

INVESTIGATION INTO ONLINE LEARNING READINESS OF HIGHER EDUCATION STUDENTS DURING COVID-19 PANDEMIC

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ABSTRACT

This study aims to investigate the online learning readiness of learners and to examine this readiness according to various variables. The descriptive survey model was used in this study. The data of the study were collected from 1963 higher education students who participated voluntarily according to the convenience sampling method. Demographic information form and online learning readiness scale were used as data collection tools. The pandemic period academic grade point means of students constitute their academic achievement for this study. MANOVA was used to investigate whether the demographic variables influenced the readiness sub-factor mean scores of the students. One-factor ANOVA was used to determine whether the academic achievements of the students differ significantly according to their readiness levels. In this study, it was observed that the students had moderate-level readiness, but they were close to the high-level limit. It was observed that gender, education level and the faculty/college were effective on readiness while the grade level and the type of education were not effective. Learners who have a personal computer, internet connection or smart mobile phone are more ready for online learning. In addition, students with a high level of readiness got academically more successful. Readiness is crucial in the success of the experiences and activities to be performed in the online learning environment. Increasing the technological facilities and computer use, the competence of learners will increase online learning readiness and academic success. ☒

Keywords: COVID-19 pandemic, online learning readiness, demographic variables, academic achievement

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INTRODUCTION

The development and widespread use of internet technology has increased the significance of distance education. Information and communication technologies have become an effective strength in transforming educational environments (Ali, 2020). Goh and Sandars (2019) states that technology transforms pedagogical activities and digitizes education. The COVID-19 pandemic accelerated this transformation and increased the importance of distance education (Terenko & Ogienko, 2020), which has made distance education a necessity (Ali, 2020). Distance education has supported the acquisition of knowledge and skills by not allowing the learning process to be interrupted during this extraordinary period. Online learning which is defined as distance education activities using information and communication technologies (Ko & Rossen, 2017) played a significant role in the pandemic period. The pandemic period has forced universities to rapidly adopt online learning while it was previously seen as an

alternative way of learning and teaching (Alonso et al., 2005). It has become an opportunity for to meet the learning needs of students in during the pandemic period (Altınay et al., 2020). Online learning has provided universities and instructors with significant opportunities in planning and managing the learning-teaching process, distributing course content and monitoring students.

As the COVID-19 pandemic increases interest and expectation to online learning, it is more necessary than ever to identify the factors that effectiveness of these environments. New studies are needed for universities to adopt online learning and to evaluate their goals and missions (Lakshmi et al., 2020). The rapid transition to online learning has brought many challenges, such as technological infrastructure, online learning system quality, cultural, self-efficacy and trust (Almaiah et al., 2020). The rapid transition of universities to distance education has raised a new question: *“Are students ready to online learning?”* This question revealed the need to rethink perceptions and features in the online learning environment from students. For an effective online learning, students need to feel comfortable, be willing to learn, and be aware of the use of technological facilities. The success of online learning depends on willingness and acceptance of students to use of this environment (Almaiah et al., 2020). Students need to be ready for online learning to take advantage of online learning and gain a more successful experience (Yurdugül & Sırakaya, 2013). Readiness is important for the success of the experiences and activities that students will experience in the online learning environment (Demir Kaymak & Horzum, 2013; Kruger-Ross & Waters, 2013). Online learning readiness needs to be considered for successful online learning implementation (Allam et al., 2020).

Online Learning

Online learning is a learning environment where the instructor and the students are physically separate (Huang, 2002), and communication, interaction and access to content (Ally, 2004) take place over the internet (Ko & Rossen, 2017). It provides students with the opportunity to access resources from wherever they want and to communicate with other students and instructors. It supports the acquisition of knowledge and skills through synchronous and asynchronous learning applications using internet technology (Khan, 1998). In asynchronous learning, students and instructors can be involved in the learning process whenever they want, while interaction and communication is provided in the same time period with synchronous learning (Ally, 2004). The flexible learning opportunity offered by online learning increases the quality and accessibility of the educational process.

Online Learning Readiness

Students in online learning environment are expected to have some self-efficacy (Hung et al., 2010; Yurdugül & Sırakaya, 2013). These self-efficacies, which are considered under the concept of readiness, are related to how ready students are to make the most of digital resources (Yılmaz, Sezer, & Yurdugül, 2019). Readiness, which is frequently emphasized and measured in online learning, is explained with different sub-dimensions in the literature (Martin et al., 2020). Self-efficacy, which constitutes the readiness' sub-dimensions, is defined as the believing in themselves of the individual that they can be successful in performing a task (Zimmerman, 2000). Hung et al. (2010) explains attitudes, abilities, personal characteristics and emotional reactions of students in the online learning environment as self-directed learning; to keep in mind, recall and voluntarily increase their learning as motivation for learning; to determine their own learning to show better learning performance as learner control; their ability to use computer and internet to perform a task as computer and internet self-efficacy; the interaction of students among themselves or with the instructor as online communication self-efficacy. These self efficacies are important for online learning and have an impact on academic achievement (Yavuzalp & Bahcivan, 2020).

