Relationships between Connectedness, Performance Proficiency, Satisfaction, and Online Learning Continuance

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Abstract
Maintaining momentum is vital in terms of how soon students can complete a program, especially for those who are in the early stage of taking online courses. This study attempted to extend the existing literature by examining the influence of online students' perceived sense of connectedness, performance proficiency, and satisfaction on their intentions to continue an online learning course. A quantitative survey approach was adopted to test our hypothesized structural model. Three hundred and sixty-nine students who had taken fewer than three fully online courses participated in this study. The results revealed that three out of four testing hypotheses were all supported at the 0.01 significance level, and one of the path coefficients indicated that online students' confidence in their ability or competency to perform academic tasks did not directly influence their intention to take future online courses. Instead, the influence of performance proficiency on online learning continuance intention was mediated through the factor of satisfaction. In addition, satisfaction was found to have a significantly direct impact on online learning continuance intention, suggesting that when students taking online courses are satisfied with their online learning experience, the likelihood for them to continue taking other online courses is higher.

Keywords: Online learning continuance intention; online student connectedness; performance proficiency; satisfaction

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Online learning continues to grow regardless of disciplines, educational levels, public or private institutions, etc., and more efforts have been dedicated to ensuring the quality of online courses and programs over the last decade across the United States. With more than 6.3 million higher education students in the United States who have taken at least one online course in 2016, representing 31.6% of all students (Seaman et al., 2018), growing concerns and challenges are emerging. Low retention rates in online courses and low persistence rates in online programs are two serious problems. Learners benefit from the flexibility and convenience of technology-enhanced online learning environments; however, at the same time, students could possibly feel that they are isolated from the learning community due to lack of communication and interaction. This becomes an obstacle for their successful learning. Students may withdraw from online courses at any time for a variety of reasons and at any level of their learning process (Bawa, 2016).

Academic momentum was included in educational research as a perspective on university achievement in explaining degree completion and non-completion (Adelman, 2006; Attewell et al., 2012; Zhang, 2019). Martin et al. (2013) noted that initial academic course load and progress and early achievement were strongly associated with degree completion. Furthermore, their study findings indicated that prior knowledge and experience and ongoing study experiences have an effect on academic momentum. Due to this aspect, students' continuance usage intention of online learning environments and/or continuance intention toward e-learning system have been thoroughly discussed and studied over the past two decades (Abdullatif & Velázquez-Iturbide, 2020; Dağhan & Akkoyunlu, 2016; Panigrahi et al., 2018). According to Lin (2012), the continuance intention of using information system (IS) is defined as "the continued usage of IS by adopters, where a continuance decision follows an initial acceptance decision" (p. 500). Prior studies on e-learning continuance intention emphasized investigating online student's adoption/performance expectation (Uğur & Turan, 2018), perceived value (Chiu et al., 2005; Dağhan & Akkoyunlu, 2016), and perceived usability (Al-Fraihat et al., 2020; Al-Samarraie et al., 2018; Lew et al., 2019) towards online learning services/programs. These factors are also principal indicators for online learning success and continuance in higher education (McGill et al., 2014). However, these studies have ignored the direct or indirect effect of online students' learning experience, learning satisfaction, and their feelings regarding sense of learning community on their online learning continuance intention (OLCI). It is also essential to indicate what dynamic components of online learning experiences can have an impact on students' learning satisfaction. Little evidence has been drawn from investigating students' OLCI in the aspects of their perceived quality of the online learning experience and learning community, but understanding this intention is pivotal to the consistent improvement of active and learner-oriented online instructions.

In terms of online courses and programs, it is essential to ensure their quality and effectiveness; thus, online students can have better learning experiences and therefore are likely to enroll in more online courses in subsequent semesters. Trespalacios and Lowenthal (2019) conducted a program evaluation study that investigated graduates' perceptions and what they like and dislike about their coursework in a fully online educational technology program. Their research included students' learning satisfaction and sense of community as two fundamental indicators of program outcomes and graduates' perceptions regarding program quality. The

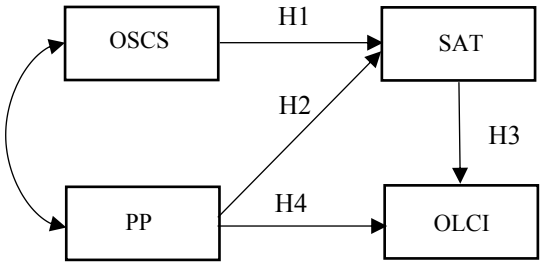
findings concluded that students' satisfaction is an essential element for students to remain in online programs; in addition, students enjoy hands-on courses involving constructive learning activities and thus, they can experience quality interactions and sense of community.

