Setting the Stage for Success: Readiness and Connectedness as Antecedents of Learning Continuance Intention in Online Learning

Yingqi Tang
Hungwei Tseng
Jacksonville State University, USA

Yu-Chun Kuo
Rowan University, USA

Hsin-Te Yeh
Metropolitan State University of Denver, USA

Jianfang Liu
Economic School, Shandong Technology and Business University, China
202013887@sdtbu.edu.cn

Abstract
Through a hierarchical multiple regression analysis, this study investigated how dimensions of online learning readiness and online connectedness influence students' intentions to continue to take online courses. Data from 369 students who took at least one online course at a four-year public university showed that online learning readiness had a stronger relationship with continuance intention than online student connectedness, while online learning readiness had a significant correlation with online student connectedness. Online learning readiness and connectedness were indicators of online learning persistence. Factors such as age, computer/internet self-efficacy, self-directed learning, learner control, and facilitation influence students' intention to continue with online learning. Moreover, among the five subscales of readiness, motivation had the strongest connection with continuance intention. In addition, course facilitation was positively and significantly related to the intention to continue participating in courses. The study's implications and directions for future research were also explored.

Online course delivery became a primary medium of instruction during the COVID pandemic; therefore, while it is essential to comprehend factors that determine the success of online learning from the perspective of instructors, instructional designers, technical support staff, and institutional administrators, it is equally important for them to understand and assess how prepared students are for online learning. Since the early 21st Century, researchers started to explore the dynamic factors and constructs, learner characteristics and capabilities that would help to assess students' readiness or preparedness for smooth and successful online learning experience (Dray et al., 2011; Hung et al., 2010). Online learning readiness (OLR) refers to a person's preparedness and capacity to successfully participate in an online course or online learning activities (Chien et al., 2022). It consists of a set of skills, attitudes, and behaviors that enable students to participate in online learning activities and accomplish their learning objectives. Moreover, when students are well-prepared for online learning, they are more likely to be active agents in the learning community, to have positive experiences, and to have a higher intention to continue their online learning journey.

Prior studies have identified factors that affect students' online learning continuance intention (OLCI). The factors were concentrated in three perspectives: (a) students' characteristics and learning attitudes (Cochran et al., 2014; Zhu et al., 2020b), (b) e-learning systems or services (Dağhan & Akkoyunlu, 2016; Dai et al., 2020; Lin, 2011), and (c) senses of presence and connectedness (Dai et al., 2020; Zhao et al., 2021). Studies found that online learning readiness (OLR) can strongly predict the extent to which a student will experience and achieve online learning (Joosten & Cusatis, 2020; Kirmizi, 2015; Tang et al., 2021) and can influence their persistence in online courses and programs (Aragon & Johnson, 2008; Yu & Richardson, 2015).

Understanding students' readiness for online learning is critical because it gives teachers insights about their students and allows them to provide direction for a successful and productive online learning experience. In online learning environments, educators may find it necessary to assist students to cultivate self-directed learning abilities and foster a sense of control over their learning experiences, as emphasized by Hung et al. (2010). However, the literature review revealed little research attention to the associations among online learning readiness, online learning experiences, and online learning continuance intention (Ngah et al., 2022; Zhao et al., 2021). Thus, the purpose of the study was to examine the relationships among online learning readiness, online connectedness, and online learning continuance intention, and to investigate how dimensions of OLR and online connectedness influence students' intention to continue to take online courses.

Literature Review

Online Learning Readiness (OLR)

To have positive and productive experiences in an online learning environment, learners must be prepared. The concept of online learning readiness has changed over time in response to changes in technology, pedagogical techniques, and educational environments. In the late 1990s, Warner et al. (1998) introduced the concept of online learning readiness in the Australian Technical Vocational Education and Training sector (TVET), describing it as the degree to which learners are prepared to participate in online learning, considering their technical skills,

learning attitudes, and motivation. With the increased prevalence of online learning and advancements in technology at the beginning of the 21st century, scholars began examining factors that determine online learning readiness. Evans (1999), Guglielmino and Guglielmino (2003), and Schreurs et al. (2008) emphasized the importance of computer and internet self-efficacy, as well as the learner's competency in using technological tools (Martin et al., 2020a), in determining the level of readiness of students for engaging in online learning. Furthermore, Smith (2005) examined student behaviors and attitudes, and identified factors such as self-directed learning, motivation, and learner control that contribute to effective online learning preparation. Smith et al. (2003) revealed the importance of possessing efficient communication abilities in the context of online education. Hung et al. (2010) presented an extensive framework of online learning readiness consisting of five dimensions: computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy. These factors illustrate the complex nature of online learning readiness and the necessity of considering a wide range of elements when evaluating students' preparedness for online learning.