Readiness is a significant factor affecting the success of applications in the online learning environment (Hung et al., 2010; Johnson et al., 2008; Yeh, 2010). It is stated that the low-level of success, satisfaction and engagement of students in the online learning environment is due to not being ready for online learning (Yurdugül & Demir, 2017). Students' low computer/internet self-efficacy and reluctance to taking responsibility for their own learning are cited as the main reasons for their failure (Almaiah et al., 2020). Lack of basic computer skills of students limits their effective use of the online learning (Kuo et al., 2013). It is seen that readiness has an effect on the interaction between the students and their

environment (Chen, 2001; Moore & Kearsley, 2011) and affects the learning outcomes of the students (Demir Kaymak & Horzum, 2013). Readiness is an important predictor of satisfaction (Kumar, 2021) and motivation in the online learning environment (Yılmaz, 2017). Joosten and Cusatis (2020) state that readiness for online learning is related to learning outcomes. Some self-efficacies, which constitute the sub-dimensions of readiness, are predictor of academic success and help students adapt to new learning environments (Alivernini & Lucidi, 2011; Joosten & Cusatis, 2020).

The readiness of students should be determined before starting online learning (Machado, 2007; Yılmaz et al., 2019; Yurdugül & Demir, 2017). Determining the readiness of students, which is defined as the input of the online learning process; it is necessary for increasing the quality, determining the measures to be taken (Gülbahar, 2012), making students more ready for online learning and using the learning process effectively (Korkmaz et al., 2015). Therefore, the readiness of students should be researched and supported (Ali, 2020).

Purpose of Study

The purpose of online learning is to improve the quality of education rather than to complete the semester (Allam et al., 2020). With the increasing importance of online learning in higher education, more research is needed on how online learning will be more effective. Although current studies generally focus on comparing traditional learning with online learning, attention should also be paid to antecedent variables, such as student demographic characteristics (Joosten & Cusatis, 2020). The number of studies describing the relationship between readiness and learning outcomes such as academic achievement is limited (Joosten & Cusatis, 2020; Wei & Chou, 2020; Yu, 2018). Since the pandemic period provides a wide participant with an online learning experience, it is thought that new studies will reveal more valid findings.

In this study, the effects of demographic variables of students on online learning readiness and the effects of readiness level on academic achievement were examined. It is seen in the literature that demographic variables have an effect on readiness (Keramati et al., 2011; Khalifeh et al., 2020; Korkmaz et al., 2015; Martin et al., 2020; Nami & Vaezi, 2018; Yılmaz et al., 2019). It is stated that researchers to investigate the relationship between the online learning self-efficacy of students and demographic variables will provide the opportunity to increase academic success (Yavuzalp & Bahcivan, 2020). Thus, it has been investigated whether variables, such as gender, grade level, type of education, education level, faculty/college and technological opportunities, make a significant difference on the readiness or not. Determining whether individual differences have an impact on readiness will help determine the preventions to be taken to increase readiness. In addition, determining the effect of readiness on academic achievement will provide information about which self-efficacy should be supported. It is thought that the findings of this study will contribute to the improvement of online learning. In this context, the aim of this study is to investigate the online learning readiness of students and to examine readiness according to various variables. Under this main purpose;

1. What are the means scores of online learning readiness of the student?
2. Do the online learning readiness mean scores of the students differ significantly according to gender, grade level, type of education, education level, faculty/college, having a personal computer, having a stable internet connection and having an internet connection smartphone?
3. Is there a significant difference between online learning readiness levels and academic achievement?

RESEARCH METHOD

Research Model

Descriptive survey studies are conducted on large samples to determine of participants characteristics such as opinions, beliefs, interests, skills, abilities and attitudes (Fraenkel & Wallen, 2006). In this study, descriptive survey model was used to examine readiness for online learning of the students and to determine the variables affecting on readiness.

Participants

In this study, the participants were higher education students educated in different faculties/college of a state university in the spring term of the 2019-2020 academic year. The research data were obtained according to the convenience sampling method from 1963 students, who voluntarily participated. The demographic information of the participants is shown in Table 1.

