Do vocational college students ready for online learning in post-COVID instruction?

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Article Info	Abstract
Keywords: Online learning Readiness Vocational college Research Article	The purpose of this research is to examine the readiness level of vocational college students for online learning according to various variables. The sample of the study included 334 (231 freshmen and 103 sophomore) students studying at a vocational college of a state university in Turkiye. Data collection tool used in the research consisted of Student Demographics Form and Online Learning Readiness Scale. Quantitative data obtained from the study were statistically analyzed with Three Factor MANOVA for independent groups. The findings showed that the average level of readiness for online learning of participants was at good extent, the dimension with the highest average was online communication self-efficacy, and with the lowest average was computer/internet self-efficacy. It was determined that the level of readiness for online learning of participants did not differ significantly according to the graduated high school, department and grade level. Readiness for online learning needs to be considered in detail to help all students use online tools for learning in order to get the most out of their post-COVID education. It is recommended that students be provided with opportunities to improve their readiness for online learning, which is necessary for them to continue their lifelong learning.

1. Introduction

Digitization and the onlineization of education have strongly re-emerged as a central focus of education policy because of COVID19 Pandemic. The astonishing developments in online learning technologies have changed the way university classroom teaching is delivered and initiated change and transformation in higher education (Hamann, Glazier, Wilson & Pollock, 2020). This is especially true for vocational and technical education that supports the economy of countries. Digitalization and being online in vocational education are seen as an opportunity for competition in the field of economy today. (Cattaneo, Antonietti & Rauseo, 2022).

Preparing an online instruction requires developing the online readiness of the students. When it comes to online teaching activities in schools, the focus has been on students' readiness to learn online. Additionally, with the help of advances in ICT and due to the unexpected results of the COVID 19 pandemic, distance education, mainly using online technologies, is becoming widespread around the world (Ates-Cobanoglu & Cobanoglu, 2021). In these post-Covid times, online learning systems hereafter Learning Management Systems (LMS) offers students ease of access, flexibility, learning at their own pace and individualized learning materials and interactivity in educational environments so the growing

numbers of online vocational courses are remarkable nowadays (Wei & Chou, 2020). For this reason, vocational college students need to have the basic 21st century knowledge and experiences in order to fulfil the requirements of their profession in the digital world and to constantly update themselves.

Students' readiness to study within a LMS is crucial (Budzar, Ali & Tariq, 2016) due to the distance that really exists between instructors and students and the self-paced nature of distance learning, online learning can be difficult for students. The need to understand whether vocational college students are ready to learn online is further important as usual because LMS and blended learning are being more and more popular in instructional settings around the world as schools are quarantined as a precaution due to the spread of the COVID-19 disease. With the disease turning into a pandemic, schools and universities in many countries have started to offer their learning and teaching activities online. Since then, there has been increased interest from researchers trying to identify components that may influence students' online learning readiness, beginning with the development of online learning technologies.

So, do vocational college students think they are ready to learn online? Are they ready to learn from LMSs? As educational institutions begin to place more emphasis on online and blended learning technologies, it has become crucial to answer these questions in the post-COVID-19 pandemic period so that institutions can make the most of these technologies.

2. Literature

Morrison (2003) explained online learning as the acquisition of knowledge and skills by students through online learning materials developed and offered. Unlike traditional education, online learning takes advantage of the use of multimedia resources to enhance interactivity and encourage students' self-learning (Tsai, 2009). For many students, online learning is an attractive method because it solves the time and place constraints related to learning by facilitating access to information (Dube & Scott, 2017). Although online learning offers many advantages, it can present barriers that students may not have experienced before in a traditional classroom (Tsai, 2009). As with alternative learning methods, online learning requires certain skills that students must develop before interacting with online learning objects (Pillay, Irving & Tones, 2007). Aware of this, researchers are examining whether students at all levels are ready to learn online.