Computer/Internet Self-Efficacy

Compeau and Higgins (1995) defined computer internet self-efficacy as the perception of one's ability to use a computer and apply computer skills to a broader task. Given that an online course is facilitated through technology-mediated tools, it is imperative that students possess the necessary proficiency in utilizing computers and the internet. Research has shown that individuals who have higher levels of computer self-efficacy are more likely to participate in e-learning activities and have better performance in online courses (Aboobaker & Muneer, 2022; Wolverton et al., 2020). In addition, computer self-efficacy has a positive influence on learners' attitudes, motivation, and satisfaction in e-learning environments, which leads to improved learning outcomes (Chen, 2017; Chien, 2012; Doğru, 2020; Lu et al., 2016). Moreover, students' level of self-efficacy with computers is significantly inversely related to their level of anxiety over e-learning (Azizi et al., 2022; Saadé & Kira, 2009). Therefore, computer/internet self-efficacy evidently plays a crucial role in the effectiveness of e-learning experiences.

Self-Directed Learning

Knowles (1975) defined self-directed learning as "process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p. 18). Important characteristics of self-directed learners include intrinsic motivation, the ability to choose personal objectives, self-discipline, the capacity for self-evaluation, and metacognitive skills (King, 2011). Self-directed learners in the context of online learning are prone to engaging actively in learning tasks, exhibiting effective time management skills, and seeking assistance when necessary (Botha et al., 2015; Garrison, 1997; Zhu et al., 2020a).

Learner Control

Learner control refers to instructional approaches that provide students with some control over educational events. It gives students autonomy and decision-making authority over their learning experiences, allowing them to accommodate and optimize their benefits (Hannafin,1984; Scheiter, 2014). Due to the flexible nature of e-learning, students must assume

more accountability for their own learning progress. Online learning is more likely to be successful for students who can direct their own learning progress, manage their time efficiently, and maintain focus on learning duties. Learner control is identified as a key factor in determining both learning outcomes and satisfaction with e-learning courses (Clark & Mayer, 2011; Kraiger & Jerden, 2007; Piccoli et al., 2001).

Motivation for Learning

Learning motivation is what compels a person to seek out and engage in educational activities. It involves the desire to acquire new knowledge, skills, and experiences as well as a willingness to put in the necessary effort to do so. Learning motivation can be affected by a variety of factors, including personal interests, internal rewards, external pressures, and social support. The motivational orientation of students, whether intrinsic or extrinsic, has substantial effects on their academic performance. Motivated learners are more likely to take on an extensive approach to learning, engage in challenging activities, and demonstrate higher levels of achievement in online learning environments. (Amrai et al., 2011; Conley & French, 2013; Daumiller & Zarrinabadi, 2021; Trevino & DeFreitas, 2014).

Online Communication Self-Efficacy

Online communication self-efficacy refers to an individual's confidence in their ability to communicate effectively with others via online channels (e.g., email, social media, messaging applications, video conferencing, and discussion boards, etc.). Students possessing a greater degree of self-efficacy in online communication tend to exhibit motivation and perseverance in their endeavors to actively engage and excel in online learning environments. They are more open to participating in discussions, inquire about concepts, and express thoughts and emotions, thereby fostering increased involvement in online learning activities and enabling effective collaboration with both instructors and peers (Roper, 2007; Wang et al., 2022).

Online Student Connectedness (OSC)

According to Bolliger and Inan's (2012) definition, connectedness refers to an individual's perception of being recognized and sense of belonging. The term pertains to an individual's belief or perception about the existence of a relationship between themselves and one or more other individuals. Bolliger and Inan developed the Online Student Connectedness Survey (OSCS) as a tool for assessing the degree of connectedness among online students. The OSCS comprises four distinct subscales: comfort, community, facilitation, and interaction and collaboration. Zimmerman and Nimon (2017) investigated the validity and reliability of the OSCS and established connections with comparable instruments, such as the Classroom Connectedness Survey (CCS) and the Community of Inquiry Survey (CoI), confirming that it accurately measures feelings of connection among participants in online courses at higher education institutions. Hart (2012) argued that students are more likely to be actively engaged in the learning process if they feel a stronger connection to the classroom. The most engaged and devoted students in online courses are those who perceive a strong social presence and sense of closeness with peers. Learning community and social connectedness significantly predicted self-determined requirements, satisfaction, and the intention to continue online learning (Geary et al., 2023; Tseng et al., 2022; Zhu et al., 2020a). Moreover, research showed that connectedness

improves students' physical and emotional health, academic advancement, and likelihood of graduating (Arslan, 2021; Bridgstock et al., 2019; Wilson, 2018).