Table 1. Demographic Information of the Participants

Variable	Group	N	%
Gender	Female	1214	61,8
	Male	749	38,2
Grade level	First grade	370	18,98
	Second grade	493	25,1
	Thirt grade	464	23,7
	Fourth grade	636	32,4
Education level	Associate degree	206	10,5
	Licence	1757	89,5
Type of education	Daytime education	1524	77,6
	Evening education	439	22,4
Faculty / college	Faculty of Economics and Administrative Sciences	374	19,1
	Faculty of Arts and Sciences	478	24,4
	Faculty of Education	277	14,1
	Faculty of Dentistry	63	3,2
	Faculty of Theology	165	8,4
	Faculty of Agriculture	116	5,9
	School of Physical Education and Sports	83	4,2
	Faculty of Music and Performing Arts	43	2,2
	Faculty of Fine Arts	76	3,9
	Faculty of Health Science	82	4,2
	Vocational School of Technical Sciences	107	5,4
	Vocational School of Social Sciences	99	5,0
	Having a personal computer	Yes	1248
No		715	36,4
Having a smartphone with internet connection	Yes	1891	96,3
	No	72	3,7
Having a stable internet connection	Yes	1230	62,7
	No	733	37,3

Data Collection Tools

Demographic information form and online learning readiness scale were used as data collection tools. The pandemic period academic achievement of students constituted their academic achievement scores. "*The Scale of Online Learning Readiness*" developed by Hung et al. (2010) and adapted to Turkish by Yurdugül and Sirakaya (2013) was used to determine readiness levels of students. The scale consists of 18 items in five sub-factors (Table 2).

Table 2. Sub-Factors of Online Learning Readiness Scale

Sub-factors	Number of Items	Definition
Computer and internet self-efficacy	3	The self-confidence in computer and internet use
Self-directed learning	5	Taking responsibility in their own learning
Learner control	3	Directing own learning experience and learning process
Motivation for learning	4	Intrinsic motivation that drives to do activities
Online communication self-efficacy	3	To be able to use medium-specific communication tools and to express themselves in this environment

Yurdugül and Sirakaya (2013) state that the findings obtained from the adapted scale are consistent with the findings of the original scale. The items in the scale range from "*Strongly disagree (1)*" to "*Strongly agree (5)*" according to the 5-point Likert type grading scale. A minimum of 18 and a maximum of 90 points are obtained from the scale. The high scores on the scale indicate that readiness is high of students.

Data Analysis

MANOVA was used to determine whether the demographic variables had an effect on the readiness sub-factor mean scores of the students. MANOVA enables students in different groups to be compared simultaneously in terms of more than one variable (Büyüköztürk, 2020). It was observed that the mean scores for readiness and academic achievement skewness and kurtosis value were between ± 1.5 and showed a normal distribution (Tabachnick & Fidell, 2015). The correlation value between the sub-factors of the online learning readiness scale ranges between 0,344 and 0,624. In cases which the variance-covariance matrices of the scores related to the dependent variable are not homogeneous ($p < .05$), instead of Wilks' Lambda, Pillai's Trace value, which has a less distortion rate, was taken into account (Özkara, 2019). One-factor ANOVA was used to investigate whether the academic achievements of the students differ significantly according to their readiness levels.

Implementation and Data Collection Process

During the first five weeks of the spring semester of the 2019-2020 academic year, the courses were given face-to-face. The remaining nine weeks were moved on the online learning environment due to the pandemic. While the students were learning through synchronous lessons (Big Blue Button), the course contents were shared over the learning management system (MOODLE) and the students were given the opportunity to learn in asynchronous. Assessments were made in the form of homework, projects or online exams, depending on the preference of instructors. In the first week of the online learning process the data on readiness were collected through a digital form created on the learning management system. The academic grade point means of the students in the spring term was evaluated as academic achievement scores.

FINDINGS

Research Question 1

The mean scores were calculated by summing the answers in the sub-factors of the online learning readiness scale (OLRS) and dividing them by the number of items. Mean scores and standard deviation values for online learning readiness is given in Table 3.

Table 3. Descriptive Statistics into Online Learning Readiness Mean Scores

Sub factors	Number of Items	M	SD
OLRS	18	3,50	0,62
CIS	3	3,53	0,85
SDL	5	3,56	0,68
LC	3	3,23	0,85
MFL	4	3,56	0,80
OCS	3	3,58	0,92

Note. OLRs: Online learning readiness scale, CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

It was seen that the means of readiness sub-factors varied between 3,23 and 3,58 and the overall mean was 3,50. OCS was the factor with the highest mean, followed with SDL, MFL and CIS, respectively. LC was seen to be the sub-factor with the lowest mean. Mean scores ranging from 1 to 5 according to the 5-point Likert scale were divided into three levels as low, moderate and high. 1,00 to 2,33 was rated as low average level, 2,34 to 3,67 as moderate level, and 3,68 to 5,00 as high average level (Allam et al., 2020). It was observed that 40,3% of the students had high level, 52% of them had moderate level and 5,5% had low level of online learning readiness. The distribution of levels in readiness sub-factors is shown in Table 4.

