

STUDENT PERSISTENCE IN ONLINE LEARNING: A LITERATURE REVIEW

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Abstract: The advantages of online learning have allowed learners to join courses that help them conveniently improve their knowledge and skills. One of the challenges facing online programs, however, is to retain students and address the issue of high dropout rates. This article reviews literature to determine factors influencing student persistence in online programs and explores solutions to reduce attrition rates. Ninety articles in peer-reviewed journals published between 2000 and 2022 were examined and included in the literature. The selection criteria consist of topic relevance, studies having empirical data and year of publication. Additional procedures involve searching databases, screening abstracts, analyzing full texts, and synthesizing. Factors contributing to student persistence in online learning include internal factors (i.e. motivation, satisfaction, and self-efficacy), external factors (i.e. financial aid, peer and family support), and student skills (i.e. time management and self-regulation skills). Several viable solutions are providing orientation programs, creating collaborative learning environments and enhancing faculty support. This critical review creates a foundation for further research on the issue of student retention in online programs.

Keywords: online learning, persistence, retention, attrition

1. Introduction

Online learning has created educational opportunities for students with ranging academic needs. Using a variety of platforms, online learning has now been incorporated into the curriculum of most schools and universities. Indeed, nowadays the growth of online programs can be found in every aspect of a student's academic career, from pre-enrolment to post-graduate (Floyd & Casey-Powell, 2004). Some of the commonly cited advantages include unrestricted access to study resources before exams, accommodation of various learning preferences, and scheduling flexibility (Butler, 2010). Additionally, students have an increased possibility to engage in the learning process or interact with their classmates when they attend classes online (Kuo et al., 2013). The emergence of online learning, however, also comes with significant challenges. High attrition rates are now a big concern for online educators and a problem for online learning as a whole (Carr, 2000; Clark, 2003).

According to Gaytan (2015), persistence is correlated with an institution's reputation, financial standing, program stability, and capacity to maintain degree programs. Despite the prevalence of online learning, attrition is a problem that many educational institutions have to

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confront. Research has shown that online courses often have lower retention rates than traditional face-to-face settings (Liu, Gomez, & Yen, 2007; Herbert, 2006; Holder, 2007). Terry (2007) found that the attrition rates on campuses and in blended learning, which were respectively 3.83% and 4.04%, were considerably lower than the online rate of 7.69%. Furthermore, dropout rates in online classes can be up to 10-20% higher than face-to-face courses (Harris & Parrish, 2006; Xu & Jaggars, 2013).

On the basis of the aforementioned rationales, it is necessary to improve retention in online learning (Lee & Choi, 2011; Wuellner, 2013). The current literature review synthesizes the various factors influencing student persistence, as well as explores strategies and solutions to address the issue of attrition. The review's findings are very pertinent to studies addressing the issue of student persistence in online learning environments. The findings are also expected to contribute to the existing literature on online student persistence by providing an integrative summary of results based on a proposed model. The authors hope to encourage other researchers to reflect on the results and look into new research directions. The categorization provided in this review may inspire further study on the interplay among the various factors within and between the categories. The following research questions were formulated to guide this review:

1. What are the factors contributing to student persistence in online learning?
2. What strategies are recommended for increasing student retention in online learning?

2. Definitions of Terms

Online learning

What exactly constitutes online learning is still up for debate among practitioners and researchers. Given the inconsistency of definitions, online learning described in this review is a form of distance education made feasible by technological devices used by isolated learners in their own settings away from the main education source (Hartnett, 2016).

Persistence

According to Martinez (2003), persistence relates to “the act of continuing toward an educational goal” (p. 3).

3. Influential Models of Student Persistence in Online Learning

Several scholars have made prominent contributions by putting forth models to explain why students drop out. These theories and theoretical frameworks have guided subsequent studies on student persistence and attrition. Tinto (1975) developed the Student Integration Model (SIM), which highlighted the importance of student engagement and the equal responsibility shared by both individuals and institutions. The model emphasizes student-related factors (such as family background, personal characteristics, and pre-college education) and institutional factors (such as peer interactions, faculty interactions, and social integration). This model, however, does not have contributing values to the online learning environments as it is only applicable to traditional on-campus students (Ashar & Skenes, 1993; Rovai, 2003).

Bean and Metzner (1985) created the Student Attrition Mode (SAM) for nontraditional students in response to Tinto's SIM's limitations. Five variables that affect students' decisions to drop out were included in the model. The three predictor variables consist of student background, academic variables, and environmental variables; and two outcomes that can affect attrition include academic and psychological outcomes. In this model, the role of external

factors is emphasized. However, due to the substantial differences between the definitions of nontraditional students and distance learners, SAM is unlikely to be applied to distance learners (Kember, 1989).

Both SIM and SAM are for on-campus students whose characteristics are different from online learners. Kember (1989), therefore, developed a longitudinal process design which is specifically tailored to conditions in which learning takes place at a distance. Kember assumed that distance education learners were working adults with families. The model emphasizes the intricate relationships between variables like family, motivation, and capacity to finish school, as well as previous achievements, educational experiences, and institutional support. Building on Tinto's (1975) SIM and Bean and Metzner's (1985) SAM, Rovai (2003) suggested a Composite Persistence Model (CPM) that can be used for distance education students. In this model, the relevant variables before admission are distinguished from the relevant factors after admission. Three groups of variables are pre-entry factors (e.g. student characteristics and student skills), internal factors (e.g. social integration, and satisfaction), and external factors (e.g. finances and family factors). CPM has been widely used in recent studies on online dropout (Packham, Jones, Miller, & Thomas, 2004; Lee, Choi, & Kim, 2013). Rovai's model is adopted as the analysis framework for this review as it is the most up-to-date and helps disclose some of the factors that affect student persistence in online environments.

