items that seek to assess the existence of difficulties with the moodle system and with basic informatics. The student reception dimension (explained variance=3.479) assesses whether, when entering the course, the student participated in activities that presented the institution, the course and its structure.

Finally, the disclosure and attendance factor (explained variance=3.022) and the comprehension factor (explained variance=2.971) that analyzed the attendance of the students and the attention to the student presented the smallest contributions to the explanation of the variance of the data in addition to inadequate reliability (Crombach's Alpha less than 0.6). Thus not being used for the following analysis. .

Then, the perception of the actives and dropouts on each of the factors was analyzed. Table 10 shows the descriptive statistics of the factors from the factor analysis, which were formed from the weighted average of the weights of the factor loads, and the *t* test.

Table 10. Results of descriptive statistics and *t* test of factors, according to active and escaped groups

Factors	Active		Dropouts		Test t	
	Average	DP	Average	DP	Value	Sig.
Academics aspects	3.987	0.857	3.566	1.002	6.597	0.000
Reputation*	4.233	0.738	3.902	0.869	6.007	0.000
Non-academic aspects**	4.104	0.844	4.048	0.853	0.938	0.349
Technological difficulties*	1.679	1.039	2.100	1.275	-5.314	0.000
Student Reception *	4.347	0.912	4.008	1.078	4.978	0.000
Diffusion and Service**	4.382	0.718	4.356	0.801	0.509	0.611
Understanding*	1.094	0.812	1.042	0.903	0.869	0.385

*Note: Test t of difference of means between the active and the evaded. * heteroscedastic t test, ** homoscedastic t test.*

The results showed that academic aspects presents an average of 3.99 in the group of those who did not dropout and statistically (*Sig.*=0.000) lower (3.57) among those who dropped out of the courses, indicating that, in general, the interviewees agreed with academic aspects.

The interviewees agreed with the reputation, since the average was 4.23 and 3.90 between the active and the evaded, respectively. Comparatively, it is also observed that the average difference between the two groups is statistically significant (*Sig.*=0.000), demonstrating that the dropouts were less satisfied with this dimension.

In the dimension Non-academic aspects, both groups had similar mean perceptions (*Sig.*=0.349) indicating partial agreement with the adequacy of non-academic aspects. The low averages (1.68 and 2.10) of the technological difficulty factor in both groups indicated that the students did not have difficulties with the systems, with the average of dropouts being statistically (*Sig.*=0.000) greater than that of the active.

The results also indicated that, on average, active and dropout students partially agree with the student's reception promoted by the institution. The average agreement is slightly higher for active students.

Generally, the results of the factors indicate that; although, the students who dropped out had statistically lower averages than the assets in four dimensions, the perception of both groups was of partial agreement with the academic and non-academic aspects, reputation, and partial disagreement technological difficulties.

Dropout Probability

In the last step, the impact of factors and other profile variables on the probability of dropout from the application of the Logit model was evaluated. Results of the *EM* used the model estimated with the heteroscedasticity correction, using the *White test* method. The achievement of adequacy was observed by not rejecting the null hypothesis of the χ^2 test of *Pearson* for 859 observations whose result was 866.76 and *prob.* out of 0.1760. These results indicated that the group of students exposed to these elements presented a larger number of ROS. The estimates are shown in Table 11.

Table 11. Results of marginal effects on students' dropout from courses offered by OUB/UFSM

Variable	Dy / Dx	Relationship with dropout	P > |z|
Gender (M/F):	-0.091966 ** (0.04307)	<	0.034
Age	0.046270 *** (0.02617)	>	0.077
D1_Income	-0.037094^{NS} (0.04381)	<	0.397
D2_Income	0.178498 * (0.04973)	>	0.000
High school education	0.033509^{NS} (0.04916)	>	0.495
Course Level	-0.016780^{NS} (0.04043)	<	0.678
Time dedicated to the activities Course	-0.096156 * (0.03952)	<	0.015
Distance from the pole	0.129301 * (0.04037)	>	0.001
D1_Frequency to the pole	0.174132 * (0.04180)	>	0.000
D2_Frequency to the pole	-0.176697 * (0.05633)	<	0.002
Factor 1 - Academic Aspects	-0.115173 * (0.03453)	<	0.001
Factor 2 – Reputation	-0.062637^{NS} (0.04152)	<	0.131
Factor 3 - Non-Academic Aspects	0.079198 * (0.02726)	>	0.004
Factor 4 - Technological Difficulties	0.071494 * (0.01702)	>	0.000
Factor 5 - Student Reception	-0.014049^{NS} (0.02539)	<	-0.580
$P(Y = 1)$	0.588542		

*Note: *, ** and *** significant at 1%, 5% and 10%, respectively; NS not significant; () standard deviation.*

Dropouts in higher education are due to a set of factors that relate to different dimensions, whether social, economic, academic, institutional and/or personal aspects (Radovan, 2019). It is no different with higher education courses in distance learning. For the OUB/UFSM courses, generally, the variables showed expected signs, according to Chart 2, and statistical significance, and for a student with average characteristics, the probability of dropping out of a course offered in this type of teaching $P(Y = 1)$, is 58.85%. Evidence that finds a parallel in Saldanha and Bender (2020), which, when analyzing the OUB/UFSM courses, reported a dropout rate equivalent to 55%. These results indicated that dropout may not be a problem specific to a course and/or a period/year, but a characteristic of these courses.

For the profile variables, the estimates of the *EM* were calculated. For the gender variable, the fact that a student is female reduces the probability of dropout by 0.0914 or 9.14 percentage points compared to the male gender. This result corroborated the empirical evidence (Laham & Lemes, 2016; Sousa & Maciel, 2016), which can be attributed to different aspects, among them the search for professional qualification due to the greater participation of women in the labor market due to the lack of alternatives. It may be the result of the knowledge area of the courses, which at OUB/UFSM are mostly graduated, an area that is more representative of the female gender (Viana, Souza & Anjos, 2017).

With regard to the age variable, the positive *EM* indicated that students with higher age groups have the probability of dropping out by 4.63 percentage points. Result that is in line with the evidence from Silva (2013), Bittencourt and Mercado (2014) and Utami et al. (2020), when they argue that older students have a higher risk of dropping out. This is a situation that would be related to the higher opportunity cost of keeping studying, whether for extra-course reasons, in the case of personal obligations, as well as possible difficulties in monitoring academic activities, adaptation to educational systems and teaching modality (Bittencourt, 2011).

Income was divided into two variables to better measure its effect on dropout. The first, D1_Income, has the measured effect for those who earn up to two minimum wages, while D2_ Income measures the effect of students with an income higher than five minimum wages. The results showed that the income level has opposite effects on dropout.; In the case of lower levels, the marginal effect was negative; although, not significant, while for higher levels of income, the probability of dropout increased by 17.85 percentage points, significant at 1%.

This evidence indicated that, for students with higher income levels, the importance of higher education or even continuing education to improve income tends to be less than for those with low-income levels, who have a higher expectation that higher education can contribute to the improvement of financial conditions and quality of life. About this, Sousa and Sousa (2016) emphasized that individual, and social issues, such as income, especially low-income levels, are predictive of students' permanence (or contrary to dropout) and that such findings imply structural solutions.

A second set of variables refers to the time dedicated to the academic activities of the course, the frequency at which the student went to the pole and the distance from the student's place of residence in relation to the face-to-face support pole. These three variables were included in the study. As for the first, the negative marginal effect indicated that students who devote more than ten hours a week to the course activities reduced the probability of dropout by 9.62 percentage points. Considering the research with students, carried out by CAPES (2018), which obtained an average of 10.7 hours per week dedicated to distance learning courses, the estimated result may indicate a pattern of behavior of students in relation to studies in courses in this teaching modality.

Bittencourt and Mercado (2014) point out that students in the distance education modality must dedicate at least 20 hours per week to the course activities. Corroborating, Herrnann *et al.* (2016) reported that students who completed the course devoted about 20 hours a week, while dropouts reported studying about 8 hours a week. In contrast, Aydin et al. (2019) found that most of learners indicated that their weekly studying hours and studying hours before exams varied between 1-5 hours.

The second variable, which defines the distance between the student's residence and the pole, had a positive *ME* in relation to dropout, suggesting that students residing more than 30 kilometers away from the pole were more likely to drop out of the course. Considering the sample of 859 OUB/UFSM students surveyed, 55.5% of them live more than 30 kilometers away, confirming the result reported. Evidence supported by

Silva (2013) and CAPES (2018), who identified the distance from the pole as one of the main factors that contribute to dropout.

Complementing this group, the student's attendance at the pole showed different relations, depending on the number of times of trips to the pole. If, on the one hand, attending the pole one or more times a month (D1_frequency to the pole) increases the probability of dropout by 17.41 percentage points; on the other hand, attending the polo once in the bi-month or semester (D2_frequency to the polo) reduced the probability of dropout by 17.70 percentage points.

The result *a priori* contradictory to the D1_frequency to the pole can be explained by the requirement that face-to-face academic activities, at least monthly, would imply the need for more time and displacement to the detriment of activities of a professional, personal or even financial nature. Evidence that aligns the variable distance from the pole, which demonstrated that more than half of the students live in distances greater than 30 kilometers from the pole, which is a factor directly related to dropout.

The result of the variable D2_frequencia to the pole demonstrated that less frequent face-to-face activities would reduce the number of dropouts and/or dropouts from the courses. It is worth mentioning that, regimentally, the distance courses offered at the Open University of Brazil system, have the minimum requirement of a face-to-face meeting to conduct an evaluative activity; however, the course coordinators have autonomy to define the face-to-face activities.

The variables referring to the place of completion of high school (whether in public or private school) and the level of the course (whether undergraduate or graduate) showed the expected signs regarding dropout (Table 2). Students who attended high school in a private school have increased the probability of dropping out Students who attend postgraduate courses have reduced the probability of dropping out of OUB/UFSM courses)not showing statistical significance to the sample studied.

The last group of variables are related to the factors obtained in the factor analysis. The higher the sensitivity, the higher the negative predictive value and higher the probability of true negative results. Among all factors, the academic aspects are the ones with the greatest contribution, since being satisfied with the academic conditions of the course reduces the chance of the student evading by 11.52 percentage points. This result is in accordance with the literature, as one of the most important reasons for dropout behavior is an academic adaptation problem (Kilinc & Okur, 2021). Conversely, technological difficulties increase the chance of dropout; therefore, students who perceived more difficulties with the technology involved in the courses, have the probability of dropout increased by 7.15 percentage points. Such results are in line with Mezzari et al. (2013) and Bawa (2016) which demonstrated that difficulties in using the system increase dropout.

The result for the Non-academic Aspects factor indicated that students who, agreed with the quality of the infrastructure, facilities, equipment, and the functioning of the centers, are more likely to dropout. When it comes to quality, it would be expected that a pole with better conditions would reduce the chance of dropout. During these 10 years the published researches have shared some fundamental concerns. This factor has an impact of 7.15 percentage points, less than the 17.67 percentage points of D2_Frequency to the pole.

Results that suggested that, for the student, the dropout decision is more related to the number of times the student travels to the pole than the quality of the same. Complementing this evidence is the fact that students often conducted their activities in places other than the center, except the evaluative activity. This situation was also reported in a study performed by CAPES (2018), when students reported that they performed activities primarily at home and at work, and less frequently at the center.

Seeking statistical confirmation, the Hosmer-Lemeshow test was performed, which assessed the quality of the estimated model, comparing the observed and expected frequencies and the model's predictive capacity test (Table 12).

Table 12. Results of the tests of quality of adjustment and predictive capacity

Hosmer-Lemeshow test			
Number of observations	**Number of covariate patterns**	**Statistics χ^2**	**Prob.**
850	845	866.78	0.1760
Predictive ability test			
Classified	D	~D	Total
+	385	147	532
-	101	217	318
Total	486	364	850
Expected positive values		Pr (D|+)	72.37%
Expected negative values		Pr (D|-)	68.24%
Properly classified			70.82%

Note: H_0: the data fit is appropriate. The number of 850 observations, lower than the total sample, of 859, resulted from the exclusion of those instruments that presented missing information.

The test of Hosmer-Lemeshow indicated the rejection of the H_0; therefore, the estimated model can be considered adjusted, which assumed that the residual variation is explained correctly. Corroborating the adequacy of the model, the predictive capacity test showed that the model correctly classified 70.82% of the 850 observations analyzed. For values of $Y = 1$, the model was correct in 72.37% of the observations, while for values equal to 0 ($Y = 0$), the model correctly classified 68.24% of the cases.

CONCLUSIONS

As a public policy, the offer of distance courses through the Open University of Brazil system has as one of its objectives the expansion of access to higher education, mainly to the population that resides in areas more distant from educational institutions. However, the effectiveness of this policy depends on the institutions' ability to take students to the conclusion of the courses. In this context, dropout can be considered a measure of inefficiency of the courses, whereas each student who gives up represents at the same time the failure of the policy, given that the objective of forming an individual is not achieved, . It is an irreversible cost for all the system, since public investments were made, thus increasing the cost per graduating student.

This discussion guided the objective of understanding the determinants of the dropout of courses in the distance modality of the Open University of Brazil system offered by UFSM. Although, in general, the dropout rate of the institution (47%) is below the national indexes (67%), the assessment of the rate per course indicates that some trained less than a third of its students. Thus, it is understood that the institution needs specific action strategies for these courses, seeking alternatives that aim to make them efficient.

As for the determinants of dropout, the results indicated that male students, with higher levels of income, who live a greater distance from the pole and who travel to it more frequently are more likely to dropout. Conversely greater agreement with the adequacy of academic aspects and lower technological difficulties reduces the chance of dropout.

Contrary to the evidence, the adequacy of the non-academic aspects, which refer to the infrastructure, equipment and functioning of the hubs, increases the likelihood of dropout. However, the variation in dropout due to the non-academic aspects of the pole is much smaller than the distance and frequency of going to the pole. Therefore, it is suggested that the increase in face-to-face activities has a greater impact on the probability of dropout than the physical conditions of the pole.

Generally, the perception of students regarding factors related to the quality of the course was high, indicating that the courses have high levels of quality both in Academic Aspects and in Non-Academic Aspects. It was

also observed that the institution's reputation is high, that the students agreed that they are well received and served and do not present technological difficulties. Therefore, the results suggested that, in terms of quality, UFSM courses have managed to reach satisfactory levels. In this sense, external factors such as displacement to the pole, and personal factors such as the compatibility of work hours and studies and income, as well as family issues emerged as possible dropout triggers.

Although, dropout is higher in distance learning courses compared to face-to-face courses, investments in education would be more efficient and would bring better results if dropout were reduced in both contexts. Thus, higher education institutions should build systems of institutional self-assessment that seek to better identify the causes of dissatisfaction, lockouts and dropout and act more effectively and quickly in driving changes to achieve higher completion rates.

In particular, it is understood that educational institutions must advance on two main points. First, to understand why the student has evaded, by expanding the institutional assessment for the evaded, including creating specific research instruments for this group. Due to lack of reliable comparable data on universities, students and researchers alike are not able to identify relevant competences and courses in Europe. Together, this information may allow institutions to better plan courses and their offerings, as well as adopting strategies aiming to expand completion indicators.

Limitations and Future Research

Despite the relevance of the results obtained, one of the limitations is its non-generalization to other OUB courses, since the analysis was limited to UFSM. Therefore, future research can expand the research to other institutions, as well as identifying other factors that may contribute to the understanding of the dropout of courses in this type of teaching and consequently expand the predictive model capacity.

Future research may seek to understand the role of factors external to the course in dropout. Factors such as the job market, student expectations regarding employability and remuneration, and family incentives to take the course are external factors that can play an important role in dropout. Another line is to carry out comparative research between dropout in the Open University of Brazil system and in the private distance education system. Furthermore, since the Open University is a system financed by public resources, research that adequately identifies the cost of dropout and that it is compared to other alternatives for providing higher education at a distance, such as the purchase of places in private institutions, is essential, aiming greater efficiency in public spending.

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THE VIEW OF PROSPECTIVE SOCIAL STUDIES TEACHERS ON BLENDED LEARNING

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ABSTRACT

With the effect of technology and the pandemic, different approaches have begun to come to the fore in the understanding of education. Blended learning, which is one of these approaches, is known as the combination of distance education and face-to-face education with the support of educational technologies. It is becoming more widespread. Therefore, teachers and prospective teachers are expected to be competent in blended learning. The aim of this study is to determine the views of social studies prospective teachers on blended learning. The data of this study, which was carried out in the basic qualitative research design, were obtained through semi-structured interviews. The data were analyzed inductively using the NVivo12 software. As a result of the research, it is seen that blended learning saves time and enables multidimensional learning. On the other hand, technological inadequacies and reduced socialization are seen as limitations of this approach. They state that there are many tools that can be used in this approach where the responsibilities of teachers and students increase. All of the participants say that they do not have sufficient knowledge about the application process and models of blended learning and they consider their undergraduate education insufficient in this regard. In line with the results of the study, it is recommended to include blended teaching practices in teacher education.

INTRODUCTION

Just as education has an impact on society, society also has an undeniable impact on education. The philosophies and approaches that guide educational activities adapt to the general characteristics of the period in which we live. Technological developments, the needs of the society and the individual, and the social, political, and economic environment of the period determine the quality of educational activities (Bacanak, Karamustafaoglu, & Kose, 2003). Many of the developments that have an impact on the lifestyle of most people in the world occur in the field of technology. After the 2000s, many areas of life have been affected by the internet surrounding all people in the world. Education services have also been affected by this change and new approaches have become visible in education. One of them is blended learning. There are many definitions of blended learning. While Horton (2000) defines blended learning as combining the strengths of computer-assisted learning and face-to-face learning, Garrison and Vaughan (2008) emphasize the balanced and harmonious combination of face-to-face education and online education. The development of blended learning is based on the computer-based learning model. However, it has been possible to take its current form with the introduction of the internet. Thus, the opportunity to access more students in distance education has emerged and education technologies have started to contribute more to face-to-face education processes.
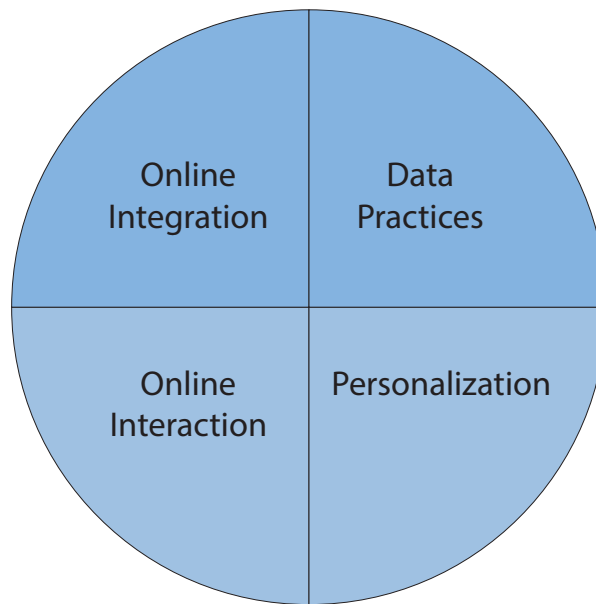
Figure 1. Components of blended learning

Four components make up blended learning. These components shown in Figure 1 are as follows; online integration, data practices, personalization, and online interaction. Blended learning is based on the integration of online and face-to-face activities. The online integration component includes the integration of face-to-face and distance education. The next component, data practices, means the use of data practices at all stages of both integration and teaching. The personalization component explains situations such as the ability of students to adjust their own learning pace, the ability to give personalized feedback, and the opportunity of personalized learning space in blended learning. Finally, online interaction refers to the interaction between teachers and students in distance education processes and emphasizes that the activities carried out in blended learning are not one-sided (Graham, Borup, Short, & Archambault, 2019). Whatever model of blended learning is adopted, it should include these basic components.

There are four different models of blended learning in practice. These models are rotation model, flex model, A La Carte model, and enriched virtual model (Christensen, Staker, & Horn, 2013). The rotation model is a model in which face-to-face education has a more important place than other models. It has some sub-models in itself. These are the station rotation model, lab rotation model, and flipped classroom model. In the station model, students work in small groups between different stations on a rotating basis. At least one of these stations must contain online activities. The lab model, on the other hand, has a practice process in which online education activities are carried out in computer laboratories in schools. Finally, the flipped classroom model is a model in which theoretical knowledge is learned individually at home with the help of educational technologies, and effective learning studies based on practices aiming to reinforce and expand this knowledge are carried out in the classroom. Another main model of blended learning is the flex model. In the flex model, online learning is the backbone of student learning while face-to-face education has a supportive role. In this model, students have more flexibility in making decisions on their own learning. In the A La Carte model, students take some courses of their choice through distance education as well as face-to-face education. In this way, students continue some of their courses completely online, and some of their courses completely face-to-face. Finally, in the enriched virtual model, while students take all of their courses online, they use face-to-face training only for support purposes. This model of blended learning has the least effect on face-to-face education (Graham, Borup, Short, & Archambault, 2019). Considering the four basic components of blended learning, the practice process carried out in line with a specific model brings many benefits for both teachers and students.

It is possible to collect the contributions of blended learning under three main headings. These are increased effective learning, increased cost-effectiveness, increased access, and flexibility (Graham, 2006). In addition to these, other important benefits of blended learning are that it increases students' participation in the

lesson, allows students to adjust the learning pace, personalizes teaching, reduces dependency on space, increases interaction outside the school, and provides fast and personalized feedback (Wilson & Smilanich, 2005). In addition to these benefits in practice, it brings many educational outcomes. It is also known that students develop communication skills, cooperation, critical thinking skills, and creativity in classrooms where blended teaching is implemented (Dziuban et al., 2018; Graham et al., 2019). In addition, it is among the contributions of blended learning that students increase their success, enable them to take their own educational responsibilities, and provide diversity in resources (Bursa & Cengelci Kose, 2019; Porter et al., 2014; Wilson & Smilanich, 2005).

Despite many contributions of blended learning, it has some limitations in practice. The most important of these limitations is experienced in access to technology. Variables such as the socio-economic level of the students, and the opportunities of the school and the environment may cause some inadequacies in students' access to technological devices and regular internet (Sethy, 2008). It is also possible in this process for students to experience a loss of motivation, especially against distance education (Fresen, 2007). Blended learning also brings some difficulties for teachers. Teachers are required to create or select distance learning content, edit and share them with students. All these processes require teachers to devote more time to the out-of-class preparation process, in addition to the requirement of techno-pedagogical content knowledge (TPACK). These requirements may cause some teachers to have difficulties (John, 2006).

Students and teachers have new duties and responsibilities in blended learning classrooms. One of the most basic tasks of students in this process is to participate in online activities outside of school and to fulfill the responsibility of learning in a self-controlled way. In addition, participating in active learning activities in the classroom, developing materials, taking part in group studies, and sharing comments and questions about online learning activities constitute other important duties of the students (Bergmann & Sams, 2012). Besides students, teachers have many duties and roles. The main task of teachers outside of the classroom is to produce the content convenient for online learning services or to select from ready-made content, edit and share them with their students. In addition, following students' participation in online activities, giving them feedback, and keeping their interest and motivation levels high are other duties of the teachers (Bates, Almekdash, & Gilchrest-Dunnam, 2017). In addition to these, they need to make preliminary preparations for the active learning activities to be carried out in the classroom, prepare the activity plans, implement these activities by guiding students and work on reinforcing the online activities (Marsh, 2012).