Table 4. Descriptive Statistics into Online Learning Readiness Mean Scores by Levels

Factors	Levels								
	Low (1,00 to 2,33)			Moderate (2,34 to 3,67)			High (3,68 to 5,00)		
	N	%	M	N	%	M	N	%	M
OLRS	108	5,5	2,03	1064	54,2	3,45	791	40,3	4,06
CIS	241	12,3	1,96	949	48,3	3,28	773	39,4	4,33
SDL	88	4,5	1,83	984	50,1	3,37	891	45,4	4,12
LC	367	18,7	1,90	1107	56,4	3,85	489	24,9	4,23
MFL	168	8,6	1,82	743	37,8	3,55	1052	53,6	4,14
OCS	262	13,4	1,84	782	39,8	3,90	919	46,8	4,33

Note. OLRs: Online learning readiness scale, CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

Research Question 2:

Gender

It was seen that there was a significant difference between the mean scores of readiness of students according to gender (Pillai's Trace = 0.017, F (5.1957) = 6.803, p <0.01, η² = 0.017). SDL mean scores of females (M = 3.60) differed significantly from males (M = 3.51), mean OCS scores of males (M = 3.67) from females (M = 3.53) by gender. There was no significant difference between the MFL, LC and CIS mean scores (Table 5).

Table 5. MANOVA Results into Online Learning Readiness Scores by Gender

Gender/Sub-factors	M	SD	df	F	p	η ²
Female (Male)						
CIS	3,50 (3,57)	0,81 (0,91)	1-1961	2,674	0,102	0,001
SDL	3,60 (3,51)	0,66 (0,70)		6,717	0,010	0,003
LC	3,24 (3,20)	0,83 (0,88)		1,153	0,283	0,001
MFL	3,57 (3,55)	0,78 (0,83)		0,146	0,703	0,000
OCS	3,53 (3,67)	0,91 (0,94)		10,669	0,001	0,005

Note. CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

Grade Level

It was observed that the mean scores of online learning readiness did not differ according to the grade level (Pillai's Trace=0.009, F(15,5871)=1.168; p>0.05; η²=0,003). According to the Post Hoc (Games-Howelt) test, it was seen that grade level did not have a significant effect on any of the readiness sub-factors (Table 6).

Table 6. MANOVA Results into Online Learning Readiness Scores by Grade Level

Sub-factors	Grade	M	SD	df	F	p	η ²
CIS	First grade	3,55	0,84	3-1959	1,237	0,295	0,002
	Second grade	3,52	0,85				
	Third grade	3,59	0,80				
	Fourth grade	3,49	0,90				
SDL	First grade	3,60	0,68	3-1959	1,210	0,304	0,002
	Second grade	3,58	0,63				
	Third grade	3,52	0,67				
	Fourth grade	3,55	0,72				
LC	First grade	3,30	0,84	3-1959	1,346	0,258	0,002
	Second grade	3,22	0,83				
	Third grade	3,18	0,82				
	Fourth grade	3,22	0,89				
MFL	First grade	3,63	0,79	3-1959	1,537	0,203	0,002
	Second grade	3,51	0,80				
	Third grade	3,57	0,76				
	Fourth grade	3,55	0,84				
OCS	First grade	3,62	0,92	3-1959	0,848	,468	0,001
	Second grade	3,54	0,94				
	Third grade	3,62	0,85				
	Fourth grade	3,56	0,96				

Note. CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

Online communication self-efficacy

Education Level and Type of Education

While there was no significant difference between readiness scores according to type of education (Wilks' Lambda = 0.996, F (5.1957) = 3.051; p> 0.05; η² = 0.004), it was seen that there was a significant difference between education level (Wilks' Lambda = 0.992, F (5.1957) = 3.051; p<0.05; η² = 0.008).

Table 7. MANOVA Results into Online Learning Readiness Scores by Education Level and Type of Education

	M	SD	df	F	p	η ²
Type of Education: Daytime (Evening)						
CIS	3,55 (3,48)	0,85 (0,84)	1-1961	2,154	0,142	0,001
SDL	3,57 (3,52)	0,67 (0,71)		1,901	0,168	0,001
LC	3,23 (3,21)	0,84 (0,86)		0,261	0,609	0,000
MFL	3,56 (3,57)	0,80 (0,82)		0,127	0,722	0,000
OCS	3,57 (3,60)	0,92 (0,95)		0,296	0,586	0,000
Education Level: Licence (Associate degree)						
CIS	3,52 (3,64)	0,85 (0,83)	1-1961	3,458	0,063	0,002
SDL	3,55 (3,66)	0,68 (0,62)		4,585	0,032	0,002
LC	3,20 (3,42)	0,85 (0,83)		12,091	0,001	0,006
MFL	3,54 (3,73)	0,81 (0,76)		9,764	0,002	0,005
OCS	3,56 (3,77)	0,93 (0,85)		9,960	0,002	0,005

Note. CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

Faculty/College

It was seen that the faculty/college where students were educated made a significant difference on readiness (Pillai's Trace=0.082, F_(55,9755)=2.943; p<0.01; η²=0,016), which created a significant difference between the CIS (F=5.394, p<0,01), SDL (F=1,835, p<0.05), LC (F=3.174, p<0,01), MFL (F=3.766, p<0,01) and OCS (F=5.366, p<0,01) meant scores of the faculty/college where the students were educated (Table 8).