4. Methods

4.1. Selection Criteria

The criteria used to select the appropriate articles include topic relevance, empirical studies and publication time. To be specific, the eligible research must (a) discuss online learning and issues related to student persistence; (b) include theoretical/conceptual contributions, empirical data or data from experimentations; (c) appear in peer-reviewed, academic journals published after 2000.

4.2. Search Methods

The search was initially performed on relevant and popular databases such as ERIC (n=25), JSTOR (n=30), and ProQuest (n=18). Keywords used include: 'online learning', 'online courses', 'strategies', 'persistence', 'retention', 'attrition', 'withdrawal' and 'dropout'. 73 articles were retrieved in the first searching phase. To increase the number, the search was then done on Google Scholar using the same keywords, yielding 127 articles. Additionally, academic journals that were known to produce high-impact research articles on online learning, such as Distance Education, Computers & Education, Journal of Computer Assisted Learning, American Journal of Distance Education, and The Internet and Higher Education, were specially examined.

4.3. Search Outcomes

A total of 200 articles were identified for review. They were first scanned for eligibility by year of publication in peer-reviewed journals, leaving 156 articles. The articles then underwent a screening phase which was performed by reading titles and abstracts. Articles found to be inappropriate or not meeting the selection criteria were excluded, leaving 90 articles for the analysis phase.

4.4. Analysis Phase

All the relevant articles that can address the research questions were analyzed through full-text reading over the course of one and a half months. The following factors were examined: the theoretical frameworks which form the background for this review, student characteristics affecting persistence, student skills affecting persistence, internal factors, and external factors, as well as recommended strategies and recommendations for future research. Of the 90 articles that were chosen, 72 reported on empirical data and 18 on conceptual contributions. The majority of the empirical articles studied factors affecting learner persistence in online environments using quantitative methods. The conceptual publications were mostly concerned with strategies suggested for improving retention in online learning. The articles were published in the domains of Business, Education, Nursing and Engineering. Most of the reviewed studies were conducted in the US and some other countries. Table 1 presents a quantitative description of the reviewed articles.

Table 1

Quantitative Data Description of the Reviewed Articles

Variables	Details	Number of publications
Type of publication	Empirical	72
	Conceptual	18
Type of analysis	Quantitative	59
	Qualitative	10
	Mixed	3
	Others	18
Domain	Business	25
	Education	57
	Nursing	2
	Engineering	2
	Others	4
Country of study	USA	76
	Australia	3
	UK	2
	China	2
	Korea	3
	Others	4

5. Results

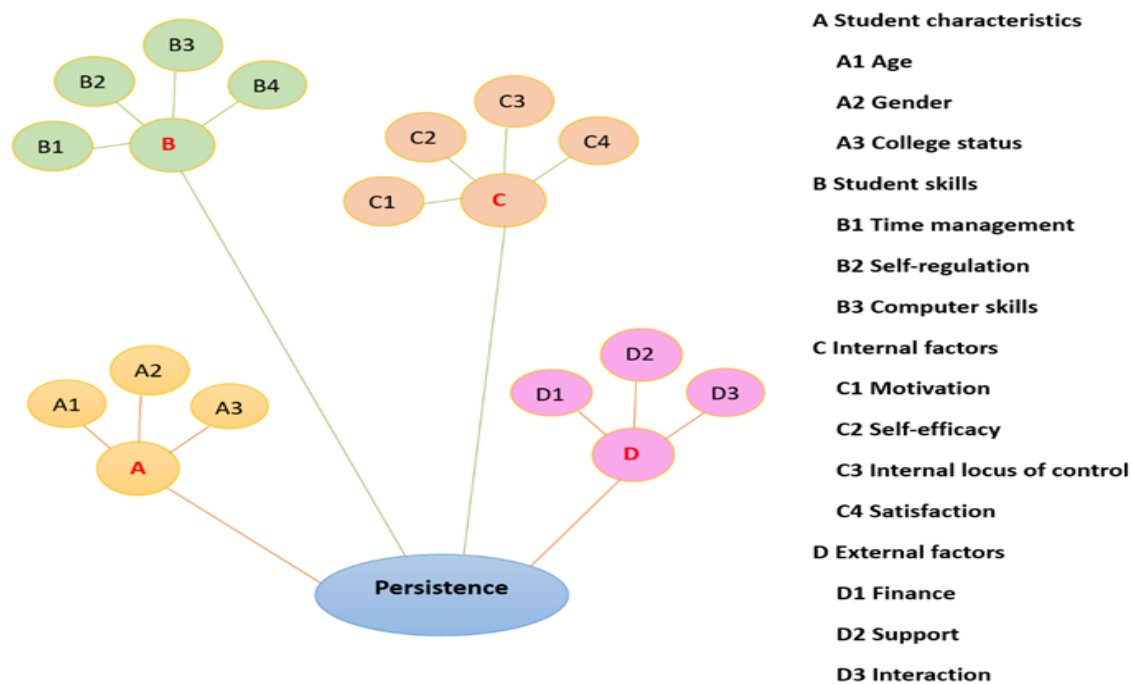
From the comprehensive analysis of 90 peer-reviewed articles, we have drawn several important findings on two main categories in accordance with the two research questions: (a) Factors affecting online student persistence and (b) Suggested strategies for improving student retention.