It is seen that there are many duties and responsibilities that teachers have to fulfill in blended learning. The quality of the education the teachers receive directly affects their success in applying blended learning. For this reason, it is considered important that teachers have learned about blended learning in the pre-service or in-service trainings (Atmacasoy & Aksu, 2017). After the long-term break of face-to-face education due to a pandemic in recent years, many universities have started to implement the blended learning approach in some of their courses. However, when the contents of the compulsory and elective courses in the Social Studies Teacher Training Program, which has been prepared by the The Council of Higher Education (YOK) and implemented in Turkiye since 2018, are examined, there is no information about blended learning in the content of any of these courses. For this reason, it is necessary to reveal the views of prospective social studies teachers on the theory and practices of blended learning.

When the literature is examined, it is seen that there are some studies on blended learning in Social Studies or the flipped classroom model, which is one of the sub-models of blended learning. It is noteworthy that the number of these studies has increased especially in the last five years. Some of these studies in the field of social studies are conducted at undergraduate level (Arifin, et al., 2019; Ganiyu & Ojewale, 2018; Gokdemir, 2018; Rinehardt-Cline, 2018) and at secondary school level (Ashiru & Zakari, 2020; Bursa & Cengelci Kose, 2020; Duffy, 2016; Dursunlar, 2018; Erdogan, 2018; Karaman, 2018; Mings, 2018; Nayci, 2017; Saritepeci, 2012; Sogut, 2019; Sahin, 2021; Sahin, 2020; Serefli, 2020; Uzun, 2019; Winter, 2016; Yayi, Yusuf & Jarimi, 2018; Yildiz, 2011). With these studies carried out with the blended learning or flipped classroom model, it has been found that blended learning in social studies education increases the academic achievement of students (Ashiru & Zakari, 2020; Duffy, 2016; Dursunlar, 2018; Erdogan, 2018; Gokdemir, 2018; Mings, 2018; Rinehardt-Cline, 2018; Sogut, 2019; Sahin, 2021; Sahin, 2020; Uzun, 2019; Yayi, Yusuf & Jarimi, 2018; Yildiz, 2011), provides effectiveness in learning (Karaman, 2018), increases student effort and performance and affects students' attitudes positively (Nayci, 2017; Saritepeci,

2012; Serefli, 2020), increases the level of students' responsibility (Bursa & Cengelci Kose, 2020), affects group works positively (Winter, 2016), enhances interaction with teachers and students (Karaman, 2018), promote a learning-friendly environment, and promoting zero waste (Arifin, et al., 2019).

THE IMPORTANCE AND PURPOSE

Despite all studies in the literature, to our knowledge, there is no study determining the views of prospective social studies teachers on blended learning. The blended learning approach, which has become widespread throughout the world and Turkiye, has gained even more importance, especially with the pandemic. With this study, it is considered important to determine the competencies of prospective teachers, who will be practitioners of blended teaching in their future career, and to have a formative effect on teacher education. Therefore, the aim of this study is to determine the views of prospective social studies teachers on blended learning. For this purpose, the answers to the following research questions were sought:

1. How do prospective social studies teachers define blended learning?
2. What do prospective social studies teachers think about blended learning models?
3. What do prospective social studies teachers think about the advantages and disadvantages of blended learning?
4. What do prospective social studies teachers think about the roles of teacher and student in blended learning?
5. What do prospective social studies teachers think about the role of blended learning in social studies education?
6. How do prospective social studies teachers evaluate their undergraduate education in the context of blended learning training?

METHOD

This research, in which prospective social studies teachers' views on blended learning were determined, was carried out in a basic qualitative research design in accordance with the qualitative research approach. In this design, the main purpose of the researchers is to reveal and interpret the meaning that the participants created regarding the subject under investigation (Merriam, 2009). In this study, it was tried to determine how the participants give meaning to blended learning and the semantic structure they created about blended learning.

Participants

Purposive sampling methods were used in the determination of the participants of the study in accordance with the qualitative research approach (Yildirim & Simsek, 2013). In this context, a total of six prospective social studies teachers, who have taken more than 75% of the courses in the social studies teacher training program, constitute the participants of the study. In this way, it is aimed that the prospective teachers who are in the last year of the social studies teaching undergraduate program will present more detailed views about the program. The participants were selected voluntarily and codes were used instead of participants' real names in the study. Participants were informed that they could leave the study whenever they wanted. In addition, their consent was obtained regarding their voluntary participation in the study. Information about the participants is given in Table 1.

Table 1. Information about the participants

Code names of the participants	Gender
Tayfun	M
Seda	F
Fatma	F
Kemal	M
Nuray	F
Serkan	M

As seen in Table 1, the participants of the study consisted of three female and three male prospective social studies teachers.

Data Collection and Analysis

The data of the study were collected through semi-structured interviews from the prospective teachers. One of the data collection tools used in the basic qualitative research design is semi-structured interviews (Merriam, 2009). Semi-structured interviews provide flexibility to the researcher and allow asking new questions during the interview (Yildirim & Simsek, 2013). First of all, the researcher formed semi-structured interview questions based on the literature. The draft questions formed by the researcher were examined by 2 experts working in the field of social studies education and the interview questions were finalized in line with their opinions. Afterward, interviews were conducted with six prospective teachers using interview questions and the data of the study were collected. The data of the study were collected in 2021.

Data were analyzed inductively. In line with the inductive content analysis, codes and themes were identified and then, semantic structures were examined (Braun & Clarke, 2006). Nvivo 12 qualitative data analysis software was used for the data analysis. In order to increase the reliability of the study, the data of the study were analyzed by an expert working in the field of social studies education other than the researcher, and the analyzes were compared. Miles and Huberman's inter-coder reliability formula was used for inter-coder reliability. Accordingly, the analyzes of the researcher and the coder were compared and the agreement was found to be 89%. This result reveals the existence of a strong agreement (Miles & Huberman, 1994). As a result of this comparison, it was seen that the inter-coder reliability between the experts was found to be high. Direct quotations are included in the presentation of the findings obtained from the data analysis.

FINDINGS

The findings of the study are presented under the headings in accordance with the purposes of the study. These titles are as follows; definition of blended learning, blended learning models, advantages and disadvantages of blended learning, roles of teachers and students in blended learning, and evaluation of blended learning in social studies undergraduate program.

Definition of Blended Learning

The first finding of the study is related to the definition of blended learning. Participants Tayfun, Kemal, and Serkan defined blended learning as a combination of face-to-face education and distance education. Tayfun used the following expressions while defining blended learning: *"The type of education that emerges as a result of the joint use of face-to-face education and distance education."* On the other hand, Seda, Fatma, and Nuray used the definition of the flipped classroom model, which is one of the sub-models of blended learning, while defining blended learning. Fatma, one of the participants, defined blended learning with the following statements: *"Blended learning is when students reinforce and make the knowledge they have learned in face-to-face education permanent by using technology in online environments."* These statements showed that half of the participants confused blended learning with the flipped classroom model. Thus, it is seen that pre-service teachers have limitations in defining blended learning. This can be explained by the limited blended learning experiences of prospective teachers.

Models of Blended Learning

There are four main models and three sub-models of blended learning. Under this heading, the findings obtained in line with the views of prospective teachers on blended learning models are presented (Figure 2).
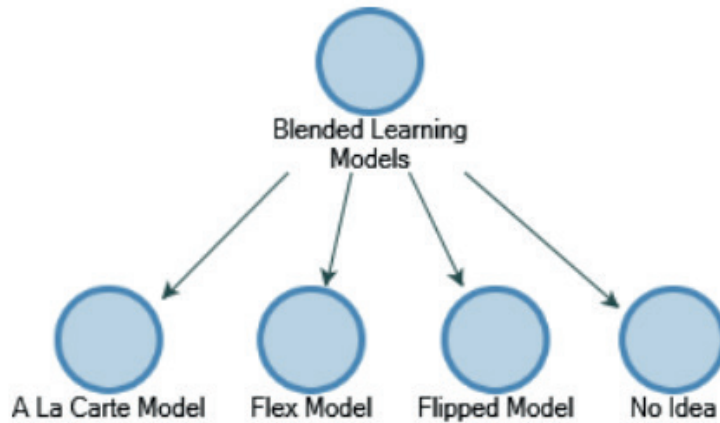
Figure 2. Blended learning models

As can be seen in Figure 2, prospective teachers presented their views on two main models and a sub-model of blended learning. However, only two of the prospective teachers expressed their opinions about the models, and the other prospective teachers said that they did not have any ideas on this subject. Kemal, one of the participants, stated that he had heard of the flex model and the A La Carte model. Fatma, on the other hand, said that she knew the flipped classroom model and explained it with the following words: *"In the flipped classroom model, the information to be learned is accessed online, the student comes to the course prepared by studying it. Instead of giving lectures in the classroom, priority is given to discussions, activities and reinforcing the subject."* Other participants stated that they did not have any knowledge about blended learning models. This shows that although they took most of the courses in the social studies teacher training program, most of the participants did not know about blended learning models. This can be explained by the fact that blended learning is rarely found in the content of the courses they take and in their personal works.

Advantages and Disadvantages of Blended Learning

Considering the basic components and assumptions of blended learning it brings many advantages in the classrooms where blended learning models are applied. In this regard, prospective teachers mentioned many advantages of blended learning. These advantages are as shown in Figure 3.

Figure 3. Advantages of blended learning

As seen in Figure 3, prospective teachers stated that there are many advantages of blended learning. Five of the participants stated that the most important advantage of blended learning is that it reinforces teaching. Tayfun, one of the participants, expressed his views on the advantages of blended learning as follows: "*As the lessons will be taught both face-to-face and online, it will be easier for the teacher to teach the lesson and this may provide more detailed and in-depth learning for the students.*" Three of the participants mentioned the increase in the possibility of doing activities in the classrooms thanks to blended learning. Fatma, one of the participants, gave examples of in-class activities that can be done in the social studies lesson with blended learning with the following statements: "*Time can be allocated for watching videos, movies and documentaries that can be used to reinforce the subject and ensure the permanence of learning in blended learning.*" Two participants emphasized the increase in the number of learning spaces that students can use thanks to blended learning. In this regard, Seda used the following expressions: "*Blended learning has removed the limitation of the classroom or school, and has transformed every space with internet and technological equipment into a learning environment.*"

Participants stated that blended learning has many advantages, but it also has disadvantages, albeit a limited number. The disadvantages of blended learning stated by the participants are introduced in Figure 4.
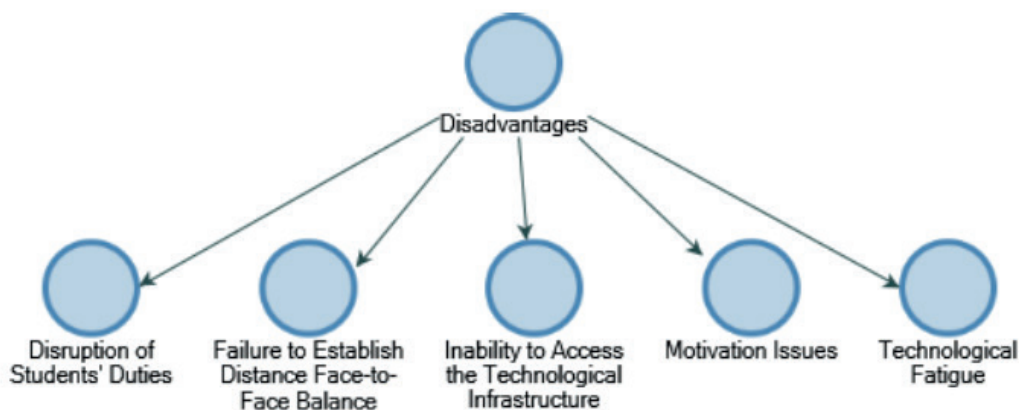
Figure 4. Disadvantages of blended learning

While two of the prospective teachers stated that they did not think of any disadvantages of blended learning, four of them expressed some disadvantages of blended learning. The most frequently expressed disadvantage of blended learning is the problem of not being able to reach the technological infrastructure. Fatma conveyed her views on the disadvantages of blended learning as follows: "*For students who have limited access to technological tools and internet problems, blended learning cannot achieve its purpose.*" The second most frequently stated disadvantage of blended learning is negligence. Nuray explains her views on this issue as follows:

> *Not every student can fulfill their responsibilities and perform the action of accessing information by using online services. In this case, not all of the students in the class can participate in the activities and topic discussions held in the classroom environment*

In addition, the decrease in student motivation, the lack of a good balance between distance education and face-to-face education in lessons, and the technological fatigue that can be experienced due to the fact that both social and educational life are based on technology are other disadvantages mentioned by the participants. Thus, the prospective teachers stated that despite the many advantages of blended learning, it has a limited number of disadvantages.

The Roles of Teachers and Students in Blended Learning

Performance and motivation of teachers and students have an important place in the successful implementation of blended learning. There are many tasks that are expected to be fulfilled by both teachers and students in the classroom and out-of-class processes, and there are roles they need to undertake in these processes. In

this regard, the participants expressed many tasks and roles expected to be carried out by both teachers and students. The statements of the participants about the teachers' tasks and roles are given in Figure 5.
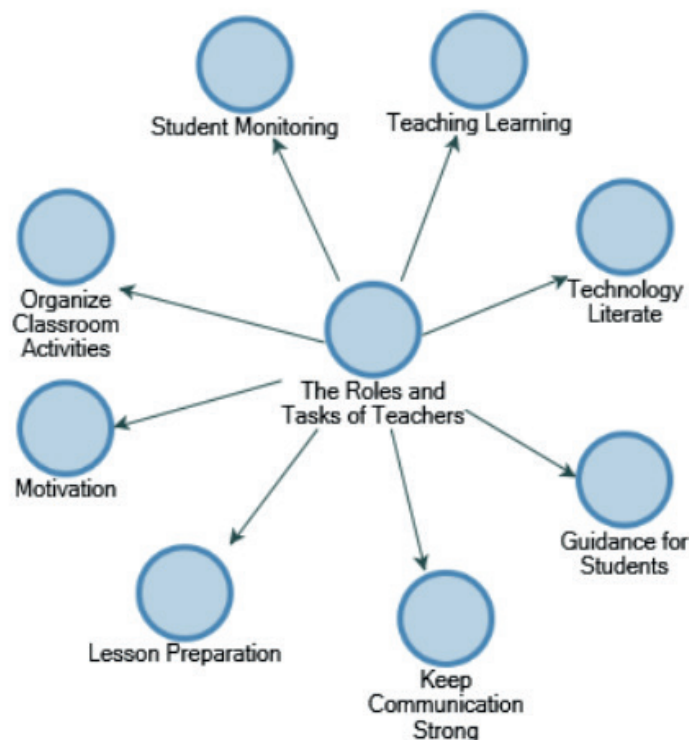
Figure 5. The Roles and Tasks of Teachers

As shown in Figure 5, the participants emphasized some of the in-class and out-of-class tasks of teachers in blended learning processes. Organizing classroom activities, having techno-pedagogic content knowledge and following students were the tasks frequently highlighted by the prospective teachers. Kemal, who thought that teachers should have techno-pedagogic content knowledge, expressed his views as follows: *"Teachers should know effective methods and tools that can be used in distance education and be able to use them effectively. In addition, teachers should follow the innovations closely and seek ways to adapt these innovations to the education model."* Fatma stressed the importance of student follow-up in blended learning with the following statements: *"The teachers should follow the students in accessing the information and turning what they learned into a skill."* In addition, keeping strong communication with students, motivating them, teaching and guiding them to learn, and making preliminary preparations for the lessons were among the other duties and roles of teachers expressed by the participants. The subject of making preliminary preparations for the lessons includes the processes of preparing and sharing online activities with the help of educational technologies. One of the main duties and responsibilities of the teacher in blended learning is to produce or select the distance education content to be used in out-of-class processes, organize this content and share it with the students. There are many websites and smart device applications that can be used in blended learning. While one of the prospective social studies teachers stated no idea about this subject, the blended learning tools expressed by the other participants are shown in Figure 6.
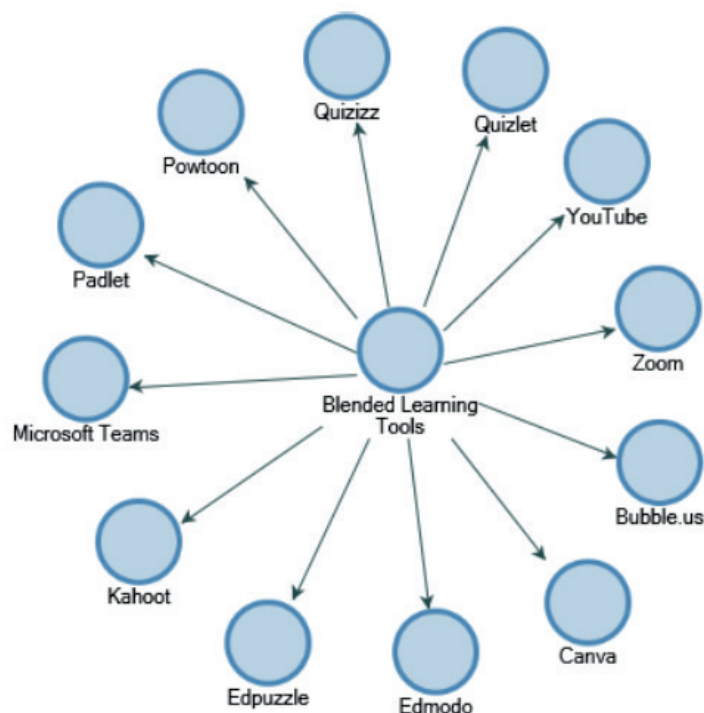
Figure 6. Blended Learning Tools

As seen in Figure 6, the participants mentioned many tools that can be used in blended learning. Among these tools, Kahoot, Zoom, Powtoon, Canva, and Bubble.us were the most frequently stated ones. Thus, it is seen that prospective teachers were aware of many blended learning tools.

In addition to teacher duties and roles, there are many tasks and roles that students are expected to fulfill in blended learning. Some of these roles were expressed by the participants. According to the prospective teachers, the tasks and roles of the students in blended learning are given in Figure 7.
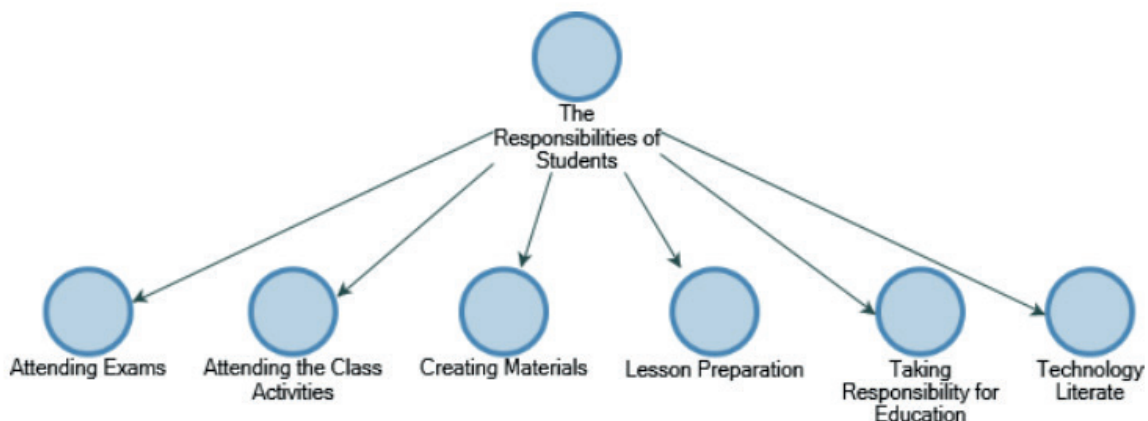
Figure 7. The Responsibilities of Students

As shown in Figure 7 above, preparing for the lesson and participating in the lesson were among the responsibilities that most of the prospective teachers said. Tayfun said that "*Students should come to class prepared*". Similarly, Fatma said, "*The students should come to class by studying*", and another participant Nuray stated, "*Students must follow the lessons in online education on time and attend without missing any lesson*". Some of the participants emphasized active participation in the lesson as one of the main responsibilities of the students in the classroom. Fatma, who thought that students should be active in the classroom, expressed

her views as follows: *"Participating in classroom activities, and participating in discussions and conversations on the subject of the lesson mean performing the tasks assigned by the teacher."* Another student responsibility frequently mentioned by the participants is related to the students taking their own educational responsibilities in blended learning. One of the participants, Kemal, stated that students should take their educational responsibilities as follows: *"The student should carefully follow both face-to-face and distance education, and be aware of his responsibilities by fulfilling the duties assigned to him. He should be able to take responsibility for his own learning, especially in cases where distance education is carried out."* In addition to these tasks, developing classroom materials, having technological knowledge and participating in exams were other student tasks that were stated by the participants.

Blended Learning in Social Studies Education

Prospective teachers were asked to present their opinions and suggestions on how they can benefit from blended learning in social studies education. In this regard, it was seen that four of the participants did not have any ideas about how blended learning could be used in the social studies course. On the other hand, the opinions presented by other participants pointed to the limited use of blended learning or the flipped classroom model in social studies education. Kemal, one of the participants, stated that there are some situations that require face-to-face education in the social studies course, and that blended learning can be used in a limited way. Kemal's views on this subject are as follows:

> *Topics that require material use and classroom interaction can be conducted face-to-face. For example, the lessons which require in-class discussions can be taught face-to-face, making the learning more effective. The tasks given to reinforce the learning or the preparation phase of the lessons can be carried out remotely, which provides us time-efficiency and efficiency.*

Another participant Fatma emphasized the use of the flipped classroom model with her explanation on the use of blended learning in social studies teaching. Fatma's views on this matter are as follows:

> *A topic related to the course is delivered to the students via the online environment. It is ensured that students study the subject and come prepared for the lesson. In the course, important parts of the subject can be discussed instead of giving a long lecture. Question-answer, discussion, etc. on the subject can be done with students. Various activities can be done in the course to ensure permanent learning and to reinforce the subject.*

Based on the opinions of the prospective teachers on this matter, it is possible to say that it is not fully understood how blended learning can be used in the social studies course. It is noteworthy to conclude that the prospective teachers who expressed their opinions on this matter also mentioned the use of blended learning in a limited way.

Evaluation of Blended Learning in Undergraduate Program

Prospective social studies teachers were asked to evaluate their undergraduate program and the courses they took in terms of learning about the skills and practices of blended learning. In this context, all of the prospective teachers stated that they found the courses and their undergraduate education insufficient. Fatma used the following statements on this matter: *"I think blended learning was not taught me in my undergraduate education."* Similarly, Tayfun expressed his incompetence especially about blended learning models as follows: *"Honestly, I know nothing about blended learning models."* Finally, Seda thought that although she had knowledge about the blended learning models, they did not have as much experience in blended learning as face-to-face education. Seda's remark on this matter is as follows: *"Although the blended learning models that we were told during our undergraduate period contributed to our development, I think that it is not more successful than the face-to-face education model."*

Although prospective social studies teachers presented various views on the definition of blended learning, its advantages and disadvantages, the roles of teachers and students in blended learning, and blended learning tools, their views on the association between blended learning models and blended learning and social studies were limited. In addition, they stated that the undergraduate education they received was insufficient to acquire necessary knowledge and practices related to blended learning.

DISCUSSIONS AND CONCLUSION

The views of prospective social studies teachers on blended learning were investigated and the findings of the current study are expected to contribute to social studies teacher education. The first finding of the present study is about how prospective teachers perceive blended learning. Half of the prospective teachers defined blended learning as a combination of face-to-face and distance education, which is similar to the findings in the literature, while the other half used the description of flipped classroom model while describing blended learning in a limited way. On the other hand, all 15 teachers in the study by Hensley (2020) expressed meaningful views on what blended learning is and how it is implemented in the classroom. This shows that half of the prospective teachers have insufficient knowledge about blended learning.

