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رابطه بین آمادگی دانشجویان برای یادگیری برخط و رضایت آنان از یادگیری برخط

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چکیده

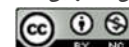
در بحران کووید-۱۹، دوره‌های برخط به عنوان شیوه اصلی آموزش برای اکثر دانشگاه‌های ایران بدل شدند. این مطالعه به بررسی رابطه بین آمادگی دانشجویان برای یادگیری برخط و رضایت آنان از یادگیری برخط در دانشگاه الزهرا در این دوره پرداخته است. از پرسشنامه برخط برای جمع‌آوری داده‌ها از ۱۲۰ دانشجو استفاده شد. داده‌های جمع‌آوری شده با استفاده از روش‌های آماری توصیفی و استنباطی تجزیه و تحلیل شدند. یافته‌ها نشان داد که اکثر دانشجویان برای فعالیت‌های یادگیری برخط خود به تلفن‌های هوشمند متکی هستند. علاوه بر این، مشخص شد که آمادگی کلی آنان برای یادگیری برخط و رضایت از این تجربه هر دو در سطح متوسط قرار دارند. بیشترین سهم در آمادگی دانشجویان به دلیل آمادگی فناورانه آنان بود. علاوه بر این، بزرگترین چالش، کنترل یادگیرنده بود. یافته‌های تحلیل همبستگی نشان دهنده رابطه معنادار بین ابعاد آمادگی یادگیری برخط و سطوح رضایت از یادگیری برخط بود. تحلیل مدل معادلات ساختاری، همبستگی قوی بین آمادگی کلی برای یادگیری برخط و رضایت از تجربه کلی یادگیری برخط را نشان داد. در نهایت، کنترل یادگیرنده به عنوان قوی‌ترین پیش‌بینی‌کننده رضایت از یادگیری برخط بود و ۳۲ درصد از واریانس را تشکیل داد. در مقابل، عواملی مانند یادگیری خودهدایت شده، خودکارآمدی ارتباط برخط، آمادگی فناوری و انگیزه در آموزش، رضایت از یادگیری برخط را پیش‌بینی نکردند. این تحقیق می‌تواند به تصمیم‌گیرندگان در تشخیص اهمیت افزایش تجربیات دانشجویان و درک چگونگی تأثیر شایستگی‌های مختلف دانشجویان بر نتایجی مانند رضایت از یادگیری برخط کمک کند.

واژه‌های کلیدی

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ORIGINAL ARTICLE

The relationship between students' online learning readiness and their online learning satisfaction

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ABSTRACT

During the COVID-19 crisis, online courses emerged as the major mode of education for most universities in Iran. This study explored the relationship between students' readiness for online learning and their satisfaction with online learning at Al-Zahra University during this period. An online questionnaire was conducted to gather data from 120 students. The collected data were analyzed using both descriptive and inferential statistical methods. The findings indicated that most students relied on smartphones for their online learning activities. Additionally, it was also revealed that their overall readiness for online learning and satisfaction with the experience were both at a moderate level. The greatest contribution to students' readiness was due to their technological readiness. In addition, the biggest challenge is learner control. The findings of the correlational analysis indicated a significant relationship between the dimensions of online learning readiness and levels of satisfaction with online learning. The SEM analysis revealed a strong correlation between preparedness for online learning and satisfaction with the overall online learning experience. Finally, learner control emerged as the strongest predictor of online learning satisfaction, accounting for 32 percent of the variance. In contrast, factors such as self-directed learning, online communication self-efficacy, technology readiness, and motivation in education did not significantly predict satisfaction in online learning. This research can assist decision-makers in recognizing the importance of enhancing student experiences and understanding how various student competencies contribute to outcomes like online learning satisfaction.

KEY WORDS

COVID-19, online learning, readiness, satisfaction, student.



Introduction

The COVID-19 pandemic has dramatically transformed the teaching and learning process in higher education, making online learning the new norm for institutions since its onset. As an urgent measure to curb virus transmission, universities swiftly shut down due to the pandemic's rapid progression. More than 1.5 billion learners worldwide have been affected by the closure of schools and universities (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2020a; United Nations Children's Fund [UNICEF], 2020). The pandemic has sparked a digital transformation in higher education, with virtual learning environments and online interactions becoming standard (Kumar, 2020; Strielkowski, 2020), leading to the cessation of conventional learning methods in universities. In summary, face-to-face learning was discontinued, and online education became the preferred, often sole option available (Hussein et al., 2020; Pal & Vanijja, 2020), serving as the only solution to maintain global educational activities (Cinar, Ekici & Demir, 2021).