5.1. Factors Affecting Online Student Persistence

Based on Rovai's model, which comprises four factors including (A) learner characteristics, (B) student skills, (C) internal factors and (D) external factors, a summary of earlier studies is provided below.

Figure 1

Factors Affecting Online Student Persistence



5.2. Student Characteristics

5.2.1. Demographic Variables

Research on demographic variables affecting persistence has yielded mixed results. According to some researchers, there is no noteworthy difference in the age of students who drop out from online courses (Levy, 2007; Tello, 2007; Willging & Johnson, 2009), while others noted age as one of the most frequently cited factors relating to persistence. James, Swan, and Daston (2016) found that the persistence rate is higher among older online students than younger ones. This finds support in the claim that older students perform better and are more likely to persist (Wladis, Conway & Hachey, 2015). According to Rovai (2001), there are gender-related differences in social interactions and a feeling of community, and this may have an impact on how long students stick with online courses. On the contrary, according to Eliasquevici et al. (2017), gender differences in student retention in online learning environments were not always present. As mixed results were found in studies, Willging and Johnson (2004) claimed that demographic variables cannot be used as a predictor of dropouts.

5.2.2. College Status/Graduating Term

Levy's (2007) study included 108 participants who completed all 18 undergraduate and graduate e-learning courses and 25 dropouts at a large US state institution. The participants responded to a questionnaire on academic locus of control and a survey measuring motivation.

The findings suggest that lower-level college students are more likely to drop out than students at higher levels. According to Levy, students who are just beginning their degree feel less prepared to handle the demands of the classroom. On the other hand, students who have been in the program for an extended period of time might be more driven to finish the course because they have already put a lot of time and effort into it. This finding finds support in the claim that non-seniors were more likely to drop online courses than seniors (Cochran et al., 2014). However, Traver, Volchok, Bidjerano, and Shea (2014) pointed out that the year status could not be used as a precise predictor of retention.

5.3. Student Skills

5.3.1. Time Management

Leeds et al. (2013) asserted that time management can be a predictor of dropout. The decision of a student to drop out of an online course may be influenced by an inaccurate estimate or unrealistic expectation of the time required to finish the assignments. According to Holder (2007), in contrast to non-persisters, students who have good study habits and effective time management skills are more likely to persist. In a study conducted by Stanford-Bowers (2008), 39 participants from ten community colleges in Alabama were selected to answer open-ended questions related to factors contributing to persistence. It was found that administrators, academic staff, and students all agree on the significance of time management in persistence.

5.3.2. Self-regulation

Self-regulated learning (SRL) is regarded as essential to the success of online learning (Dillon & Greene, 2003; Hartley & Bendixen, 2001). Self-regulation is one of the key elements that can affect the academic achievement and persistence of online, nontraditional learners (Stephen, Rockinson-Szapkiw & Dubay, 2020). According to Barnard-Brak, Paton, and Lan (2008), online learners must continuously adapt their behaviors to persist when faced with challenges. These behaviors include goal setting, environment structuring, time management, task strategies, help-seeking, and self-evaluation. In many studies, self-regulation has been considered as correlated with persistence (Gomez, 2013; Lee, Choi, & Kim, 2013; O'Neill & Sai, 2014). According to Lee and Choi (2011), a major factor in the high dropout rates among online students is their inability to self-regulate their learning. Students who dropped out of online courses were found to have substantially lower self-regulation abilities than those who persisted (Lee et al., 2013).

5.3.3. Computer Skills

Bawa (2016) points out that online learners may be accustomed to technology and the digital world; however, this does not imply that they are similarly knowledgeable about e-learning environments or educational technology, which may cause them to drop the course. In distance education courses, computer confidence was found to be a useful means of differentiating successful completions from unsuccessful ones (Osborn, 2001). According to Harrell and Bower (2011), having basic computer skills will improve an online student's persistence, whereas having more advanced computer skills is linked to a rise in withdrawal rates. One possible reason proposed by the authors is Internet distraction, which could cause students with more advanced computer skills to lose concentration on the course content. On the contrary, Dupin-Bryant (2004) claims that improved computer abilities are unrelated to student retention. Further research on the relationship between computer skills and persistence is therefore recommended.

5.4. Internal Factors

5.4.1. Motivation

High attrition rates have led to motivational questions in distance education (Meşe & Sevilen, 2021). Indeed, high attrition and dropout rates have been attributed to lack of motivation (Artino, 2008; Keller, 2008; Muilenburg & Berge, 2005). Gredler (2005) presents the expectancy-value model in which persistence is one of the five achievement-related behaviors influenced by the motivational process. Brophy (2010) defined motivation as ‘a theoretical construct to explain the initiation, direction, intensity, persistence, and quality of behavior, especially goal-directed behavior’ (p.3). Motivation keeps students persistent in finishing online courses (Eliasquevici et al., 2017; Shaw et al., 2016). According to research, motivated students are more apt to be involved in demanding tasks, to show active engagement, and to be more persistent (Schunk et al., 2008). When faced with challenges, students who are more motivated may persist and seek out more challenging tasks (Hartnett & Hartnett, 2016).

5.4.2. Self-efficacy

Self-efficacy is another significant motivational element that influences students' task choices, effort, persistence, and achievement (Brophy, 2010). Research shows that there is a positive correlation between self-efficacy and persistence in online courses (Joo, Lim, & Kim, 2013; Hart, 2012). In Kemp's (2002) study, data were collected from 121 undergraduate online students at a university in Canada. The results indicated that a greater level of self-efficacy will enhance resiliency and have a positive impact on the effort put forth in studies. Similarly, self-efficacy is one of three factors identified by Holder (2007) as differentiating persistent students and non-completers in online environments.