A similar finding was reached about the models of blended learning. There are four main models of blended learning (Christensen, Staker, & Horn, 2013). However, it was found that most of the prospective teachers do not have any knowledge about the models of blended learning. The fact that blended learning is not included in the course contents in the social studies teacher training program and that prospective teachers have not experienced blended learning practices in the courses they take may be the main reasons for this finding. However, Yilmaz and Malone (2020) concluded in their study that teacher candidates who have blended learning experience in their teacher education program have more positive views on this matter. Such a finding points to the necessity to include blended learning courses in social studies teacher education programs.

Another finding of the current study is related to the views of prospective teachers on the advantages and disadvantages of blended learning. According to the views of prospective teachers, blended learning has important advantages. The main advantages are that it strengthens teaching, provides opportunities for activities, gives students responsibility for learning, increases group work, class participation and interaction, and provides time efficiency. These findings are in line with the findings of Hensley (2020). Hensley (2020) found that students taking responsibility for their own learning, the opportunity to receive education in different places, the active participation of students in the lesson and reinforcement of learning are among the advantages of blended learning. Similarly, Akgunduz and Akincioglu (2017) concluded in their study that blended learning reinforces learning of secondary school students. On the other hand, a few of the prospective teachers stated the disadvantages of blended learning. These disadvantages can be listed as the problems of accessing technology, loss of motivation, and negligence. These findings of the current study coincide with the findings of many studies in the literature. For example, Yilmaz and Malone (2020) concluded in their study that students often experience problems in accessing the internet in a blended learning process and sometimes they feel lonely and unhappy. Similarly, Naidoo and Singh-Pillay (2020) revealed in their study that poor connection and lack of opportunities to access technological devices cause problems in blended learning. On the other hand, many studies have concluded that blended learning is effective in increasing student motivation (Horn & Staker, 2015; Kieschnick, 2017). This can be explained by the appropriate use of the right technological tools in blended learning.

The views on teacher and student roles in blended learning are another finding of the current study. Almost all of the participants stated that teachers and students have many duties and roles in the blended learning process. Participants gave examples of teacher responsibilities. In this context, it has been stated that teachers have duties and roles such as making preliminary preparations, following student learning, motivating students, organizing and guiding activities in the classroom, keeping communication and being competent in technology use. Similarly, all of the participants stressed many duties and responsibilities of the students such as preparing for the lesson, participating in the activities and developing materials in the activities, taking responsibility for their own learning and knowing how to use technology in the process of blended learning. These findings correspond to the findings in the literature. In the previous studies, similar duties, roles and responsibilities of teachers and students are emphasized (Saeed, 2020; Sorbie, 2015). Another role of the teacher is to prepare learning activities outside the classroom by using educational technologies. In this context, teachers have responsibilities such as finding and choosing the right educational technologies. In parallel with the development of information technologies in education, there are many websites and tools that can be used to communicate with students, to follow student learning, to coordinate students, and to conduct online education activities in blended learning process. With the widespread use of smart devices, the number of applications used for educational services is increasing consistently. According to

another finding of this study, prospective teachers gave many examples of tools that can be used in a blended learning. When the tools that the participants suggested are examined, it is seen that these tools are used for content creation, content sharing and live lessons. In support of this finding, Raymond (2019) revealed with the views of teachers in his study that there are many technological tools that can be used in education. Therefore, it can be concluded that Information Technologies in Social Studies courses have an important impact on the formation of students' views on this matter. Because when the contents of these courses are examined, it is seen that social media tools, computer, phone and smart device applications that can be used in social studies education are explained (YOK, 2018).

Another finding of the current study is the views of prospective teachers on blended learning in social studies education. The use of blended learning models in social studies education brings many educational advantages (Erdogan, 2018). But it was concluded that almost all of the participants did not have any knowledge about how to use blended learning in social studies education. This situation can be explained by the absence of any course in the social studies teacher training program in which blended learning and the tools of blended learning are taught. In addition, the fact that the pre-service teachers in the last year of the social studies undergraduate program have not experienced blended learning in the courses they take explains this situation. On the other hand, Hensley (2020) emphasized the necessity and importance of in-service training on blended learning as a result of the views of teachers.

Last finding of the study explains the reason of lack of knowledge in participants about blended learning. Because, all of the prospective teachers find the undergraduate education they have received insufficient in terms of gaining knowledge, skills and practices related to blended learning. The insufficient knowledge, skills and practices related to blended learning in undergraduate education cause prospective teachers to have difficulty in establishing a connection between social studies education and blended learning. In a systematic review on blended learning, Atmacasoy and Aksu (2017) emphasized that blended learning is not sufficiently included in teacher education programs in Turkiye. This study supports the result reached in the research.

It is possible to offer some recommendations in line with the results of the study. Updating the social studies teacher training program to include blended learning, conducting practices on different models of blended learning in order to increase the experience of prospective teachers, and examining the orientations of teacher candidates in different universities with a large sample group constitute the implications of the current study.

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OBSTACLES TO DISTANCE EDUCATION FOR STUDENTS WITH LEARNING DISABILITIES AND WAYS TO FACE THEM: FROM THE POINT OF VIEW OF FEMALE TEACHERS

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ABSTRACT

Distance education for students with learning disabilities (LDs) has been used as an official practice in Saudi Arabia since COVID-19's outbreak. This study's aim was to explore the obstacles to distance education (DE) for these students and ways to face them based on teachers' opinions. In Saudi Arabia's Eastern Province, 111 female LDs teachers working in public elementary schools were randomly selected. The researchers collected data by sending online surveys via email and analyzed the data with the SPSS program version 24. The teachers rated obstacles to DE related to (1) students with LDs, (2) teachers, and (3) DE system infrastructure. There were no statistically significant differences in the mean scores of the teachers' views based on educational level or number of DE training courses attended, but there were statistically significant differences between the views of teachers with more than 10 years of experience and those of other teachers. However, there were no statistically significant differences in the average scores of teachers' views on ways to face DE obstacles associated with any of the studied variables. The teachers provided recommendations to support students with LDs, enhance family engagement in making instructional decisions, and provide DE training to students with LDs and their teachers.

Keywords: COVID-19, distance education, learning disabilities, learning disabilities teachers, special education teachers, obstacles.

INTRODUCTION

When the World Health Organization officially declared COVID-19's status as a pandemic on March 11, 2020, face-to-face education around the world was disrupted, and there arose an urgent need to use distance education (DE) as an alternative solution. Schools have not faced this level of disruption since World War II, and this pandemic posed a huge challenge for teachers in terms of urgently and intensively adapting their classes to the use of DE to maintain educational continuity at the same quality level as face-to-face education (Al-Jarah, 2020). The United Nations Educational, Scientific and Cultural Organization noted that with the advent of the pandemic, governments have been compelled to close schools, preventing 89% of students—which is more than 1.5 billion people—in 188 countries, including Saudi Arabia, from accessing classrooms in person (UNESCO, 2021). This crisis may lead to a change in the way teachers view traditional face-to-face education and DE for all students, especially those with learning disabilities (LDs)(Al-Ahmadi, 2009;

Alsarawi, 2021). The Saudi Ministry of Education (MOE) defined LDs based on Kirk's definition, which states that "a learning disability is a disorder in one or more of the basic psychological processes that include the understanding and use of written or spoken language, which appears in disorders of listening, thinking, speaking, reading and writing (spelling, expression, and calligraphy), and mathematics that are not due to reasons related to intellectual, hearing, visual disabilities or other types of disabilities, learning circumstances or family upbringing" (Kirk, 1962, as cited by MOE, 2020, p. 12).

LDs represent one of the most common types of disabilities in Saudi public schools. According to the Department of Planning and Development in the Eastern Province (2021), the total number of students who were classified as students with LDs at the elementary level in the Eastern Province was about 3,150 students (1,638 female and 1,512 male). Saudi Arabia has faced the transition from face-to-face education to DE by developing a ministerial plan that works to maximize opportunities for benefiting from technology and the media in all schools for all students, including those with LDs. The MOE uses EIN, a platform that contains 20 channels for K-12 students, and is activating Madrsti, a school platform that hosts classes and contains sets of educational materials and aids to aid students in DE. Through this program, the Saudi government plan was aimed to achieve the MOE's most important goal: "to achieve a safe and healthy return for students in all school levels and for their faculty and administrative staff" (MOE, 2021, p. 6).

Saudi schools' DE practices in response to the COVID-19 crisis are consistent with Al-Rubaie et al.'s (2004) definition, which indicated that DE is delivery of an educational mode or training materials through an electronic educational medium that includes TV channels, video tapes, audio tapes, computers, multimedia technology, or other available media to transmit information. In light of the lack of studies focusing on DE for students with LD and regardless of DE as a specific and clear concept, DE could be an effective teaching mode in the disabilities field, but it still represents a relatively recent experience at the local level with this category of disabilities, and it could be tainted by some obstacles (Alsarawi, 2021). The researchers believe the use of DE with students with LDs in Saudi schools may be not only a temporary necessity to adapt to the pandemic's conditions but also a complementary future direction to traditional education. Therefore, to achieve successful DE for students with LDs, it is clearly necessary to conduct this study, which addresses (a) exploring the obstacles to DE for female students with LDs based on their teachers' views and (b) discovering solutions that facilitate DE success in light of the pandemic and beyond.

LITERATURE REVIEW

Importance and Advantages of Distant Education for Students with Learning Disabilities

DE's philosophy relies on the theory of learner independence because of the lack of face-to-face interaction with teachers (Al-Kasji, 2012, p. 36), and it is worth noting that DE provides learning opportunities for those whose circumstances prevent them from enrolling in face-to-face education. When teachers and learners are physically separated, such as amid this pandemic, they must interact through modern means of communication. Thus, Internet connections must be high-quality, so virtual classrooms can be used as an alternative to traditional classrooms and so immediate feedback can be obtained from students (Lassoued et al., 2020). DE's importance lies in its enrichment of the educational process by providing audio, reading, and visual educational materials, which help students access required knowledge in various ways (Ayda, 2020). DE also helps solve the challenges facing schools, such as high rates of absenteeism and school dropout, by providing a flexible system for monitoring students' progress, developing learners' ability to learn independently, and enhancing communication between teachers and students and between teachers and students' families (Al-Khamisi, 2020).

Al-Maliki (2008) and Shuaib and Mohammad (2014) summarized some advantages of using DE with students with LDs:

- DE enhances the 21st-century skills of students with LDs in using technology to accomplish the tasks assigned to them by their teachers.
- DE facilitates the use of varied instructional strategies to meet the different needs of LDs.
- DE aids implementation of individual students' learning plans so schools and families can monitor students' progress and performance through various programs.

- In reading, writing, and math, DE uses multimedia and assistive technology to support students' specific disabilities.

Murders (2017) commented that DE allows use virtual synchronous and asynchronous classes that provide students with LDs with comfort and a flexible learning pace. Additionally, the online organizational structure provides students with LDs additional time to process and understand information received from teachers. Murders also indicated that students with LDs feel more independent and confident when attending remote online courses than they do when attending face-to-face classes.

Obstacles of Distant Education and Learning Disabilities

Despite DE's advantages for all students, research has shown that this type of education has various barriers. For instance, Assareh and Bidokht (2011) identified four main types of obstacles: (1) students-related obstacles, including students' ability to access the Internet and required devices and their levels of confidence, motivation, skills, and family income; (2) teacher-related obstacles, which include their levels of knowledge about and competency in using DE; (3) curriculum-related obstacles, involving lack of materials; and (4) schools' structural and support factors. Some studies have indicated that there are differences between male and female students regarding barriers to DE. For example, gender plays an influencing role in students' assessment (Muilenburg & Berge, 2005), and female students have shown less enthusiasm for DE than their male peers. Additionally, female students face more obstacles than male students in terms of using DE (Alshwiah, 2021; Aljarida & Al Batayna 2019).

These obstacles could be more challenging for students with LDs. Al-Thaher (2010) indicated that students with LDs have unique characteristics that must be considered when teaching. For example, these students show slow information processing, which may be due to problems in working memory, their ability to transfer information from short-term memory to long-term memory. Al-Thaher also indicated that students with LDs sometimes suffer from isolation, lack of engagement with peers, and repeated frustration and lack of motivation and perseverance in learning, which results in psychological and social pressures. It is evident from these characteristics that teaching these students represents a major challenge for teachers even in traditional classrooms, but the challenge may be greater when using DE.

Allam (2021) confirmed that there are some problems that may hinder DE for students in general, including students' and teachers' lack of experience. Teachers may not have access to the correct mechanisms for using DE, and students may have feelings of academic isolation during group discussions, which may be due to frequent interruption of Internet connections and the lack of an attractive interactive environment to raise students' responses to the educational process. Therefore, if the reality of DE, according to Allam's study, poses challenges for use with students in general, it likely is more challenging for use with students with LDs because of the need to meet their unique academic and behavioral needs. Therefore, DE specifically for students with LDs represents a thorny problem requiring a multidisciplinary team that works with a spirit of cooperation and efficiency within the virtual classroom and an efficient teacher who can use effective technical means that account for students' unique characteristics.

DE makes it difficult to for teachers to observe and understand students' feelings, especially anger and resentment (Shuaib & Mohammad, 2014). Students with LDs may suffer from a lack of interaction within the virtual classroom because some teachers lack understanding of effective virtual teaching strategies (Murders, 2017) or due to DE's lack of sensory stimuli that were provided by traditional classes (Shehata, 2021).

PURPOSE OF THE STUDY

As highlighted in the literature reviewed here, several studies have been focused on DE considering the LDs field; however, very few studies have examined the barriers facing female Saudi students with LDs, for whom (as for most Saudi students) this was their first DE experience. Therefore, this study was aimed at identifying the obstacles students faced when trying to learn virtually. Based on the relative newness of the DE experience for students with LDs in Saudi schools and these students' high possibility of facing relevant obstacles to DE, this study's purpose is twofold: (a) Explore the obstacles to DE for students with LDs, and b) explore practical solutions that help teachers face the obstacles of teaching students with LDs.

STUDY QUESTIONS

1. What are the obstacles to DE for students with LDs from teachers' prespectives?

   From this question, the three following sub-questions emerged:
   - what are the obstacles to DE for students with LDs related to DE system infrastructure?
   - what are the obstacles to DE for students with LDs related to students?
   - what are the obstacles to DE for students with LDs related to teachers?

2. To what extent do teachers' views differ regarding the obstacles to DE with differences in academic degree, years of teaching experience, and attended the number of professional development courses on DE for students with LDs?

3. What are the ways to confront the obstacles to DE for students with LDs from the viewpoint of their teachers?

4. How different are the teachers' views on ways to confront DE obstacles for students with LDs based the studied variables (academic degree, years of teaching experience, and number of courses attended on DE for students with LDs)?

STUDY RATIONALE

The findings of this study could pave the way for additional practical and research endeavors. The hope for this study is to open new horizons for educational developers and researchers in the educational field to address challenges limiting the effectiveness of teaching students, especially female students, with LDs through DE. Stakeholders and decision makers in the MOE could use teachers' input to improve DE quality by developing educational services and providing the needed support and relevant professional development opportunities.

TERMINOLOGY

The researchers identified procedural definitions of the terms used in this study to prevent the possibility of conceptual misunderstanding of the research context.

Obstacles are challenges standing in the way of achieving effective education that meets the needs of students with LDs according to their unique characteristics and their individual educational plans, including challenges related to (a) the DE system infrastructure, (b) the students with LDs, and (c) LDs teachers.

Distance education (DE) is a type of e-learning that requires use of the Internet. In DE, students study through a virtual classroom within an educational platform, in which the teacher uses multimedia technology and audio or visual presentations. The teacher–learner interaction takes place synchronously or asynchronously, and it has many names, including digital education, virtual classrooms, Internet education, and education technology.

LDs teachers are teachers licensed by the MOE to teach students with LDs, with bachelor's degrees in special education and (a) specialization in the LDs field or (b) higher diplomas or postgraduate studies in the LDs field.

METHOD

To answer the research questions, the researchers used the descriptive survey method, which was specifically selected for its suitability for the study's purpose; it focuses on describing the researched phenomenon or the relationship between variables without the need to study cause-and-effect relationships (Creswell, 2014). In this research, the researchers adopted the descriptive approach by using a questionnaire to survey the participants' opinions, collecting quantitative data that were transformed into descriptive statistics and graphs.

Research Setting and Participants

The study took place in Saudi Arabia's Eastern Province during the 2020–2021 academic year. The targeted population comprised female teachers who were working in LDs programs in elementary schools in the Eastern Province. The total population was 188 teachers from 94 school, according to the Eastern Province's Planning and Development Department's 2021 statistics. Two teachers from each school were targeted to be involved in the study. The researchers conducted the study using a random sample, and 111 female LDs teachers—about 60.65% of the target population—participated in the study.

Table 1 shows the variation in the participants' demographic information. The participating teachers were working in different cities of the Eastern Province (49.5% in Al-Qatif, 28.8% in Dammam, 15.3% in Al-Khobar, and 6.3% in other cities). Most of the teachers hold bachelor's degrees, whereas only four teachers hold master's degrees. More than 50% of the participants had more than 10 years of LDs teaching experience. Regarding the number of training courses on DE for students with LDs the teachers had completed, 61 teachers had completed 1–5 courses, whereas 44 teachers had completed more than 6 courses. Only 6 teachers had not completed any relevant courses on DE for students with LDs.

Table 1. Demographic information

Demographic Information	Category	N
City	Dammam	32 (28.8%)
	Khobar	17 (15.3%)
	Qatif	55 (49.5%)
	Other cities	7 (6.3%)
Academic Degree	Bachelor	107 (96.4%)
	Master	4 (3.6%)
Years of Teaching Experience	Less than 5	4 (3.6%)
	5 to 10	47 (42.3%)
	More than 10	60 (54.1%)
Numbers of Training Courses on DE for Students with LDs	0	6 (5.4%)
	1 to 5	61 (55.0%)
	More than 6	44 (39.6%)

Instrument

The researchers designed a five-point Likert scale questionnaire tool (*strongly agree* = 5; *agree* = 4; *neutral* = 3; *disagree* = 2; and *strongly disagree* = 1) based on the relevant literature. The questionnaire includes two sections: (a) basic information (teaching city, academic degree, years of teaching experience, and number of completed training courses on DE for students with LDs) and (b) questions about the obstacles to DE for students with LDs. In its initial form, the questionnaire's second portion contained 35 items distributed among four domains—(1) infrastructure-related obstacles, (2) teacher-related obstacles, (3) student-related obstacles, and (4) confronting DE obstacles. The questionnaire was electronically distributed via e-mail. The link was sent by the Director of the Special Education Department, which has a list of the email addresses of the targeted teachers. Completing the questionnaire takes approximately 7 minutes.

Data Collection and Statistical Analysis

After establishing the questionnaire's validity and reliability, the researchers electronically distributed the revised questionnaire to the research sample. After obtaining official approval from the Department of Special Education in the Eastern Province and the Institutional Review Board of Imam Abdulrahman Bin Faisal University, the researchers contacted the Director of the Department of Special Education about sending the electronic questionnaire to the teachers via official department e-mail. The survey link was sent

to all targeted teachers except the teachers who participated in the pilot study. A week later, to increase the response rate, they contacted the director again to remind the teachers to participate in the study. It took approximately 6 weeks for the questionnaire to be completed by 111 teachers. The researchers entered the data into the Statistical Package for Social Sciences (SPSS) program and extracted the results.

After the data was encoded and entered into the SPSS, the researchers determined the length of the cells for the Likert scale (lower and upper limits of each response category). by calculating the scale's range (5 – 1 = 4) and dividing the range by the scale's number of cells (5) to obtain the correct cell length (4 / 5 = 0.80) (Abdel Fattah, 2013). This cell length value was added to the lowest value in the scale (the beginning of the scale), to determine the upper bound of the top cell, and the range of each cell was calculated as follows:

- Values from 1 to 1.80 represent *strongly disagree.*
- Values from 1.81 to 2.60 represent *disagree.*
- Values from 2.61 to 3.40 represent *neutral.*
- Values from 3.41 to 4.20 represent *agree.*
- Values from 4.21 to 5.00 represent *strongly agree.*

Then, the following statistics were calculated:

1. Pearson's correlation coefficient, to measure the validity and the internal consistency.
2. Cronbach's alpha, to measure reliability.
3. Frequencies, percentages, and arithmetic means, to understand the responses to the study tool items and their domains.
4. The standard deviation of the scale responses arranged from the least to the greatest when the artithmetic means are equal.
5. T-test, to identify the response differences attributable to academic degree.
6. Analysis of variance (ANOVA), to identify the differences attributable to a variable (e.g., years of teaching experience or number of training courses on DE of students with LD).

Content Validity

To ensure the questionnaire actually measures what it is designed to measure, the researchers presented the questionnaire in its initial form to 14 experts in special education and psychology. These experts included 2 school teachers and 12 university faculty members who hold at least master's degrees. They asked the experts to provide feedback regarding the items' relevancy to the domains and the phrases' clarity and to provide any suggestions for further developing the tool. The experts' opinions were evaluated by the researchers to improve the questionnaire's statements that reached 80% of the experts' agreement regarding need for amendment. Six items were deleted, 2 items were added, and 7 items were modified. The questionnaire's initial form comprised 35 items, and the questionnaire was reduced to 31 items following the amendment.

Internal Consistency

To ensure the validity of the scale's construction, the researchers calculated the instrument's internal consistency. The researchers piloted the questionnaire to 40 LDs teachers, who were excluded from the final sample of the study. The Pearson correlation coefficient was calculated for each item and the domain to which it belongs. The level of statistical significance was 0.01. Table 2 shows the values of internal consistency, which are statistically significant for all items.

Table 2. Values of survey items' Pearson's Correlation Coefficients

Obstacles Related to DE Infrastructure		Obstacles Related to LDs Teachers		Obstacles Related to Students with LDs		Ways to Confront DE Obstacles	
Item Number	Correlation Coefficient	Item Number	Correlation Coefficient	Item Number	Correlation Coefficient	Item Number	Correlation Coefficient
1	.796**	9	.443**	16	.761**	23	.752**
2	.558**	10	.530**	17	.798**	24	.725**
3	.818**	11	.783**	18	.730**	25	.618**
4	.686**	12	.583**	19	.788**	26	.657**
5	.479**	13	.664**	20	.723**	27	.670**
6	.627**	14	.743**	21	.592**	28	.474**
7	.767**	15	.654**	22	.775**	29	.604**
8	.501**					30	.729**
						31	

**The correlation coefficient for all data of the domain to which it belongs, at the level of statistical significance 0.01

Reliability

Based on the pilot sample, the questionnaire's reliability was calculated using Cronbach's alpha. The tool's reliability value at the time of application was 0.92, which is a high-stability coefficient that can be trusted in the tool's application. Table 3 shows the reliability values. The Cronbach's alpha value for the questionnaire's domains ranged between 0.75 and 0.86, and the overall value was 0.92, which indicates that the research tool has a high degree of reliability that can be relied upon in conducting the study (Cortina, 1993).

Table 3. Values of Cronbach's Alpha for the survey domains

Domains	Number of Items	Cronbach's Alpha
Obstacles Related to DE Infrastructure	8	0.81
Obstacles Related to LDs Teachers	7	0.75
Obstacles Related to Students with LDs	7	0.86
Ways to Confront DE Obstacles	9	0.84
General Reliability	31	0.92

FINDINGS

What are the Obstacles to DE for Students with LDs from Teachers' Perspectives?

To answer this question, the researchers calculated frequencies, percentages, arithmetic means, and standard deviations. Table 4 provides an overview of the obstacles to DE for students with LDs from teachers' perspectives based on the means and the order of domains in terms of the level of agreement on the Likert scale. It is evident from the table that the student-related obstacles, for which the mean was 4.00 out of 5, came in first place in terms of agreement, whereas the teacher-related obstacles, for which the mean was 3.82 out of 5, came in second place. Finally, in third place came the obstacles related to DE system infrastructure, for which the mean was 3.66 out of 5. Overall, the mean of all obstacle domains was 3.83 out of 5. Therefore, the researchers concluded that the teachers agree that there are high barriers to teaching

their students with DE. The general mean of all obstacles, at 3.83, is an average that falls within the fourth category of the five-point Likert scale (3.41 to 4.20). This category that indicates overall agreement that there are significant obstacles to DE for students with LDs. The following sections summarize the obstacles related to students with LDs, teachers, and DE system infrastructure.