Many students had to transition from face-to-face classes to online learning settings mid-semester, adopting new roles in learning through information technology. Learning in an online environment requires a set of skills that are usually different from learning in traditional environments. Online learners are encouraged to be more self-directed, resourceful, and independent, consistent with a learner-centered approach (Palloff & Pratt, 2007). Shifting from traditional classrooms to virtual classrooms can alter students' perceptions of this teaching approach, which may vary from what previous studies have shown (Coman et al., 2020). The objectives of this study are as follows:

- 1) To assess students' preparedness for online learning;
- 2) To gauge students' satisfaction with online learning;
- 3) To examine the correlation between students' readiness for online learning and their satisfaction with online learning.

Literature review

Learning can extend beyond traditional face-to-face classroom interactions to virtual environments. Online learning is a process that takes place over the internet. In other words, online learning is an educational approach in which students learn in fully virtual settings. In online learning, pedagogical processes occur through the use of devices such as laptops, computers, and other electronic gadgets. Online learning provides more accessible methods of learning without the need for physical presence in traditional classrooms. It also offers greater access to information, services, and opportunities for collaboration. For students, online learning has no time limits, and location and distance are not issue. They can access course content, attend classes, and complete assignments from anywhere with an internet connection. For instructors, tutoring can be done anytime and anywhere (Ally, 2008). Online learning can also be synchronous, where students and instructors participate in the learning at the same time, asynchronous, where students access the learning at their own time, or a combination of both (Mohammadi, 2024; Fabriz, Mendzheritskaya & Stehle, 2021).

Since its inception, COVID-19 online learning has differed from normal online learning because of the limited time that students, professors, and higher education institutions have had to adapt to the online learning platform. This action has placed

significant pressure on all stakeholders involved in education and has created many challenges for educational administrators, professors, students, families, and government regulations. This is because digital disruption in the education sector was sudden, untimely, and somewhat unusual, and there was no preparation for its implementation (Pal & Vanijja, 2020). Consequently, many educational institutions have primarily focused on uploading educational content to virtual spaces rather than on implementing effective online teaching and learning methods (Adnan & Anwar, 2020). This is especially true because many professors and students who have little experience with online learning feel like they are being forced to participate without adequate support. Additionally, the shift to emergency online learning has led to a decline in the quality of education (DeVaney et al., 2020; Hodges et al., 2020).

Some professors can quickly and easily transfer to virtual learning environments and need training and support in this field (World Bank, 2020). Often, they cannot monitor the students based on their attendance and participation. Despite the abundance of information, which is a feature of the current era, students face obstacles and distractions when attending and passing online classes (Yang et al., 2020). Moreover, the psychological pressure of online courses and the problems that arise in this field for completing assignments (Aguilera-Hermida, 2020) prevent them from succeeding in education. In addition, readiness for online learning among students (Zou, Li & Lin, 2021) is fundamental to their preparation, and abrupt shift from traditional to online classes during the pandemic had negative effects on their preparation (Farrington, 2020; Dorn, 2020), which was caused by problems with access to

technology, Internet networks, and a decrease in the quality of teaching (UNESCO, 2020b).

While staff and faculty members of world-renowned universities have been trained on how to use online learning (Shahzad et al., 2020), in many cases it has not occurred in Iran's higher education system, and this system has faced many challenges in online learning under normal conditions (Mirzaei, Saadi & Sepahpanah, 2019; Rezaee et al., 2018; Bagheri Majd & Sedghi Boukani, 2017; Mahmoodi & Mostashiri, 2017; Bagheri Majd, Shahei & Mehralizadeh, 2013; Hosseini Largani, 2009), which will increase the vulnerability of the educational system. In addition, many technical and support tasks, such as designing web pages for conducting exams, setting pages in the Learning Management System (LMS), creating links for students to enter the class, recording classes, and providing students with access to them, are also assigned to faculty members. On the other hand, the successful implementation of online learning requires a detailed educational plan, long-term projections, and specific educational infrastructure. Researchers have warned that confusion may arise as a result of the sudden and temporary shift to online learning during the COVID-19 emergency (Bozkurt & Sharma, 2020; Hodges et al., 2020; Selwyn, 2020).