5.4.3. Internal Locus of Control

Research has shown that the internal locus of control is closely related to course completion (Morris, Wu, & Finnegan, 2005). Learning success and determination to continue learning are more likely to occur for students having an internal locus of control (Joo, Joung & Sim, 2011). However, studies have shown mixed results and there has been no consensus on the correlation between internal locus of control and persistence. Academic locus of control was found to be significantly greater among online course participants when comparing those who completed the course and those who dropped out (Lee, Choi, & Kim, 2013). Levy (2007) conducted a study including 18 undergraduate and graduate e-learning courses at a major US state university. Data collected from a sample of 372 completers and 81 dropout students showed that academic locus of control had no impact on the choice of the students to withdraw from the online course.

5.4.4. Satisfaction

Previous studies claimed that dropout and persistence rates in online learning were correlated with students' satisfaction (Arbaugh, 2000; Billings, 2000; Thurmond, Wambach, Connors, & Frey, 2002). A high level of satisfaction may indicate that students are likely to continue their online education (Palmer & Holt, 2009), which contributes to lower attrition rates (Chute, Thompson, & Hancock, 1999). Müller's (2008) conducted a qualitative study with 20 online students at a US college and found that students who are dissatisfied with their teachers or their learning are more likely to have less success than their persistent peers. When compared to students who persevered and finished the online course, those who dropped out of the course reported being less satisfied (Levy, 2007) and participating significantly less, particularly at the

beginning of the semester (Nistor & Neubauer, 2010). Support for this finding can be found in the study of Park and Choi (2009), with results indicating that persistent students rate satisfaction higher than those who drop out.

5.5. External factors

The significance of external factors has been recognized by many researchers, and many suggested frameworks included them as part of their analysis (e.g., Bean & Metzner, 1985; Tinto, 1993; Rovai, 2003; Kember, 1989).

5.5.1. Finance

Considered an additional responsibility, finance was an issue affecting student persistence (Boston et al., 2011). In a study among 857 students at a US university, Qayyum, Zipf, Gungor and Dillon (2019) found that finance was crucial for encouraging online students to continue learning. Students having greater financial needs were more likely to persist if they were given scholarships as financial assistance. The findings imply that financial support may be important in assisting students who are at risk of dropping out to continue their studies.

5.5.2. Support

Emotional support may come from family, friends and peers. According to Park and Choi (2009), persistent students feel that their family and peers are supportive of their academic endeavors, in contrast to non-persistent students who report less support. Holder (2007) concludes that the comfort of understanding they are not alone in the learning process and knowing their friends and family are there to support them were key factors in the students' persistence. In addition, a sense of community within the classroom will greatly aid persistence. Müller (2008) also notes that social connections to peers will encourage students to persist.

Institutional support, including student support services, course orientation programs, and technological support, plays a crucial role in the successful completion of online programs (Heyman, 2010). Institutional support was ranked third among retention-influencing factors by faculty members, whereas students ranked it as the fifth most important element for online learning success (Gaytan, 2015). Students receiving tutoring assistance felt motivated to continue their academic path (Nichols, 2010). However, unlike earlier research suggesting that institutional support was a significant factor in learning persistence (Barefoot, 2004), Joo, Joung and Sim (2011) concluded that learning persistence was not directly influenced by institutional support.

5.5.3. Interaction

Social interactivity (student–student and student–instructor) may lead to a higher chance of online dropouts (Liu, Magjuka, Bonk, & Lee, 2007; Morris, Finnegan, & Wu, 2005; Tello, 2007). In particular, a student's choice to continue in an online course is significantly influenced by the instructor-student interaction in that course (Gaytan, 2015; Heyman, 2010). On the contrary, Grandzol and Grandzol (2010), in a study among 349 online community college students across six colleges, found that there was no positive correlation between student-student interaction and course completion rates.

5.6. Strategies for Improving Student Retention

The strategies suggested in the reviewed articles can be categorized into five groups. These recommendations for improving student retention in online environments are summarized in Table 2.

Table 2*Strategies for Improving Student Retention*

Strategies	Detailed strategies
Early student-focused initiatives	Analyzing student characteristics (Raju & Schumacker, 2015; Colorado & Eberle, 2010; Cochran et al., 2014; Xu & Jaggars, 2011) Offering orientation programs (Eliasquevici et al., 2017; Gaytan, 2015; Wuellner, 2013; Wojciechowski and Palmer, 2005). Organizing supportive activities (Kashif & Shahid, 2021; Li, Luo, Lei, Xu & Chen, 2022; Zheng, Liang, Yang & Tsai, 2016; Chou, 2004)
Student support	Maintaining ongoing communication with students (Clay et al., 2008); Smailes & Gannon-Leary, 2011; Dow, 2008) Technological support (Blau et al., 2016; Eliasquevici et al., 2017; Moore & Greenland, 2017; Nichols, 2010; Ludwig-Hardman and Dunlap, 2003)
Instructor-student interaction	Fostering interaction (Pittenger & Doering, 2010) Feedback (Gaytan, 2015; Heyman, 2010; Shaw et al., 2016; Hosler & Arend, 2012; Shea, Li & Pickett, 2006; Hodges & Cowan, 2012; Sheridan & Kelly, 2010; Muirhead, 2004)
Collaborative learning	Relationships with peers (Hegler, 2004; Smith et al., 2004) Building learning communities (Angelino et al., 2007; Beaulieu & Williams, 2006; Ancar et al., 2006; Reilly & Mcbrearty, 2007; Moallem, 2003)
Faculty training and support	Professional development activities (Blau, Mittal, Schirmer & Ozkan 2017; Gaytan, 2015; Parkes, Gregory, Fletcher, Adlington & Gromik, 2015; Harris, Larrier & Castano-Bishop, 2011)