Online learning readiness (OLR) is a term that includes students' preferences regarding learning; trust in the environment in which learning takes place and students' ability to participate in the act of learning (Warner, Christie & Choy, 1998). With another definition, OLR can be expressed as the degree of readiness of students to take courses online (Alem, Plaisent, Zuccaro & Bernard, 2016). Student readiness is required in online learning environments as well as in any learning environment (Horzum, Kaymak & Gungoren, 2015). Readiness to learn online requires some preparation to participate in a learning experience (Engin, 2017). As in any environment, students should be in control of their own learning experience, managing study time, following the lesson, finishing their studies on time and actively contribute to learning activities (Hung, Chou, Chen & Own, 2010). Students, who are thriving in the online education, can follow their lessons online, have the skills to use technology and surf the Internet, and are ready to learn individually and learn from the online environment (Alem et al. 2016; Engin, 2017; Liu, 2019).

Previous research has explored the different dimensions of online learning readiness that can affect student success in online learning environments. Several scales that measure OLR such as Hung et al.'s (2010) online learning readiness scale (OLRS), Yu and Richardson's (2015) students' online learning readiness (SOLR) tool and Ilgaz & Gülbahar's (2015) e-readiness scale consist of four or five factors. OLRS (Hung et al., 2010) is an exhaustive tool that covered all aspects of OLR: computer/Internet self-efficacy (CIS), learner control (LC), motivation to learn (ML), online communication self-efficacy (OCS) and self-directed learning (SDL). For the goals of the present research, OLRS was chosen. CIS relates to students' ability to demonstrate appropriate computer and Internet skills. LC is about students controlling

their learning, for example studying course content again or passing on certain topics. ML focuses on the learning attitudes of online learners and showing willing take part in learning (Ibrahim & Nat, 2019). OCS is about learners' asking questions about a topic, responding in discussion groups, commenting on what has been written, and participating in discussions in online learning environments. SDL is about students taking control within the learning act to achieve the learning objectives in the lesson (Hung et al, 2010) and that strategically responding to the requisitions of a particular learning action (Geng, Law & Niu, 2019). Many research studies have used the OLRS.

Kirmizi (2015) and Topal (2016) determined the relationship between OLR, satisfaction and academic achievement in their research studies. The findings show that students' SDL was the most important determinant of academic success of a course, and ML was found to be the strongest predictor of course satisfaction (Kirmizi, 2015) and students with higher averages for SDL, ML, and LC were found to be more satisfied with online courses (Topal, 2016). In studies conducted with university students in Turkiye, Çakır and Horzum (2015), Cigdem and Yıldırım (2014), Kayaoğlu and Dağ Akbaş (2016), Nayci (2021) students' online learning readiness levels were found to be above the medium value in all dimensions of the scale. Regarding the factors affecting learner success in online learning environments, Cigdem and Ozturk (2016) investigated the relationship between OLR and success in a blended computer literacy course by using OLRS. Although students reported high motivation to learn, this factor did not predict learner achievement significantly. The research found that SDL strongly predicted academic achievement. Torun (2020) investigated the relationship between OLR and higher education students' academic performance during online learning. The findings showed that SDL was the strongest predictor, and learning motivation was also a predictor of students' academic performance during online learning.

More research has been done on OLR recently, as an effect of the Covid19 pandemic. Naji, Du, Tarlochan, Ebead, Hasan, and Al-Ali (2020) investigated factors affecting students' OLR and they found that on online learning, being ready and motivated, feeling self-sufficient, being self-directed, and technical support significantly affect students' OLR. Callo and Yazon (2020) stated that the OLR of the students in their research is significantly affected by the familiarity and ability to online learning, the teaching of the online learning experience, the device used and the good connection, self-efficacy, and previous experience. They also stated that students' and teachers' OLR depends on their access and use of technological tools and their e-learning self-efficacy. Wei and Chou (2020) found that the CIS and ML dimensions had a positive effect on course satisfaction. Kalkan (2020) examined OLR of university students using Yurdugül and Demir's (2017) e-learning readiness scale. The research found that the factors that significantly affect students' OLR were CIS and OCS, followed by SDL, LC and ML.