Online learning readiness

There are two perspectives on online learning readiness. One concerns the organization and addresses the learning environment only. The second perspective concentrates on individual learners' online learning readiness. The second perspective was adopted in this study. Readiness for online learning generally refers to the mental and physical preparedness of stakeholders in the online learning process. Warner, Christie & Choy (1998) initially introduced the concept of

readiness for online learning. They assessed online learning readiness based on three criteria: students' preference for online learning, confidence in using ICT for learning, and ability to learn independently. Since then, numerous researchers have examined this concept and established the dimensions of readiness for online learning. According to Zou, Li & Lin (2021), online learning readiness encompasses students' preferences for online education compared to traditional classroom settings, their proficiency and willingness to use digital communication tools, and their capacity for independent learning. Reyes-Millan et al. (2023) stated that readiness for online learning encompasses a student's capacity and motivation to participate in educational activities and successfully complete them in a virtual learning setting. In essence, readiness refers to the abilities students possess to handle online education or the competencies required for effective learning in a digital environment. This readiness encompasses two primary elements: the technological aspect of computers and the learning journey that individuals undergo (Jaoua et al., 2022). These elements can be divided into several dimensions. For example, Hung et al. (2010) included five dimensions of learning preparedness in their online learning readiness scale: learner control, self-directed learning, motivation for learning, computer/internet self-efficacy, and online communication self-efficacy. Essentially, learner control evaluates the extent to which students can determine the content, timing, location, and method of their learning experiences. In self-directed learning, students take on the responsibility of organizing, implementing, and evaluating various aspects of their educational journey. This approach empowers learners to manage their learning processes independently. Motivation for learning determines whether students have the motivation to learn. Computer

and the Internet Self-efficacy refers to a person's confidence in their ability to navigate online learning environments and work with technological devices. Finally, the ability to effectively interact with instructors and peers in virtual learning environments is known as online communication self-efficacy. This specific skill is essential for successful participation in digital educational settings (Chien, Yeh & Kwok, 2022).

Since the introduction of online learning readiness, various methods have been proposed for its measurement. McVay, (2000) (2001) used a 13-item measure to assess students' readiness for online learning. According to Widodo, Wibowo & Wagiran (2020), students' online learning readiness can be assessed by examining several key factors, including the adequacy of their equipment, proficiency in using technology, capacity for independent learning, level of motivation, and perception of the usefulness of online learning. Looock et. al. (2022) reported that motivation, learning strategies/regulation, attitudes toward learning, personality-related aspects, as well as digital literacy are different dimensions of e-learning readiness.

Readiness is crucial for the success of the experiences and activities that students encounter in an online setting (Demir Kaymak & Horzum, 2013; Kruger-Ress & Waters, 2013). Researchers believe that online learning readiness determines students' preparedness to effectively learn in a virtual environment (Salamat et al., 2022; Wei & Chou, 2020; Demir Kaymak & Horzum, 2013). It is also seen as a powerful factor in the successful implementation of online learning (Wulanjani & Indriani, 2021). Students' readiness for online learning is a crucial factor in achieving educational success (Dangol & Shrestha, 2019). The low level of student satisfaction in the online learning environment can be attributed to a lack of

readiness for online learning (Yurdugul & Demir, 2017). Online learning readiness may also result in students feeling stressed. Based on Kabir et al.'s (2021) research results, it was found that most students with readiness levels below optimal experienced moderate to high levels of perceived online learning stress. Furthermore, students' readiness and willingness to engage in online learning contribute to their level of satisfaction (Ranadewa et al., 2021), and readiness is related to learning outcomes (Joosten & Cusatis, 2020).

Many studies have considered readiness for online learning. Some studies have measured individual readiness for online learning (Cariño & Mandigma, 2024; Vo, Long & Vo, 2024; Nurhikmah et al., 2024; Fomsi & Johnson, 2023; Reyes-Millán et al., 2023; Lalduhawma, Thangmawia, & Hussain, 2022; Simamora, Wahyudin & Utami, 2022; McLeod, 2022; Yan-Li et al., 2022; Dogham et al., 2022; Zeybek, 2022; Hasim & Yusof, 2023; Akmal et al., 2021; Insawang, 2021; Marsevani, 2021; Ranganathan et al., 2021; Taskin & Erzurumlu, 2021; Cinar, Ekici & Demir, 2021; Fearnley & Malay, 2021; Viet & Linh, 2021; Lee, 2020; Allam et al., 2020; Blayone et al., 2018; Deveci Topal, 2016; Cigdem & Ozturk, 2016). Other studies have reported the factors that contribute to readiness (Ahmadipour and Musavi Moulaei, 2024; Hassan & Hamzah, 2024; Vo et al., 2024; Dello Stritto, Aguiar & Andrews, 2023; Zandi, Rhom & Ruhoma, 2023; Wagiran et al., 2022; Al Mamun et al., 2022; Cinar, Ekici & Demir, 2021; Alsobhi, Meccawy & Meccawy, 2021; Cheon, Cheng & Cho, 2021; Yasin, Azman Ong & Abd Aziz, 2020; Naji et al., 2020; Kalkan, 2020; Callo & Yazon, 2020; Hung et al., 2010). Along the same lines, a third set of studies explored the connection between readiness for online learning and various factors including academic