5.6.1. Early Student-Focused Initiatives

Student-centered initiatives can improve student persistence and retention rates in online students (Brewer & Yucedag-Ozcan, 2013). As aforementioned, student characteristics have been found to be related to persistence. Therefore, it is useful to find and analyze pre-college and beginning-semester data so that students at risk of dropping out can be identified and predicted (Raju & Schumacker, 2015; Colorado & Eberle, 2010). Findings from the analysis can lead to decision-making actions regarding policies, student coaching, resources and procedure for online learning process (Cochran et al., 2014; Xu & Jaggars, 2011). It is also necessary to offer orientation programs that familiarize students with the challenges and particular requirements of online courses. Entrance orientations for learning strategies, self-discipline, time management, and technological skills should also be organized (Eliasquevici et al., 2017; Gaytan, 2015; Wuellner, 2013; Wojciechowski and Palmer, 2005). Furthermore, supportive activities must be arranged to help students develop self-regulation skills (Kashif & Shahid, 2021). In the early stages of online instruction, students should receive the appropriate guidance on self-regulated learning techniques, such as goal-setting and help-seeking (Li et al., 2022). It is recommended that teachers gain a better understanding of their students' online self-

regulation processes and give more appropriate and timely guidance in order to help students become effective online self-regulators (Zheng et.al, 2016). Chou (2004) concurred that learner-centered goals and activities improve the educational process, which is thereby beneficial to the students.

5.6.2. Student Support

It is necessary for institutions to maintain ongoing communication with students so that support can be provided in a timely manner. Activities such as faculty-initiated phone calls (Clay et al., 2008), communication through social media (Smailes & Gannon-Leary, 2011) and live chats (Dow, 2008) are expected to enhance student integration, as well as produce a stronger feeling of community and a lower chance of dropping out of the course. Student support resources may include study skills sessions, technological support and counseling for academic issues (Angelino et al., 2007). Technological support includes an effective course management system and easy access to technological resources (Blau et al., 2016; Eliasquevici et al., 2017). Such activities are believed to accommodate online learners (Moore & Greenland, 2017; Nichols, 2010) and minimize the feeling of isolation and, as a result, improve their relationship with the institution (Ludwig-Hardman and Dunlap, 2003).

5.6.3. Instructor-Student Interaction

It is suggested that instructor-student interaction be maintained on a weekly basis (Pittenger & Doering, 2010). Active instructor-student communication can also be fostered through instant and meaningful feedback (Gaytan, 2015; Heyman, 2010; Shaw et al., 2016). According to Hosler and Arend (2012), student engagement can be enhanced by prompt feedback. Shea, Li, and Pickett (2006) further noted the beneficial effects of teachers' questioning and feedback on students' perceptions of learning and connectedness. In order to create instructor presence, foster student engagement and facilitate higher levels of learning, instructors must be able to give prompt responses to questions and timely feedback on assignments (Hodges & Cowan, 2012; Sheridan & Kelly, 2010). To do this effectively, it is necessary to develop a specific feedback rubric and a carefully designed timeline for feedback (Muirhead, 2004).

5.6.4. Collaborative Learning

There have been a lot of studies on the use of learning communities, where peers can learn from one another and relationships between students can be enhanced (Hegler, 2004; Smith et al., 2004). By giving students a sense of belonging, learning communities can greatly lessen negative emotions of 'physical separation, feeling isolated, lack of support, and disconnection.' (Angelino et al., 2007). Such communities also create comfortable spaces for student cooperation (Beaulieu & Williams, 2006; Ancar et al., 2006) and provide opportunities for learners' self-direction and self-management (Reilly & Mcbrearty, 2007). Moallem (2003) investigated the results of employing a design model to create an online course that was better structured for group learning. In this model, the focus is on problem-solving tasks and fostered communication among group members, which may have a beneficial impact on student interaction in an online course.

5.6.5. Faculty Training and Support

Institutional support for faculty members emerged as a further solution for student retention. Institutions should actively encourage faculty members to take part in professional development activities like workshops and training sessions (Blau et al., 2017; Gaytan, 2015).

Training topics may include theoretical background on retention (Boston et al., 2011), understanding online learners' needs (Harris et al., 2011) and adopting suitable technology for teaching (Parkes et al., 2015), which will help instructors better prepare for their courses. Assistance with instructional materials and technology may also benefit faculty members as it gives them the opportunity to discuss issues and get support (Blau et al., 2017).