Table 4. Obstacles to DE for students with LDs based on teachers' responses

Domain	Mean	Agreement Level	Order
Obstacles Related to DE Infrastructure	3.66	Agree	3
Obstacles Related to LDs Teachers	3.82	Agree	2
Obstacles Related to Students With LDs	4.00	Agree	1
Overall Mean	3.83	Agree	

Obstacles related to Students with LDs

Table 5 shows that the participants strongly agree with the items that measure the obstacles to DE related to students with LDs. The responses' agreement average was between 4.22 and 4.26, which is an average located in the fifth category (4.21 to 5), thus indicating the *strongly agree* option.

The order of the specific obstacles based on the participants' responses from the largest mean to the least mean are as follows:

1. Weakness of motor skills, such as holding a pen, among students with LDs, which is significant because of repetitive writing on tablets.
2. Lack of family awareness regarding the need to create a home educational environment free of distractions for their children.

On the other hand, the teachers agreed on the items measuring the student-related DE obstacles from 3 to 7 according to their arrangement of phrases, for which the mean lied between 3.47 and 4.14, which is an average that falls in the fourth category of the five-point Likert scale (3.41–4.20), the *agree* category. The following is a presentation of the obstacles from the greatest mean to the smallest mean:

1. The student's lack of face-to-face support, such as the teacher's body language, and external motivation during DE.
2. The student's preoccupation with distractions available on electronic devices during DE.
3. The lack of visual communication, despite the student's need for it.
4. StudentsLDs' lack of motivation for DE.
5. The student's family's lack of cooperation with the LDs teacher regarding DE.

Teachers somewhat agreed that students' negative attitudes toward DE prevent them from being taught effectively; the mean was 3.20, which falls in the third category of the five-point Likert scale (2.61–3.40), representing the *somewhat agree* option. Finally, by evaluating the overall mean of the items covering the student-related DE obstacles, it becomes clear to that the teachers agree with the items in general; the general arithmetic mean reached for all obstacles 4.00, which falls into the fourth category of the five-point Likert scale, between 3.41 and 4.20.

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	Item Order
Lack of visual communication despite student's need for it.	42 (37.8%)	49 (44.1%)	9 (8.1%)	10 (9.0%)	1 (0.9%)	4.09	0.95	5
The student's lack of motor skills, such as holding a pen, because of repetitive writing on tablets.	58 (52.3%)	35 (31.5%)	8 (7.2%)	9 (8.1%)	1 (0.9%)	4.26	0.97	1
The student's lack of direct support, such as the teacher's body language, and motivation during DE.	49 (44.1%)	39 (35.1%)	15 (13.5%)	6 (5.4%)	2 (1.8%)	4.14	0.97	3
The student's lack of motivation for DE.	32 (28.8%)	34 (30.6%)	28 (25.2%)	14 (12.6%)	3 (2.7%)	3.70	1.10	6
The student's family's lack of cooperation with the LDs teacher during DE.	22 (19.8%)	36 (32.4%)	29 (26.1%)	20 (18.0%)	4 (3.6%)	3.47	1.11	7
The student's family's low awareness of the need to provide an educational environment at home free of distractions for their children with LDs.	48 (43.2%)	47 (42.3%)	9 (8.1%)	6 (5.4%)	1 (0.9%)	4.22	0.88	2
The student's preoccupation with the distractions available on devices during DE.	46 (41.4%)	44 (39.6%)	8 (7.2%)	12 (10.8%)	1 (0.9%)	4.10	1.00	4
Overall Mean						4.0		

Obstacles related to LDs Teachers

The average for the obstacles related to the teachers was 4.43, an average located in the fifth category of the five-point Likert scale from 4.21 to 5, indicating strong agreement. The teachers agree on the items that measure the obstacles related to the teacher from 2 to 6, according to their arrangement in the below "arrangement of phrase", where their average ranges between 3.49 and 4.16, in the fourth category of the five-point Likert scale from 3.41 to 4.20, indicating agreement. Based on Table 6, the obstacles related to the teachers and their mean are listed from the largest to the smallest mean as follows:

1. The difficulty of the process of identifying and evaluating students with LDs during DE.
2. The difficulty of managing the behavior of students with LDs during DE.
3. The difficulty of clarifying abstract concepts during DE.
4. The difficulty of using assessment tools, including the difficulty of measuring the goals of individual educational plans.
5. The difficulty of attracting the attention of students in virtual classes.
6. The lack of cooperation between the general education teacher and the LD teacher in achieving individual educational goals.

On the other hand, the teachers agree to some extent that the negative attitudes of teachers could affect the effectiveness of the DE for their students with LDs. By parameter, the mean was 3.20, an average in the third category of the five-point Likert scale, from 2.61 to 3.40, indicating agreement to some extent. We concluded by looking at the general average of the axis of learning obstacles for female students with distance learning difficulties related to the female teacher. The fourth category of the five-point scale (from 3.41 to 4.20) indicates agreement.

Table 6. Results of teachers' responses on the items of obstacles related to LD teachers to DE

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	Item Order
Difficulty of conducting evaluation of students with LDs during DE.	66 (59.5%)	30 (27%)	13 (11.7%)	1 (0.9%)	1 (0.9%)	4.43	0.8	1
Difficulty of managing the behavior of students with LDS during DE.	46 (41.4%)	44 (39.6%)	15 (13.5%)	5 (4.5%)	1 (0.9%)	4.16	0.89	2
Difficulty of teaching abstract concepts during DE.	39 (35.1%)	47 (42.3%)	12 (10.8%)	12 (10.8%)	1 (0.9%)	4	0.99	3
Difficulty of attracting students with LDs during DE.	24 (21.6%)	33 (29.7%)	33 (29.7%)	19 (17.1%)	2 (1.8%)	3.52	1.07	5
Lack of cooperation between general education teachers and LD teachers to achieve individual educational goals during DE.	23 (20.7%)	41 (36.9%)	19 (17.1%)	23 (20.7%)	5 (4.5%)	3.49	1.17	6
Negative attitudes of teachers toward the effectiveness of DE with LDs.	15 (13.5%)	32 (28.8%)	26 (23.4%)	36 (32.4%)	2 (1.8%)	3.2	1.09	7
Difficulty of using objective assessment tools to mentor the progress of students with LDs toward their goals.	28 (25.2%)	60 (54.1%)	13 (11.7%)	9 (8.1%)	1 (.9%)	3.95	0.88	4
Overall Mean				3.82				

Obstacles related to the Infrastructure of DE

The table shows items 1 to 7. The data shows that teachers acknowledge that they face some obstacles related to the infrastructure of DE. The overall mean of all obstacles was 3.66, in the fourth category of the five-point scale from 3.41 to 4.20, indicating that teachers agree with the items on the scale. Here is a summary of the obstacles and their means from the greatest to the smallest mean:

1. Most students with LDs lack the technical skills necessary for DE.
2. There are no explicit laws, legislation or regulations in the Ministry of Education that preserve the rights of students with LDs during DE.
3. The low income of families prevents them from providing a computer for their children with LDs.
4. There may be a lack of Internet connection during DE.
5. There may be limited training opportunities that focus on adapting to DE in students with LDs.
6. Some teachers may lack the technical skills necessary for DE.
7. There are no technical or educational alternatives for supporting students with LDs during DE.

On the other hand, the teachers believe to some extent that there are negative trends in the school administration toward the use of DE with the students with LDs; the mean was 2.78, in the third category of the five-point scale from 2.61 to 3.40, reflecting consent to some extent.

Table 7. Results of teachers' responses to the items of obstacles to DE for students with LDs

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	Item Order
There are no explicit laws, legislation and regulations in the Ministry of Education that preserve the rights of students with LDs during DE.	46 (41.4%)	35 (31.5%)	15 (13.5%)	10 (9%)	5 (4.5 %)	3.96	1.15	2
The negative attitudes of the school administration toward the use of DE with students with LDs	11 (9.9%)	19 (17.1%)	32 (28.8%)	33 (29.7%)	16 (14.4%)	2.78	1.19	8
Lack of technical alternatives to support students with LDs during DE.	22 (19.8%)	42 (37.8%)	18 (16.2%)	24 (21.6%)	5 (4.5%)	3.47	1.17	7
There may be a lack of Internet connection during DE.	35 (31.5%)	44 (39.6%)	18 (16.2%)	12(10.8%)	2 (1.8%)	3.88	1.03	4
Some teachers need to develop their technical skills for DE.	18 (34%)	49 (44.1%)	23 (20.7%)	20 (18%)	1 (0.9%)	3.57	1	6
Some students with LDs lack the technical skills needed for DE.	34 (30.6%)	51 (45.9%)	16 (14.4%)	8 (7.2%)	2 (1.8%)	3.96	0.95	1
Lack of training opportunities that focus on conditioning students with LDs for DE.	21 (18.9.2%)	57 (51.4%)	21 (18.9%)	10 (9%)	2 (1.8%)	3.77	0.92	5
Low income may prevent families from providing computers for their children with LDs.	34 (30.6%)	46 (41.4)	20 (18%)	9 (8.1%)	2 (1.8 %)	3.91	0.99	3
Overall Mean				3.66				

To What Extent do Teachers' Views Differ Regarding the Obstacles to DE with Differences in Academic Degree, Years of Teaching Experience, and Attended the Number of Professional Development Courses on DE for Students with LDs?

Academic Degree

The researchers conducted T-tests to examine the differences between the average scores of teachers' views on DE obstacles that are attributed to the educational qualification variable (academic degree). The data on Table 8 show that are no statistically significant differences in the perspectives of teachers on the obstacles to DE due to academic degree, where the T value reached 0.403 with a statistical significance of 0.687.

Table 8. Differences in the mean of DE obstacles that are attributed to the academic degree

Academic Degree	Number of teachers	Mean	Standard Division SD	T Value	Statistical Significance
Bachelor's degree	107	84.1402	14.08495	0.403	0.687
Masters' degree	4	81.2500	13.57387		

Years of Teaching Experience

The researchers used an analysis of variance ANOVA to test the difference between teachers' perspectives on the obstacles to DE attributed to the variable years of teaching experience (see Table 9). We found that there are statistically significant differences in teachers' perspectives on obstacles to DE due to the years of teaching, where the value of (P) was (3.941) and the value of statistical significance was (0.022). To find the mean differences in favor of any category of years of teaching experience, a post-test was conducted as shown in Table 11. The results were in favor of those teachers with more than 10 years of experience.

Table 9. Differences in the mean of DE obstacles that are attributed to the years of teaching experience

	Sum of squares	Degrees of freedom	Average squares	F	Statistical Significance
Between groups	1470.054	2	735.027		
Within groups	20143.801	108	186.517	3.941	0.22
Total	21613.856	110			

Table 10. Shefi post-test for finding the differences in the average of DE due to three years of experience

Years of teaching experience	Differences between means	Error deviation	Statistical Significance
>10		7.05250	. 045
<5	14.33333*	2.66027	.027
(5-10)	5.97695*	110	

Number of Professional Development Courses on DE of Students with LDs that were Teachers Attended

To examine the differences in obstacles to DE for students with LDs in terms of the variable number of courses through DE for these students, we conducted an ANOVA. Based on the results, there are no statistically significant differences in the teachers' perspectives on the obstacles to DE attributed to the number of taught courses on DE for students with LDs, where the value of (P) was (0.473) and the value of statistical significance was (0.624).

Table 11. Differences in the mean of DE obstacles attributed to the number of professional development courses on DE

	Sum of squares	Degrees of freedom	Average squares	F	Statistical Significance
Between groups	187.637	2	93.818		
Within groups	21426.219	108	198.391	.473	0.624
Total	21613.856	110			

What are the Ways to Confront the Obstacles to DE for Students with LDs from the Viewpoint of Their Teachers?

The teachers strongly believe that there are ways to address the highlighted obstacles regardless of their type. The items on table 12 from 1 to 6 show the arithmetical mean ranges between 4.31 and 4.59, in the fifth category of the five-point Likert scale. The category of 4.21 to 5 indicates strong agreement. The following items represent the ways that the teachers believe they can confront the obstacles to DE for students with LDs from the largest to the smallest mean:

1. Educating families about the importance of creating an educational environment for their children at home, free of distractions.
2. Providing free internet to students with limited income.
3. Training families on how to provide appropriate support to children during DE.
4. Passing laws, legislation and regulations in the Ministry of Education to protect the rights of users with LDs in DE.
5. Providing materials and moral incentives for users in DE.

On the other hand, the parameters ranged from 7 to 9, according to their arrangement in the above table "arrangement of expression," where their arithmetical mean ranged between (3.76 to 4.20), an average falling into the fourth category of the five-point scale (from 3.41 to 4.20) and indicating approval. The following is a presentation of the obstacles and their mean from the largest to the smallest mean:

1. Using feedback and reports issued by the LD teacher to improve DE.
2. Creating active social networking sites and educational forums to enhance cooperation and interaction between students.
3. Providing asynchronous education by registering the classroom through the virtual platform.

By looking at the general average of the axis of ways to confront the obstacles to teaching students with SLD, it becomes clear to us that teachers strongly agree with the items of the axis in general, as the general arithmetical mean of all obstacles was 4.31, falling into the fifth category of the five-point scale from (4.21 to 5) and indicating strong agreement.

Table 12. Results of teachers' responses on the items of Obstacles related to students with LDs to DE

Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD	Item Order
Laying down laws, legislation and regulations in the Ministry of Education that preserve the rights of DE users.	54 (48.6%)	45 (40.5%)	7 (6.3%)	5 (4.5%)		4.33	0.79	5
Activating social networking and educational media to promote cooperation and interaction between students with LDs and their teachers.	38 (34.2%)	53 (47.7%)	15 (13.5%)	5 (4.5%)		4.12	0.81	8
Providing asynchronous classes by recording classes on the school platform.	28 (25.2%)	44 (39.6%)	23 (20.7%)	16 (14.4%)		3.76	0.99	9
Taking advantage of feedback and reports issued by the LD teachers to improve the remote learning process.	31 (27.9%)	71 (64%)	9 (8.1%)			4.2	0.57	7
Providing free internet to students with STDs from low income families.	75 (67.6%)	30 (27%)	3 (2.7%)	2 (1.8%)	1 (0.9%)	4.59	0.72	2
Increasing family awareness regarding the creation of an educational environment at home, free of distractions.	71 (64%)	37 (33.3%)	1 (0.9%)	1 (0.9%)	1 (0.9%)	4.59	0.65	1
Providing training for families in how to support their children with LDs during DE.	60 (54.1%)	46 (41.4%)	3 (2.7%)	2 (1.8%)		4.48	0.64	3
Providing training for teachers, students, and families on how to use ED platforms.	58 (52.3%)	46 (41.4)	5 (4.5%)	1 (0.9%)	1 (0.9%)	4.43	0.71	4
Efficient provision of tangible and verbal rewards for students during DE.	56 (50.5%)	41 (36.9%)	8 (7.2%)	4 (3.6%)	2 (1.8%)	4.31	0.89	6
Overall Mean	4.31							

How Different are the Teachers' Views on Ways to Confront DE Obstacles for Students with LDs Based the Studied Variables (academic degree, years of teaching experience, and number of courses attended on DE for students with LDs)?

Academic Degree

There are no statistically significant differences in the average scores for teachers' responses on the ways of confronting DE obstacles that are attributed to the academic degree variable, where the T value is (-0.466), statistically prominent (0.642) but not statistically significant (table).

Table 13. Differences in the mean of DE obstacles that are attributed to the academic degree

Academic Degree	Number of teachers	Mean	Stander Division SD	T Value	Statistical Significance
Bachelor's degree	107	38.7570	4.15238	-0.466	0.642
Master's degree	4	39.7500	5.31507		

Years of Teaching Experience

However, there are statistically significant differences in teachers' views about ways to confront the obstacles to DE due to years of experience, where the value of (F) was (0.992). The statistical significance was (0.374).

Table 14. Differences in the mean of DE obstacles that are attributed to the years of teaching experience

	Sum of squares	Degrees of freedom	Average squares	F	Statistical Significance
Between groups	34.558	2	17.279	0.992	0.374
Within groups	1881.677	108	17.423		
Total	1916.234	110			

Number of Professional Development Courses on the DE of Students with LDs that were attended by the Teachers

In terms of PD courses on DE, there are no statistically significant differences in the average degrees of the female teachers' perspectives on ways to confront the obstacles to DE due to the variable number of PD courses available, where the value of (F) was (0.339) and the value of statistical significance was (0.714).

Table 15. Differences in the mean of DE obstacles that are attributed to the number of professional development courses on DE

	Sum of squares	Degrees of freedom	Average squares	F	Statistical Significance
Between groups	34.558	2	17.279	0.992	0.374
Within groups	1881.677	108	17.423		
Total	1916.234	110			

DISCUSSIONS AND CONCLUSION

What are the Obstacles to DE for Students with LDs from Teachers' Perspectives?

The results indicate that teachers strongly believe that obstacles to DE related to the LDs come first, and more specifically to the weakness of the motor skills of students with LDs, which ranked first among these obstacles with an average of 4.26. This result can be explained side by side with the unique characteristics of the LDs that require special support, guidance, direct instruction, and modeling on handwriting and hand activities, which showed us the most prominent obstacles to DE, as well as the students' need for motivation and direct support, face-to-face, from their teachers (Al-Badawi, 2017; Al-Ahmari, 2019). The difficulty of the identification process and the application of fair evaluation during DE ranked first among obstacles related to teachers with an average of 4.43. This result aligned with the complexity of evaluation activities and mentoring progress for all students during DE, which can be more challenging for LDs because any evaluation errors may deprive them of appropriate services and suitable placement decisions (Mohammed, 2020; Al-Waqfi, 2015). Thus, it becomes clear to us that it is difficult to carry out the identification process during DE. On the other hand, we attributed the difficulty of conducting objective evaluation to the cultural dimension due to the lack of direct visual communication between the students with LDs and their teachers during DE (such as the display camera feature in some female schools), which may hinder the process of identifying those students and direct monitoring of their progress even after identifying them (Al-Ahmari, 2019). The obstacles related to the infrastructure of DE came in third. It is worth noting that teachers ranked the lack of technical skills of LDs as the first obstacle related to the infrastructure of DE in the Saudi school system, with an average of 3.96. This result is consistent with what had been found locally—the low level of student knowledge in using virtual classrooms and educational technologies (Al-Harbi & Tayeb, 2020). Several authers have indicated that regardless of the type of obstacles to DE, the lack of priorexpertise with DE represents the key of these obstacles, and the hope taht the COVID-19 pandemic becomes a incentive for promoting a better robust system of DE **(Aslam et al., 2021a; Aslam et al., 2021b; &Alshwiah, 2021)**.

To What Extent do Teachers' Views Differ Regarding the Obstacles to DE with Differences in Academic Degree, Years of Teaching Experience, and Attended the Number of Professional Development Courses on DE for Students with LDs?

As for the educational qualification variable, there were no statistically significant differences in the average degrees of female teachers' perspectives on DE obstacles due to their educational levels. We attribute this observation to the fact that the majority of participants were from the Eastern Province and therefore have the same characteristics, as 96.4% of them held bachelor's degrees. This result agrees with Al-Badawi (2017), who found that the judgment on the obstacles to e-learning by teachers does not differ according to the academic degree variable. In contrast there were statistically significant differences in the average degrees of the parameters due to years of teaching experience. The differences were between those with more than 10 years of experience and with less than five years of experience and those whose years of experience ranged between five and 10 years in favor of those with more than 10 years. This result may indicate that teachers with more than 10 years of teaching experience are more able to face DE obstacles. The result of this study differs from the conclusion drawn by Al-Aqaly (2018), who found that there are no differences in the obstacles to using technology due to years of teaching experience.

Regarding the number of passed courses in DE, the results indicated that there were no statistically significant differences in the average scores of the teachers' views due to the variable of passed courses on distance education for LDs. This study agrees with the one conducted by Al-Badawi (2017), who concluded that the judgment on the obstacles of DE does not differ according to the variable number of courses passed in the field of DE. In line with this result, we believe that it is more appropriate for us to focus in future studies on the types of courses and their relevance to DE for LDs as well on the number of courses passed. This finding supports Alshwiah (2021) that indicated that teacher-related obstacles can be addressed by focusing on quality of providing teachers with appropriate, meaningful, relevant, and purposeful training in the use of technology and the DE system.

What are the Ways to Confront the Obstacles to DE for Students with LDs From the Viewpoint of Their Teachers?

A majority of the teachers suggested that one of the most prominent ways to confront the obstacles to teaching LDs with DE is to educate parents and families about the importance of creating a convenient and supportive environment for children at home. Ferri et al. (2020) also confirmed the importance of creating an environment free of distractions at home to maximize the benefits of DE. It is worth noting that the provision of free internet to students from low -income families came in the second place in ways of facing the obstacles of teaching students with LDs, with an average of 4.59. This result confirms the findings of Al-Salami and Makawi (2020) regarding the necessity of providing a strong internet network in the public schools to face the obstacles of DE. The result of the current study also agrees with the results of other studies that indicated that the presence of slow or no internet at all is an obstacle that needs to be addressed to make DE available to all students (Al-Jama`an& Al-Jama`an, 2019; Al-Maliki& Sha`ban, 2020; Al-Nafjan, 2020; Al-Otaibi, 2020; Fauzi & Khusuma.2020; Ferri et al. 2020; Mohammed, 2020). Thus, the current study is consistent with Alshwiah (2021) in terms of encouraging that the decision makers of the Saudi Ministry of Education should provid computers with high-speed Internet to the students, and schools should provide asynchronous sessions to make course content accessible for all students.

As for training parents on how to provide appropriate support to their children during DE, it ranked third as one of the solutions to DE obstacles with students with LDs, with an average of 4.48. This finding supports the findings of Ferri et al. (2020) regarding the need to address the challenges related to DE in an emergency situation represented by the lack of parental support for their childern. This result is also consistent with what Fauzi and Khusuma (2020) said about the need to enhance the cooperation of parents during DE with their children. Thus, we conclude that training parents on how to provide appropriate support to their children with LDs during DE is one of the ways which may contribute to facing some obstacles.

How Different are the Teachers' Views on Ways to Confront DE Obstacles for Students with LDs Based the Studied Variables (academic degree, years of teaching experience, and number of courses attended on DE for students with LDs)?

Regarding to educational level, years of teaching experience, and number of courses offered on DE for LDs, the result was the absence of statistically significant differences in the average degrees of the teachers' views on ways to confront the highlighted obstacles. The absence of variation due to these variables might be explained by the fact that of the similarity in the characteristics of participating teachers, as 96% of them hold bachelor's degrees, 54% of them have more than 10 years of teaching experience, and 55% completed one to five courses on DE for LDs. The researchers tried to support this conclusion with previous studies, but there were limits in that no national study yet directly supports this result, except for Al-Salmi and Al-Makkawi (2020), who focused on studying the obstacles of DE from the viewpoints of teachers of deaf and hard-of-hearing students. However, other relevant research findings on DE during COVID-19 pandemic have indicated that the pandemic represents a huge shift that promote to discover different ways to confront DE obstacles regardless of the variation on teachers' charactrstics (Aslam et al., 2021a; Aslam et al., 2021b; Alsarawi, 2021; &Alshawish, 2020).