Allam, Hassan, Sultan, Mohideen and Kamal (2020), Neupane, Sharma, and Joshi (2020) and Dorsah (2021), in their studies to investigate students' OLRs, have found that students are ready for online learning (Dorsah, 2021; Neupane, Sharma & Joshi, 2020) and they have good computer/internet literacy, however they are not self-learners and they do not have motivation to participate in online learning (Allam et al. 2020). In their research with students enrolled in a chemistry course, Kalman, Esparza, and Weston (2020) concluded that some of the personal characteristics, adaptability, organizational skills, and self-awareness enable students to be successful and excel as online students. Nayci (2021) examined the OLR of students studying at four different vocational schools and found that students' OLR levels were quite high and did not differ significantly according to grade level, gender and age, but differed significantly according to years of digital tool use.

The main aim of this research is to determine OLR of military vocational college students and the potential relationships between OLRS sub-dimensions and vocational college students' demographics such as academic program, graduated high school and grade level in post-COVID instruction. For this purpose, in this study, the following research questions will be investigated:

1. What is the level of OLR of vocational college students?

2. Does OLR of vocational college student significantly differ according to their demographics?

3. Methodology

In this research study, exploratory descriptive survey research design, which is a quantitative approach and is based on collecting and analyzing numerical data from a sample to describe trends, attitudes or opinions of a population (Creswell & Creswell, 2017) was used.

3.1. Data Collecting Tools

An online questionnaire uploaded to the LMS running in the school's internal network was used to collect data from the participants. The questionnaire consisted of two sections: the first section required participants' demographics (department, graduated high school etc.) and the second section consisting of 18 OLRS items in 5 different dimensions aimed to measure the students' OLR. In this study, OLRS (Hung et al. 2010), translated into Turkish by Yurdugul and Alsancak Sarıkaya (2013), was used to measure the OLR of military vocational college students. The participants answered to a 5-point Likert-type scale (1= strongly disagree, 2= Disagree, 3= Undecided, 4= Agree, 5= strongly agree).

Scale's dimensions are SDL (5 items), ML (4 items), LC (3 items), CIS (3 items), and OCS (3 items). There is no reverse coded item in the scale. The internal consistency coefficients (Cronbach alpha values) of the scale were .92 in the CIS sub-dimension, 0.84 in the SDL sub-dimension, .85 in the LC sub-dimension, .80 in the ML sub-dimension, and .91 in the OCS sub-dimension determined.

3.2. Sampling

This study was conducted in a military vocational college of a state university in Turkiye. The online survey via the college's LMS, named Course Portal (MOODLE), was conducted in October 2021 at the beginning of fall semester of 2021-2022 academic year. Although all students were informed about the survey, since participation was voluntary, a total of 334 students, 231 out of 925 freshmen and 103 out of 963 sophomore students from different academic programs were participated in this study.

The sample represented approximately 18% (334 out of 1888) of the student population of vocational college for 2021–2022 academic year. Due to the special situation of the school, all participants were male. Based on the departments, 118 (35.3%) students were from the department of Electronics and Communication Technologies, 93 (27.8%) from the department of Business Administration, 51 (15.3%) from the department of Computer Technology, 45 (13.5%) from the Automotive programs, and 27 (8.1%) from the department of Construction.

3.3. Data Analysis

The data of the study were analyzed with "Three-Factor MANOVA for Independent Groups". One of the basic assumptions of the three-factor MANOVA analysis is that the dependent variable of the data set is normally distributed. In this study, it was examined whether the skewness and kurtosis values had extreme values in order to determine whether the dependent variables had a normal distribution (Table 1).

Table 1.

The skewness and kurtosis values of the dependent variables

Dependent Variable	Skewness	Kurtosis
CIS	-.312	-.365
SDL	-.494	.092
LC	-.363	-.257
ML	-.727	.821
OCS	-.610	-.117

When the skewness and kurtosis values of the dependent variables given in Table 1 are examined, it is seen that they are between -1 and +1. Since these values are within reasonable limits as stated in the literature (Morgan, Leech, Gloeckner & Barrett, 2004; George & Mallery, 2016), it can be said that the dependent variables have a normal distribution.