6. Discussion

This review of literature was conducted to ascertain fundamental factors influencing student persistence in online environments. We were able to categorize the identified factors into four major categories by using the CPM model proposed by Rovai (2003). Among the four types, internal factors are most discussed in the reviewed studies. Almost unanimous agreement exists in the literature that internal factors such as motivation, self-efficacy, locus of control and satisfaction are critical elements contributing to persistence (Eliasquevici et al., 2017; Holder, 2007; Levy, 2007; Park & Choi, 2009; Shaw et al., 2016). We also found that factors related to student characteristics and student skills have yielded mixed findings. Regarding external factors, the review of the existing literature has revealed mixed results regarding the correlation between interactivity and persistence. With its unique characteristics, online education differs significantly from traditional modes of learning, including the lack of direct physical contact between students and teachers (Gillett-Swan, 2017). Interactivity in online environments, which involves three core types, i.e. learner-teacher, learner-content, and learner-learner (Moore, 1989), is a complex element that needs in-depth investigation. Further research is necessary to confirm the effects of student characteristics, student skills and some external factors such as interactivity. Furthermore, from our review, we could point out that the factors are interrelated and can work together to help overcome barriers to persistence. While students' characteristics and skills may predict dropout decisions, we reiterate that internal and external factors together can help students perform better. Thus, more research could be carried out to examine the relationship of various factors within and between categories as well as the combined effects of the factors. Next, a large portion of the literature included in this review used a quantitative research approach. This will pose the need for future study to critically investigate the interplay among the factors and validate the results using a mixed-methods approach.

In addition, insights on suggested solutions for enhancing student retention in online learning were another thing we looked for. The strategies suggested in the reviewed studies were grouped into five main categories, most of which were found to focus on tackling the external factors affecting student persistence. The findings have also confirmed that joint efforts from the institution, the instructor and the student can contribute to student persistence. Moreover, our findings suggest that institutions play a critical role in the improvement of student retention. Online learners do not study on-campus and may encounter obstacles and barriers. Thus, there should always be room for improvements in institutional initiatives so that online learners can receive flexible and timely support. Administrators should be proactive in carrying out activities and programs to maintain and foster institution-student interactivity. Another important consideration is that institutions need to figure out how to improve faculty training for teaching online.

7. Conclusion

Persistence is a complex matter that can affect course completion. Guided by Rovai's framework, the current review has synthesized factors influencing student persistence, namely

student characteristics, student skills, internal factors and external factors. One limitation of the review is that the influential factors and strategies for online student retention are discussed from a comprehensive perspective. These factors, therefore, should be examined using bigger samples and analyzed in light of more real-world contexts in future studies. Furthermore, strategies for improvements require shared responsibilities among different entities. Further research is also recommended to develop and assess evidence-based strategies that can improve persistence for the online student.

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Appendix

Summary of Reviewed Articles

Author, year	Title		Sample	Instrument(s)
	Research question(s)/Purpose			
Ancar (2006)	Professional Connections through the Technology Learning Community		Nearly 500 students in the College of Engineering, and approximately 60 peer mentors, have participated in the TLC since fall semester 1999.	Artifacts and a group discussion
	The purpose of this study was to determine how the TLC initiative affected students' development of professional networks and relationships with technology faculty, staff, and industry professionals.			
Angelino, Williams & Natvig (2007)	Strategies to engage online students and reduce attrition rates.		(Conceptual contributions)	
	This article presents key concepts in online learning and a review of different methods of engaging students with the goals of enhancing the learning process and reducing attrition rates.			
Arbaugh (2000)	Virtual classroom versus physical classroom: An exploratory study of class discussion patterns and student learning in an asynchronous Internet-based MBA course.		62 students in an MBA program at a Midwestern US university	The instrument was developed by the university to assess student attitudes towards distance education via compressed video
	This exploratory study reports the results of comparing a classroom-based and an Internet-based MBA class section at a Midwestern U.S. university.			
Artino (2008)	Motivational beliefs and perceptions of instructional quality: predicting satisfaction with online training		780 students from a U.S. service academy were invited to participate in the present study. A total of 646 students completed the survey (response rate = 83%)	The instrument used in the present study was composed of 48 items on motivation beliefs
	The objective of the study was to investigate the relations between students' motivational beliefs, their perceptions of the learning environment and their satisfaction with a self-paced, online course.			
Barnard-Brak, Lan & Paton (2010)	Profiles in self-regulated learning in the online learning environment		Students enrolled in online degree programs at a large, public university located in the Southwestern United States	Online Self-Regulated Learning Questionnaire (OLSQ), a 24-item scale with a 5-point Likert-type response format
	The purpose of the current study was to examine whether profiles for self-regulated learning skills and strategies exist among learners.			
Barefoot (2004)	Higher education's revolving door: Confronting the problem of student drop out in U.S. colleges and universities.		(Conceptual contributions)	
	While we will never be able to predict or control dropout with 100% certainty, the dynamic nature of entering students requires that we take a hard look at our cherished structures, especially the ways in which we deliver instruction.			
Bawa (2016)	Retention in online courses: Exploring issues and solutions - A literature review.		(Conceptual contributions)	
	This article reviews literature to ascertain critical reasons for high attrition rates in online classes, as well as explore solutions to boost retention rates.			
Beaulieu & Williams (2006)	Micro-strategies: Small steps toward improved retention.		(Conceptual contributions)	
	Building micro-strategies into the structure of learning communities can help an institution attain a valuable uptick in retention.			
Billings (2000)	A framework for assessing outcomes and practices in web-based courses in nursing		(Conceptual contributions)	
	This article presents a framework to assess the dynamic interaction of technology used to offer Web-based courses, the teaching-learning practices in these courses, and the outcomes enabled by the technology. Concepts of the model include outcomes, educational practices, faculty support, learner support, and use of technology.			