Aspects Influencing Online Learning Continuance Intention (OLCI)

The concept of online learning continuance intention refers to the inclination of individuals to sustain their involvement in online learning activities or courses over a period. It evaluates the level of determination demonstrated by individuals in their pursuit of online learning. The study of continuation intention is significant in the disciplines of educational research and practice because of its impact on learner retention, completion rates, and overall academic accomplishment. Intentions to continue online learning are complex, and the significance of contributing factors can vary depending on the learners and their respective circumstances. The factors that have been identified in the literature include computer anxiety, computer self-efficacy, and enjoyment (Alenezi et al., 2010), communication self-efficacy and learning motivation (Hung, 2016), learning satisfaction, perceived usefulness, perceived ease of use, perceived value, information quality, and connectedness (Al Amin et al., 2023; Lee, 2010; Li et al, 2021; Nugroho et al., 2019; Roca et al., 2006; Tseng et al., 2022; Wang et al., 2021; Wu & Zhang, 2014). Additionally, personal traits, attitude, and curiosity (Dai et al., 2020), compatibility of hardware/software (Indriana et al., 2022), and social interaction (Chung et al., 2020; Panigrahi et al., 2018; Li & Zhao, 2021) have also been found to be relevant factors.

Research has been undertaken to investigate students' continuous intention towards online learning, with sole focus either on their state of preparedness or connectedness (Farsawang & Songkram, 2022; Tseng et al., 2022). Therefore, this study was designed to examine students' willingness to continue with online learning by including both readiness and connectedness factors. The research questions leading the study were:

Q1: What is a student's level of online learning readiness, online student connectedness, and continuance intention for online learning?
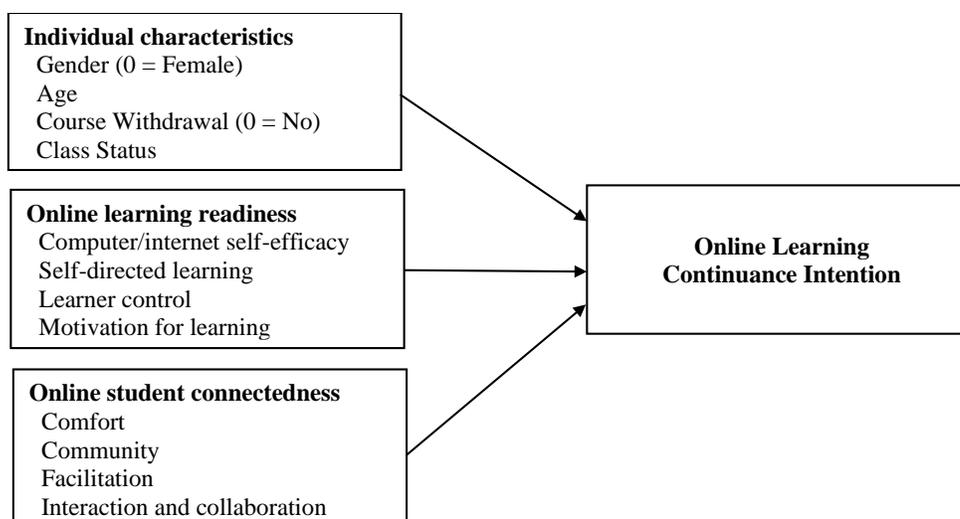
Q2: Does gender influence online learning readiness levels?

Q3: What is the correlation between online learning readiness, online student connectedness, and continuance intention?

Q4: After controlling for individual characteristics, do variables relating to students' readiness and connectedness for online learning have a positive effect on their intention to continue learning? (See Figure 1)

Figure 1

Hierarchical Multiple Regression Analysis Model

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┌─────────────────────────────────┐
│ Individual characteristics      │
│   Gender (0 = Female)           │
│   Age                           │
│   Course Withdrawal (0 = No)    │
│   Class Status                  │
└─────────────────────────────────┘
┌─────────────────────────────────┐          ┌──────────────────────────┐
│ Online learning readiness       │          │   Online Learning        │
│   Computer/internet self-efficacy│ ────────▶│ Continuance Intention    │
│   Self-directed learning        │          │                          │
│   Learner control               │          └──────────────────────────┘
│   Motivation for learning       │
└─────────────────────────────────┘
┌─────────────────────────────────┐
│ Online student connectedness    │
│   Comfort                       │
│   Community                     │
│   Facilitation                  │
│   Interaction and collaboration │
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Methodology

Participants

The survey was distributed to 1187 students who had taken at least one online course at a four-year public university/institution in the southern United States. A total of 369 students responded, for a response rate of 31%. There were 268 female participants, accounting for 72.6% of the total (See Table 1). Approximately 43.1% of the participants belonged to the age group of 20 to 29 years. Among the sample, 83.7% were undergraduate students, and 26.8% were in their junior year. Most of them (n =128, 34.7%) enrolled in a single online course, while five participants (1.4%), enrolled in more than five courses. Approximately 10% of the students withdrew from classes. Among those students, 9.7% dropped one course and 0.8% dropped two.