A sense of community plays a critical role in the success of online learning and course completion (Shea et al., 2005). According to Hart (2012), online students who perceive a strong social presence and a sense of connectedness will be the ones who are interactively involved and persistent in their learning. This is because students with stronger senses of connectedness can experience quality engagement that can foster their higher levels of thinking and they "tend to possess greater perceived levels of cognitive learning" (Rovai, 2002b, p. 330).

Satisfaction (SAT) is another factor that has been used extensively in educational studies for explaining students' perceived learning experience (Eom & Ashill, 2016; Kuo et al., 2013; Weidlich & Bastiaens, 2018), persistence (Bornschlegl & Cashman, 2018; Joo et al., 2013; Lee & Choi, 2013; Yang et al., 2017) and success (Yang et al., 2017). Moreover, it is found to be an agent for online learning acceptance (Lin et al., 2016) and an important element that has a positive association with persistence in online learning contexts (Joo et al., 2013; Lee & Choi, 2013). In the present study, satisfaction is defined as "Students are pleased with their experiences in learning online" (Moore, 2005, p. 4).

Momentum of persistently taking courses is vital in terms of how soon students can complete a program. Chiu et al. (2005) stated that users' acceptance/adoption after their initial use of e-learning service is the important determinant of their e-learning success that will further lead to an extension of the continuance intention in using e-learning services for longer terms. Thus, indicating the factors associated with successful course or program completion is essential, especially for students who are in the early stage of taking online courses. In this respect, this study attempted to extend the existing literature by examining the influence of online students' perceived sense of connectedness (OSCS), performance proficiency (PP), and satisfaction (SAT) on their online learning continuance intention (OLCI). A structural model (see Figure 1) that integrated the aforementioned factors was proposed and tested in order to elucidate the relationships among these variables.

Figure 1
Hypothetical Relationships



Theoretical Foundation and Hypotheses Development

Online Student Connectedness

Hagerty et al. (1993) defined the occurrence of connectedness as "… when a person is actively involved with another person, object, group, or environment, and that involvement promotes a sense of comfort, well-being, and anxiety-reduction" (p. 293). A sense of community or connectedness in an online context is vital for students to perceive feelings of "cohesion,

spirit, trust, and interdependence" (Rovai, 2002a, p. 206) and students would possess shared expectations and commit to shared learning goals. Contrarily, when there is a lack of sense of connectedness among peers in an online course, students can have less motivation in participating in the knowledge sharing process (Ergün & Avcı, 2018) and would have limited opportunities for help-seeking (Kizilcec et al., 2017). Moreover, lack of connectedness is a contributing factor that hinders student persistence, which can diminish a student's motivation in learning. Students with a lower level of sense of belonging in an online course tend to disconnect themselves from interacting and engaging with peers, especially for students who are in their early stage as online learners. For the purpose of better understanding and measuring overall levels of online students' connectedness, Bolliger and Inan (2012) developed and validated the Online Student Connectedness Survey (OSCS). They defined connectedness as "the sense of belonging and acceptance. It refers to a person's belief that a relationship exists between him or her and at least one other individual" (Bolliger & Inan, 2012, p. 43). The survey consists of four subscales: comfort, community, facilitation, and interaction and collaboration.

Online Student Connectedness, Performance Proficiency, and Satisfaction

According to Rovai (2002b), a sense of community is fundamental for students to build inter-relationships and to sustain their positive learning experience, that will lead them to "possess greater perceived levels of cognitive learning" (p. 330). One of the most consistent findings within the connectedness literature is the end result of students' improved engagement and persistence in learning/academic achievement (Maddrell et al., 2017; Martin & Bolliger, 2018). When online students feel connected with instructors/facilitators and peers in the learning community, they are more likely to communicate openly and interact effectively, which encourages them to engage in cognitive and higher-order learning (Redmond et al., 2018). These behaviors will then lead to higher satisfaction, which in turn is associated with persistence and continuance intention. In addition, a learning community can facilitate meaningful and positive collaboration that will improve students' proficiency (Wu et al., 2017). One of the benefits of online learning is that students can communicate and ask for feedback from instructor/peers asynchronously using computer-mediated interactive tools. In this co-learning environment, it is important for students to enhance their interrelationships with peers and interactively exchange knowledge. Those who are socially accepted and supported by others may achieve higher performance proficiency (Ainin et al., 2015).