Limitations

Despite the importance of the results in this promising study, they are not without flaws that should be taken into consideration. For example, relying on distributing the questionnaire electronically and not distributing it in person may affect the number of responses. In addition to voluntary participation, only those who wanted to participate in filling out the questionnaire participated. Finally, the government directives issued to provide summer vacation led to the short time specified for the implementation of the study.

Recommendations for Practice

- Allocating one or two days per week for female LDs to attend school for the purposes of identification, evaluation, assessment, monitoring of progress, and training in motor and technical skills if needed.
- Establishing a department for DE within the Ministry of Education, its administration and its offices in all regions.
- Holding meetings for teachers and families of LDs to exchange information and experiences that may lead to addressing any relevant obstacles.
- Enhancing the engagement of teachers and families of LDs in decision-making regarding the educational process and suggesting possible solutions for DE at the level of the Ministry of Education.
- Organizing workshops to train teachers and students on necessary technical skills during DE.
- Focusing on strengthening efforts by making periodic awareness-raising for parents of LDs on how to create an educational environment at home that is free of any distractions.

Research Suggestion

Obstacles to DE for students with LDs are worthy of further investigation, and based on the current study, the researchers suggest addressing the following aspects in future research:

- Examining the obstacles to DE from the point of view of their families.
- Studying obstacles to DE from the point of view of students with LDs.
- Expanding the scope of the study by replicating the research topic and conducting a similar study with a different methodology or in different settings or different samples.
- Studying the reality of DE for LDs from the point of view of their teachers (pros and cons of DE).

Finally, DE in light of the Corona pandemic may continue beyond the pandemic. Therefore, the issue of DE for LDs still needs additional research. We hope that this study represents a prelude to future studies that enrich the local field and that the results will be used in future practice.

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AT SCHOOL OR HOME? EIGHT GRADERS' FIRST PRACTICES WITH ONLINE GEOMETRY LESSONS

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ABSTRACT

Undoubtedly, one of the areas most affected by the Covid-19 pandemic process was educational activities. In this study, the 33 eighth graders of a public elementary school in Turkiye were observed for a six-week online learning period. The aim was to obtain whether any changes occur in their geometry attitudes during the process and to reveal their preferences between online distance learning (ODL) and regular face-to-face education. In this context, structured as a mixed study, a Geometry Attitude Scale (GAS) and a questionnaire about online distance learning was administered at the beginning; further GAS and learners' opinions in response to open-ended questions were administered at the end of the process. Quantitative results indicated that gender and mathematics achievement levels have no relationship with GAS and ODL. Still, the qualitative analysis provided that ODL does not cause any change in students' attitudes towards geometry lessons; moreover, students commonly prefer face-to-face education over ODL.

Keywords: Online mathematics learning, online geometry lessons, learning during COVID-19, geometry attitudes.

INTRODUCTION

Due to the Covid-19 outbreak across the world in early 2020, education throughout the world has had to be continued remotely. Turkiye has also continued regular formal training by distance education via online learning (abbreviated as ODL) for all educational levels from middle school level up to university level.

In today's world where the technology age is experienced, individuals are expected to have high-level thinking and creativity skills. In this sense, geometry has been viewed to provide opportunities for learners to develop this creative thinking and proof skills (National Council of Teachers of Mathematics [NCTM], 2000) and prepare them for future careers. However, according to students, while mathematics itself is already hard (Nardi & Steward, 2003), the geometry that emerges with its combination with shapes makes the situation even more complicated for them (Bulut et al., 2002).

In unusual situations such as the Covid-19 outbreak that was not on the account, countries opted for different strategies to progress educational activities, the habits of ODL process have become in demand. While research assert that visualization is core in geometry learning (Hershkowitz, 1989), others support this view with use of computers (Clements et al., 2008) and 3D-technology (Hollebrands & Okumus, 2018), this may provide a point of view to see geometry lessons with ODL. Questions such as how geometry lessons are affected by the ODL process and how it affects student learning are seen as missing points in the literature, especially at the elementary education level. In fact, such research is needed in order to highlight the needs of a group of learners to push up the quality of geometry courses. For this purpose, the studies that merge students' attitudes towards and online class activities around a specific context, seem to be necessary.

Purpose of the Study

The main focus of this mixed study is to explore eighth-graders' perceptions towards online geometry lessons. Relatedly, the following questions guided the process; (i) what are the perceptions of learners towards geometry? (ii) is ODL affect those perceptions in any way? (iii) is there a gender and mathematics achievement effect on their perceptions? (iv) what are their overall perceptions of ODL after first experience with a six-week period? Following a review of literature presented to describe the methodology used to answer these questions.

REVIEW OF RELEVANT LITERATURE

Online Distance Learning

As computers and internet technology have become involved in educational services, the delivery of the instruction has redefined to include both print and online media (Moore & Kearsley, 2005). Moreover, with the rise of Covid-19 crisis, this way of instructional delivery had to turn out to include an instructor placed in a different location from the learner along with providing instructional content at the same or different times (Moore et al., 2011). By providing students with online content and interaction, that one of the most common forms of distance education, is called online distance learning (Bagriacik Yilmaz, 2019). Accordingly, as a more recent, explicit, and improved version of distance education, ODL guides the current study with synchronous sessions.

With the rapid technology development, ODL allows and ensures that students unable to attend formal education for cases such as health, disabilities, distance is included in the system (Burdina et al., 2019). It offers access to a wide range of masses at the same time provides this popularity (Fedynich et al., 2015), it proposes both spatial and temporal flexibility (Houlden & Veletsianos, 2019), and with this feature it has become a widespread learning tool (Randler et al., 2014) – especially after Covid-19 outbreak which is a very recent example.

Perceptions of ODL

Since the learning is broad and complex itself (Askew & Field, 2007), barriers to students' participation in ODL are various and sophisticated (Thistoll & Yates, 2016) and engaging students –especially young learners- to the process can be a challenging case (Ross, 2010). Unlike traditional face-to-face learning, ODL entails unique demands. For instance, it reverses common teacher-student roles by locating students in the foreground and makes them responsible for the organization of the instructional process such as plan, self-direct, evaluation of their work themselves, etc. (Peters, 2004).

Afolabi (2017) and Sahin and Shelley (2008) showed that students' perceptions, competencies, and skills of online learning are conspicuous indicators of judging quality and boosting its efficiency. While Jung (2012) found gender differences in the perceived quality dimension of ODL; reversely, Andoh et al. (2020), explored postgraduate students' perceptions about online learning was not correlated with age, gender, or program of study, but was significantly related to study center location and semester of study.

Despite foregoing benefits, online learning may not be the most effective choice in all situations (Randler et al., 2014). For instance, when compared to traditional face-to-face education, most students –specifically at the K12 level- are not familiar with ODL (Cavanaugh et al., 2004) and Conrad (2002) found that those students show fear and anxiety when they start ODL thinking what to do. Hence, this may result in negative perceptions and higher dropout rates relatedly. Oteng-Ababio (2011) stated that while students have a positive outlook about ODL, they have negative notions of getting exams in this way. At the elementary level, Burdina et al. (2019) confirmed that students had positive perceptions, but the quality of teacher-student interaction and instruction should be upgraded to deliver a high-level e-learning environment for pupils.

As discussed above, although there is fairly comprehensive literature on ODL - particularly on perception - there is a lack of research in a specific field. Akgunduz and Akinoglu's (2016) study showed that ODL and blended learning environment had a positive impact on seventh graders' science attitudes and self-directed learning skills. Reju and Jita's (2018) study illustrated that with online mathematics lessons the abstract nature of mathematics did not appropriately address by the tutors and the incompetency of the tutors about handling the challenges of that abstract construct, complicated the case even further. Moreover, inappropriate instructional content made learners develop negative perceptions to participate in online mathematics courses.

Very limited research (Lee et al., 2021; Randler et al, 2014) obtained in terms of gender differences related to ODL choices and perceptions, and those did not obtain any gender effect on students' preferences. Reversely, Kara (2020) found that girls were more satisfied with ODL sessions rather than boys.

Covering the foregoing literature, online learning studies seem to be skewed towards high school and undergraduate level. Most of the available study reports point out the university level and in developed countries (Bacow, 2020; Bright & Graham, 2016; Evans, 2020; Lee, 2020a; 2020b; Poon, 2019), and access to technology in these countries is already higher than in others. Even in developing countries, the possibility of accessing technological opportunities such as computers and the Internet is more accessible for university level students and beyond. In this context, findings from those studies cannot, therefore, be applied in whole in other economies (Andoh et al., 2020), and hereunder primary and middle school levels should be investigated by regarding the students' perceptions of ODL within specific cases. At this point, the current study tries to fill this gap by examining the eighth-graders' perception of ODL in geometry courses.

Why Geometry?

Geometry is one of the core areas of mathematics that studies spatial objects such as shapes, edges, grids; relations such as equality, parallelism; and transformations such as reflection and rotation (Clements, 1998). To make these concepts clear for students, teachers use various representations, such as drawings, schemes, and graphs. For this reason, much research confirms that the use of technology in geometry lessons is effective (Kalbitzer & Loong, 2013; Latsi & Kynigos, 2012). Since the ODL process continues online and via computer, the effectiveness of a geometry teaching designed with this method and how it is perceived by students can be investigated more accurately. Furthermore, there are various studies that prove the positive results of applications such as dynamic software and AR technology in geometry lessons in terms of student learning in a regular face-to-face classroom environment at the elementary school level (Auliya & Munasiah, 2020; Dogruer & Akyuz, 2020); not encountered with ODL studies on this subject at the same level. Specifically, with the explosion of Covid-19 various studies reported about the educational activities during the outbreak (Baggaley, 2020; Lee et al., 2021), but very limited focus on specific issues. Khairiree (2020) reported an action research about secondary students' online geometry lessons -transformation geometry- with augmented reality. The results revealed more than 50% of participant students prefer to join lessons in normal classrooms. Hence, the current study may fill a gap with a specific context in geometry.

Framework

Social interaction lies at the center of all learning activities (Vygotsky, 1978) and now it constructs the base for distance education studies (Vrasidas & Glass, 2002). This conceptual framework offered for distance education studies is driven and shaped the current study. The framework constructed on the elements illustrated at Figure 1, considering the constructivism and collaborative learning. Basically, the interaction context in distance education consists of, inter alia, institutional and department policies, technologies used, the teacher, the number of students enrolled in a program, and course content. Policies and curriculum will inevitably affect the teacher's choice of structure and the content of the course. The framework of the current study has been drawn in this context and the lessons have been performed accordingly.
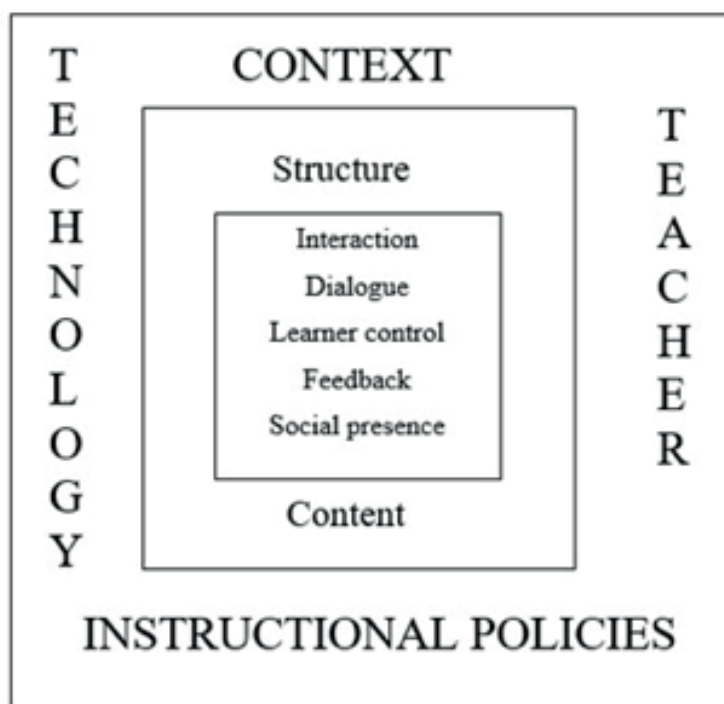
Figure 1. Conceptual Framework for Studying Distance Education (Vrasidas & Glass, 2002, p. 6).

METHOD

The explanatory mixed method as mentioned in Creswell (2014) was preferred in order to get more in-depth information about ODL courses and to increase the validity of the data. This design provided collection and analysis of quantitative data and following qualitative data. Consequently, qualitative data is expected to complement the results of quantitative data and deepen the interpretation.

Participants

The study was conducted in an eighth-grade classroom of a public school in Turkiye. The classroom was a total of 33 students with 19 girls and 14 boys. Classroom was heterogenous in terms of academic achievement according to their cumulative grand points of the previous year. Purposive sampling methos was utilized for selection of participant based on their willingness to take part in the study. The researcher was also the mathematics teacher of the participant classroom.

Online Lessons

As most of the education systems implemented distance education to provide the continuity of learning, the Ministry of Education Turkiye announced the online lessons at very early stages of Covid-19 lockdown. At the time, the data was collected for the current study, the mathematics lessons were determined three hours per week for elementary level. During the study following topics were covered as defined in national curriculum: "Point, line, line segment; their reflection and translation; reflection and translation of polygons; basic elements and surface area of right-angled prisms; basic elements of right-angled circular cylinder, surface area and volume; basic elements of the right-angled pyramid." The determined time for these topics was six weeks. The researcher is the mathematics teacher of the participant classroom as well. All the necessary permissions on ethics were obtained from the Ministry of National Education.

To apprehend the natural environment of online sessions, the whole process proceeded according to the country curriculum and the distance education instructions specified by the education ministry. The ODL lessons continued using the ZOOM video conference program. The duration of the lessons was designed as a 30-minute lesson, a 10-minute break.

The lessons and instructions consisted of three phases in line with the framework. The core phase was the beginning of the lessons, as in the face-to-face education process, the readiness of the students is measured. To provide this, a retrospective question or a small discussion was offered. This was to construct multidirectional interaction, to strengthen the students' social presence. Feedbacks were provided simultaneously to sustain communication. The second phase constituted the content and structure of the lessons. As mentioned before, the content was planned parallel to the national curriculum. The ODL's were structured as adaptable to the digital environment.

The last phase was mainly focused on teacher moves and process. Context and technology dimension was provided by the teacher. Instructions were supported via GeoGebra which is dynamic geometry software to provide students a more effective and fruitful learning environment. GeoGebra was chosen to enhance students' participation, communication, and learning. Lessons were enriched by extra digital working sheets by GeoGebra, videos and online exams designed on Kahoot. Figure 2 illustrates examples from online lessons. Instructional policies were drawn the borders of the context related to the national curriculum
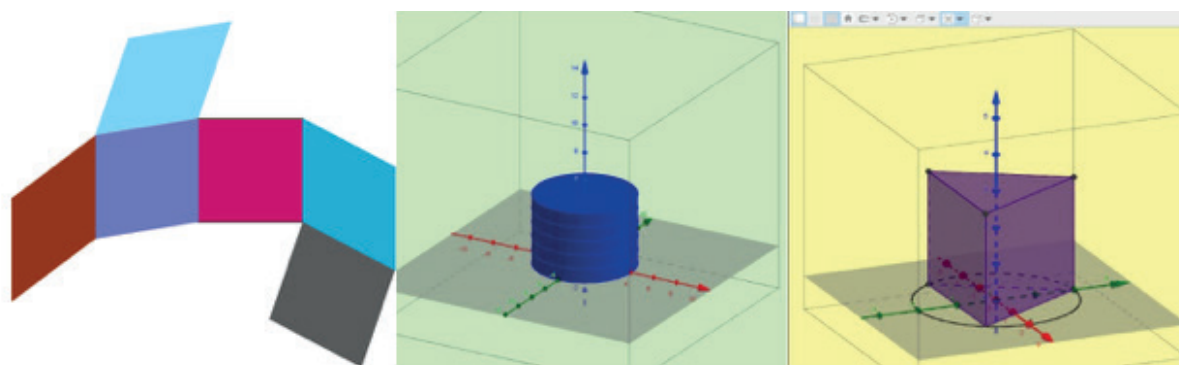

Figure 2. Examples of GeoGebra activities used in online lessons

Data Collection and Analysis

The study was based on a mixed-method including a web-based questionnaire and open-ended questions. Data was collected online. The lessons were recorded and transcribed for qualitative analysis.

GAS was used to measure students' attitudes towards geometry, which was developed by Bulut et al. (2002). The scale is composed of 17 items, and it is in the form of a five-point Likert scale. The reliability coefficient (Cronbach alpha) was found as .95 for the current study. It was administered to study participants at the beginning and at the end of the study. Sample items are "Geometry is like a puzzle. I enjoy solving", and "It is impossible to love geometry".

ODL scale was used to measure students' ideas on ODL in terms of quality, the role of instructor, context, interaction, enjoyment. It was developed by Walker (2003) and included 42 items on a five-point Likert scale. The Cronbach's coefficient was reported as .90 for this study. The scale was administered to the students at the end of the study to evaluate their opinions about the first practices of ODL. Sample items are "If I have questions in distance education, the teacher takes time to answer them", "I was able to share information with other students", and "We had the opportunity to work in groups".

Open-ended questions consisted of five questions that investigated whether students' views on geometry lessons changed with ODL, their views on the content and quality of online lessons, and their preferences between face-to-face and online education. These questions were administered to justify quantitative data and to deepen the study in terms of what the participant students were experiencing and the things that they really expected from this sweeping and distinctive process. The participant students replied to these questions online. Sample questions are "What do you think about the content of geometry lessons you take in distance online education? Were the contents (lectures in this context, assignments, videos, materials etc.) sufficient?

There was a voluntary basis for students' participation in the survey part of the study. All of the students attending ODL sections wanted to participate in the questionnaire section. Those quantitative data were analyzed via SPSS 25. For the statistical analyses MANOVA and paired-sample t-test was utilized to determine relationships and differences between study variables if they existed. There was no missing data, and all the preliminary analysis steps such as normality tests ensured the analysis.

Qualitative data was documented via the content analysis method. The object of (qualitative) content analysis can be all sorts of recorded communication (i.e. transcripts of interviews, discourses, protocols of observations, video tapes, documents). In this respect, the first students' responses to open-ended questions were transcribed. To define categories, the main idea was to formulate a criterion of definition, derived from the theoretical background and research question. The researcher and a mathematics teacher worked together to define categories. Following this criterion, categories were created and reduced step by step. Within a feedback loop, those categories were revised, eventually, main categories were created. Trustworthiness issues are handled as following: Coding process was finalized with an inter-coder agreement (Miles & Huberman, 1994) on defined categories to provide reliability and the data is presented via rich explanations for the validity.

FINDINGS

Findings were evaluated and presented under two headings.

Qualitative Results

Qualitative data were collected from responses of students to open-ended questions regarding students' views on geometry lessons changed with ODL, their views on the content and quality of online lessons, and their preferences between face-to-face and online education.

According to students' responses quality, perception, communication, and choice categories were defined. The content of the questions also had a guiding effect in defining these categories. Frequencies of students' mentions in their responses constructed the basis of the codes. Inter-coder reliability was provided with 95% agreement on codes (Miles & Huberman, 1994). Table 1 illustrates the frequency of obtained content and afterwards some written responses of students were presented in the following section.

Table 1. Types of contents determined from data

Categories defined	Mention sequence/Total responses
Quality	15/33
Perception	21/33
Communication	17/33
Choice	28/33

A roll call was taken to keep data of attendance. At the end of the study, it was determined that 91% of the students attended classes on average. At the end of the process, one lesson was reserved for students to answer the questionnaires sent to them. Participation in this course was complete and no data was lost.

In the following part, samples of students' responses are provided. The samples were chosen with a mathematics teacher who participated in the categorization process in terms of offering various remarks from ODL lessons.

Sample Explanations for Quality

All of the students participating in the study expressed a positive opinion on the quality and appropriateness of the content of distance education offered, and the competence and dominance of the teacher. Following some of the answers given by the participating students are presented.

S1: *The communication of our teacher with us was good, she provided enough documents related to the subject and we did not have any difficulties regarding the lectures …*

S6: *It was the best you could be in these circumstances; the content of the lesson was just fine; technology use was good to understand geometry concepts …*

S10: *So, what can I say about the contents prepared by the teacher? Nothing was missing. In other words, I think that she provided as much documentation as possible so that we did not feel the difficulties of distance education. She used technological tools as GeoGebra.*

S24: *Although it is not an ordinary course working order, we did not have a problem in terms of content. Our teacher was quite adequate in terms of both her expression and the contents she presented …*

Sample Explanations for Perceptions

According to their responses, most of the participant students did not develop positive perceptions about ODL. It was observed that the students developed a negative attitude because they were unfamiliar with this sudden situation and, the first time they encountered this process. In addition, they underlined the concern that an abstract lesson such as mathematics might become more difficult for them to understand. Following some of them are provided:

S13: *I like math and geometry. I was afraid that I could not learn from those lessons. I did not do badly I faired, but I do not prefer ODL at all, it is awful, something is missing, the classroom environment is very different…*

S8: *This is no substitute for face-to-face learning. Not too bad, but I do not prefer to continue with this… The environment is not like a natural classroom.*

S2: *It cannot be said that I do very well in math lessons, but I generally like it. I could not get used to this situation. Unfortunately, it did not replace the school. So, I would like to continue lessons at school. did not like distance education.*

S20: *Distance education cannot replace face-to-face education. I like mathematics and geometry subjects, but I prefer to be in the classroom environment. I wish we could go back to our school as soon as possible…*

Sample Explanations for Communication

The majority of students' responses indicate that there was only one-way communication during the process. They highlighted that there was only one-way communication between them and the teacher during the process and that they did not communicate with other class members. Additionally, they stated that they were unable to exchange ideas as in the real classroom setting. In fact, while effective communication is possible in the virtual environment, the students added that they could not find this environment. They described that they felt unfamiliar with the new teaching environment and were somewhat abstaining from it as the source of this situation. Following some examples are provided:

S21: *So, if you are asking about the teacher's communication with us, I cannot say that there is a problem in that matter. In other words, I do not know how better communication could be achieved in such an environment, she explained, providing feedback on what we did not understand. But of course, there was no communication between us as in the classroom environment. How can we communicate without even seeing each other's faces?*

S15: *I cannot say that we spend quality time regarding communication, even looking into the eyes of the teacher in the classroom is much more effective, it feels like I understand the subjects better.*

S10: *There was no communication between us like at school. The teacher actually tried to involve us, but I think that since this distance education is a first for me and my other friends, maybe we have adaptation problems. Sometimes I was afraid to talk in class. We could not do any group work anyway.*

All the students participating in the study stated that they preferred face-to-face learning. Learning in this virtual mode seemed to obligate them to take responsibility for their own learning. Therefore, for individuals who are used to continuing their education under teacher management, it seems that such a sudden change has caused discontent and adaptation problems, which is reflected in student responses. Again, deficiencies in technological infrastructure such as the internet, phone, tablet, and computer actually constitute one of the most striking situations reflected in student responses. Some of the responses from collected data as:

> S12: …*This situation seems to provide much freedom. I follow rules and take more responsibility at school. Everything seems a bit arbitrary now. This also discourages me from working.*

> S7: *I prefer face-to-face learning because many of our friends who do not have internet access could not attend classes because of this, I used my mother's phone to attend the classes, and we sometimes had connection problems. Sometimes there were uncomfortable situations during the lesson because I had a little brother at home. So definitely face-to-face learning.*

> S13: *This was a compulsory distance education. Both could be preferred, but I would still prefer to be in school. There is no communication, we could get in touch with friends during break times. Also, while I am trying to follow the lesson on the computer screen, I cannot make eye contact with the teacher on the other hand, which is a big shortcoming for me. I feel like I do not understand the lesson then. Therefore, it should definitely be face-to-face learning.*

Quantitative Results

Students' cumulative mathematics scores of previous years ranged from 2 to 5 with a mean of 4.33. Students' ODL means were 3.44 by reporting a low willingness and satisfaction. Pre-Geometry scores mean was 3.57 and post-Geometry scores mean was 3.88 that reported moderately positive attitudes to the geometry. Table 2 illustrates the paired sample t-test results of pre-post GAS.