Data Collection and Analysis

Prior to data collection, this study received Institutional Review Board (IRB) approval from the university. Data collection was carried out using EvaluationKit, an online tool that has been integrated into the university's system. The survey was distributed three weeks prior to the finals week. The respondents were invited to participate in the survey. The statistical analysis was conducted using IBM SPSS. Independent samples *t*-Test, correlation analysis, and hierarchical multiple regression analysis were performed. To compare the effects of variables on a similar scale, improve interpretability, and quantify the relative relevance of predictors in regression models, standardized beta coefficients were employed in regression analysis.

Table 1

Demographic Profile of the Respondents (n = 369)

Demographic	Item	Number (Percentage)
Gender	Female	268 (72.6%)
	Male	101 (27.4%)

Age	Under 20	96 (26.0%)
	20-29	159 (43.1%)
	30-39	55 (14.9%)
	40-49	45 (12.2%)
	Over 50	14 (3.8%)
Course Enrolled	One	128 (34.7%)
	Two	102 (27.6%)
	Three	51 (13.8%)
	Four	48 (13.0%)
	Five	23 (6.2%)
	More than five	5 (1.4%)
	Missing	12 (3.3%)
Course Withdrawal	One	36 (9.7%)
	Two	3 (0.8%)

Instruments

  The Online Learning Readiness Scale (OLRS). The OLRS, which was adopted from Hung et al.'s (2010) multidimensional instrument for college students' readiness for online learning, consists of 18 items distributed across five subscales: computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy.

  The Online Student Connectedness Survey (OSCS). The OSCS, adopted from Bolliger and Inan (2012) to measure students' perceptions of connectedness in online programs, consists of 25 items distributed across four subscales: comfort, communication, facilitation, and interaction and collaboration.

  The Online Learning Continuance Intention (OLCI). The OLCI consists of 4 items modified from Alraimi et al. (2015) to measure students' intention to continue using online learning platforms.

  All items were measured using a five-point Likert scale ranging from "strongly agree" to "strongly disagree." Cronbach's alpha (α) was used to assess the internal consistency of each subscale. In this study, all subscales' Cronbach's alpha were above .7, indicating an acceptable internal consistency (Nunnally & Bernstein, 1994). The example questionnaire and Cronbach's alpha for each subscale are presented in Table 2.

Table 2

Descriptive Statistics, Reliability Information of Each Scale

Scales	# of Items	Sample Item	Cronbach's alpha	Mean	SD

OLRS	18		.94	4.19	.58
Computer/internet self-efficacy	3	I feel confident in my knowledge and skills of how to manage software for online learning.	.91	4.36	.71
Self-directed learning	5	I carry out my own study plan.	.87	4.13	.70
Learner control	3	I can direct my own learning progress.	.75	3.98	.75
Motivation for learning	4	I am motivated to learn.	.86	4.29	.59
Online communication self-efficacy	3	I feel confident in using online tools (email, discussion) to effectively communicate with others.	.83	4.21	.61
OSCS	25		.96	3.48	.78
Comfort	8	I have no difficulties with expressing my thoughts in my online courses.	.94	4.06	.69
Community	6	My peers have gotten to know me quite well in my online courses.	.96	2.80	1.16
Facilitation	6	I receive frequent feedback from my online instructors.	.90	3.74	.86
Interaction and collaboration	5	I work with others in my online courses.	.95	3.09	1.16
OLCI	4	I intend to continue taking online learning courses in the future.	.96	4.06	.97

Results

Level of Online Learning Readiness, Online Student Connectedness, and Continuance Intention

The study employed descriptive statistics to analyze the online students' readiness, connectedness for online learning and level of continuance intention. The mean for online learning readiness was 4.19 (SD = .58). Furthermore, the mean scores for the five dimensions of readiness were arranged in descending order as follows: computer/internet self-efficacy (M = 4.36, SD = .71), motivation for learning (M = 4.29, SD = .59), online communication self-efficacy (M = 4.21, SD = .61), self-directed learning (M = 4.13, SD = .70), and learner control (M = 3.98, SD = .75). Second, the mean score for the connectedness was 3.48 (SD = .78). Moreover, the mean scores for the four sub-scales of connectedness were arranged in descending order as follows: comfort (M = 4.06, SD = .69), facilitation (M = 3.74, SD = .86), interaction and collaboration (M = 3.09, SD = 1.16), and community (M = 2.80, SD = 1.16). Finally, the mean score for the online learning continuance intention was 4.06 (SD = .97), implying that students are more inclined to continue taking online classes (see Table 2).