Empirical evidence from previous research suggested the notion that connectedness had positive influences on students' learning satisfaction (Abedine et al., 2010). Precisely, students in an online learning environment who feel a strong sense of connectedness are more likely to perceive positive learning satisfaction (Reinhart, 2010). Moreover, the correlational results from LaBarbera's (2013) study indicated that there was a positive and significant relationship between perceived connectedness and overall satisfaction with the course (r = .575, p =.01). Thus, we proposed the following hypothesis:

H1. There is a positive and significant relationship between online student connectedness and satisfaction.

In the recent decade, as the paradigm shifts from teacher-centered to learner-centered teaching with the rapid development of information and communications technology (ICT), online learners are responsible for their own learning in such self-directed and autonomous online environments and are required to prepare for proficient computer and internet competency. Since online learning is learner-centered and students are encouraged to learn autonomously, individuals' learning motivation and self-directed learning competencies can

result in higher efficacy beliefs on learning performance. In order to perform well in online learning environments, students must interact with instructor, peers, and content (Kuo et al., 2013) using technology-enhanced tools. For students who are confident about computer/Internet, communication, and self-regulated learning skills, they can concentrate more on their learning and knowledge acquiring process and further to develop desires for learning autonomy. Those attributes in learning play significant roles in determining students' satisfaction (Cidral et al., 2018; Jan, 2015; Kauffman, 2015; Li, 2019). In addition, the more students believe learning via online environment can improve their abilities and performance, the more they feel satisfied with their online learning experience (Wu et al., 2010). Performance proficiency refers to how well an individual can perform the tasks that require him/her to master knowledge, skills, and abilities (Chao et al., 1994; Yu et al., 2010). Students' ability to perform tasks and solve problems may have an impact on students' intention with online learning (Yu et al., 2010). Eom and Ashill (2016) underlay the vital role of the process in online course design which will contribute to producing learning outcomes. The purposeful and the meaningful instructional design process can facilitate instructional discourse, shape constructive knowledge exchanges among students, and affect students' performance proficiency, which in turn affect their affective reactions to online learning satisfaction. More recently, Chu et al. (2021) added that students' perceived learning outcomes contribute heavily to students' satisfaction and is the key to retaining positive learning attitudes.

Zhou (2017) investigated the factors that influenced students' online collaborative learning experiences in massive open online courses (MOOCs) and found that students' performance proficiency had a positive and significant influence on their satisfaction with MOOCs. That is, the more students believed that MOOCs could improve their performance, the higher chances that they were satisfied with MOOCs. Findings from Baber's (2020) cross-country study indicated that students who had higher perceived learning outcome would be more satisfied in their online learning experience. Accordingly, we proposed the following hypothesis:

H2. There is a positive and significant relationship between performance proficiency and satisfaction.

Online Learning Continuance Intention

Students' learning satisfaction has been identified as another perspective of students' perceived learning and learning outcomes. In addition, it has been identified as a predominant factor in association with learning motivation (Seiver & Troja, 2014; Todorova & Karamanska, 2015; Yau et al., 2015), engagement (Hewson, 2018; Pelletier et al., 2017), and online learning success (Al-Samarraie et al., 2018; Goh et al., 2017). Notably, user satisfaction was considered an essential variable and it was often found to have a mediating effect between other continuation factors (such as confirmation, perceived usefulness, flow experience, human-computer interaction, and service quality) and user intention on system continuous usage. In the online learning context, findings from Al-Samarraie et al.'s (2018), Chen et al.'s (2018) and Zhou's (2017) studies revealed that satisfaction is strongly linked with online learning continuance intention. For instance, Alraimi et al. (2015) studied factors that enhanced users' intention to continue using MOOCs and the findings revealed that user satisfaction ($\beta = .0179$, $p < 0.05$) was a strong predictor for users' continuance intention in MOOCs. Therefore, the following hypothesis was proposed:

H3. There is a positive and significant relationship between satisfaction and online learning continuance intention.