performance, intention to participate in online learning, learning effectiveness, satisfaction, academic resilience, adoption of online learning, information technology skills, and self-directed learning (Lp and To, 2025; Abdikoohikheyli, Rezaei Rad & Razaghi, 2024; Dai, Luan & Lin, 2023; Zandi, Rhom & Ruhoma, 2023; Wut et al., 2022; Yan-Li et al., 2022; Wang et al., 2022; Zeybek, 2022; Taskin & Erzurumlu, 2021; Yaras & Gunduzalp, 2021; Yavuzalp & Bahcivan, 2021; Ramadhana et al., 2021; Cigdem & Ozturk, 2016). For example, Wang et al. (2022) stated that preparedness for online learning has a significant relationship with the online academic performance of college students. Similarly, Zeybek (2022) reported a significant relationship between pre-service teachers' online learning readiness and their engagement in the online environment. Alblooshi (2024) found a positive correlation between satisfaction with distance learning and technical competencies, communication competencies, and social competencies with an instructor. However, there was no relationship between social competencies with classmates, self-directed learning, and satisfaction. In previous studies, Lee, Yoo & Wang (2023), Siregar (2022), Hasim and Yusof (2023), Yan-Li et al. (2022), and Kumar (2021) have shown a significant positive relationship between students' readiness for online learning and their satisfaction.

Online learning satisfaction

Satisfaction refers to how much students feel their learning experiences meet their expectations. This is an important aspect that must be continuously improved (Almaiah, Al-Khasawneh & Althunibat, 2020). Elliott and Healy (2001) defined satisfaction as the experience of students from the time they begin

their education until graduation. According to Islam et al. (2018), student satisfaction is the degree to which technology use is consistent with existing student values, needs, and experiences of using online learning platforms. In other words, student satisfaction encompasses the overall contentment of students with online education and their satisfaction with the assistance provided by instructors and student advisory services (Kerzic et al., 2021). The importance of student satisfaction in online education cannot be overstated (Jiang et al., 2021). Moreover, the extent to which students are content with online learning significantly influences their willingness to embrace digital learning approaches (Zhu, 2012). Satisfaction also has a positive influence on motivation to use online learning, and students who are satisfied are more comfortable using online learning. Online learning satisfaction significantly enhances student motivation, resulting in more thorough engagement with educational content (Bismala & Manurung, 2021). Moreover, students' satisfaction in online environments plays an important role in how online learning is designed, delivered, and implemented. It likely has a significant impact on the quality of the learning experience (Iigaz & Gulbahar, 2015).

Several studies have examined satisfaction with online learning. Some scholars have assessed students' satisfaction with online learning (Liwanag & Padohinog, 2025; Mosleh, Afzal & Jubeh, 2024; Jeremias, Rijoly & Binnendyk, 2023; Kaled & Ahmed, 2022; Hasim & Yusof, 2023; Adewoyin and Ebabhi, 2022; Tian & Lu, 2022; Aldhahi et al., 2022; Elkins et al., 2021; Abo Seada & Mostafa, 2017). Other researchers have studied the key factors that influence satisfaction with online learning (Yin et al., 2024; Atukunda, Khabusi & Othieno, 2024; Chowdhury et al., 2024; Limbu & Pham, 2023; Fang, Lu & Zhang, 2023; Nyathi &