T-test results (see Table 2) revealed a statistically significant increase in GAS scores from beginning (M = 3.5, SD = .87) to the end (M = 3.8, SD = .72), t (32) = 6.58, p < .005. The mean increase was obtained as .31 with a moderate eta squared statistic (.57).

Table 2. Paired sample correlations

	N	Correlation	p
GeoAttitude & GeoAttitudeEnd	33	.960	.000

According to the statistical results students reported a more positive attitude compared to the beginning of the study.

MANOVA was performed to investigate sex and cumulative mathematics scores differences in Geometry and ODL attitudes. General linear model did not indicate a statistically significant difference between boys and girls on the combined dependent variables, F (3, 24) = 2.28, p = .105, Wilks' Lambda = .78, partial eta squared = .22. Further students' mathematics achievement levels did not have any effect on their attitudes throughout dependent variables, F (9, 58) = .82, p = .597, Wilks' Lambda = .75, partial eta squared = .09. Table 3 illustrates the MANOVA results of the data.

Table 3. MANOVA results

Independent Variable	Dependent Variable	F	p	η^2
Gender(boy/girl)	GeoAttitude	3.755	.064	.126
	GeoAttitudeEnd	4.300	.048	.142
	ODL	1.529	.227	.056
CumMatGPA	GeoAttitude	1.271	.305	.128
	GeoAttitudeEnd	1.556	.224	.152
	ODL	.675	.575	.072

ODL* = Online Distance Learning Scale

DISCUSSION

The main purpose of this exploration is to evaluate eighth-graders' perceptions of ODL after getting a certain period of lectures which was their first experience with it. the 33 eighth graders were observed for a six-week online learning period. The aim was to obtain whether any changes occur in their geometry attitudes during the process and to reveal their preferences between online distance learning (ODL) and regular face-to-face education. The data is evaluated via qualitative and quantitative analysis.

Quantitative data did not provide statistically significant results for gender and math achievement effect on GAS and ODL perception. Several studies also investigated learner attitudes toward ODL (Akgunduz & Akinoglu, 2016; Andoh et al., 2020; Simon et al., 2014; Smidt et al., 2014) and gender is not correlated with perceptions toward ODL. Therefore, in the current study, the students' perceptions have no relation with gender regarding the ODL process. This was a similar finding to Al Salman, Alkathiri and Bawaneh (2021) in which they report gender, education level or region has no significant effect on distance education preferences. Furthermore, the data revealed that students' mathematics achievements do not have an effect on their ODL preferences.

Quantitative data illustrated that students' GAS scores have increased moderately from beginning to the end. This finding was in line with Khairiree (2020) and Auliya and Munasiah (2020) who found that use of augmented reality and geometry applications positively affected students' attitudes towards geometry. Additionally, in the current study, students may have welcome use of GeoGebra, and this may have caused this increase in their attitudes.

Qualitative data revealed that although teacher-student one-way interaction was perceived as moderately effective this period, the quality of teacher-student and student-student relationships and interactions seemed to decrease. This finding is in line with the studies conducted during the pandemic period (Batmang et al., 2021; Foti, 2020; Lee et al., 2021). These results show that although there is a level of social interaction that is encouraged and made available online, the lack of face-to-face communication significantly and negatively affects students' sense of community and overall satisfaction. Almost all of the students answered negatively to the question "about involvement level of group work" asked in the distance education scale administered to the students. Accordingly, it can be confirmed that the students view group work as the weakest and less satisfactory component of their online journey. This finding is also consistent with Lee et al. (2021) in which they assert despite their success in supporting students' individual learning, and providing efficient materials and content for the lessons, teachers could not effectively facilitate students' collaborative learning during the pandemic. Also, they highlighted that the communication occurred in one way between teacher and student. The student-student interaction stayed in low levels when compared to the face-to-face school environment. This may also prevent the taking-sharing ideas among them which also creates an extra obstacle to this process in their view.

In the current study, students generally stressed that they cannot make eye contact with the teacher in distance education, and even this is a critical point for effective communication. In their responses to open-ended questions, they drew attention to the importance of non-verbal communication in regular face-to-face education. However, ODL leaves no open-door for non-verbal communication since it is only available through a videoconferencing method (Neill, 2017). In line with this, students' responses from open-ended

questions indicated that being away from the classroom environment made it difficult for them to make sense of the context. In the same way, students expressed low satisfaction in the interaction, among others. This result was consistent with Fedynich et al. (2015) in which interaction was identified at the lowest levels of satisfaction of graduate students. Furthermore, Kara (2020) found that student-student and teacher-student interaction was an important predictor of quality of online learning environments. Hence, low levels of student-student interaction and one-way communication between teacher and students may elucidate the choice of face-to-face learning over ODL. In this respect, Ferguson and DeFelice (2010) emphasized that the use of live chat rooms and blogs would provide for increased interaction. Teachers may raise interaction by providing examples of classroom and designing group projects which can promote critical thinking. Yet, foregoing research indicates that even if learning goes online still the teacher's role remains important as acting as a mentor (Burdina et al., 2019). In the current study, students' overall perceptions were positive in terms of managing the lessons, providing feedback on the questions, providing sufficient documents on the topics, promotion of critical thinking and creativity, and teaching methods. The findings are in line with Andoh et al. (2020), Azarcon et al. (2014), Farahmandian et al. (2013), and Keelson (2011). In these studies, students were generally satisfied with teaching methods, delivery of content, and encouragement of students' thinking.

While research mainly reveals and highlights the positive aspects and advantages of ODL, some report disadvantages on the contrary. A variety of them reports that ODL allows students who are unable to attend school for obvious reasons, to acquire a full range of content knowledge (Chen & Chen, 2006; Ward et al., 2010). Moreover, Robinson (2008) states that ODL makes conditions more equitable for disadvantaged groups to continue regular educational activities. In the current study, the students who participated in the study emphasized that distance education has negative effects both socially and psychologically for those who do not have the internet at home and do not have technological devices such as tablets and computers, and they also fall behind in their intended curriculum. Similarly, Jung (2012) revealed that difficulties with technology access create barriers to ODL which causes high dropout rates from their programs. As a very recent report Azhari and Fajri (2021) reveal that parents' economic factors and limited internet facilities are obstacles to be handled and Lee et al. (2021) support the same deficiencies causing a big withdrawal from online educational process.

As a final question, students asked to make a choice between ODL and regular face-to-face education. Almost all of them indicated to continue their education in school. This finding was parallel to the findins of Randler et al. (2014) and Lee et al. (2021) that age is an important predictor of willingness to participate in ODL. Since the participating students are in a very young group, they may not want to/be able to take responsibility for their own learning and vote for face-to-face education. In fact, although it is known that the new generation is intertwined with technology and is more experienced than many teachers in this regard, it can be considered as a remarkable finding that they prefer face-to-face education instead of ODL. Perhaps, as emphasized by the students in the current study, we need to embrace more student-centered opportunities and approaches by taking into account their thirst for socialization and advancing their learning.

This study was designed to create a student-centered learning environment through principles of constructivist learning ideaa in a defined framework. However, students' responses demonstrated that practically it seems to have more teacher centric. Most of the students were merely passive only reacting to teacher questions.

CONCLUSION, LIMITATIONS AND SUGGESTIONS

This study seeks to provide a glimpse into the regular process of an ODL course of geometry. Evaluation of elementary school level students' perceptions and their practices in terms of ODL is useful to identify missing points, to overcome deficiencies, to keep the participation and satisfaction level of students to the ultimate, to improve teaching quality relatedly. Satisfactory responses were only related to the teacher's effectiveness as face-to-face education as it was. Teacher's being efficient in technology to deliver instruction effectively seemed to improve the success of ODL moderately. Aforementioned highlights that the role of the teacher is the most crucial factor in face-to-face education. On the other hand, unfavorable results were dominant in students' responses and pointed out that the facilities for access to ODL should be critically looked at and should be developed rapidly. Failure in handling the negatives revealed in the study may cause many more dropouts in courses. In this way, this study adds to the literature the ways of designing ODL lessons regarding students' needs.

This study is limited with participants and to the environment studied in. The results may only be generalizing to the studies with similar contexts. Other researchers may prefer to change the grade level, content of the mathematical subject, sequence and catering of technological materials of ODL and further may conduct comparison studies to obtain more generalizable results.

As provided in face-to-face education, the importance of catering to individual learner needs and providing social support to increase learner engagement should not be underestimated. Moreover, learner-teacher and learner-learner interactions which are key determinants of educational environments also should be underscored in ODL sessions. Future research can also integrate group work into ODL, using group extensions available on video conference platforms to examine student engagement and student attitudes.

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TECHNOLOGY FATIGUE DURING THE COVID-19 PANDEMIC: THE CASE OF DISTANCE PROJECT-BASED LEARNING ENVIRONMENTS

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ABSTRACT

Technology has invaded all spheres of life, including education and providing a lot of facilities. It has played a great role in managing education during the coronavirus disease (COVID-19) crisis. However, technology might prove detrimental if there is too much of it which may negatively affect its users in some way. This study aimed to investigate final-year students' technology fatigue in distance project-based learning environments during the COVID-19 pandemic. The study employed an online survey approach to collect data from 86 final-year students. The results showed that technology does not highly fatigue final-year students in distance project-based learning environments. Still, the study reported some factors that contribute to increasing and decreasing final-year students' technology fatigue level, which may inform project supervisors and decision-makers on the best practice for implementing distance project-based learning without putting students under great pressure and fatigue resulting from technology. This study adds to a limited yet growing body of literature on a very important topic, technology fatigue, that has recently arisen in the academic sector especially during the COVID-19 pandemic, when technology was the quickest and most ideal response to the global lockdown.

Keywords: Distance learning, project-based learning environments, Saudi Arabia, technology fatigue, university students.

INTRODUCTION

Technology is a vital part of human life in the current era. Throughout the day, people use their smartphones to, for example, browse the internet, social network, communicate with work and friends, and read the news. In 2020, with the rapid spread of coronavirus disease (COVID-19) and the subsequent long lockdown, many daily life aspects transferred to virtual realms, including education. Due to the urgent closure of schools and universities, students and instructors were required to stay online for all academic matters, from classes to office hours to graduation ceremonies. This overuse of technology may lead to the feeling of being overloaded and exhausted (Yu et al., 2019), triggering many other implications that encourage researchers to investigate this matter. One implication is technology fatigue, defined as stress caused by technology and frequent changes in technology (Halupa & Bolliger, 2020). The variable of technology fatigue is relatively new in the Saudi education literature and has not yet been researched. This study thus aims to investigate the technology fatigue of final-year students at King Faisal University, Saudi Arabia who worked on projects distantly during the COVID-19 pandemic.

LITERATURE REVIEW

Technology Fatigue

Recently, technology significantly developed to become a crucial part of people's lives that they cannot quit. However, this development has brought a higher incidence of technology stress, overload, and fatigue (Shu et al., 2011; Fitzgerald, 2021). Technology fatigue is the experience of having lots of new technologies being

introduced so quickly that one needs to learn and use them in a limited time, which causes them to feel unable to keep up with them all (Wujcik, 2011). Researchers have reported many reasons for technology fatigue, such as information overload, system features, communication overload, device proliferation, and operating multiple gadgets with multiple functions (Lee et al., 2016; Karr-Wisnewski and Lu, 2010; Grandhi et al., 2005). This fatigue and stress may decrease productivity (Ayyagari, 2012) and negatively affect academic achievements (Sass & Goldring, 2021). It may also lead to physical and psychological strains (Lee et al., 2016) like headaches, stiff shoulders, eyestrain, backaches, difficulty sleeping, and depression (Okonoda et al., 2017).

When the COVID-19 global pandemic first began, educational institutions urgently introduced technology to students, parents, teachers, and employees for instant use in an effort to keep education going but it lasts over a prolonged period of time. The pandemic's social distancing then triggered the extensive use of technology and resulted in many reports of technology fatigue (Williams, 2021). Supporting this claim, Niemi and Kousa (2020) studied students' and teachers' perceptions on distance learning in a Finnish high school during the COVID-19 pandemic and found that overall, the technical problems that students face require using more technical applications than in face-to-face schooling. They also found that students spend much more time on distance learning than they do on face-to-face learning. The students therefore felt highly pressured and were overloaded with tasks and exam deadlines. In addition to the e-learning requirements that force students and teachers to use technology is personal technology use in daily life. Already there is evidence that fatigue and exhaustion caused by excessive social media use alone can decrease student academic performance and disable the effective completion of learning activities (Cao et al., 2018; Yu et al., 2019; Aharony & Zion, 2019; Wang et al., 2020).

On the other hand, there is evidence that the effect of technology fatigue maybe only true for the older generation who was born before the context of the iPhone as the youngers have not been affected by the rapid and urgent shift caused by the COVID-19 pandemic (Golu, 2021). They, the younger, may need longer time, estimated by two years, of full dependence on working distantly (Golu, 2021) using videoconferencing and other technology-based tasks for work in addition to private life technology-based tasks to be affected by technology fatigue (Molino et al., 2020; Palumbo, 2020). There are some factors that can mitigate the fatigue effects of excessive technology activities such as balancing work-life (Golu, 2021). Working hours must be carefully defined. Moreover, a user needs to pay attention to self-care measures, such as having enough breaks to rest while working, mindfulness, relaxation, or meditation exercises (Carissoli et al., 2015; Gaggioli et al., 2019; Linardon et al., 2019; Golu, 2021). In their study that measures the levels of coping with online course (Zoom) fatigue of preservice teachers in the emergency remote teaching process, Bayindir and Gokce (2021) mentioned some actions taken by teachers to mitigate the effect of Zoom fatigue such as resting, exercising, having snacks, and relaxing. Halupa and Bolliger (2020) have explained a number of factors that are believed to mitigate technology fatigue experienced by faculty in higher education, such as administration, support, time to learn, technology-free zones, and responsibility. The authors demonstrated that the administrators should have more reasonable expectations from the faculty and eliminate the need for immediate communication. They moreover expressed the need of having more training opportunities that were effective and timely. They also added that support should be ongoing based on demand and adequate time must be allocated to learn about new technology and platforms. The faculty in Halupa and Bolliger's (2020) study advocated for finding technology-free zones where they take breaks and disconnect, to select user-friendly and stable programs or platforms to work on, and to provide good and simple resources to learn from when required. Finally, the students need to be more responsible for their own learning along with providing them with more guidelines and explanations, tutorials, training, and support.

Scholars have rarely researched the concept of technology fatigue in the educational context. However, some studies have highlighted the fatigue resulting from the extensive use of certain types of technology, such as videoconferencing, especially during the COVID-19 pandemic (Bailenson, 2021; Riva et al., 2021; Toney et al., 2021; Bennett et al., 2021). These articles reported that videoconferencing for long periods during the day seems particularly exhausting and increases fatigue. Other studies have researched social media fatigue (Dhir et al., 2019; Lee et al., 2016; Lee et al., 2014). These studies showed that connecting and communicating via social networks may require increased energy that may lead to diminished enthusiasm and fatigue. Moreover,

researchers have implicitly identified technostress as one of technology fatigue's consequences (Vega-Munoz & Estrada-Munoz, 2020; Penado Abilleira et al., 2021; Wang et al., 2020).

In a more specific context, Halupa (2018) investigated technology fatigue in faculty members. The study claimed that technology is changing rapidly and may cause change fatigue that triggers change resistance in some faculty; the study also distinguished between technology resistance and technology fatigue. Another study, Halupa and Bolliger (2020), examined technology fatigue in higher education faculty in the United States. The authors argued that technology fatigue is a combination of technostress and change fatigue and explored the faculty's perceptions of technology fatigue, as well as compared their fatigue levels based on gender. The study's findings revealed that all the faculty experienced moderate levels of technology fatigue, though male faculty were more fatigued than female faculty.

As revealed from the above literature, technology fatigue has received little attention from scholars in the educational field. Moreover, student technology fatigue specifically remains unexamined. Researchers have already found technology fatigue to have negative consequences on academic outcomes, so it is worth examining students' technology fatigue to ensure their productivity and performance, as well as provide them essential support. This study thus adds to the limited yet growing body of literature on this important topic especially during the COVID-19 pandemic, when technology is the quickest and most ideal response to global school closures.

Distance Project-Based Learning Environments

Project-based learning (PBL) is traditionally defined as a student-centered teaching and learning method that encourages learners to engage in rich learning situations to collaboratively or individually accomplish a certain goal over a period of time (Al Mulhim & Eldokhny, 2020). The literature indicates that PBL is widely used in the education field (Al Mulhim & Eldokhny, 2020; Chen et al., 2019; Holmes & Hwang, 2016; Johnson et al., 2013; Rogers et al., 2011). It also reports that PBL can improve education outcomes, such as attitudes toward learning, motivation, academic achievement, self-assessment, self-directed learning, the learning of higher-order thinking skills, self-regulation skills, research skills, practical thinking, problem-solving skills, creativity, and collaboration (Al Mulhim & Eldokhny, 2020; Ardhyantama et al., 2020; Bilgin et al., 2015; Chen et al., 2019; English & Kitsantas, 2013; Mahasneh & Alwan, 2018; Dilekli, 2020; Wahyuningsih et al., 2021, Edy et al., 2020; Yuliansyah & Ayu, 2021).

Distance project-based learning (DPBL) is very similar to traditional PBL but occurs remotely online, as the project team does not meet face-to-face nor with their supervisor. Educational institutions have broadly applied DPBL during the COVID-19 pandemic (Ardhyantama et al., 2020; Edy et al., 2020; Hira & Anderson, 2021; Kuladinithi et al., 2020; Kartikawati, 2020; Rahayu & Fauzi, 2020; Wahyuningsih et al., 2021; Yuliansyah & Ayu, 2021). However, the DPBL environment has not yet been studied alongside technology fatigue, though there are different arguments about it. From one perspective, the DPBL environment itself can sometimes be stressful and exhausting when the goal is higher than the students' cognitive abilities or if they are accustomed to traditional learning only. DPBL also has many demands that can increase students' and teachers' boredom and stress (Ardhyantama et al., 2020). In such a case, DPBL becomes unmotivating and discouraging, and students may not achieve the anticipated learning outcomes (Dilekli, 2020). As a result, teachers need to prepare and monitor students well in this learning setting to provide necessary support when needed. Teachers also need to create good communication with students to reduce stress levels resulting from out-of-control factors like the internet connection problems (Ardhyantama et al., 2020). All these factors can contribute to more reliance on technology use, which may lead to more fatigue. From another perspective, there is evidence that PBL helps improve students' ability to manage stress and fatigue (Sirotiak & Walters, 2009). Moreover, studies carried out during the pandemic on DPBL have shown that it is an appropriate alternative to traditional face-to-face learning (Ardhyantama et al., 2020; Hira & Anderson, 2021; Yuliansyah & Ayu, 2021; Yustina et al., 2020), especially for practicum knowledge (Edy et al., 2020). Even so, this debate has not yet been resolved, and further investigation is required to give preference to one of these perspectives.

THEORITICAL BACKGROUND

Findings from studies on technology stress agree with the transactional theory of stress and coping by Lazarus and Folkman (1984). According to this theory, psychological stress results from the interaction between the individual and the environment, particularly when the individual's commitments exceed their resources and endanger their well-being. In other words, stress is a transactional process in which stressors interact with an individual's ability to work and achieve their goals, which leads to fatigue as the individual's response to the stressors (Cooper et al., 2001). There are different types of environmental stressors, such as demands, conditions, workload, temporal factors, relationships, the novelty or ambiguity of a situation, and event uncertainty (Lazarus & Folkman, 1984; Lee et al., 2016). Working with technology itself is a major stressor when it overloads individuals and requires them to use it too much, longer, or faster than they can manage, which studies have proven to be fatiguing (Moore, 2000; Karr-Wisniewski & Lu, 2010). In this context, fatigue can take different forms, such as discomfort, dissatisfaction, exhaustion, and negative attitudes toward technology (Lee et al., 2016; Fuglseth & Sorebo, 2014; Salanova et al., 2013). This current study adopts the transactional theory of stress and coping to understand technology fatigue in DPBL environments.

Considering the COVID-19 pandemic, having sudden and immediate changes in academic plans and fully shifting from PBL to DPBL was not easy for some students and their teachers. They could not meet face-to-face again for a long time. Even now, they have to rely on distance learning and online meetings, which are not always clear of disturbances or interruptions and may occur despite the absence of some team members (Kuladinithi et al., 2020). Adding to that, many teachers and students have reported several technology-related obstacles that they faced during the pandemic, such as lack of access to computers and the internet, technical problems, lack of technological competence, and a large assignment load (Kartikawati, 2020; Rahayu & Fauzi, 2020). These burdens only increased and the role of technology enlarged, which creates an evident stressor that may affect learning outcomes. This situation raises this study's main question, which asks how fatigued final-year students who enrolled in a DPBL environment were during the pandemic.

RESEARCH QUESTIONS

- To what extent did final-year university students experience technology fatigue in distance project-based learning environments during the COVID-19 pandemic?
- What factors contributed to final-year university students experiencing increased levels of technology fatigue in distance project-based learning environments?
- What can help final-year university students lower their level of technology fatigue in distance project-based learning environments?

METHOD

Research Approach

The research followed a descriptive survey approach, the most appropriate for the research objective to assess graduating students' technology fatigue as caused by a DPBL environment during the COVID-19 pandemic.

Participants

The study recruited all the final-year students (n = 86), aged 22–24 years old, from the Educational Technology Department at the Faculty of Education, King Faisal University, Saudi Arabia at the end of the last semester of the 2020/2021 school year. The participants enrolled in a mandatory course, the Graduation Project, which had taken place throughout the whole year. They were asked to complete an online survey to assess their levels of technology fatigue resulting from the DPBL environment during the COVID-19 pandemic.

Data Collection

For the purpose of this research, an adapted version of the technology fatigue survey developed by Halupa and Bolliger (2020) was employed to measure the final-year students' technology fatigue levels. The survey consisted of 20 closed-ended items, including 4 reversed items, and 2 open-ended questions. Closed-ended items can easily "generate frequencies of response amenable to statistical treatment and analysis" (Cohen et al., 2007, 321), whereas open-ended questions can "catch the authenticity, richness, depth of response, honesty and candor" (Cohen et al., 2007, 330). The closed-ended items were measured on a 4-point Likert scale (Strongly Agree = 4; Agree = 3; Disagree = 2; Strongly Disagree = 1). These items' highest total score was 80, and the lowest was 20. The open-ended questions asked about the factors that increase and decrease technology fatigue in DPBL environments.

A total of eight experts from the educational technology field evaluated the instrument's validity. The experts recommended rewording some of the closed-ended items. These modifications took place, and the instrument then reached its final form.

Halupa and Bolliger's (2020) original technology fatigue instrument had a reliability of 0.95. The present study survey's reliability was calculated using the test-retest method by administering it to a pilot sample of 15 final-year students. Spearman's coefficient showed a result of 0.92, which indicated a high and significant reliability.

Data Analysis and Results

A total of 86 final-year students (15 males and 71 females) completed the survey. The closed-ended items were analyzed through frequencies, percentages, and descriptive data. Responses to the two open-ended questions were analyzed using open coding to "build a descriptive, multi-dimensional preliminary framework for later analysis" (Khandkar, 2009, 8). The data were then categorized and compared according to any arising themes.

The analysis of the survey data generally showed that the final-year students were moderately fatigued (survey total mean = 2.3 of 4) after using technology in a DPBL environment during the COVID-19 pandemic.