Table 8. MANOVA Results into Online Learning Readiness Scores by Faculty/College

	Faculty/College	M	SD	df	F	p	η ²	Post Hoc
CIS	(1) Faculty of Economics and Administrative Sciences	3,40	0,89	11-1951	5,394	0,000	0,03	
	(2) Faculty of Arts and Sciences	3,52	0,85					
	(3) Faculty of Education	3,67	0,73					
	(4) Faculty of Dentistry	3,62	0,86					3-1,
	(5) Faculty of Theology	3,43	0,79					11-1, 11-
	(6) Faculty of Agriculture	3,69	0,90					2, 11-5,
	(7) School of Physical Education and Sports	3,50	0,92					11-10,
	(8) Faculty of Music and Performing Arts	3,43	1,03					11-12
	(9) Faculty of Fine Arts	3,73	0,84					
	(10) Faculty of Health Science	3,36	0,90					
	(11) Vocational School of Technical Sciences	3,91	0,71					
	(12) Vocational School of Social Sciences	3,34	0,84					
SDL	(1) Faculty of Economics and Administrative Sciences	3,50	0,70	11-1951	1,835	0,044	0,01	
	(2) Faculty of Arts and Sciences	3,56	0,65					
	(3) Faculty of Education	3,56	0,64					
	(4) Faculty of Dentistry	3,49	0,71					
	(5) Faculty of Theology	3,56	0,63					
	(6) Faculty of Agriculture	3,60	0,69					
	(7) School of Physical Education and Sports	3,73	0,75					11-1*
	(8) Faculty of Music and Performing Arts	3,56	0,82					
	(9) Faculty of Fine Arts	3,61	0,80					
	(10) Faculty of Health Science	3,44	0,70					
	(11) Vocational School of Technical Sciences	3,75	0,60					
	(12) Vocational School of Social Sciences	3,56	0,64					
LC	(1) Faculty of Economics and Administrative Sciences	3,05	0,88	11-1951	3,174	0,000	0,018	11-1

	(2) Faculty of Arts and Sciences	3,24	0,85				
	(3) Faculty of Education	3,19	0,85				
	(4) Faculty of Dentistry	3,21	0,82				
	(5) Faculty of Theology	3,29	0,78				
	(6) Faculty of Agriculture	3,21	0,84				
	(7) School of Physical Education and Sports	3,25	0,84				
	(8) Faculty of Music and Performing Arts	3,39	0,95				
	(9) Faculty of Fine Arts	3,39	0,86				
	(10) Faculty of Health Science	3,23	0,66				
	(11) Vocational School of Technical Sciences	3,51	0,81				
	(12) Vocational School of Social Sciences	3,32	0,84				
MFL	(1) Faculty of Economics and Administrative Sciences	3,41	0,86	11-1951	3,766	0,000	0,021
	(2) Faculty of Arts and Sciences	3,58	0,80				
	(3) Faculty of Education	3,47	0,79				
	(4) Faculty of Dentistry	3,67	0,72				
	(5) Faculty of Theology	3,66	0,70				
	(6) Faculty of Agriculture	3,58	0,80				11-1, 11-3, 11-10
	(7) School of Physical Education and Sports	3,72	0,78				
	(8) Faculty of Music and Performing Arts	3,52	1,02				
	(9) Faculty of Fine Arts	3,65	0,88				
	(10) Faculty of Health Science	3,46	0,66				
	(11) Vocational School of Technical Sciences	3,86	0,74				
	(12) Vocational School of Social Sciences	3,58	0,75				
OCS	(1) Faculty of Economics and Administrative Sciences	3,47	0,96	11-1951	5,366	0,000	0,029
	(2) Faculty of Arts and Sciences	3,62	0,92				
	(3) Faculty of Education	3,52	0,89				
	(4) Faculty of Dentistry	3,50	0,91				
	(5) Faculty of Theology	3,46	0,94				11-1,
	(6) Faculty of Agriculture	3,69	0,95				11-2,
	(7) School of Physical Education and Sports	3,78	0,82				11-3
	(8) Faculty of Music and Performing Arts	3,72	1,02				11-5,
	(9) Faculty of Fine Arts	3,81	0,96				11-10,
	(10) Faculty of Health Science	3,26	0,87				11-12
	(11) Vocational School of Technical Sciences	4,02	0,74				
	(12) Vocational School of Social Sciences	3,49	0,87				