One of the assumptions that must be fulfilled in multivariate analyses such as MANOVA is the multivariate normal distribution. In this study, multivariate normal distribution was investigated according to Mahalanobis Distance Coefficient values. The Mahalanobis Distance Coefficient extreme values for the data set are presented in Table 2.

Table 2.

Extreme values of Mahalanobis Distance

			Case Number	Value
Mahalanobis Distance	Highest	1	251	18,52954
		2	82	17,97624
		3	208	17,71435
		4	241	17,32059
		5	336	15,95858
	Lowest	1	140	,13526
		2	256	,31801
		3	253	,38265
		4	215	,38265
		5	118	,45308

When the extreme values presented in Table 2 are examined, it is seen that the value of 20,515, which is the value to be considered for 5 variables, is small. Critical values of Mahalanobis distance with five variables at $\alpha = .001$ is 20.515 (Tabachnick & Fidell, 2013). In this case, it can be said that the extreme values in the data set will not adversely affect the three-way MANOVA analysis and the multivariate normality assumption is fulfilled. However, in the analyses for each dependent variable, it was checked whether the homogeneity of the variances and the equality of the covariance matrices, as another basic assumption of the three-factor MANOVA analysis, were provided. The results of Levene's Test and Box's M statistics are given in Table 3.

Table 3.

The results of Levene's Test and Box's M statistics for homogeneity of variances and equality of covariance matrices

Dependent Variable	Levene's Test				Box's M Testi				
	F	df1	df2	Sig.	Box's M	F	df1	df2	Sig.
CIS	1.205	14	319	.270					
SDL	.647	14	319	.825					
LC	.659	14	319	.813	240.463	1.144	180	12794.061	.092
ML	.946	14	319	.510					
OCS	1.206	14	319	.269					

When Levene's Test and Box's M statistics for assumptions were examined, it was found that error variances and covariance matrices were equal for each of the independent variables (p> .05). Wilk's Lambda value was interpreted to determine the common effect in the analyses and the significance level was determined as .05 in all analyses.

3.4. Validity and Reliability

To test the internal consistency and construct validity of the OLRS, Hung et al. (2010) used confirmatory factor analysis and as a result of the analyses performed, each item of the scale had a significant load between 0.55 and 0.85 on the five factors, and all factors of the OLRS showed sufficient reliability and discriminant validity. Therefore, the OLRS constitutes a valid tool to measure students' OLR (Hung et al., 2010). From this study conducted with vocational college students, the reliability of the sub-dimensions of the scale was calculated as below; CIS = .806, SDL = .724, LC = .656, ML = .720 and OCS = .783, and the reliability of OLRS was determined as .887. Cronbach's Alpha values indicate that the sub-dimensions of the OLRS are sufficiently reliable (George & Mallery, 2016; Hajjar, 2018). The

data-model fit indices of the Turkish version of the OLRS scale were x2/sd=4.63, RMSEA=.074, GFI=.94, CFI=.94 and NFI=.92. These results show that compliance is at a minimum sufficient level.

3.5. Findings and Discussions

Before the three-way MANOVA, the descriptive statistics for the measurements were evaluated and presented in Table 4.

Table 4.

Means and standard deviations to scores of OLRS's dimensions

Dimensions	Mean	Std. Deviation
CIS	3,3822	,91439
SDL	3,9874	,62363
LC	3,7066	,78847
ML	4,1826	,61478
OCS	4,0729	,76087
OLRS	3,8974	,55235

The averages and standard deviations of the participants' OLR scores are presented in Table 4. The OLRS average score is 3.89, which indicates that vocational college students' readiness for online learning is sufficient. The average scores of the dimensions from the largest to the smallest are as follows; ML (M=4.18), OCS (M=4.07), SDL (M=3.98), LC (M=3.70) and CIS (M=3.38).

This shows that vocational college students are motivated to learn online. In addition, vocational high school students consider themselves sufficient in online communication and at a level that can manage their own learning. However, it is seen that the means of CIS and LC dimensions remain low relative to other dimensions.