Sibanda, 2023; Sari et al., 2023; Gachigi et al., 2023; Shodikin et al., 2023; Ab Hamid, Omar Zaki & Zizah Che Senik, 2022; Hai & Nguyen, 2022; Mohammed et al., 2022; Suhandiah et al., 2022; Keng, 2022; Wilczewski et al., 2022; Zaharia et al., 2022; Jiang et al., 2021; Bismala & Manurung, 2021; Landrum et al., 2020). These studies have identified numerous factors that contribute to student satisfaction in online learning. Some of the factors mentioned in these studies include ease of access, ease of use, system stability, system reliability, prompt response to queries (Atukunda, Khabusi & Othieno, 2024), and quality of educational services (Putu Puja et al., 2024). Other factors to consider include student experience, readiness for online learning, the presence of lecturers in online learning (Suhandiah et al., 2022), as well as learner-learner interaction (Nyathi & Sibanda, 2023), lecturer-student interaction, course assessment (Zahari, Abdul Rahman & Zahari, 2025), and content update frequency (Li & Chen, 2025). Additionally, factors such as learner inspiration and motivation, potential obstacles to e-learning, group and professor interaction, the use of technology (including AI and other tools) in e-learning (Singh et al., 2024), and academic, social and technical support (Walia et al., 2025) have been highlighted. Lastly, student motivation and engagement, as well as support from course content and design, educators, technology, and administration, are all important factors for satisfaction with online learning (Bhasin & Gupta, 2024).

Students' readiness for online learning was not identified, especially among Iranian students, who can present serious challenges. The number of studies that describe the relationship between readiness and satisfaction with online learning is limited. According to Kumar (2021), researchers have not adequately

explored the connection between students' readiness for online learning and their satisfaction. This study aims to investigate the impact of online learning readiness on students' satisfaction with online learning at Al-Zahra University during the COVID-19 pandemic.

Research Methodology

Procedure

This study utilized a correlational research design to investigate how variables may be related to each other. The degree of the relationship is indicated by the correlation coefficient. Therefore, a correlational research design was used to determine the relationship between students' readiness for online learning and their satisfaction with online learning. The sample respondents were B.Sc. students (N=340) at Al-Zahra University. It is a single-sex university in Iran that admits female students. In this study, SPSS Sample Power software was used to determine the sample size based on correlation parameters. A total of 120 students were selected as the research sample using simple random sampling.

Online questionnaires were distributed to students. Undergraduates were provided with documents electronically through Google Forms. Students were given a deadline of one month to submit the completed questionnaire. The survey responses were analyzed descriptively and inferentially using SPSS version 21 and AMOS Software. To categorize online learning readiness and its components, as well as online learning satisfaction and its components, the percentage of the mean score was calculated using Basar et al. 's (2021) formula. It was then divided into three categories: weak (<50%), medium (50-75%), and strong (>75%).

Instrumentation

The questionnaire used to collect data consisted of three sections: educational profiles (number of units passed virtually, number of academic semesters completed online, access to the internet at home, etc.), Online Learning Readiness (OLR), and Online Learning Satisfaction (OLS) measures. Several survey instruments have been developed to assess the OLR (Martin, Stamper & Flowers, 2020; Yu & Richardson, 2015; Ilgaz & Gulbahar, 2015; Bryant & Adkins, 2013; Atkinson, Blankenship & Bourassa, 2012; Atkinson, Blankenship & Droege, 2011; Panuwatwanich & Stewart, 2012; Hung et al., 2010). In this study, the questionnaire was adopted from Hung et al. (2010) and later modified to suit the study. Hence, technology readiness has been substituted for computer/Internet self-efficacy because some researchers have reported the problem of unpreparedness for e-learning due to a lack of competence in using digital technology (Almaiah, Al-Khasawneh & Althunibat, 2020; Toquero, 2020). Technology readiness is related to willingness to use new technologies, which varies among individuals (Parasuraman, 2000). The OLR measure consisted of 22 items, including seven items on Technology Readiness (TR), five items on Self-Directed Learning (SDL), three items on Learner Control (LC) in an online context, four items on Motivation in Learning (ML), and three items on Online Communication Self-efficacy (OCS). The OLR used a 5-point Likert scale. The OLS was measured in five dimensions: Content Structure (CS), Student-Professor Interaction (SPI), Student-Student Interaction (SSI), support/guidance (SG), and assignments (AS). The OLS measure was composed of 26 items (based on 5-point Likert scale), encompassing seven items on CS, six items

on SPI, three items on SSI, three items on SG, and seven items on AS.

The content validity of the questionnaire was reviewed by experts in higher education and online education. They evaluated relevance of the items and the clarity of their formulation. Cronbach's alpha was estimated for the scales used in the study to ensure internal consistency among the items. The reliability of the OLR and OLS measures was 0.84 and 0.96, respectively, which is considered an acceptable indicator for field research.

Findings

The results showed that the students had completed at least one semester, a maximum of five semesters, and on average three semesters virtually. On average, students completed 38 academic units virtually. All students had internet access at home, with Only 20% using smartphones to connect to the classroom. Using a personal laptop (17%) for this purpose was ranked second, while 5% used a personal

computer to enter the classroom. Among students, 49% used smartphones and laptops, 9% used smartphones and personal computers, 8% used smartphones and other people's devices (such as their parents), and 6% used laptops and personal computers. The rest of the students used a combination of these tools to sign up for classes.