Zhou (2017) explored factors that influenced students' continuance intention in MOOCs in mainland China. He hypothesized that students' performance proficiency positively influenced their satisfaction with MOOCs. The results indicated that the effect of performance proficiency on students' continuance intention was significant. That is, the more students felt that they were able to gain required knowledge or skills with MOOCs, the higher possibility that they would choose to continue learning with MOOCs in the future. Thus, we proposed the following hypothesis:

H4. There is a positive and significant relationship between performance proficiency and online learning continuance intention.

Methods

Participants

Participants in this study were 369 students who had only taken fewer than three fully online courses in a southern university. Of the participating students, 72.6% (n = 268) were female, and 27.4% (n = 101) were male (see Table 1). Ninety-nine participants (26.8%) were in their junior year and the majority of respondents (n = 110, 29.8%) reported being in the 20–24 age range.

Table 1
Demographic Information of Participants (N = 369)

Gender	
Female	268 (72.6%)
Male	101 (27.4%)
Age	
Under 20	96 (26.0%)
20-24	110 (29.8%)
25-29	49 (13.3%)
30-39	55 (14.9%)
40-49	45 (12.2%)
Over 50	14 (3.8%)
Class Level	
Freshman	86 (23.3%)
Sophomore	92 (24.9%)
Junior	99 (26.8%)
Senior	32 (8.7%)
Graduate Students	60 (16.3%)

Instrument and Procedure

The researchers adopted a quantitative survey approach to test the hypotheses. Data collection was carried out via EvaluationKit (an online course evaluation solution that has been implemented in the university) three weeks prior to the final week. Participants were invited to complete the following four surveys.

Online Student Connectedness Survey (OSCS)

This 25-item (5-point Likert scale) instrument was developed and validated by Bolliger and Inan (2012) to measure perceptions of connectedness of students enrolled in online programs

in higher education. To assess the internal consistency of each set of scale and subscale, Cronbach's alpha (α) is used. The OSCS consists of four subscales: (a) comfort:8 items; for example, "I feel comfortable asking other students in online courses for help"; α = .944; (b) community:6 items; for example, "I feel emotionally attached to other students in my online courses"; α = .957; (c) facilitation:6 items; for example, "Instructors promote collaboration between students in my online courses"; α = .903; (d) interaction and collaboration:5 items; for example, "I collaborate with other students in my online courses"; α = .946.

Performance Proficiency (PP)

Performance proficiency was measured by four survey items (5-point Likert scale) that were adopted from Chao et al. (1994). The items are, for example, "I am confident about the adequacy of my academic skills and abilities" and "I have performed academically as well as I anticipated I would." In this study, Cronbach's Alpha of .875 indicated an acceptable internal consistency.

Satisfaction (SAT)

Students' online learning satisfaction was measured by 3 items of a 5-point Likert scale survey (α = .909) developed by the researchers. Three survey items are "The online course(s) that I have taken this semester provided me with a valuable learning experience," "I would advise other students to take online courses," and "After all, my attitude toward online learning is positive."

Online Learning Continuance Intention (OLCI)

This 4-item (5-point Likert scale, α = .957) survey was adopted from Alraimi et al. (2015) and modified to reflect the online learning context. Example survey items are, "I intend to continue taking online learning courses in the future" and "I will keep taking online learning courses as regularly as I do now."

Table 2 summarizes the information of the four instruments used in this study, including number of survey items, reliability of surveys, and results of descriptive statistics (mean and standard deviation).

Table 2

Descriptive Statistics and Reliability Information of Each Scale (N = 369)

Constructs	# of items	Cronbach	Mean	SD
Online Student Connectedness (OSCS)	25	.960	3.484	.781
Performance Proficiency (PP)	4	.875	4.280	.596
Satisfaction (SAT)	3	.909	4.080	.888
Online Learning Continuance Intention (OLCI)	4	.957	4.064	.967

In terms of data analysis, a multivariate correlational analysis was performed to test the degree of the relationships between online student connectedness, performance proficiency, and online learning continuance intention of the online students. Next, a path analysis was conducted using IBM SPSS AMOS 24.0 to examine the proposed hypothetical model.