Note. CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy, *p<0.05

According to the Post Hoc (Hochberg's GT2) analysis conducted to find out between which faculties/colleges there is a difference, all readiness sub-factor mean scores of students in Vocational School of Technical Sciences were significantly higher than those of the Faculty of Economics and Administrative Sciences; CIS and OCS mean scores were significantly higher than those of Faculty of Arts and Sciences, Faculty of Theology, Faculty of Health Science and Vocational School of Social Sciences. In addition, it was seen that the CIS mean score of the students in the Faculty of Education was significantly higher than the students in the Faculty of Economics and Administrative Sciences, the OCS mean score of the students in the School of Physical Education and Sports was significantly higher than the students in the Faculty of Economics and Administrative Sciences and Faculty of Health Science.

Personal Computer, Stable Internet Connection and Smartphone with an Internet connection

Having a personal computer (Wilks' Lambda=0.922, F(5,1957)=32,995; p<0.01, η²=0,078), having a smartphone with an internet connection (Pillai's Trace=0.011, F(5,1957)=4.552; p<0.01; η²=0,011) and having a stable internet connection (Pillai's Trace=0.067, F(5,1957)=27.961; p<0.01, η²=0,067) were effective on online learning readiness. It was observed that the readiness of all sub-factors mean scores of students who had a personal computer, a smartphone with an internet connection and a stable internet connection were significantly higher than those who did not have these (Table 9).

Table 9. MANOVA Results into Online Learning Readiness Scores according to Personal Computer, Stable Internet Connection and Internet Connection Smartphone

Variables / Subfactors	M	SD	df	F	p	η ²
Has a Personal Computer (No)						
CIS	3,71 (3,23)	0,81 (0,84)	1-1961	152,209	0,000	0,072
SDL	3,61 (3,47)	0,68 (0,67)		18,644	0,000	0,009
LC	3,32 (3,05)	0,82 (0,86)		52,008	0,000	0,026
MFL	3,65 (3,41)	0,78 (0,82)		43,245	0,000	0,022
OCS	3,72 (3,34)	0,89 (0,94)		79,289	0,000	0,039
Has a Smart Phone (No)						
CIS	3,55 (3,11)	0,84 (1,06)		18,927	0,000	0,010
SDL	3,57 (3,39)	0,67 (0,76)		4,994	0,026	0,003
LC	3,24 (2,94)	0,84 (0,97)		8,261	0,004	0,004
MFL	3,57 (3,23)	0,79 (0,96)		12,858	0,000	0,007
OCS	3,59 (3,25)	0,91 (1,10)		9,879	0,002	0,005
Has an Stable Internet (No)						
CIS	3,69 (3,27)	0,82 (0,85)		116,514	0,000	0,056
SDL	3,59 (3,52)	0,67 (0,68)		4,672	0,031	0,002
LC	3,30 (3,10)	0,84 (0,85)		27,153	0,000	0,014
MFL	3,64 (3,43)	0,77 (0,84)		29,773	0,000	0,015
OCS	3,72 (3,35)	0,88 (0,95)		76,972	0,000	0,038

Note. CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy

Research Question 3:

Academic achievement scores of students varied significantly depending on their level of online learning readiness ($F(2-1960)=10,566$, $p<0.01$). According to the Post Hoc (Hochberg's GT2) analysis, the academic achievement mean score of students with high readiness ($M=3,02$) was higher than moderate ($M=2,90$) and low ($M=2,86$) readiness level students. It was seen that there was a significant difference between students with high CIS and MFL levels and those with low and moderate levels. There was a significant difference between the academic achievements of students with a high SDL level and those who were intermediate. There was a significant difference between the academic achievements of students with high LC and those with low levels and there was no significant difference between the academic achievements of students according to their OCS levels (Table 10).