Online Learning Readiness by Gender

An Independent Samples t-Test was utilized to assess the gender-based differences in the five dimensions of online readiness. The population variances of the compared female and male groups were equal (equal variances assumed) except for the motivation for learning variable.

There were statistically significant differences ($t(367) = 2.99$, $p < .01$) in the overall online readiness scores, with the mean score for female ($M = 4.25$, $SD = .52$) being higher than that for male ($M = 4.05$, $SD = .70$). In addition, there were significant gender differences for computer/internet self-efficacy ($t(367) = 2.09$, $p < .01$), self-directed learning ($t(367) = 3.20$, $p < .05$), motivation for learning ($t(367) = 2.40$, $p < .05$), and online communication self-efficacy ($t(367) = 2.50$, $p < .05$), with females scoring higher than males. However, no significant differences on learner control ($t(367) = 1.76$, $p > .05$) between female ($M = 4.03$, $SD = .72$) and male ($M = 3.87$, $SD = .82$) were identified (see Table 3).

Table 3

Independent Samples T-test for Gender Differences in Online Learning Readiness

Variables	Female (*n* = 262)		Male (*n* = 107)		
	M	SD	M	SD	t
OLR	4.25	.52	4.05	.70	2.99**
OLR_CSE	4.41	.63	4.24	.86	2.09*
OLR_SDL	4.21	.66	3.95	.76	3.20**
OLR_LC	4.03	.72	3.87	.82	1.76
OLR_ML[1]	4.34	.51	4.16	.72	2.40**
OLR_OCSE	4.24	.63	4.05	.78	2.50**

Note: OLR: Online learning readiness
           OLR_CSE: Computer/internet self-efficacy
           OLR_SDL: Self-directed learning
           OLR_LC: Learner control
           OLR_ML: Motivation for learning
           OLR_OCSE: Online communication self-efficacy
           [1]: group being compared are unequal
           *p < .05, **p < .01*

Correlation Between Online Learning Readiness, Online Student Connectedness, and Continuance Intention

To examine the relationships between online learning readiness, online student connectedness, and continuance intention, a multivariate correlational analysis was performed, and Pearson correlation coefficients were calculated. The results demonstrated that all three variables were significantly correlated (see Table 4). Online learning readiness had a stronger relationship with continuance intention ($r = .63$, $p < .01$) than online student connectedness ($r = .37$, $p < .01$), while online learning readiness had significant correlation with online student connectedness ($r = .45$, $p < .01$).

Table 4

Correlations Between Online Learning Readiness, Online Student Connectedness, and Continuance Intention

Variables	Online learning readiness	Online student connectedness	Continuance intention
Online learning readiness	1	.45**	.63**
Online student connectedness	-	1	.37**
Continuance intention	-	-	1

** $p < .01$

Hierarchical Multiple Regression Analysis of Online Learning Continuance Intention

The present study employed a hierarchical multiple regression analysis. The first model, only containing the individual characteristics (i.e., gender, age, course withdrawal, and class status variables), explained 7.1% of its variance, which was significant ($F = 6.906$, $p < .001$); only age ($\beta = .204$, $p < .01$) was a significant predictor of online learning continuance intention. The second model, containing the individual characteristics and the OLR (i.e., computer/internet self-efficacy, self-directed learning, learner control, motivation for learning, and online communication self-efficacy), could explain 42.7% of its variance, which was significant ($F = 29.613$, $p < .001$). More specifically, the second model showed that age ($\beta = .122$, $p < .05$), computer/internet self-efficacy ($\beta = .223$, $p < .01$), self-directed learning ($\beta = .189$, $p < .01$), learner control ($\beta = .194$, $p < .01$), and motivation for learning ($\beta = .228$, $p < .05$) were significant predictors of online learning continuance intention. The third model, containing the individual characteristics, OLR, and OSC (i.e., comfort, community, facilitation, and interaction and collaboration), explained 47% of the variance, which was significant ($F = 34.121$, $p < .001$). To be more precise, the third model showed that age ($\beta = .122$, $p < .05$), computer/internet self-efficacy ($\beta = .207$ $p < .01$), self-directed learning ($\beta = .173$, $p < .05$), learner control ($\beta = .150$, $p < .05$), and motivation for learning ($\beta = .247$, $p < .01$) were significant indicators of online learning retention intention. Moreover, the R^2 increase from the first model to the second model was significant ($R^2 = 35.7\%$, $F = 44.462$, $p < .001$), as was the R^2 increase from the second model to the third model ($R^2 = 4.3\%$, $F = 7.163$, $p < .001$). It is worth noting that within the third model, online communication self-efficacy was significantly and negatively associated with continuance intention ($\beta = -.237$, $p < .05$).