Blau et al. (2016)	Perceived learning and timely graduation for business undergraduates taking an online or hybrid course	263 business undergraduates taking at least one online or hybrid course in the fall of 2015	Online survey
	This study tests the impact of background, technological, and course-related variables on perceived learning and timely graduation		
Blau et al. (2017)	Perceived learning and timely graduation for business undergraduates taking an online or hybrid course	A sample of 263 business undergraduates	Survey content was developed primarily based on a literature review by Gary Blau
	The purpose of this study was to test the impact of background, technological, and course-related variables on perceived learning and timely graduation		
Boston, Ice & Gibson (2011)	Comprehensive assessment of student retention in online learning environments	Data included enrollment and academic achievement data through December 31, 2009 with a total of 20,569.	The predictor variables were all of the various student background data downloaded from the APUS data warehouse. The data sets were regressed on the variable, using suggestions from Cohen, Cohen, West, and Aiken (2002).
	The purpose of the study was to determine which factors were most relevant in determining retention.		
Brewer & Yucedag-Ozcan (2013).	Educational persistence: Self-efficacy and topics in a college orientation course	The sample consisted of 512 students	The General Self-Efficacy Scale (GSE)
	The study explores whether self-efficacy is related to enrollment persistence		
Chou (2004)	A model of learner-centred computer-mediated interaction for collaborative distance education	Upper level undergraduates	Conference transcripts from both synchronous and asynchronous communication and student surveys
	This study examines interaction patterns at both interpersonal and system levels in a learner-centered distance collaborative learning environment.		
Clay, Rowland & Packard (2008)	Improving undergraduate online retention through gated advisement and redundant communication	Fifty-seven students University of Western Georgia (UWG)	Existing retention data in UWG eCore courses and their face-to-face counterparts offered at UWG as well as telephone survey with students who enrolled in eCore courses in Fall 2006 and later withdrew.
	This article highlights the results of a telephone survey conducted to determine the causes of eCore attrition, and the retention improvement data following the implementation of a comprehensive orientation and advisement program and redundant communications to students		
Cochran, Campbell, Baker, & Leeds (2014)	The role of student characteristics in predicting retention in online courses	Undergraduate students (n = 2,314) from a large state university	Questionnaire
	This study examines previous research literature on traditional face-to-face classes to determine how individual characteristics of students may be associated with the likelihood of withdrawal from online classes		
Colorado & Eberle (2010)	Student demographics and success in online learning environments	170 graduate students enrolled in online courses at a US Midwestern university during the spring 2005 and summer 2005 semesters	The MSLQ
	This article discusses the relationship between student demographics and success in online learning environments		
Dillion & Greene (2003)	Learner differences in distance learning: Finding differences that matter	(Conceptual contributions)	
	This article reviews the relationship between three influential ID factors, namely age, aptitude, and motivation, and L2 learning.		
Dow (2008)	Implications of social presence for online learning: A case study of MLS students	102 library and information science graduate students at Emporia State University	Focus group interviews
	This study explores factors that influence students' interpersonal awareness of others while learning online		

Dupin-Bryant, 2004	Pre-entry variables related to retention in online distance education	Four hundred and sixty-four students who were enrolled in online distance education courses participated in the study	The study research questionnaire was developed, tested, and reviewed by a panel of distance education professionals. A pilot study was conducted.
	Are there pre-entry variables that distinguish individuals who complete university online distance education courses from those who do not?		
Eliasquevici, Seruffo, & Resque (2017)	Persistence in distance education: A study case using Bayesian network to understand retention	90 students, who were about to graduate, filled out a computer questionnaire on their skills and characteristics prior to course admission, as well as on the internal and external factors after admission which may have influenced their permanence	A research instrument with open- and close-ended questions based on Rovai's (2003) Composite Model was developed to investigate which variables facilitate student persistence.
	This study aims to identify the main factors which may influence student retention in distance undergraduate programs		
Floyd & Casey-Powell (2004)	New roles for student support services in distance learning	(Conceptual contributions)	
	This chapter discusses ways in which community colleges can strengthen the delivery of online courses to ensure that programs such as admissions, advising, and financial aid, as well as career and academic counseling, and library and registration services, are meeting the needs of distance learners.		
Gaytan (2005)	Comparing Faculty and Student Perceptions Regarding Factors That Affect Student Retention in Online Education	15 online students were identified and interviewed to determine their perceptions related to critical factors affecting student retention in online courses.	A grounded study method was used to interview students taking online courses, analyze their responses related to the critical factors that affect student retention, and compare them with those given by expert online faculty.
	The purpose of this qualitative study was to compare faculty and student perceptions regarding factors that affect student retention in online courses		
Gomez (2013)	Leadership behavior and its impact on student success and retention in online graduate education	A total sample size of 303 doctoral students who enrolled in a multi-disciplinary online doctoral program in organizational and in strategic leadership at a private graduate university.	Secondary and program specific data
	This study examines the predictive impact of student characteristics on persistence in an online doctoral leadership program.		
Grandzol & Grandzol (2010)	Interaction in Online Courses: More Is NOT Always Better	359 lower-level students taking online, undergraduate business courses	
	The author investigated course enrollments, student and faculty time spent in interaction, and course completion rates, all drivers of resource consumption.		
Harris et al. (2011)	Development of the student expectations of online learning survey (SEOLS): A pilot study	17 students enrolled in online courses of a master's level counseling program at a mid-sized Midwestern University in the United States.	The Student Expectations of Online Learning Survey (SEOLS)
	This study investigated the reliability of the Student Expectations of Online Learning Survey (SEOLS) as a tool for assessing student expectations for elements of online courses.		
Harris & Parrish (2006)	The art of online teaching: Online instruction versus in-class instruction	Students who were participating in online instruction and in traditional in-class instruction.	The Internal Control Index (ICI) developed by Duttweiler (1984) was used to measure student locus of control.
	This article examines objective data regarding learning outcomes of students who participated in asynchronous online (web-based) instruction versus in-class (traditional) instruction.		
Harrell & Bower (2011)	Student characteristics that predict persistence	225 online students from five Florida community colleges	The questionnaire was created based on Rotter's (1996) Locus of Control Scale and adapted by Valecha & Ostrom (1974).
	Which student characteristics (learning style, locus of control, computer experience and access, previous online experience, demographics) can be used to best predict the persistence of community college students in online courses?		