Table 10. ANOVA Results Regarding the Academic Achievement of Students according to the Readiness Levels

Sub-factors	Level	N	M	SD	df	F	p	Post Hoc
OLRS	(1) Low	108	2,86	0,63	2-1960	10,566	0,000	3-1*, 3-2*
	(2) Moderate	1064	2,90	0,61				
	(3) High	791	3,02	0,60				
CIS	(1) Low	241	2,87	0,58	2-1960	7,667	0,000	3-1, 3-2
	(2) Moderate	949	2,92	0,62				
	(3) High	773	3,01	0,59				
SDL	(1) Low	88	2,88	0,61	2-1960	10,657	0,000	3-2
	(2) Moderate	984	2,89	0,61				
	(3) High	891	3,02	0,59				
LC	(1) Low	367	2,88	0,62	2-1960	4,454	0,012	3-1
	(2) Moderate	1107	2,94	0,61				
	(3) High	489	3,01	0,58				
MFL	(1) Low	168	2,85	0,64	2-1960	6,442	0,002	3-1*, 3-2*
	(2) Moderate	743	2,91	0,61				
	(3) High	1052	2,99	0,60				
OCS	(1) Low	262	2,90	0,61	2-1960	1,681	0,186	-
	(2) Moderate	782	2,94	0,60				
	(3) High	919	2,97	0,61				

Note. OLRS: Online learning readiness scale, CIS: Computer and internet self-efficacy, SDL: Self-directed learning, LC: Learner control, MFL: Motivation for learning, OCS: Online communication self-efficacy; *: $p<0,05$

DISCUSSION

In this study, which aimed to investigate the students' readiness for online learning and examine their readiness according to various variables, it was observed that the students had moderate level readiness, but it was close to the high-level limit. Allam et al. (2020) found that today's students have a high computer and internet self-efficacy. Chung et al. (2020), Korkmaz et al. (2015), Nayci (2021) and Yılmaz et al. (2019) also state that the online learning readiness of students is high. Technology has an important place in the lives of learners, who are called digital natives. It can be said that today's students have high digital competencies and interests because they are more familiar with information and communication technologies (Nayci, 2021). Therefore, university students can adapt to this transformation more easily (Hung et al., 2010) and this transformation can respond to their educational requests (Ali, 2020). As in this study, in the studies of Saritaş and Barutçu (2020) and Çakır and Horzum (2015), it is seen that students need a control mechanism to manage their own learning experience and learning process. It is expressed that the learning process of students can be supported by creating a lesson plan by the instructors and checking the outcomes of the courses at regular intervals (Saritaş & Barutçu, 2020).

In this study, it is seen that readiness differs according to gender. It was seen that the self-directed learning scores of the females were significantly higher than the males and the online communication self-efficacy scores of the males were significantly higher than the females. However, there was no significant difference between computer and internet self-efficacy, motivation for learning and learner control. Although Nayci (2021) revealed that female students' online communication self-efficacy is significantly higher than that of male students, this finding is valid only for associate degree students. While Sakal (2017) observed a significant difference in favor of males in the dimension of online communication self-efficacy, Alsancak Sırakaya and Yurdugül (2016), Çakır and Horzum (2015) found that the mean scores for self-directed learning of females were significantly higher than men's. Self-directed learning (Hamdan et al., 2021; Park & Yun, 2018) and online communication self-efficacy (Kumar, 2021) are critical factors for online learning. Dikbas Torun (2020) claimed that self-directed learning is the strongest predictor of academic success. It is seen that the improvement in learners' self-regulation can provide better learning outcomes in online education (Kara et al., 2021). Thus, especially for male students' efforts such as study plans, time management, material/method selection, and help-seeking should be supported to gain self-learning responsibility. Instructor's feedback is important to students in online learning (Alqurashi, 2016). Yu and Richardson (2015) consider that social integration is an important factor in readiness for online learning. Hence, it should be ensured that students have the skills to use online tools and see online learning as a way to communicate and share. In this context, instructors can create a communication platform for the course and especially encourage female students to use it. As can be seen in this study, there are studies in the literature that do not show a significant difference by gender concerning computer and internet self-efficacy (Çakır & Horzum, 2015; Nayci, 2021; Sakal, 2017), learner control and motivation for learning (Alsancak Sırakaya & Yurdugül, 2016; Çakır & Horzum, 2015; Nayci, 2021; Sakal, 2017).

It was observed that the education level and the faculties/colleges were effective for the online learning readiness of the students while the grade level and the type of education did not affect it. Saritaş and Barutçu (2020) argued that the difference in readiness between grade levels occurred whether the students had taken online courses before or not. In this context, all students in this study had taken compulsory online courses previously prevented the difference between grade levels. Taking technological lessons in different semester causes a difference between grade levels (Yılmaz et al., 2019; Yurdugül & Demir, 2017). It may be the reason for no difference the fact that the students in this study had taken the information and communication technologies course in the first semester. Thus, it would be more beneficial to give weight to technology-supported lessons in the first year in structuring the curriculum. In the literature, it is seen that grade level does not affect readiness (Korkmaz et al., 2015; Martin et al., 2020; Nayci, 2021), but the faculty/college has an effect on readiness (Ishtaiwa, 2014; Nami & Vaezi, 2018; Sakal, 2017; Sun & Rueda, 2012). It is seen that the online learning readiness of computer engineering students is higher than that of social sciences and humanities students (Khalifeh et al., 2020; Nami & Vaezi, 2018; Sun & Rueda, 2012). Yılmaz et al. (2019) stated that there are differences between faculty/college students in terms of online learning readiness and that Faculty of Science students have the highest mean. In other studies, it has been observed that the computer-internet self-efficacy of the students in the computer and