Table 5

Results of Hierarchical Multiple Regression Analyses of Online Learning Continuance Intention

Variable	Model 1 β	Model 2 β	Model 3 β
Individual characteristics			
Gender (0 = Female)	–.089	.006	.001
Age	**.204**	**.122***	**.122***
Course Withdrawal (0 = No)	.086	–.059	–.044
Class Status	.054	.002	–.030
OLRS			
Computer/internet self-efficacy		**.223**	**.207**

Self-directed learning		**.189****	**.173***
Learner control		**.194****	**.150***
Motivation for learning		**.228***	**.247****
Online communication self-efficacy		−.127	**−.237***
OSCS			
Comfort			
Community			.063
Facilitation			−.064
Interaction and collaboration			**.272****
			−.042
R^2	.071	.427	.470
F	6.906***	29.613***	24.121***
p-value	.000***	.000***	.000***
ΔF	6.906***	44.462***	7.163***
ΔR^2	.071	.357	.043

Note. $n = 369$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Discussion

Online Learning Readiness

The mean score of online learning readiness for this study was 4.19, indicating that students' readiness for online learning was above the midpoint of the scale. As a result, students were prepared to participate in online learning activities, which aligns with the findings of past research (Chung et al., 2020a; Chung et al., 2020b; Cigdem & Yildirim, 2014; Dorsah, 2021; Hung et al., 2010). Regarding the five dimensions, results indicate that participants scored highest in computer/internet self-efficacy and lowest in learner control. The results are consistent with those of Chung et al. (2020a), Chung et al. (2020b), and Hung et al. (2010), but differ from those of Cigdem and Yildirim (2014), and Dorsah (2021). Further analysis of readiness by gender revealed that women had significantly higher levels of readiness for online learning. Females are more proficient with technology, responsible for their own learning, committed to education, and confident in their ability to communicate effectively online. The present discovery contradicts results reported by Chung et al. (2020a; 2020b) and Hung et al. (2010), which indicated no significant gender-based variations, and Dorsah (2021), who established that males demonstrated a higher level of readiness. One possible explanation for the observed differences in research outcomes could be the cross-regional nature of the studies, in which the unique cultural, social, and economic characteristics of each country may have influenced the results.

Online Student Connectedness

The mean score of connectedness indicates that students' sense of connectedness is greater than the midpoint of the scale. Meanwhile, comfort score is the greatest and community score is less than the midpoint of scale. According to Dallimore et al. (2010), students' comfort in participating in class discussions had a favorable effect on their learning. Kiener et al. (2014) underlined the necessity of creating an engaging learning environment in the classroom where students felt comfortable and motivated. It stimulates active learning, problem-solving, and a positive mindset, ultimately leading to academic success. However, the findings indicated that during the learning process, students might lack a sense of belonging, feel emotionally distant from one another, or be unfamiliar with one another despite feeling comfortable and safe in their academic environment. These concerns have been voiced in the past regarding the lack of peer engagement and participation. Lack of peer-to-peer connection may cause students to feel distanced from their peers in addition to possibly leaving them confused and upset with the assignments and course material (Allen et al., 2018; Garrison et al., 2005; Kaufmann et al., 2016).

Correlation Between Online Learning Readiness, Online Student Connectedness, and Continuance Intention

The correlational analysis results indicate that students' level of readiness has a greater influence on their intention to continue learning than their level of connectedness in the online environment. In addition, after controlling for individual characteristics (gender, course withdrawal, age, and class status), hierarchical multiple regression analysis results reveal that variables associated with online learning readiness and online student connectedness had a positive effect on students' intention to continue online learning. In the first regression model, students' individual characteristics explained only 7.1% of the variance in their intention to continue learning. In addition, when online learning readiness and connectedness variables were added to the regression analysis (Model 3), the model significantly explained 47% of the variance in students' intent to continue online learning. Thus, the findings indicate the importance of both factors in online education. This result is in accordance with Farsawang and Songkram's study (2022) that readiness predicts students' desire to continue online learning. More specifically, age, computer/internet self-efficacy, self-directed learning, learner control, and facilitation were considerably connected with the intention to continue learning online, while online communication self-efficacy was considerably and adversely correlated. Farsawang and Songkram (2022) additionally captured mediating factors, such as attitude, motivation, engagement, and satisfaction in the relationships between online learning readiness and continuance intention during the pandemic. They concluded that motivation and attitude were more influential than satisfaction on students' intention to continue. The context of forced online learning during the pandemic may have altered the traditional satisfaction-continuance relationship. Incorporating Self-Determination Theory elements (Deci & Ryan, 1985, 2000), Community of Inquiry framework (Garrison et al., 1999), and Social Cognitive Theory constructs (Bandura, 1989) into a model may lead to a more comprehensive prediction of online continuance intention and improved explanatory power.