Results

Correlational Findings

Multivariate correlational analysis was performed, and Pearson correlation coefficients were calculated to investigate the relationships between Performance Proficiency, Satisfaction, and four subscales in online student connectedness. First, the results of the descriptive analysis indicated that Comfort had the highest mean score ($M = 4.06$, $SD = .69$) among four *OSCS* subscales. In contrast, students reported the lowest means score ($M = 2.80$, $SD = 1.16$) on *Community* (see Table 3). The results also revealed that all tested variables are correlated with each other significantly with Pearson correlation coefficients(r) ranging from $r = .17$ *to* $r = .77$ ($p < .01$).

The results revealed that the Performance Proficiency (PP) had the strongest correlation with online students' Satisfaction ($r = .60$, $p < .01$). Moreover, in terms of four *OSCS* subscales, Comfort and *Facilitation* had strong correlations with PP ($r = .59$ and $r = .46$, respectively) and Satisfaction ($r = .49$ and $r = .50$, respectively). Contrarily, weak correlations are found between Community, Interaction and Collaboration, Performance Proficiency, and Satisfaction ranging from $r = .17$ *to* $r = .22$.

Table 3

Intercorrelations of Online Students' Performance Proficiency, Satisfaction, and Four OSCS Subscales

Variable	1	2	3	4	5	6	Mean	SD
1. PP	—	.60**	.59**	.18**	.49**	.22**	4.06	.97
2. SAT		—	.46**	.17**	.50**	.22**	4.28	.60
3. CFT			—	.42**	.64**	.46**	4.06	.69
4. COM				—	.62**	.77**	2.80	1.16
5. FAC					—	.64**	3.74	.86
6. INT						—	3.09	1.16

Note. $N = 369$, ** $p < .01$

Abbreviations: PP, Performance Proficiency; SAT, Satisfaction; CFT, Comfort; COM, Community; FAC, Facilitation; INT, Interaction and Collaboration.

Goodness of Fit Indices of the Research Model

Path model fit tests were done in AMOS and the results of the path analysis indicated good model fit χ^2 (1, $N = 369$) = 1.387, $p > .05$, and the χ^2/df ratio is 1.387; RMSEA = .032, NFI = .998, NFI= .998, NNFI = .997, CFI = .999, GFI = .998, AGFI = .959 (Hu & Bentler, 1999) as shown in Table 4.

Table 4
Goodness of Fit Indices of the Research Model

Fit Index	Criteria for acceptable fit	Model Value
χ^2/df	$0 \leq \chi^2/df \leq 3$	1.387
RMSEA	$0 \leq RMSEA \leq 0.08$	0.032
NFI	$0.90 \leq NFI \leq 1.00$	0.998
NNFI	$0.90 \leq NNFI \leq 1.00$	0.997
CFI	$0.90 \leq CFI \leq 1.00$	0.999
GFI	$0.90 \leq GFI \leq 1.00$	0.998
AGFI	$0.90 \leq AGFI \leq 1.00$	0.981

The Final Structural Model

The final form of the path model is presented in Fig. 2 with results of four path coefficients and percentages of the variances in explaining two endogenous variables (satisfaction and online learning continuance intention). Except for H4 (PP → OLCI, $\beta = .035$, $p > 0.05$), all other three testing hypotheses were supported at the 0.01 significance level (See Table 5 for more details). Furthermore, the path connecting OSCS and Performance Proficiency appears to be a strong and significant correlation indicated by the result ($\beta = .425$, $p < 0.01$).

In terms of online students' satisfaction, the path coefficients indicated median and significant correlations with online student Connectedness ($\beta = .162$, $p < 0.01$) and Performance Proficiency ($\beta = .530$, $p < 0.01$). In addition, of the variance seen in the Satisfaction, 38% ($R^2 = .38$) is explained by these two exogenous variables.

In terms of online learning continuance intention, the path coefficient indicated median and significant correlation with satisfaction ($\beta = .836$, $p < 0.01$). However, no significant relationship was found between Performance Proficiency and Online Learning Continuance Intention ($\beta = .035$, $p = .30$). In addition, of the variance seen in the Online Learning Continuance Intention, 73% ($R^2 = .73$) was explained by Satisfaction and Performance Proficiency.