instructional technologies department is higher (Alsancak Sırakaya & Yurdugül, 2016; Yurdugül & Demir, 2017). It is an expected result that students in the departments, including computer technology education, have a higher online learning readiness (Çakır & Horzum, 2015). The fact that the students are more familiar with technology and internet use and constantly use the computer in their courses reveals this situation. In this study, it was seen that students in Vocational School of Technical Sciences were more ready to learn online comparing to other faculties. Adnan and Boz-Yaman (2017), in their study with the participation of computer and civil engineering students, concluded that online learning readiness for students is quite high. It has been observed that the faculty/school of education's technology inclination increases online learning readiness. Although Yuvuzalp and Bahçivan (2020) has stated that there is no difference between self-efficacy scores according to education level, the reason for the difference in this study is thought to be due to the faculty/college. It is thought that the higher readiness of students in technical sciences to learn online comparing to other faculties makes the difference between the level of education, as most of the associate degree students are in technical programs. Computer and internet literacy courses can be included in the curriculum to increase the online learning readiness of students in faculties with low readiness.

In this study, it was seen that students who have a computer, stable internet connection or smart mobile phone are more ready to learn online. Nami and Vaezi (2018) point out that computer ownership is important. It is observed that students who own a computer, laptop or tablet have higher readiness (Khalifeh et al., 2020; McCoy, 2010; Nami & Vaezi, 2018). Access to technology and technical skills emerge as an important factor in online learning readiness (Adnan & Boz-Yaman, 2017; Rasheed et al., 2020). Computer use and ownership is an important indicator that students are ready to learn online (Basol et al., 2018). Yılmaz et al. (2019) state that students with a personal computer or a smart mobile phone have higher online learning readiness. Nayci (2021) found that students who started using digital tools a long time ago had higher readiness. In this context, it is seen that technological facilities are one of the important factors affecting the readiness of students.

In this study, it was seen that readiness was effective on academic achievement and students with a high level of readiness were more successful academically. Korkmaz et al.'s (2015) study showed that there was a significant positive relationship between academic achievement and some factors of online learning readiness. Joosten and Cusatis (2020) state that online learning self-efficacies is significant in predicting the academic performance or course grade of students. Beliefs towards online learning are a positive predictor of academic achievement (Bernard et al., 2004). In this context, it is seen that interventions to increase the online learning readiness of students will increase their academic success.

CONCLUSION

The COVID-19 pandemic has led to strict prevention worldwide. These restrictions have forced universities to switch to online learning and this once again demonstrated the significance of distance education. The pandemic period has made online learning the primary learning environment, which has accelerated the transition of universities to online learning. It is seen that this transition is not limited to the pandemic period and has made online learning a permanent part of teaching activities. Readiness is significant for the success of the online learning environment. Students who are not ready for online learning may have an unsuccessful experience and create a negative bias towards the future. Therefore, it is recommended that online and face-to-face courses should be taught together (Orban et al., 2018), and students should be accustomed to the online learning environment without leaving face-to-face lessons (Yılmaz et al., 2019). By providing online learning experiences to students, online learning readiness can be increased, and the required success can be achieved more easily (Joosten & Cusatis, 2020). Although the rapid transition to online learning due to the global pandemic has caused readiness to be ignored, it has enabled a large group of people to experience online learning. This experience will lead to the success of future online learning activities. Given that the main purpose of online learning is to increase the quality of education (Allam et al., 2020), it is thought that the findings revealed in this study will increase the success of future applications. This study has enabled us to see to what extent students who are compulsorily involved in the online learning process during the pandemic period are ready for online learning. This study will also guide future studies on online learning readiness. These findings will assist both instructors and

designers in preparing students for online learning. Since self-directed learning and online communication self-efficacy are important factors for online learning, male students should be encouraged to take responsibility for self-learning, and female students should be encouraged to use communication platforms more. The readiness of the students in the technical faculty/college is higher than the students' in the social faculty/college. Students' readiness for online learning can be increased by including more information and communication technologies courses in the education programs of social faculties/colleges. In this study, it has been seen that the technological facilities and computer use competence of students have a significant place in their readiness for online learning. Since online learning environments bring a change in the learning culture (McAvinia, 2016), training about the features of online learning will accelerate the adaptation to online learning (Terenko & Ogienko, 2020). Students should be made more ready for online learning by providing training on computer and internet use and by increasing access to technological opportunities. Analyzing the technological possibilities of students before starting online learning will make the process more successful.

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