Online learning readiness levels

Table 1 presents the readiness of students for online learning. As shown in Table 1, students had low control in the online learning environment ($M = 3.26$) compared to their high technology readiness ($M = 4.14$). The means of the other factors ranged from 3.63 to 3.79. Overall, online learning readiness was moderate. Additionally, technology readiness and communication self-efficacy were at a strong level, while self-directed learning, motivation in learning, and learner control were at a moderate level.

Table 1: Status of students' online learning readiness

Variables	Mean Score	% of Score	Status
OLR	3.69	73.8	Median
OCS	3.79	75.8	Strong
ML	3.68	73.6	Median
LC	3.26	65.2	Median
SDL	3.63	72.6	Median
TR	4.14	82.8	Strong

Online learning satisfaction levels

Student satisfaction with online learning is illustrated in Table 2. Assignment had a mean of 2.78, indicating comparatively low satisfaction, while student-student interaction had a mean of

3.09, showing comparatively high satisfaction. The means of the other factors ranged from 2.87 to 3.02. Overall, satisfaction with online learning and all its components was at a moderate level, as depicted in the table.

Table 2: Status of students' online learning satisfaction

Variables	Mean Score	% of Score	Status
OLS	2.92	58.4	Median
CS	2.87	57.4	Median
AS	2.78	55.6	Median
SG	2.97	59.4	Median
SSI	3.09	61.8	Median
SPI	3.02	60.4	Median

The correlation between readiness for online learning and satisfaction with online learning

A correlation analysis was conducted to determine the relationship between students' levels of readiness for online learning and their satisfaction with online learning. The data presented in Table 3 demonstrate significant positive relationships between online learning satisfaction and levels of technology readiness ($r=.32$; $p\leq .01$), self-directed learning ($r=0.50$; $p\leq 0.01$), learner control ($r=0.57$; $p\leq 0.01$) in an online environment, motivation in learning

($r=0.51$; $p\leq 0.01$), and online communication self-efficacy ($r=0.28$; $p\leq 0.01$). A comparison of correlation coefficients using Cohen's classification (Pallant, 2007) revealed that the relationship between self-directed learning, motivation in learning, and learner control with online learning satisfaction was high. In contrast, the relationship between technology readiness and online communication self-efficacy with online learning satisfaction was moderate and low, respectively.

Table 3: Correlation matrix showing the relationship between students' readiness for online learning and their satisfaction with online learning

	1	2	3	4	5	6
1. OLS	1					
2. TR	0.32**	1				
3. SDL	0.50**	0.44	1			
4. LC	0.57**	0.46	0.75	1		
5. ML	0.51**	0.43	0.73	0.71	1	
6. OCS	0.28**	0.42	0.42	0.40	0.48	1

Note. * $p\leq .05$, ** $p\leq .01$

Structural Equation Modeling was used to analyze the relationship between students' overall readiness for online learning and their overall satisfaction with online learning (see figure 1). The latent variable of online learning readiness, was comprised of five observed variables: motivation for learning, learner control, technology readiness, self-directed learning, and online communication self-

efficacy. The latent variable of online learning satisfaction consisted of five observable variables: content structure, student-professor interaction, student-student interaction, support/guidance, and assignments. The values of χ^2/df , Comparative Fit Index (CFI), Goodness of Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA) were calculated. The results of the model fit indices

(CMIN/DF=1.85, GFI=0.90, CFI=0.95, RMSEA =0.075) showed that the values were within the acceptable ranges, as recommended by Brown (2015). Overall, the results of factor loading revealed that all items were statistically significant, with each item in the scale

successfully loading (≥ 0.50) under the latent dimension. The SEM analysis results showed a significant relationship between online learning readiness and online learning satisfaction, aligning strongly with Cohen's classification (Pallant, 2007).