Moreover, among five subscales of readiness, motivation had the strongest connection with continuance intention. This result is consistent with the studies of Chang et al. (2013) and Hung (2016), showing how motivation may foster students' willingness to continue their online education. It is worth noting that online communication self-efficacy has a substantial adverse association with continuing intention. Communication self-efficacy in this survey primarily

assessed respondents' comfort levels when utilizing online tools like email, discussion boards, and posting and other forms of text communication. Emailing, commenting, and publishing are common practices in social media and normal communication. However, it is probable that the skills and confidence required for these activities will not translate well in a classroom context. Online learning requires a broader range of abilities beyond basic computer literacy and communication skills, including comprehension of the course material, participation in conversations, and assignment completion. In addition, it is unclear how faculty have used these communication technologies for online teaching and how students have used them for online learning.

Another key finding is that course facilitation was positively and significantly related to the intention to continue participating in courses, demonstrating that online students were more likely to be interested in continuing to take online classes when they believed their courses were sufficiently facilitated. These findings are consistent with prior research indicating that facilitation affects students' continuing interest in one-to-one online learning (Liu & Pu, 2023). There are a number of underlying psychological and practical explanations for this. For instance, effective facilitation typically leads to greater perceived educational quality. When they believe their online courses are well structured, well supported, and instructed by qualified professors or facilitators, students are more likely to believe they are receiving a valuable educational experience. Learning can be productive as a result of effective facilitation. Students are more likely to engage with the course materials, contribute to conversations, and finish tasks if they feel supported and guided throughout the learning process. A supportive online learning experience, including timely and constructive feedback from the instructors and experiencing meaningful interactions with peers, has motivated students to continue their online learning journey (Rosser-Majors et al., 2022). Facilitating online learning entails leading, encouraging, and supporting student participation in a virtual learning environment to improve learning effectiveness and engagement (Martin et al., 2020b). In the classroom, instructors can promote facilitation by encouraging active learning, successful teamwork (Ku et al., 2013; Tseng et al., 2019), presence during the session, and other practices.

Finally, as students' age increase, they are more likely to express a desire to continue their online learning. The possible explanation is that older students have more life experience and might also have a greater understanding of their educational goals. Thus, older students tend to continue online learning. Few studies that evaluated the difference in continuing intention across age were reported in the literature. However, Almahami and Rub (2011) discovered that age had no impact on students' continuous intent to use e-learning technologies. Future studies should explore more deeply into the connections between demographic parameters like gender, age, class status and how these affect student's intent to stay in online learning. Understanding these factors is important as they can enable educational institutions to provide more personalized support, tailor interventions to address the specific challenges, and design adaptive learning systems based on the individual demographic characteristics and learning behaviors of students, enhancing their chances of persisting.

Implications

The results of the study have significant implications for online programs and instructors. Programs and instructors can contribute to the success of their online learners by evaluating and addressing students' readiness and connectedness for online learning, customizing training, establishing appropriate online learning environment, continuously enhancing course offerings,

and personalizing the learning experience. First, online programs and/or instructors should assess students' level of readiness and help those who might be having problems getting started their online learning. This could include providing additional resources, tutorials, or counseling to address specific challenges. Second, online courses should be designed based on the "universal design for learning" guidelines to meet the needs and capabilities of every student while also removing needless barriers to learning (Tang et al., 2022; Wright et al., 2023). Third, faculty need to foster a positive learning environment in the classroom by providing students with opportunities for collaboration and teamwork as well as by creating a sense of community among them, using a variety of teaching and learning methods, allowing students to interact with each other, and providing students with timely constructive feedback. Finally, by staying up to date with the most recent research and best practices, online programs and instructors should continuously improve the quality of programs and online learning environment. This could entail adopting new pedagogical concepts (Tseng et al., 2024), utilizing technological advancements, and routinely reviewing and evaluating the results of their online learning projects.