Figure 2
Final Form of the Path Model

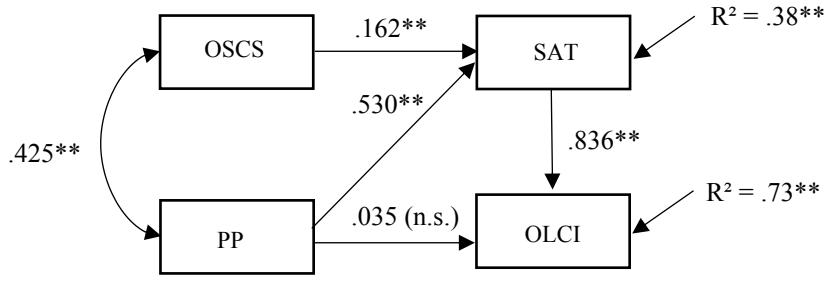


Table 5
Standardized Path Coefficients

Hypothesis	Path	Path Coefficient	Supported?
H1	OSCS → SAT	.162**	Supported
H2	PP → SAT	.530**	Supported
H3	SAT→ OLCI	.836**	Supported
H4	PP → OLCI	.053	Not supported

Note. ** $p < .01$

Discussion and Implications

In this study, we examined the relationships among online student connectedness, performance proficiency, satisfaction, and online learning continuance intention. Based on the multivariate correlational analysis, positive correlations were found between performance proficiency, satisfaction, and four subscales of online student connectedness. Online students' perceived performance proficiency and satisfaction of online learning were positively related to their intention to continue with online learning.

According to the path analysis performed in this study, the results of this study support most of our hypotheses. Online student connectedness was found to have a significant impact on students' satisfaction with online learning. Online students who possessed more of the sense of community experienced more interaction and collaboration with peers and the instructor, which resulted in more satisfied and meaningful online learning experiences. This result supports the suggestion of previous researchers that students need to be socially and academically integrated in distance learning environments to achieve meaningful learning experiences (Kanuka & Jugdev, 2006; McClannon et al., 2018; Shin, 2003). Feeling connected to peers and others is important for online students to perceive trust and interdependence (Rovai, 2002a) and to develop higher-order thinking in reflective practice learning (Demmans Epp et al., 2017; Tang & Lam, 2014) that will lead students to be more persistent in their learning. The path analysis also supports the hypothesis that the positive effect of performance proficiency on satisfaction of online students. That is, online students who perceive better of their proficiency are more likely to have a satisfied online learning experience. Students' confidence in applying the skills or abilities to perform academic related tasks is critical to satisfaction in online learning (Kuo et al., 2013).

As indicated in the study of Yu et al. (2010) and Wu et al. (2017), performance proficiency plays an important role in students' online learning or online social networking experiences. However, performance proficiency did not have a significantly direct impact on online learning continuance intention in the proposed path model of this study. This result indicates that online students' confidence in their ability or competency to perform academic tasks does not directly influence their intention to take future online courses. Instead, the influence of performance proficiency on online learning continuance intention is mediated through the factor of satisfaction.

Satisfaction was found to have a significantly direct impact on online learning continuance intention, which supports our hypothesis in this study. When students who take online courses are satisfied with their online learning experience; chances are higher for them to continue taking other online courses, as well as for them to remain in online programs

(Trespalacios & Lowenthal, 2019). Despite the sense of connectedness, building initial caring and supportive relationships between students and instructors would facilitate a more open and harmonious learning climate. This will potentially prevent students from having learning anxiety and alleviate their negative emotions (Jiang & Koo, 2020) that can further have influence on student satisfaction. As indicated in many previous studies, satisfaction was found to have a positive correlation with continuance intention in e-learning or online learning settings (Alraimi et al., 2015; Guo et al., 2016; Lin, 2012; Zhou, 2017). In addition, the significant and direct impact of satisfaction on continuance intention in online learning, which has been demonstrated in previous studies (Chen et al., 2018; Lin, 2012; Zhou, 2017), was further confirmed by this study. Dai et al. (2020) pointed out that satisfaction is an emotional response to a usage experience and is past-orientated. As the sample in this study were students who had taken fewer than three fully online courses and had limited prior learning experience, "satisfaction" plays a dominant role in predicting continuance intention. The serial and strong links among online student connectedness, satisfaction, and continuance intention are pivotal messages to instructors and institutional administrators; they must be prudent to integrate interactive teaching strategies that can facilitate online learning community, and to continue evaluating and ensuring course quality to maintain students' high levels of learning satisfaction.