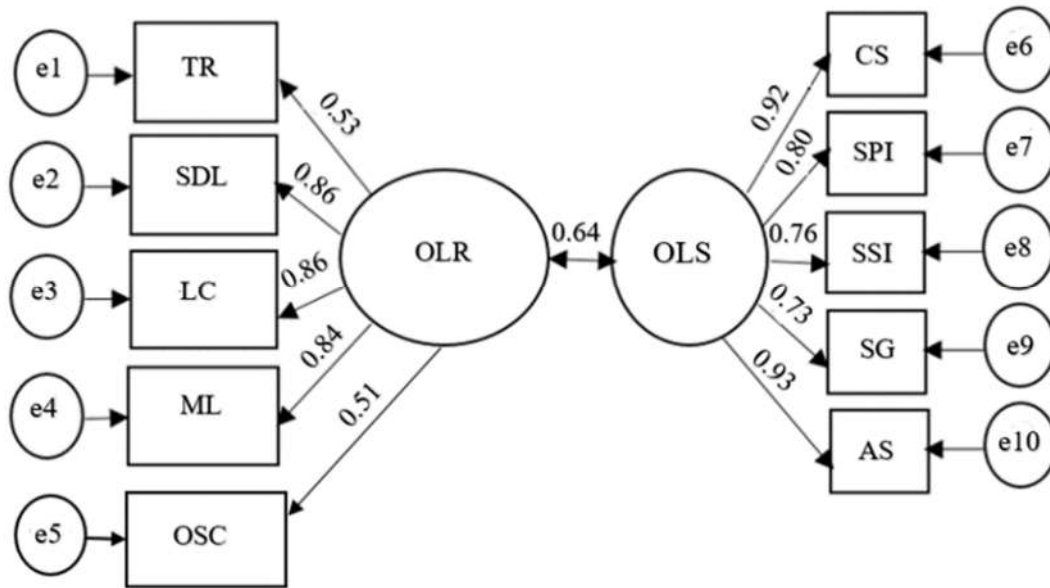


Figure 1: The relationship between overall online learning readiness and overall online learning satisfaction

A regression analysis was conducted to determine if online learning satisfaction could be predicted by factors of online learning readiness. The results showed that online learning satisfaction was predicted solely by the factor of learner control in an online environment, with an R^2 of 0.325, F value of 40.365, and p-value of less than 0.01 (refer to Table 4). Therefore, 32.5% of the variance in OLS is explained by the LC. This finding suggests that explaining online learning satisfaction through technology

readiness, motivation in learning, self-directed learning, and online communication self-efficacy may be challenging, as they do not appear to be significant predictors of online learning satisfaction. However, learner control in an online setting significantly contributes to satisfaction with online learning. It appears to be the most important predictor in the current research.

Table 4: Findings of regression analysis

Variable	β	t	p
LC	.594	6.39	.000
SDL	.145	1.08	.283
TR	.073	.721	.473
ML	.207	1.65	.103
OCS	.065	.659	.512

Discussion and conclusion

Overall, the COVID-19 crisis has had a significant impact on higher education, forcing a shift from traditional in-person learning to online education. In this case, students had to adapt to the new learning environment and prepare themselves for the integration of ICT into the teaching and learning process. Although students are increasingly exposed to technology, it cannot be assumed that they know how to effectively use these tools and methods for online learning. Instruction will be more effective if students are taught how to better utilize the opportunities and potential of technology for learning. Based on this study, students were found to use mobile phones and laptops more frequently than other devices to attend class. Similar findings have been reported by other researchers as well (Muthuprasad et al., 2021). Sage et al. (2021) reported that both laptops and smartphones are important for academics during the COVID-19 pandemic. Smartphones are often the most popular choice among students due to their convenience and usefulness for communication (Anshari et al., 2017). Rahiem (2021) also stated that most students use their phones' Internet to access materials. This finding has major implications for course design and online education. Smartphones have become prevalent in the academic environment, particularly in classrooms (Gikas & Grant, 2013). However, it is important to recognize that smartphones have limitations when it comes to certain academic activities, such as word processing, which is heavily relied upon by university students. The small size of the mobile phone screens and the inability to use various software and tools may hinder students from full benefiting from their education.

Students' readiness for online learning was found to be moderate, a result that aligns with the findings of Cinar, Ekici & Demir (2021). Technology readiness and self-efficacy in online communication were the two components that enhanced students' readiness for online learning. These results have also been supported by other researchers (Kalkan, 2020; Callo & Yazon, 2020). The proliferation of technology and students' increasing access to it have enhanced their readiness for technology and self-efficacy in online communication. These two components are closely tied to the technical aspects of online learning, while the other three components, which are crucial in the online learning process, were ranked lower. Students' readiness levels are crucial for effective online learning practices, and their preparedness is a key factor in the successful implementation of online learning. Therefore, students should ensure they are ready for online learning.