Technology Fatigue Survey

Table 1. Frequencies and Descriptive Data of the Technology Fatigue Survey

No.	Item	Percentages		Descriptive data	
		SA/A	SD/D	M	SD
1	I am tired of learning new educational technologies to implement in my online projects.	10.5	89.5	1.66	0.729
2	It seems as soon as I learn a new educational technology to use in my online projects, it becomes obsolete.	50	50	2.60	0.830
3	It is exhausting and difficult trying to keep up with technology to be able to meet teachers' expectations.	38.4	61.6	2.34	0.835
4	It takes a significant amount of time to meet my teachers' expectations in regard to using educational technology in online projects.	48.8	51.2	2.38	0.883
5	Learning new educational technologies makes me tired and/or frustrated.	11.6	88.4	1.73	0.658
6	Learning new educational technologies takes up too much of my time.	67.4	32.6	2.73	0.832
7	Keeping up with educational technology changes is exhausting.	46.5	53.5	2.33	0.860
8	The advances in educational technology occur so fast it is difficult to keep up with them.	50	50	2.56	0.745
9	I am tired of being expected to use new educational technologies in online projects.	16.3	83.7	1.95	0.718
10	I feel as though my online projects and assignments are never finished due to technology.	51.2	48.8	2.53	1.002

11	Technology makes it difficult for me to take a break from learning and/or online projects.	55.8	44.2	2.62	1.008
12	There are days when I do not want to use technology because I need a break from it.	82.6	17.4	3.26	0.935
13	I have stopped using one or more tools (e.g., social media, listservs, gadgets, etc.) because I am too tired of using technology for my online projects.	52.3	47.7	2.59	1.022
14	It energizes me to spend time learning new technologies to implement in online projects. [R]	11.6	88.4	1.79	0.671
15	Technology has improved my online project efficiency. [R]	4.7	95.3	1.48	0.627
16	I feel "mentally tired" due to the use of technology in online projects.	66.3	33.7	2.73	0.846
17	I feel overwhelmed by technology.	62.8	37.2	2.84	0.893
18	I feel apathetic toward educational technology.	2.3	97.7	1.64	0.529
19	Overall, I like using technology for my online projects. [R]	1.2	98.8	1.53	0.525
20	I learn new technologies very quickly. [R]	25.6	74.4	1.99	0.728

Note: SA = Strongly Agree; A = Agree; SD = Strongly Disagree; D = Disagree; [R] = reversed item

As mentioned earlier in this paper, due to the pandemic, the students were forced to socially distance from their supervisors and peers and continue working on their projects remotely. They worked in a DPBL environment for the first time with new technologies, several requirements, and commitments in a limited time and with little support. According to Lazarus and Folkman's (1984) transactional theory of stress and coping, when the situation is totally new and ambiguous for the students, it would be expected to place more burden and stress on them. In addition, the technology fatigue literature emphasizes how technostress and extensive exposure to technology in some circumstances can increase technology fatigue and negatively influence productivity and academic outcomes (Lee et al., 2016; Karr-Wisnewski and Lu, 2010; Grandhi et al., 2005; Ayyagari, 2012; Sass & Goldring, 2021; Okonoda et al., 2017). Despite these expectations, the survey revealed different results. The only explanation that may illustrate this is that the participants were final-year students in the Educational Technology Department and thus were very familiar with the extensive use of technology and PBL. They all belong to the younger generation who live in a technology-rich context, so they may not find the transformation caused by the pandemic as a hard shift (Golu, 2021) or were in an ambiguous situation (Lazarus & Folkman's (1984). They self-regulated their behaviors and had learned to cope with the new situation to organize and conduct their projects fully online, at which they succeeded.

Table 1 shows that item 12 had the highest mean (M = 3.26; SD = 0.935). Approximately 82.6% of the participants strongly disagreed or disagreed that there were days when they did not want to use technology because they needed to rest. The second highest mean (M = 2.84; SD = 0.893) was for item 17, which indicated that almost 63% of the participants strongly disagreed or disagreed that they felt overwhelmed by technology. Items 6 and 16 had equal means of 2.73; over 67% of the participants strongly agreed or agreed that learning new educational technologies required too much time (SD = 0.832), while about 66% felt "mentally tired" due to their use of technology for their online projects (SD = 0.846).

Meanwhile, the lowest mean (M = 1.48; SD = 0.627) was for item 15. The majority of the participants (95.3%) strongly disagreed or disagreed that technology improved the efficiency of their online projects. The second-lowest mean was for item 19, which revealed that almost all the participants (98.8%) did not like using technology for their online projects (M = 1.53; SD = 0.525). Item 18 had the third-lowest mean (M = 1.64; SD = 0.529) and showed that 97.7% of the participants were interested in educational technology.

Contributing Factors to Technology Fatigue

The survey included an open-ended question to understand the final-year students' perceptions of the factors contributing to technology fatigue in DPBL environments, and 67 students interacted with this question. Although the fatigue survey revealed that the final-year students are not highly fatigued by technology, they shared more than 258 responses and problems that were classified into 9 categories, as shown in Table 2.

Table 2. Frequencies of Factors Contributing to Technology Fatigue

Theme	N
Lack of time and overload	54
Social distancing	52
Self-learning	41
Supervisors	32
Technical problems	28
Extensive use of technology	22
Teamwork	20
Health problems	6
Lack of financial support to buy good-quality software	3

The comments revealed that lack of time and workload pressure from other courses was the main problem that the students suffered from (n = 64). Social distancing resulting from COVID-19 was another factor that negatively affected technology fatigue (n = 63). The participants reported that they lacked face-to-face meetings with the other project team members and could not find consistent times for team members to meet distantly. Moreover, some students stated that they simply did not like working on projects remotely.

The fact that conducting projects requires learning new and advanced programming skills led to challenges especially during the pandemic. The students needed to be more independent and self-taught with little or insufficient support from their supervisors (n = 51). The participants further indicated that supervisors may exaggerate the request for distant projects and do not consider the workload of other courses or time constraints (n = 42).

Technical problems also negatively influenced the participants (n = 38). Many reported that programming software they use is usually heavy and hanging a lot. A high-speed internet connection is also necessary to conduct projects, share documents, and communicate with other team members and supervisors, but such a connection may be not available for many of the students. The students also asserted extensive technology use in daily life, such as e-mails, social media, shopping, learning management systems, and virtual learning, as a vital factor that increases technology fatigue and causes the distant projects to be cumbersome (n = 35).

Similar contributing factors toward technology fatigue to those explained above were consistent findings of several studies in the literature. For example, Williams's (2021) study showed the COVID-19 pandemic's social distancing triggered the extensive use of technology and resulted in many reports of technology fatigue. More specifically, social distancing and working in DPBL are exhausting, stressfull and discouraging when the goal is higher than the students' cognitive abilities or if they are accustomed to traditional learning only (Ardhyantama et al., 2020; Dilekli, 2020). Kuladinithi et al. (2020) asserted that relying on online meetings does not always work, as they may be disturbed or interrupted and some team members may not join. Another study that agrees with this study's findings is the study of Niemi and Kousa (2020) that technical problems and spending much more time on distance learning compared to face-to-face learning made students feel highly pressured and overloaded. Many studies have reported that personal technology use in daily life such as excessive social media use alone can decrease student academic performance and disable the effective completion of learning activities (Cao et al., 2018; Yu et al., 2019; Aharony & Zion, 2019; Wang et al., 2020).

Mitigating Factors to Technology Fatigue

The second open-ended question revealed the factors that might mitigate the participants' technology fatigue. Sixty-six participants responded to this question, and their responses were coded and classified into seven categories: social nearness, time, planning, support, control, rest, and expectations, as illustrated in Table 3.

Table 3. Frequencies of Factors that Mitigate to Technology Fatigue

Theme	N
Social nearness	61
Time	58
Planning	53
Support	43
Control	39
Rest	6
Expectations	4

Almost all the respondents (n = 61) preferred social nearness and believed they needed to meet with the project team and supervisor face-to-face regularly. Fifty-eight respondents asserted they needed more time to learn the new technology software and suggested starting at the beginning of the semester. Moreover, they reported that having the practical part of the graduating project occur solely during the final semester would extremely lower their technology fatigue.

For the planning category, the participants mentioned three problems (n = 53). First, they asserted that the course plan should include all the programs that students may need to learn to complete their distant projects at the beginning of the semester. Second, instructors need to work on developing students' self-learning skills. Third, the project's tasks should be divided equally among team members and encourage their cooperation to complete the project. In total, 43 individuals indicated that they needed more support from their supervisors to accomplish their projects. They also required easy resources to learn new software on their own and sufficient opportunities for training. In turn, 39 respondents thought that daily technology use (e.g., social media use) should be balanced to reduce fatigue from the technology used for online projects. A few individuals advocated for regular rest periods during worktime as well (n = 6). Finally, 4 participants suggested having supervisors lower their expectations for students regarding their use and employment of technology in distant projects to reduce their level of fatigue.

The mitigating factors found in this study have been supported by much literature. The study by Ardhyantama et al. (2020) illustrated that in contrast to social distancing, students who are unfamiliar with distance learning would prefer working face-to-face with their colleagues and teachers. Among the very important mitigating factors reported in this study is allowing adequate time for students to learn new programming skills and software. This finding is supported by the result of Halupa and Bolliger (2020) that indicated that faculty need more time to learn about new technology and platforms presented to them by administrators. Similar to Halupa and Bolliger's (2020) findings, the students of this study also asked for self-learning skills development and should be more accountable for their own learning as well as providing them with easy supportive resources to learn from. The results, furthermore, showed the necessity of balancing the use of social media and other daily technology tasks with learning technology-based tasks. This result agrees with the studies of Golu (2021) and Halupa and Bolliger (2020). Having rest and enough breaks was also supported by the studies of Carissoli et al. (2015), Gaggioli et al. (2019), Linardon et al. (2019), Golu (2021), Bayindir and Gokce (2021), and Halupa and Bolliger (2020). Finally, the result of having supervisors decrease their expectations for students regarding their use and employment of technology in distant projects is consistent with the study of Halupa and Bolliger (2020).

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

This study investigated final-year students' technology fatigue in DPBL environments during the COVID-19 pandemic. The study's results indicated that the participants were moderately fatigued. The participants also reported some contributing and mitigating factors to their technology fatigue. The greatest contributing factors were lack of time and work overload resulting from other course projects, and social distancing. The best mitigating factors, meanwhile, were social nearness, allowing more time to learn necessary skills to accomplish their projects, and starting the projects earlier.

This study may practically imply that teachers need to train their students to use technology in a good, healthy and balanced manner especially when working remotely to avoid being fatigued. This study can also assist inform project supervisors about the factors that may contribute to student technology fatigue, which may negatively affect their productivity and academic achievements therefore they can eliminate them. It also suggests the most suitable factors to lower that fatigue, especially in a distance learning environment where students are under great pressure such as taking regular breaks from technology, balancing private daily life use of technology with the technology-based learning tasks and seeking proper support whenever required. This may inform instructional designers of technology-rich learning environment about the wellness considerations that need to be followed in order to alleviate the feeling of technology fatigue level and its negative consequences that may apply.

The result of this study is encouraging that the participants were not highly fatigued by technology. However, the sample of this study was all from the new digital generation who are very familiar with technology and use it as a crucial part of their daily lives. This result may be not applied to other older participants who do not consider technology as a part of their daily lives or those who have negative attitudes towards technology. Add to that the study was limited to the final-year students of the Dmepartment of Educational Technology who are very familiar with the extensive exposure to technology so the urgent shift to distance learning was not considered a new or ambiguous situation to them. Moreover, the findings may vary when other types of e-learning environments are used such as blended learning environments and flipped classroom environments. In the future, to enrich the growing body of literature on technology fatigue, a comparison of technology fatigue levels among individuals with different demographic characteristics such as gender, age, and study background is recommended. Another comparison may be conducted between individuals with different cognitive styles. More research on technology fatigue may be done in other e-learning environments such as gamification-based environments, flipped classroom environments, and virtual learning environments.

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STEM FACULTY MEMBERS' PERSPECTIVES AND CHALLENGES TOWARDS DISTANCE LEARNING AND VIRTUAL CLASSES DURING COVID-19 OUTBREAK

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ABSTRACT

The study aims at investigating the STEM faculty members' perspectives and challenges towards distance learning and virtual classes during COVID-19 outbreak. The results are compared with those of non-STEM faculty members from the same institution. Data collection was performed at the United Arab Emirates University in view of four demographic independent variables: Faculty Gender, Experience, Academic Rank, and Academic Track. The researchers adopted and implemented a questionnaire where its validity and reliability for collecting data have been verified. Mean, standard deviations, and one-way ANOVA tests were conducted. The results indicate that the overall of faculty members' perspectives towards distance learning and virtual classes and for both tracks (STEM, and humanities and social sciences) are Medium. The results do not show a significant difference at the level ($\alpha = 0.05$) for the independent variables: gender, and experience. However, we observe significant differences for the academic track and academic rank. We notice some significant differences in favor of full professors and associate professors as compared to lecturers. We also observe some significant differences between STEM and non-STEM tracks in favor of the former one. The results show that the calculated means for the challenges in using distance learning and virtual classes for the STEM, and humanities and social sciences tracks are Weak. This indicates that there are no apparent challenges that hinder the effort in teaching. The results do not show a significant difference at the level ($\alpha = 0.05$) for all independent variables: faculty gender, experience, academic rank, and academic track. The study concluded with few recommendations. The university should continue supporting the current efforts to provide all the requirements of teaching and learning via distance learning and virtual classes such as suitable infrastructure, internet, smart apps, and technical support. There is always a need for continuous updates of the teaching and learning platforms in line with ongoing development and training for instructors and students.

Keywords: Faculty members' preference, challenges, distance learning and virtual classes, UAEU, COVID-19.

INTRODUCTION

The COVID-19 pandemic has significantly affected the learning and teaching environment in K-12 and higher education at a worldwide scale. The closure of teaching institutions and the sudden reliance on distance learning have completely changed the normal teaching practice in favor of a technology-based teaching environment. The impact on teaching and learning practices and outcomes during the COVID-19

era should provide a rich field for research (Iyer, et al., 2020). In some cases, a negative impact on students' learning and teacher's role is expected; according to Code et al (2020), the switch has impacted the teachers' ability to support hands-on competency development, affecting student motivation and engagement Bawaneh (2010 a). On the other hand, according to Anaturk Tombak (2019) teachers believe that using technology-based teaching facilitates reaching different sources and creates enjoyable experience. Students are influenced by the widespread use of technology; according to Shatri (2020), and students can use information technology more effectively to reach new information and improve communication.

Research on Science, Technology, Engineering, and Mathematics (STEM) education before the COVID-19 pandemic has been widespread. Ulger and Cepni (2020) have reviewed and analyzed studies on STEM education contexts, such as schools and programs, career choices, talent development, and scientifically gifted student characteristics. According to Samsudin et al (2020), STEM Project-Based Learning increases effectiveness creates meaningful learning and influences student attitudes in future career pursuit. Surtano et al (2020) and Bawaneh (2010 b) have shown a positive correlation between students' problem-solving abilities and academic learning achievement in favor of STEM education. According to Sari et al., (2020) STEM education performed in the simulation-based inquiry-learning environment positively affects the development of scientific process skills and STEM awareness. Sellami et al (2017) suggested that student's interest in STEM is influenced by teachers, perceptions of homework assignments, self-confidence, and intention to pursue further study. It is no surprise that STEM education is impacted and limited by the availability of expertise, resources, and knowledge in developing countries (Badmus & Omosewo, 2020).

It is necessary to study the perspectives and challenges faced by faculty members during the fully online teaching and learning environment induced by the COVID-19 pandemic. In particular, it is more interesting to study these perspectives and challenges held by STEM faculty members as compared to non-STEM faculty members. We are exploring the different viewpoints and attitudes for STEM faculty members as compared to others. Therefore, we built a survey that aims to measure these factors among faculty members. We collected data at the United Arab Emirates University (UAEU) during the academic year 2020/2021. The study should be of considerable importance to measure the feedback of faculty members towards the new environment of distance learning and virtual classes. In particular, we are looking for the significant difference in STEM faculty members' responses compared to others. The survey results are analyzed and presented in this study. In a previous study, Malkawi et al (2020) analyzed the attitudes and challenges faced by students at the same teaching institution. The previous results indicated that the students' satisfaction level and attitudes towards distance learning and virtual classes were strong in general with varying degrees between specific items. The new study will add more value to the previous study from the perspective of faculty gender, experience, academic rank, and academic track.

Research Questions

1. What is the STEM-faculty members' perspectives towards distance learning and virtual classes during the COVID-19 outbreak?
2. Do the STEM-faculty members' perspectives towards distance learning and virtual classes during the outbreak of COVID 19 differ according to specific variables (gender, experience, academic rank, and teaching track)?
3. What challenges do STEM-faculty members face in distance learning and virtual classes during the outbreak of COVID 19?
4. Does the level of challenge faced by STEM-faculty members in distance learning and virtual classes during the outbreak of COVID 19 differ according to specific variables (gender, experience, academic rank, and teaching track)?

Importance of the Study

The importance of this study lies in identifying the perspectives and challenges held by STEM-faculty members as compared to non-STEM faculty members toward distance learning and virtual classes. The results of this study are expected to serve many relevant groups and beneficiaries such as university professors,

students, workers in the field of educational technology and curriculum design. It is also supposed to provide recommendations to decision-makers in higher education regarding the effectiveness of distance learning and virtual classes, possible mechanisms to enhance students learning, whether during the Corona pandemic or beyond, and to work possibly to overcome the challenges that instructors face in teaching using distance learning and virtual classes.

Limitations of the Study

Place Boundaries: United Arab Emirates University (UAEU)/UAE.

Time Limits: The first semester of the academic year 2020/2021.

Situational Boundaries: The spread of the Corona pandemic (COVID19).

Instrumentations: The validity, reliability, and the distribution of the items under the different dimensions.

Operational Definitions

Distance learning: The system adopted by UAEU in light of the Corona pandemic to deliver the educational content electronically through Blackboard. In particular, Blackboard Collaborate Ultra is utilized as a real-time video conferencing tool that allows uploading files, sharing applications, and using a virtual whiteboard to interact. For online exams, the LockDown browser is used within the Blackboard environment. In addition, Respondus Monitor is used in online exams to build upon the LockDown browser technology to minimize cheating during a non-proctored exam.

Distance learning and virtual class challenges: Properties (logistical, technical skills, material design, or access to platforms) that hamper faculty members' effectiveness in distance learning.

STEM: A common acronym for four closely connected areas of study: science, technology, engineering, and mathematics. It encompasses a vast array of subjects that fall into each of those terms. The fields are often associated due to the similarities that they share both in theory and practice.

STEM-faculty members: University professors at UAEU, who teach science (physics, chemistry, biology, geology, mathematics, engineering, and technology), in 2020/2021 academic year during the Corona pandemic.

LITERATURE REVIEW AND PREVIOUS STUDIES

The impact of the COVID-19 pandemic on STEM education represents an important field of research. According to Pintaric & Kravanja (2020), COVID-19 has created a major challenge, especially for study programs in STEM areas. Results show that even though the adapted learning process is effective, there is uncertainty of how successful students will pass exams. Zulirfan et al (2020) have studied the various barriers to science learning using an online system during the COVID-19 pandemic. The result shows that there is a great chance that STEM project-based science learning can be successfully carried out online by students.

The faculty member plays a major role in implementing distance learning and virtual classes; he/she plays the role of the motivator and facilitator on employing the technology through which learning is taking place. He/ She also plays the role of feedback provider regarding students' improvement levels, provider of necessary tests in a timely way, and as the one formulating the learning environment for this type of learning (Xia, 2020; Zhou, et. al., 2020; Abu Sarah, 2020). However, the students' role is summarized in watching the lessons offered by faculty members electronically and via recordings of lessons, presentations, and assignments. Students then re-listen and re-watch the lessons as many times as they wish and send the assignments/ homework electronically as well. Distance learning and virtual classes provide the space for conversation and discussion among students themselves and with their faculty members (Goldstein, 2020; Khlaif, 2020; Abu Sarah, 2020).

In studying the impact of distance learning and virtual classes on student's learning, views, perspectives, and challenges, researchers reviewed the correlated literature (Ozgur Yilmaz, 2015; Miltiadou and Savenye, 2003; Glenda, Joslyn, & Mariel, 2019) and confirmed that distance learning and virtual classes form an effective way in enhancing students' performance, motivation, preferable, and interest. On the other hand, some studies (Abu Aqel, 2012; Trotter, 2007; Al Shummari, 2007) indicated that although distance learning has a positive impact, it faces many challenges that differ according to the place, the goal used for, the time of its use, as well as the appearant statistically significant differences between male and female faculty members.

In order to study the requirements of distance learning and virtual classes and corresponding challenges, some researchers (Al Saif, 2009; Al Shahrani, 2010) have identified the importance of distance learning and virtual classes despite the many managerial and teaching challenges, overlapping of academic associations, lack of opportunities to attend preselection development programs for faculty members with regard to distance learning and virtual classes, and the employment of technology in teaching and learning. All of these factors reduce the faculty members' abilities and motivation to use technology in teaching and learning.

Malkawi et al (2020) have investigated the satisfaction level and attitudes of undergraduate students, towards distance learning and virtual classes during the COVID-19 crisis. The results indicated that the students' satisfaction level and attitudes towards distance learning and virtual classes were strong in general with varying degrees between specific items. In the current work, we evaluate the perspectives and challenging factors faced by faculty members concerning the adopted measures of distance learning and virtual classes at the same institution, UAEU. The total number of faculty members is 626 while the number of instructors is 294 distributed among nine colleges: Business and Economics; Education; Engineering; Food and Agriculture; Humanities and Social Sciences; IT; Law; Medicine and Health Sciences; and Science. Blackboard is the Learning Management System (LMS) that has been fully supported and utilized in the learning and teaching environment. All faculty members and instructors have good knowledge and experience of the basic tools within Blackboard needed for the learning and teaching process. Blackboard Collaborate Ultra is utilized as a real-time video conferencing tool that allows faculty members and instructors to add files, share applications, and use a virtual whiteboard to interact. Online lectures on the same platform are recorded for students' later views. Besides, online exams, homework, and quizzes are fully implemented for all courses. For online exams, the LockDown browser is used within the Blackboard environment. LockDown Browser is a custom browser that locks down a student's computer or iPad during an online examination in Blackboard. In addition, Respondus Monitor is used in online exams which builds upon the LockDown browser technology to ensure the computing device isn't used to cheat during a non-proctored exam. Such tools are available to all faculty members and instructors to be implemented during online quizzes and exams (UAEU, 2020).

Despite the big efforts of UAEU to implement excellent measures to smoothen the teaching and learning process, there is a clear need to investigate the outcomes of the university effort through faculty members utilizing such resources. This study aims at identifying the perspectives and challenges held by STEM-faculty members as compared to non-STEM faculty members toward distance learning and virtual classes.

METHODS AND PROCEDURES

To achieve the aims of the study, the researchers follow the descriptive analytical design.

Population and Sample

The population of this study comprised all UAEU faculty members during the academic year 2020/2021. The current study targets all faculty members' tracks at UAEU, which are classified into two main tracks: the first is STEM track, while the second is humanity and social sciences track. The study questionnaire was sent as an electronic link via the official university email for all faculty members. According to Gay and Airasian (2003), all the individuals in the defined population have equal and independent chance of being selected. The results were analyzed in light of the sample as shown in Table 1.