Implications and Recommendations

The COVID-19 pandemic has forced educational institutions to make and support emergency transition to online learning contexts (Cortes, 2020; Essa et al., 2020; Henriksen et al., 2020). This rapid change in the unexpected transition also brings the challenges to students in their learning, especially for those who have limited online learning experiences, those who least prefer online learning, or those who are not ready to learn in a self-regulated online learning environment. Although this study was not conducted during the COVID-19 pandemic, the participants of this study had taken fewer than three fully online courses. Thus, the research findings bring practical values and implications in terms of examining a structured model that consists of vital factors in students' online learning continuance intention. First, this study contributes to the body of research on online learning connectedness and extends the existing literature by providing evidence regarding the relationships between online students' perceived sense of connectedness, performance proficiency, and satisfaction on their online learning continuance intention.

Next, the results of the study emphasize the importance of keeping students satisfied with online learning and to further enhance their intention to continue to take online classes. Online learning has been around for a while and it is even more popular now because of all the remote teaching/learning due to the COVID-19 pandemic. The possible "new normal" might lead to more requests for offering online classes in higher education institutions. This makes it more important for instructors to utilize appropriate teaching strategies to help students achieve learning outcomes and continue to take online classes. Units that support instructional technologies and pedagogies are encouraged to consistently assist faculty to complete a certification course in preparation for them to teach online courses (Gurley, 2018) and provide trainings that help them learn and implement innovative ways of active teaching. Furthermore, we recommend that instructors create an online learning environment that facilitates learning community and connects students to satisfactory online learning experiences through the following ways: a) develop initial course activities (e.g., ice-breaking activity, concept mapping, goals setting) to encourage the development of trust; b) provide a learning environment where students feel comfortable asking questions and interacting with their peers and the instructor; c)

design activities for open communication and trust; use peer review for relationship building and knowledge sharing; d) promote online interaction and collaboration through activities/group projects/discussion; e) use authentic content and process scaffolds to support discourse behaviors; f) include streaming video clips to effectively demonstrate procedures and help students visualize concepts; g) provide constructive feedback and positively encourage students to increase their confidence; and h) make the class a learning community where students have trust in one another and the instructor.

Conclusion

The findings of this study suggest that students are more satisfied when they perceive they are learning, and they are more likely to learn when they are satisfied with their learning experiences. Those contribute to students' persistence in online programs (Yang et al., 2017). We believe students will continue to take online classes when they are satisfied with their learning experiences and feel connected with peers in an active and collaborative online learning environment. The four subscales (comfort, community, facilitation, interaction/collaboration) of Online Student Connectedness Survey are correlated to one another, and they all are also correlated to students' satisfaction though in different degree (ranging from $r = .17$ *to* $r = .50$). With those four factors in mind, instructors could build an online learning environment that fosters learning communities and brings satisfactory online learning experiences to students, thus strengthening student intention to continue to take online classes.

While most of the hypotheses in the study are supported by the data and analysis, we have identified some limitations of the study. In this study, participants' prior online learning experiences might have had some impact on their responses to the survey. The survey was sent out three weeks prior to finals week and online students would not be able to respond to the survey based on their complete experience of taking one online class, even before they knew their grades. Also, the participants were from different courses taught by different instructors. Different instructors had different ways of teaching online classes, which might have had an impact on the survey responses. For future investigation, researchers could consider two separate groups: first-time online students and repeat online students. Also, researchers could use participants from same or similar fields and same instructor for several semesters. In addition, the relationships of performance proficiency and online learning continuance intention could be tested again using the data collected from the suggested participants above because of the lack of studies in this area. Of course, in addition to those the current study investigated, there are many other factors that impact the relationships and dynamics of connectedness, performance proficiency, satisfaction, online learning continuance intention in online learning. Those factors, though not covered in the current study, can be topics for future studies.

Declarations

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