Limitations and Future Directions

Future research could investigate how gender intersects with other social identities such as race, ethnicity, and socioeconomic status to identify potential intervention and support areas and contribute to the creation of inclusive, effective online learning environments for all students. It is important to note that the study contains several limitations. This exploratory study is limited by its sample, which is restricted to one university, specifically female students up to the age of 24, and may not be representative of the general population. Additionally, the voluntary nature of the survey led to a low response rate, potentially resulting in self-selection bias and limiting the generalizability of the findings. When comparing gender differences of motivation for learning, the two groups were unequal in terms of sample size. As a result, the finding may be less capable of detecting genuine impacts or differences and should be carefully considered. Moreover, the relationships among these factors are complex and interrelated. For example, a student with high self-directed learning skills may be more motivated to engage in online learning, and their motivation can further boost their intention to continue. Similarly, students with strong computer/internet self-efficacy may feel more in control of their learning, which can enhance their motivation. These factors are not isolated but work together to influence students' continuous intention to participate in online learning. Educators and institutions can enhance online learning experiences by fostering these skills and promoting a supportive online learning environment, which can positively impact students' intentions to persist in online courses.

Conclusion

The purpose of this study was to investigate how student readiness and connectedness affect online learning continuation intention. The results of this analysis suggest that online learning readiness and connectedness are indicators of online learning persistence. Factors such as age, computer/internet self-efficacy, self-directed learning, learner control, and facilitation influence students' intention to continue with online learning. Gender may play a role in influencing online learning readiness, and it would be beneficial to conduct additional research to determine the underlying causes of these differences. Gender should be considered in online

learning readiness when designing effective interventions for online learning. These findings have significant implications for online learning design and implementation, emphasizing the significance of fostering students' self-efficacy, motivation, and social connectivity to encourage their continuing engagement and success in online learning.

Declarations

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Appendix 1

Online Learning Readiness (OLR)
Computer/Internet self-efficacy
1. I feel confident in performing the basic functions of Microsoft Office programs (MS Word, MS Excel, and MS PowerPoint).
2. I feel confident in my knowledge and skills of how to manage software for online learning.
3. I feel confident in using the Internet (Google, Yahoo) to find or gather information for online learning.

Self-directed learning
1. I carry out my own study plan.
2. I seek assistance when facing learning problems.
3. I manage time well.
4. I set up my learning goals
5. I have higher expectations for my learning performance.

Learner control (in an online context)
1. I can direct my own learning progress.
2. I am not distracted by other online activities when learning online (instant messages, Internet surfing).
3. I repeated the online instructional materials on the basis of my needs.

Motivation for learning (in an online context)
1. I am open to new ideas.
2. I have motivation to learn.
3. I improve from my mistakes.
4. I like to share my ideas with others.

Online communication self-efficacy
1. I feel confident in using online tools (email, discussion) to effectively communicate with others.
2. I feel confident in expressing myself (emotions and humor) through text.
3. I feel confident in posting questions in online discussions.

Online Student Connectedness (OSC)
Comfort
1. If I need to, I will ask for help from my classmates.
2. I feel comfortable expressing my opinions and feelings in online courses.
3. I feel comfortable introducing myself in online courses.
4. I can effectively communicate in online courses.
5. I feel comfortable asking other students in online courses for help.
6. I have no difficulties with expressing my thoughts in my online courses.
7. I feel my instructors have created a safe online environment in which I can freely express myself.
8. I feel comfortable in the online learning environment provided by my program.

Community

1. I feel emotionally attached to other students in my online courses.
2. I spend a lot of time with my online course peers.
3. My peers have gotten to know me quite well in my online courses.
4. I feel that students in my online courses depend on me.
5. I can easily make acquaintances in my online courses.
6. I have gotten to know some of the faculty members and classmates well.

Facilitation
1. Instructors integrate collaboration tools (e.g., chat rooms, wikis, and group areas) into online course activities.
2. In my online courses, instructors promote interaction between learners.
3. Instructors promote collaboration between students in my online courses.
4. My online instructors are responsive to my questions.
5. I receive frequent feedback from my online instructors.
6. My instructors participate in online discussions.

Interaction and Collaboration
1. I relate my work to others' work in my online courses.
2. I discuss my ideas with other students in my online courses.
3. I collaborate with other students in my online courses.
4. I work with others in my online courses.
5. I share information with other students in my online courses.

Online Learning Continuance Intention (OLCI)
1. I intend to continue taking online learning courses in the future.
2. I will continue taking online learning courses in the future.
3. I will strongly recommend online learning courses for others to take them.
4. I will keep taking online learning courses as regularly as I do now