Table 5.

Descriptive statistics of items of the OLRS

Item	Statement	Mean	sd
1	I feel confident in performing the basic functions of Microsoft Office programs (MS Word, MS Excel, and MS PowerPoint	3.2216	1.09271
2	I feel confident in my knowledge and skills of how to manage software for online learning.	2.9311	1.17458
3	I feel confident in using the Internet to find or gather information for online learning	3.9940	.96171
4	I carry out my own study plan.	3.7844	.97488
5	I seek assistance when facing learning problems	4.0389	.94041
6	I manage time well.	3.9551	.86007
7	I set up my learning goals	4.1078	.83849
8	I have higher expectations for my learning performance.	4.0509	.90400
9	I can direct my own learning progress.	3.9192	.84330
10	I am not distracted by other online activities when learning online (instant messages, Internet surfing).	3.6377	1.20206
11	I repeated the online instructional materials on the basis of my needs.	3.5629	.99576
12	I am open to new ideas	4.3892	.68313
13	I have motivation to learn.	4.1078	.82404
14	I improve from my mistakes.	4.3084	.75384
15	I like to share my ideas with others.	3.9251	1.03269
16	I feel confident in using online tools (email, discussion) to effectively communicate with others.	3.9012	1.01600
17	I feel confident in expressing myself (emotions and humor) through text.	4.2545	.79293
18	I feel confident in posting questions in online discussions	4.0629	.90987

Table 5 shows the descriptive statistics of the OLRS items. Items with the highest averages were item 12, item 14, and item 17. The items with the lowest mean are: item 2, item 1 and item 11.

Three-way MANOVA was used to examined whether the CIS, SDL, LC, ML and OCS levels of the participants show a significant difference according to the department they attend, graduated high school, the grade level they are studying, the common effect of the department they studied and graduated high school, the common effect of the department they studied and the grade level they studied, the common effect of graduated high school and the grade level they studied, and lastly the common effect of the department they study, graduated high school, and the grade level they study. The results are given in Table 6.

Table 6.

Three-way MANOVA results

Effect		Value	F	Hypothesis df	Error df	p	η^2
High School (HS)		.988	.734	5.000	315.000	.598	.012
Department (D)		.928	1.198	20.000	1045.687	.247	.019
Grade (G)		.989	.728	5.000	315.000	.603	.011
HS * D	Wilks' Lambda	.973	.438	20.000	1045.687	.985	.007
HS * G		.989	.686	5.000	315.000	.635	.011
D * G		.976	.775	10.000	630.000	.653	.012
HS * D * G		.990	.622	5.000	315.000	.683	.010

According to the three-way MANOVA results; graduated high school (λ=.988, F=.734, p>.05), the department they studied (λ=.928, F=1.198, p>.05), and their grade level (λ=.989). , F=.728, p>.05) on the sub-dimensions of online learning readiness are not significant. In addition, it was also found that on the sub-dimensions of OLRS graduated high school and the department they studied (λ=.973, F=.438, p>.05); graduated high school and their grade level (λ=.989, F=.686, p>.05); their department and grade levels (λ=.976, F=.775, p>.05); the common effect of the graduated high school, the department they attended and the grade level they studied (λ=.990, F=.622, p>.05) were not significant.

4. Conclusion and Suggestions

Online learning in the post-COVID era we live in, has become more used in education and its popularity is increasing in educational settings around the world. Therefore, determining whether students studying in schools are ready for online learning is more important than ever for schools to invest in and successfully use online learning systems. The main goal of this study is to investigate relationship between military vocational college students' demographics and their OLR. For this purpose in mind, effects of students' department, graduated high school, the grade level they are studying, the common effect of the department they studied and the graduated high school, the common effect of the department they studied and the grade level they studied, the common effect of the graduated high school and the grade level they studied, and lastly the common effect of the department they study, the graduated high school, and the grade level they study on OLRS sub-dimension were scrutinized.