Table 1. Study sample of faculty members

	Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	202	75.9	75.9	75.9
	Female	64	24.1	24.1	100.0
	Total	266	100.0	100.0	
Experience	(1-5) Years	53	19.9	19.9	19.9
	(6-10) Years	41	15.4	15.4	35.3
	(11-15) Years	61	22.9	22.9	58.3
	More than 15 Years	111	41.7	41.7	100.0
	Total	266	100.0	100.0	
Academic rank	Full Professor	57	21.4	21.4	21.4
	Associate Professor	73	27.4	27.4	48.9
	Assistant Professor	56	21.1	21.1	69.9
	Lecturer	80	30.1	30.1	100.0
	Total	266	100.0	100.0	
Track	STEM	153	57.5	57.5	57.5
	Humanities and Social Sciences	113	42.5	42.5	100.0
	Total	266	100.0	100.0	

According to Table 1, the study sample includes 266 faculty members, of which 202 Males and 64 Females. The sample is divided according to teaching experience into four categories: 19.9% (1 - 5) years of experience, 15.4% (6 -10) years of experience, 22.9%, (11 - 15) years of experience, and 41.7% for those having more than 15 years of experience. The sample is distributed over four academic ranks: 21.4% full professors, 27.4% associate professors, 21.1% assistant professors, and 30.1% lecturers. Finally, the sample includes 57.5% (153) faculty members out of 266 from STEM track and 42.5% from the humanities and social sciences track. The sample of this study is representative of all the existing social classes at UAEU in terms of gender, experience, academic rank, and teaching track.

Instrumentation

The researchers reviewed the literature related to teaching and learning in the higher education level and in the school level via distance learning, distance learning and virtual classes (Ozgur Yilmaz, 2015; Miltiadou and Savenye, 2003; Olt, 2018; Al-Shorman, and Bawaneh, 2018; Bawaneh, 2020; Bawaneh, 2019, Malkawi, Bawaneh, and Bawaaneh, 2021; AlSalman, Alkathiri, and Bawaneh, 2021). The researchers adopted Al-Shorman and Bawaneh (2018) and Bawaneh (2021) questionnaires. For translating the instrument from English to Arabic and Arabic to English, word-by-word translation was avoided. Initially, The Arabic translation of the questionnaire was prepared by three translators holding Ph.D. degree in educational technology, English teaching methods, and educational psychology, respectively, and who are graduates from the UK and USA, currently teaching in Jordanian, Saudi, and United Arab Emirate universities. As expected, there were some differences in the generated versions, especially those related to the words used among the translators in translating the instruments. The researchers, then, compared and contrasted these translations, formulated initial items that served the study objectives by changing, deleting and adding some items. Later, the translators agreed on the final instrument and the translation format. This process resulted in 17 items based on Likert-type 6-point scale with (strongly agree (6), agree (5), slightly agree (4), slightly disagree (3), disagree (2), strongly disagree (1)). Some items were written assertively, whereas others were worded passively. The questionnaire aimed at measuring the faculty members' perspectives level

towards distance learning and virtual classes and the challenges they faced during the COVID-19 crisis. The questionnaire included two parts: part one involved 11 items (1-11) and aimed to investigate the faculty members' perspectives towards distance learning, while part two included 6 items (12-17) and aimed to measure the challenges faced by faculty members in using distance learning and virtual classes during the COVID-19 crisis.

Validity and Reliability of the Instrument

To examine the validity of the instrument, the initial version was validated by a panel consisting of six experts holding a Ph.D. degree (one of them is in science education, two in educational technology, one in English education, one in physics, and one in psychology) from Yarmouk University, Jordan University, UAEU, and Imam Abdulrahman Bin Faisal University-KSA. The experts were asked to express their feedback regarding the suitability of items in terms of wording and appropriateness for measuring the goals designed to measure. Some items were deleted and several items were reworded based on recommendation and feedback. The number of items in the final version is 17. To compute the reliability index, the researchers calculated the Cronbach Alpha coefficient for the whole questionnaire which is found to be 0.751. The reliability coefficient for the first part which aimed to investigate faculty members' perspectives towards distance learning and virtual classes is 0.870, while the reliability coefficient for the second part which targeted to measure the faced challenges is 0.792. These values are considered acceptable in social sciences to achieve the purpose of the current study (Gay, Mills, & Airasian, 2009; Obiedat et al., 2016; Al-Kellani; and Al-Shraifeen, 2011).

Statistical Standard

The items of the questionnaire are classified into three categories designating weak (W), medium (M) and strong (S) according to the numerical value of the mean (M) of the individual items. For item classification, we adopt the following equation (Bawaneh and Moumene, 2021; AlSalman, Alkathiri, and Bawaneh, 2021) to obtain the item class width P;

$$P = \frac{U-L}{N},$$

where U and L represent the upper and lower limits of the scale, respectively, and N represents the number of required categories. To obtain the numerical value of P we substitute for U, L and N in the above equation, which yields;

$$P = \frac{6-1}{3} = 1.67$$

Using the numerical value of P, namely P = 1.67, the three category intervals are determined within the range between 1.00 and 6.00. The catagories were found to take the following values; $W \in (1.00, 2.67)$, $M \in (2.68, 4.35)$, and $S \in (4.36, 6.00)$ representing weak, medium and strong, respectively. As an example, a paragraph whose mean (M) lies within the range of 4.36 to 6.00, i.e., it satisfies the inequality (4.36 < M < 6.00) which is categorized as S, denoting strong (See the last column on the right in Tables 2, and 5).

FINDINGS

To answer the first question, the researchers calculated the mean and the standard deviation of the instrument items (1 - 11) prepared for this purpose, and the results were listed in Table 2.

Table 2. Means, SD, and the Category for faculty members' perspectives items 1-11, (N=266)

NO	Items	Mean		Overall		
		STEM	Humanities and social sciences	Mean	SD	Category
1	I need more training on how to use distance learning and virtual classes	3.43	3.38	3.60	1.41	M
2	Distance learning and virtual classes increase the interaction with my students	4.28	4.21	4.44	1.39	S
3	I believe distance learning and virtual classes will gradually replace conventional teaching	3.82	3.64	3.98	1.51	M
4	Distance learning and virtual classes improve student's achievement and grades	4.19	4.16	4.29	1.31	M
5	I enjoy the experience of distance learning and virtual classes	2.69	2.63	2.93	1.42	M
6	Distance learning and virtual classes offer additional value to teaching experience	2.84	2.80	2.86	1.42	M
7	Distance learning and virtual classes lead to better teaching practices	3.57	3.51	3.63	1.46	M
8	Distance learning and virtual classes help to organize my course content	3.08	2.99	3.23	1.36	M
9	Distance learning and virtual classes speed the delivery of knowledge to students	3.59	3.60	3.68	1.41	M
10	Online exam can differentiate between students	3.69	3.60	3.74	1.50	M
11	Online exams save instructors' time and efforts	3.36	3.25	3.44	1.56	M
	Overall	**3.50**	**3.43**	**3.62**		**M**

The results in Table 2 indicate that there are three items within the STEM track having the largest mean, namely, (item 2: M = 4.28, item 4: M = 4.19, and item 10: M = 3.69). This result is identical with the case of the humanities and social sciences track (item 2: M = 4.21, 4: item M = 4.16, and item 10: M = 3.60). It is remarkable to note that the two tracks have close means throughout the whole items. Table 2 shows that the overall mean of the faculty members' perspectives towards distance learning and virtual classes is (3.62) which is Medium according to statistical standards (Bawaneh and Moumene, 2021; AlSalman, Alkathiri, and Bawaneh, 2021). The conclusion is similar for both individual tracks [STEM: Mean = 3.50, and humanities and social sciences: Mean = 3.43]. By reading all instrument items, we can see that there is only one item considered Strong, while the rest are Medium, and no Weak items out of all 11 items. The largest overall mean is 4.44 corresponding to item 2, indicating that using distance learning and virtual classes increase the interaction with students. This was followed directly by item 4 (M= 4.29), indicating that distance learning and virtual classes improve student's achievement and grades. Item number 10 (M= 3.74), indicates that online exams can differentiate between students, according to faculty members. In summary, the previous results are similar between STEM and humanities and social sciences tracks, with the highest means are for items 2, 4, and 10, respectively.

Next, we look at the 3 lowest means of all item. We observe that item 6 has M= 2.86 which is the smallest mean among all items. This item addresses that distance learning and virtual classes offer additional value to the teaching experience. This is followed by item number 5 with a mean of 2.93, which measures that faculty members and instructors enjoy the experience of distance learning and virtual classes. Finally, item 8 has a mean of 3.23, which measures that distance learning and virtual classes help to organize the instructor's course content. It is good to mention that the lowest-mean items in the individual groups (STEM, and humanities and social sciences) have the same arrangement (5th, 6th, and 8th). This result almost is aligned with the overall results.

To answer the second question, the researchers calculated the means and standard deviations associated with the independent variables as shown in Table 3.

Table 3. Means and standard deviations of faculty members' preference level towards distance learning and virtual classes.

	Variable	Mean	SD
Gender	Male	3.67	1.00
	Female	3.45	.93
	Total	3.62	.98
Experience	(1-5) Years	3.57	.86
	(6-10) Years	3.49	1.06
	(11-15) Years	3.65	.98
	More than 16 Years	3.68	1.02
	Total	3.62	.98
Academic rank	Full Professor	3.81	1.05
	Associate Professor	3.76	1.00
	Assistant Professor	3.68	.92
	Lecturer	3.32	.91
	Total	3.62	.98
Academic track	STEM	3.76	.99
	Humanities and social sciences	3.43	.95
	Total	3.62	.98

Table 3 shows the mean and standard deviations for faculty members' perspectives level towards distance learning and virtual classes according to the variables: members' gender, experience, academic rank, and academic track. Results show a small difference (0. 22) in the calculated mean between members' gender. The calculated mean of female members is smaller with a value of 3.45 and where the standard deviation is 0.93. In comparison, the mean of male members is 3.67 with a standard deviation of 1.00. Regarding years of experience, the results show that the mean of the faculty members' with more than 15 years of experience is the highest among all the experience levels with a mean of 3.68 and a standard deviation of 1.02. The next group is the one with (11-15) years of experience, with a mean of 3.65 and standard deviation of 0.98. The lowest mean is 3.49 for the category of (6-10) years of experience.

According to the academic rank, Table 3 indicates that there are some differences in the means. The maximum difference is between the full professor and the lecturer categories (0.49), the next large difference is between the associate professor and the lecturer categories (0.44). The lowest mean is for lecturers and assistant professors, with a Mean of 3.32 and 3.68, respectively. The results in Table 3 show that the mean of the STEM faculty members group is (M=3.76) with a standard deviation of 0.99 higher than the mean of Humanities and social sciences group (M=3.43) and with a standard deviation of 0.95, and with a difference in the mean by (0.33).

Based on the above results, the findings of the current study show that there are apparent differences in the calculated mean of the faculty members' perspectives level towards distance learning and virtual classes according to their gender, experience, academic rank, and academic track. To determine the validity of the differences, the researchers perform the ANOVA analysis, and the results are presented in Table 4.

Table 4. ANOVA test of faculty members' preferable level towards distance learning and virtual classes

	Sum of Squares	df	Mean Square	F	Sig.
Gender					
Between Groups	2.369	1	2.369	2.434	.120
Within Groups	256.870	264	.973		
Total	259.238	265			
Experience					
Between Groups	1.340	3	.447	.454	.715
Within Groups	257.898	262	.984		
Total	259.238	265			
Academic rank					
Between Groups	10.635	3	3.545	3.736	.012
Within Groups	248.603	262	.949		
Total	259.238	265			
Academic track					
Between Groups	7.305	1	7.305	7.654	.006
Within Groups	251.934	264	.954		
Total	259.238	265			

Table 4 shows that there are statistically significant differences for two independent variables in the current study, namely, academic rank and academic track. The statistical significance values at ($\alpha < 0.05$) were (0.012, F = 3.736), and (0.006, F= 7.654), respectively. Whereas, the inferential statistics showed that there are no statistically significant differences for the rest of the independent variables in the current study, namely, faculty members' gender and their experience. The statistical significance values at ($\alpha > 0.05$) were (0.120, F = 2.434), (0.715, F= 0.454), respectively. Finally, to explore where the statistical difference of the academic rank variable exists, the researchers conducted Post Hoc Tests, using Tukey HSD as shown in Table 5.

Table 5. Post Hoc Tests, using Tukey HSD of the academic rank variable

(I) Academic Rank	(J) Academic Rank	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Full Prof	Associate Prof	.05126	.17218	.991	-.3939	.4964
	Assistant Prof	.12833	.18328	.897	-.3456	.6022
	Lecturer	.48499*	.16884	.023	.0484	.9215
Associate Prof	Full Prof	-.05126	.17218	.991	-.4964	.3939
	Assistant Prof	.07708	.17304	.970	-.3703	.5245
	Lecturer	.43373*	.15767	.032	.0261	.8414
Assistant Prof	Full Prof	-.12833	.18328	.897	-.6022	.3456
	Associate Prof	-.07708	.17304	.970	-.5245	.3703
	Lecturer	.35666	.16972	.155	-.0822	.7955
Lecturer	Full Prof	-.48499*	.16884	.023	-.9215	-.0484
	Associate Prof	-.43373*	.15767	.032	-.8414	-.0261
	Assistant Prof	-.35666	.16972	.155	-.7955	.0822

*. The mean difference is significant at the 0.05 level.

The results in Table 5 indicate that there were two statistically significant differences between the full professors and associate professors compared with lecturers in favor of full professors and associate professors.

To answer the third question, the researchers calculated the mean and standard deviation of the instrument items (12-17) prepared for this purpose, and the results are shown in Table 6.

Table 6. Means, SD, and the category for faculty members' challenges level items 12-17, (N=266)

| No | Items | Mean | | Overall | | |
		STEM	Humanities and social sciences	Mean	SD	Category
12	Distance learning and virtual classes provide a challenging environment for teaching	2.56	2.58	2.52	1.29	**W**
13	Distance learning and virtual classes add more pressure on the instructor	2.33	2.39	2.26	1.07	**W**
14	Distance learning and virtual classes has increased the burden on the instructor	2.37	2.43	2.34	1.10	**W**
15	Online exams are more challenging for instructors	2.31	2.32	2.16	1.31	**W**
16	Online exams are more challenging for students	3.06	3.06	3.07	1.51	**W**
17	Online office hours are ineffective and useless	3.58	3.65	3.55	1.47	**M**
	Overall	**2.71**	**2.74**	**2.65**		**W**

The researchers would like to point out that all the 6 items in Table 6 which aim to investigate the challenges faced by faculty members in distance learning and virtual classes are formulated negatively. The results in Table 6 show that the overall mean for the challenge level in using distance learning and virtual classes is (2.65). It is also clear from the table that the mean of the STEM track is 2.71, which is classified within the Weak category. Similarly, the classification for the humanities and social sciences tracks with a Mean of 2.74 is also classified Weak. This shows that the challenge level towards using distance learning and virtual classes in learning is generally Weak. In other words, university professors see that there are no considerable challenges that hinder their effort in teaching their students using distance learning and virtual classes.

The results in Table 6 indicate that the lowest 3 means within the STEM track belong to (item 15, M = 2.31, item 13, M = 2.33, and item 14, M = 2.37). This is fully consistent with the 3 lowest means of the humanities and social sciences track, (item 15, M = 2.32, item 13, M = 2.39, and item 14, M = 2.43). What is noticeable is that this result is similar for all items as a whole. By reading the means of the challenges faced in distance learning and virtual classes during the COVID-19 crisis, we find that the means of the six challenges have values close to each other within the range (2.16 – 3.55). The lowest mean is related to the challenges of conducting online exams (Item 15, M=2.16, and SD=1.31). The second-lowest Mean is related to item 13, with (M=2.26, and SD=1.07) which indicates that distance learning and virtual classes add more pressure on the instructor side. Similarly, item 14 refers to the increased burden on faculty members with (M=2.34, and SD=1.10). According to faculty members, distance learning and virtual classes have increased the burden on parents in terms of the cost of the Internet and the requirements for distance learning (Item 12, M=2.52 and SD=1.29). Finally, faculty members feel that the online exams are more challenging for students (Item 16, M=3.07, and SD=1.51). The category for all items of the instrument in this dimension is Weak except item number (17) which indicates that the online office hours are ineffective and useless, in other words, faculty members feel that the normal face-to-face office hours could be more effective and engaging.

To answer the fourth question, the researchers calculated the statistical means and standard deviations associated with the independent variables as shown in Table 7.

Table 7. Means and standard deviations of faculty members' challenges level towards distance learning and virtual classes.

	Variable	Mean	SD
Gender	Male	2.63	.750
	Female	2.72	.658
	Total	2.65	.729
Experience	(1-5) Years	2.83	.770
	(6-10) Years	2.59	.508
	(11-15) Years	2.67	.713
	More than 16 Years	2.58	.779
	Total	2.65	.729
Academic rank	Full Professor	2.64	.707
	Associate Professor	2.50	.790
	Assistant Professor	2.71	.637
	Lecturer	2.76	.736
	Total	2.65	.729
Academic track	STEM	2.59	.750
	Humanities and social sciences	2.74	.693
	Total	2.65	.729

Table 7 refers to the mean and standard deviations of faculty members' challenges level towards distance learning and virtual classes according to the variables: members' gender, experience, academic rank, and academic track. Results show a very small difference (0. 09) in the calculated mean between members' gender. The mean of male members is smaller with a value of 2.63 and a standard deviation of 0.75 whereas the mean for female members is 2.72 with a standard deviation of 0.658. The results show that the mean of faculty members' with more than 15 years of experience was the lowest among all the experience level catagories with a mean of 2.58 and a standard deviation of 0.779. The next group is (6-10) years, with a mean of (2.59) and standard deviation (0.508), This indicate that the challenges facing professors with long experience are fewer than those with less experience, whereas, the highest mean is (2.83) for the category (1-5) years.

Regarding the faculty members' challenges towards distance learning and virtual classes according to the academic rank, Table 7 indicates that there are differences in the means. The largest difference is between the associate professor category and the lecturer category with a value of (0.26), in favor of the lecturers. The next large difference is between the assistant professor category and the associate professor category (0.21) in favor of the assistant professor respectively. This result indicates that the lecturers and assistant professors face more challenges than other higher two categories. The means related to the challenges faced by the full and associate professors were the lowest with values of (2.64, 2.50), and a standard deviation of (0.707, 0.790), respectively. Finally, the results in Table 6 show that the mean for the STEM faculty members (M=2.59) with standard deviation of (0.750) is lower than the mean of Humanities and social sciences group (M=2.74) with a standard deviation of (0.693). This indicates that the challenges faced by the STEM track are slightly less than challenges faced by the Humanities and social sciences track.

Based on the above results, the findings of the current study show that there are apparent differences in the calculated mean of the faculty members' challenges level towards distance learning and virtual classes according to their gender, experience, academic rank, and academic track. To determine the validity of the differences, the researchers used the ANOVA test, the results were presented in Table 8.

Table 8. ANOVA test of faculty members' challenges level towards distance learning and virtual classes

	Sum of Squares	df	Mean Square	F	Sig.
Gender					
Between Groups	.451	1	.451	.847	.358
Within Groups	140.547	264	.532		
Total	140.998	265			
Experience					
Between Groups	2.458	3	.819	1.550	.202
Within Groups	138.539	262	.529		
Total	140.998	265			
Academic rank					
Between Groups	2.821	3	.940	1.783	.151
Within Groups	138.176	262	.527		
Total	140.998	265			
Academic track					
Between Groups	1.399	1	1.399	2.646	.105
Within Groups	139.598	264	.529		
Total	140.998	265			

The inferential statistics in Table 8 show that there are no statistically significant differences for all the independent variables in the current study: faculty members' gender experience, academic rank, and academic track on the challenges level towards distance learning and virtual classes. The statistical significance values at (α = 0.05) were (0.358, F = 0.847), (0.202, F= 1.550), (0.151, F= 1.783), (0.105, F= 2.646), respectively.

DISCUSSION AND RECOMMENDATIONS

In this work, the researchers investigate the faculty members' perspectives and challenges towards distance learning and virtual classes during COVID-19 Outbreak. We compare results between STEM and non-STEM faculty members. In general, we find results with no major differences between the STEM track and other tracks. This indicates that faculty members of all tracks share similar opinions on their perspectives and the possible challenges in the teaching process. Nevertheless, significant differences are observed once we perform the ANOVA test for particular categories within the sample.

The results indicate that the overall faculty members' perspectives towards distance learning and virtual classes and for both tracks (STEM, and humanities and social sciences: non-STEM) are Medium. The results do not show a significant difference at the level (α = 0.05) for the independent variables: gender, and experience. However, we observe significant differences between the academic track and academic rank. We notice some significant differences in favor of full professors and associate professors as compared to lecturers. This may be well understood by the fact that lecturers have less experience with new technology and the fact that most lecturers are involved in teaching labs and hands-on activities, which create far more challenges in teaching than regular lectures. We also observe some significant differences between STEM and non-STEM tracks in favor of the former one. This may be understood by the fact STEM faculty members are more engaged with technology in their teaching experience. Therefore, STEM faculty members have been less distracted by the online environment due to COVID 19.

Regarding the challenges faced by faculty members in distance learning and virtual classes, we observe similarities in results between STEM and non-STEM tracks. The results show that the calculated means of all challenges for the STEM and humanities and social sciences track (non-STEM) are Weak. The results do not show a significant difference at the level (α = 0.05) for all the independent variables: faculty gender, experience, academic rank, and academic track. According to the results, faculty members do not face big

challenges that hamper their teaching delivery and performance. This could be understood through the adequate training, accessibility, and availability of sufficient tools provided by the university during the COVID-19 era.

This confirms that higher education institutions in general, and the UAE University in particular, have been keen for a long time to employ technology with an added value in teaching and learning, regardless of academic path, gender, or experience. This, of course, indicates the great importance of continuing this approach and the continuous initiative in employing the latest and best technological applications in university education and learning.

The result of the current study is consistent with the results of many studies (Badmus, and Omosewo, 2020; Bawaneh, 2021; Malkawi, Bawaneh, and Bawa'aneh, 2021; Al Salman, and Bawaneh, 2021; Goldstein, 2020), that the level of satisfaction, expectations, trends, motivation, and viewpoints of workers in the educational sector, whether in public education - schools - or higher education - universities and institutes in general, is medium. This indicates many indicators, some of which are related to institutions and their lack of readiness for distance education and virtual classes, and some of them are related to people's lack of readiness in terms of knowledge and skills. The results of this study also agree with many studies in the absence of statistically significant differences for gender and the professor's experience. The same applies to the challenges faced by the university and public education sector with regard to distance education and virtual classes. The result of the current research was consistent with the results of many previous studies in this field (Bawaneh, 2021; Malkawi, Bawaneh, and Bawa'aneh, 2021; Al Salman, and Bawaneh, 2021; Iyer, Aziz, and Ojcius, 2020; Subreen Al Salman, Mohammed Alkathiri and Ali Khaled Bawaneh, 2021; Zulirfan, Yennita, and Rahmad, 2020). The challenges are common regardless of the professor's gender, experience and academic path, despite the presence of some minor differences in the arithmetic averages that did not rise to fundamental differences.

The study concludes with few recommendations. The university should continue supporting the current efforts to provide all the requirements of teaching and learning via distance learning and virtual classes such as suitable infrastructure, internet, smart apps, and technical support. There is always a need for continuous updates of the teaching and learning platforms in line with ongoing development and training for instructors and students. On the other hand, the researchers call for the importance of holding forums, conferences, and workshops for academics and educators in higher education and general education as well to think about creating new teaching methods that are compatible with the digital generation in terms of employing technology as well as maintaining the continuity of education regardless of the circumstances and conditions such as weather factors, wars , global cross-border diseases and epidemics, and so on, taking into account maintaining the quality of education.

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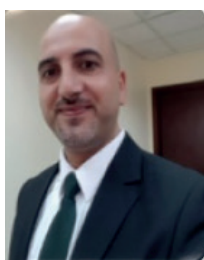
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