Students exhibited a lower level of readiness for learner control in online learning settings compared to other dimensions. Similar findings have been reported by other researchers (Rafique et al. 2021; Wulanjani & Indriani, 2021; Hung et al. 2010). Additionally, learner control seems to be the most significant predictor of online learning satisfaction, aligning with the findings of Sorgenfrei and Smolnik (2016). In general, learner control refers to the degree of autonomy and decision-making that learners have over their own learning process. In online learning environments, instructors do not directly observe students' learning tasks, students do not interact face-to-face with instructors and peers during the learning process (Salta et al., 2022), and learners are given control over their own learning. By empowering students to take control of their own learning, their interactions increase, along with their self-

efficacy and sense of belonging to the learning community. All of these factors contribute to improved academic performance (Taipjutorus, Hansen & Brown, 2012). Some work must be done in the area of learner control to prepare students for online learning. One way to achieve this is by strengthening students' self-efficacy. This can increase their control in the online learning environment because boosting self-efficacy means enhancing students' beliefs about their abilities to successfully acquire, process, and apply knowledge or skills in the learning context. This, in turn, leads to increased control over their learning.

The results revealed that self-directed learning was the second-ranked dimension, with students' scores lower than in the other dimensions. This result aligns with the findings of Maphalala, Mkhasibe & Mncube (2021). Rooted in the principles of andragogy, self-directed learning emphasizes intrinsic motivation, critical thinking, and lifelong learning skills. It requires students to be assisted and guided independently. Developing self-directed students involves fostering independence, critical thinking, and intrinsic motivation so that students can take ownership of their educational journey. Self-directed learning involves transitioning from instructor-led to student-led learning. This shift entails altering decision-making in teaching and learning processes, particularly the instructor's role in the learning process (Mahlaba, 2020).

Based on the findings of this research, students' satisfaction with online learning was at a moderate level. This result is consistent with the findings reported by Mosleh, Afzal & Jubeh (2024), Tian and Lu (2022), and Elkins et al. (2021). Assignments played the largest role in reducing satisfaction with online learning, followed by the content structure. Nevertheless, assignments completed outside of class time

serve a crucial function in student education by offering opportunities to explore new concepts, reinforce previously learned material, and apply knowledge to real-world scenarios (Hong et al., 2009). Online assignments have been shown to positively impact students' performance (Dillard-Eggers et al., 2008). There is a strong positive correlation between completing online homework and course grades (Wooten & Dillard-Eggers, 2013; Dillard-Eggers et al., 2008), as well as learning outcomes (Salame & Hanna, 2020). In addition, online homework has had a positive impact on students' perceptions, attitudes, learning experiences, and understanding. It also increases student engagement with the content and their academic achievement (Salame & Hanna, 2020). Muthuprasad et al. (2021) reported that the majority of students prefer having assignments at the end of each class for more effective learning. Content is at the heart of learning and is one of the most fundamental elements of online education. Learning content is broadly defined as the topics, attitudes, themes, behaviors, and concepts that are often grouped within each subject or learning area. These components fall under knowledge, skills, values, and beliefs, and are expected to be learned to form the basis of teaching and learning (UNESCO-International Bureau of Education [IBE], 2013). Online educational content formats that are tailored to meet the unique needs of each student are crucial for achieving successful learning outcomes. Well-structured course content ensures the effectiveness of an online class (Sun & Chen, 2016).

The results of the correlation analysis showed a significant relationship between the components of students' readiness for online learning and their overall readiness, as well as their satisfaction with online learning. Other researchers have also reported similar findings

(Altinsoy & Boyraz, 2025; Lee, Yoo & Wang, 2023; Siregar, 2022; Hasim & Yusof, 2023; Yan-Li et al., 2022; Kumar, 2021). Surprisingly, the relationship between self-directed learning, learner control, and motivation in learning, which are integral parts of the learning process, is stronger than the relationship between online communication self-efficacy and technology readiness. Based on the results of this research, we can conclude that: (1) without considering the views of users, it is impossible to enhance satisfaction with online learning. Any efforts to improve satisfaction with online learning must take into account students' perception; (2) students' readiness for online learning is a crucial factor in increasing satisfaction; (3) learner control in an online environment, motivation for learning, and self-directed learning, which are all related to the online learning process, have a greater impact on students' readiness than technology readiness and self-efficacy in online communication. Students' low motivation, lack of control over the learning environment, and inability to self-direct learning can significantly impact online learning and result in decreased satisfaction; (4) in times of crisis, satisfaction with online learning may be further compromised or overlooked. It is crucial to be more attentive in these circumstances than in typical conditions to ensure that students can successfully reach their educational objectives through online learning.

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