By analyzing the data obtained from OLRS in the study, it was seen that the students' online learning readiness levels were quite high. Similar to this result, Cakir and Horzum (2015), Cigdem and Yildirim (2014), Kayaoglu and Dag Akbas (2016) and Nayci (2021), found that university students' online learning readiness levels were above the medium value. However, it was determined that the average of vocational college students' online communication self-efficacy was relatively higher than the other sub-dimensions while average of computer/Internet self-efficacy was relatively lower than the other sub-dimensions. Unlike these results, in the study of Hung et al. (2010), the highest scores were given to the computer/internet self-efficacy dimension by the participants. This finding is similar to the result of Yasin and Ong's (2020) study conducted in a blended learning environment, online communication self-efficacy can increase students' OLR. This result contradicts the findings of Estira (2020) and Cigdem and Yildirim (2014). They found that OCS was relatively less important in their study. The most important reason for

this may be that most of the students connect to the internet and communicate through devices such as smartphones, so they do not use computers and related programs much, especially during the COVID pandemic. Due to the rapid expansion of online communication in education, today's students enter colleges with more online communication experiences than ever before. Today, it can be said that students have proficiency and interest in online communication, especially since they frequently benefit from online communication tools. It can be said that feeling competent in online communication is effective in being ready for online learning at a high level.

The results revealed that vocational school students' learner control averages were relatively lower than other dimensions. This finding was confirmed by Hung et al. (2010) and Naji et al. (2020) report that learner control is an OLR dimension with a lower mean than other dimensions. This is because, unlike traditional face-to-face learning, online learning can be interrupted by activities that appeal to students, such as online games, web applications, messaging with friends. In the relationship analyses made in the research, the study did not find a significant difference in all five dimensions of the OLRS according to the department, graduated high school and grade level. These findings are not similar to the study of Rafique et al. (2021) that revealed a significant difference in students' CIS and OCS and ML depending on the grade level. This was also an expected finding, because with the COVID-19 pandemic, students' readiness for online learning is generally considered to have improved. Additionally, it may be the result of policies set by the Higher Education Institution and the Ministry of Education that have become mandatory for students as a result of the COVID-19 pandemic. Findings from this study, which examines students' OLR levels after the Covid-19 pandemic, show that students' online communication skills have improved, but their computer usage self-efficacy has decreased relatively. The most important reason for this is that smart phones are now able to do many things that computers can do, and students prefer smart phones rather than computers when it comes to connecting to e-learning environments.

It is thought that this study will make a good contribution to the field of online education, especially in a post-pandemic situation. First of all, in this study, the scale developed by Hung et al. (2010) was used to determine students' readiness for online learning after the COVID-19 outbreak and while comparing the OLRs of the students, their departments, the types of high schools they graduated from, and their grade levels were used. In future research, it is recommended to use other personal (income status, number of siblings, etc.) and academic factors while determining students' OLRs. This work can be replicated with a larger participant group and with students in other disciplines, schools.

Theoretical and practical implications

In this study, there are some recommendations for managers: 1) Since vocational school students have a relatively low average in computer/Internet self-efficacy, orientation training should be organized by the relevant units of the university to provide training on these tools. 2) Vocational School Students reported that they were relatively deficient in controlling their learning. Course instructors should give each student tasks where they can develop their learning responsibilities and make more effort to involve them in learning activities. This will encourage students' participation in the lessons and will prevent them from engaging in other distracting activities such as online chatting, messaging, online gaming. 3) And also it is recommended that students be provided with opportunities to improve their readiness for online learning, which is necessary for them to continue their lifelong learning.

Limitations and future research directions

The first limitation of this study is that it is based on quantitative data, researchers can also use qualitative and/or mixed research designs. In addition to looking at the existing OLR status of students, the change in OLR levels can also be observed by including more interesting online learning activities in the lessons. The second limitation is that the study investigated the OLR of freshman and sophomore students of military vocational college students in Turkiye, so the results of the study cannot be generalized to students at other levels. Further research can be conducted with more participants from different departments. The current study has been done with students, and future research should include a survey

of teachers' perspectives using online teaching. In another study, the effect of students' OLR levels on course success can be investigated.

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