Hartley (2011)	Educational research in the Internet age: Examining the role of individual characteristics	(Conceptual contributions)	
	This article presents a perspective that has garnered less attention in discussions of these new learning environments—learner characteristics. This article will address two learner characteristics: epistemological beliefs and self-regulatory skills		
Hartnett & Hartnett (2016)	The importance of motivation in online learning	A total of 24 participants (21 learners and 3 lecturers)	Online questionnaires, semi-structured interviews with students and lecturers, online asynchronous discussion transcripts from the institutional learning management system
	This research examines undergraduate students' motivation within two formal and separate online learning contexts.		
Hegler (2004)	Assessing learning communities	(Conceptual contributions)	
	This study examines learning communities as a way to increase retention and student learning		
Herbert (2006)	Staying the course: A study in online student satisfaction and retention.	Every student who enrolled in an online course at a medium-sized Midwestern state university.	The Noel-Levitz Priorities Survey for Online Learners™ (PSOL)
	The purpose of this study was to determine the variables significant for retention in online courses		
Heyman (2010)	Overcoming student retention issues in higher education online programs.	Participants in the study were administrators who had at least three years working directly with fully online programs.	Interviews
	The purpose of the qualitative study was to examine what a panel of 20 experts would identify as priority issues or concerns influencing student retention in fully online undergraduate programs in higher education		
Hodges & Forrest Cowan (2012)	Preservice teachers' views of instructor presence in online courses.	52 undergraduate students at a comprehensive university in the southeastern United States who were enrolled in an education course on the topic of technology integration during the spring semester of 2011	A 22-question online survey consisting of demographics questions and questions adapted for the local context from Sheridan and Kelly (2010).
	The researchers conducted this study to investigate undergraduate preservice teacher candidates' perceptions regarding variables related to instructor presence in online courses		
Holder (2007)	An investigation of hope, academics, environment, and motivation as predictors of persistence in higher education online programs	209 online undergraduate and graduate students in degree-completion programs in a Midwest university	The questionnaire, which included 60 items, was study-specific and created based on previously validated instruments
	To what extent do measures of students' hope, as well as academics, motivation, and environment, predict persistence in online learning?		
Hosler & Arend (2012)	The importance of course design, feedback, and facilitation: student perceptions of the relationship between teaching presence and cognitive presence.	A convenience sample of students from 46 different course sections at a private, nonprofit university in the Rocky Mountain region	The CoI survey consists of 34 statements designed to measure student perceptions of teaching presence, social presence, and cognitive presence
	This study investigated student perceptions of cognitive presence as explained by three teaching presence elements; instructional design and course organization, direct instruction, and facilitated discourse.		
James, Swan & Daston (2016)	Retention, progression and the taking of online courses	The study examines recent research on the success of community college students who take online classes and explores similar comparisons using 656,258 student records collected through the Predictive Analytics Reporting (PAR) Framework.	Student records collected through the Predictive Analytics Reporting (PAR) Framework. Exploratory analysis was conducted comparing retention rates for three different groups
	The study investigated the effects of delivery mode on the retention and progression of undergraduate students. It explored differences in retention and progression among students who took all their classes online, students who took all their classes onground, and students who blended online and onground classes.		

<p>Joo, Lim, Kim (2013)</p>	<p>Locus of control, self-efficacy, and task value as predictors of learning outcome in an online university context. This study investigates the predictors of learner satisfaction, achievement and persistence in an online university located in South Korea.</p>	<p>973 learners who enrolled in an introductory, 3 credit elective course in fall, 2009 in a large online university in Korea. 897 usable responses.</p>	<p>The instrument was adopted from the Internal, Powerful Others and Chance Scale developed by Levenson (1981), the Motivated Strategies for Learning Questionnaire originally developed by Pintrich and De Groot (1990), Eccles, Adler, and Meece (1984), and Shin (2003)</p>
<p>Joo, Joung & Sim (2011)</p>	<p>Structural relationships among internal locus of control, institutional support, flow, and learner persistence in cyber universities To establish a structural equation model explaining the causal relationships among internal locus of control, institutional support, flow, and learner persistence, and to examine the practical direct and indirect effects among them</p>	<p>Responses were collected from 568 students at W Cyber University</p>	<p>Internal locus of control in Levenson's (1981) instrument was used. To measure the level of institutional support, the authors revised the instrument targeting corporate cyber education created by Kim (2009). In order to measure learning persistence, the authors used Shin's (2003) instrument</p>
<p>Kashif & Shahid (2021)</p>	<p>Students' self-regulation in online learning and its effect on their academic achievement. The objective of the study was to investigate students self-regulation in online learning and its effect on their academic achievement at the undergraduate level.</p>	<p>A sample of 450 undergraduate students of the education department of public and private universities of Lahore</p>	<p>The self-regulated online learning questionnaire (SOL-Q) was used to measure students' self-regulation in online learning.</p>
<p>Keller (2008)</p>	<p>First principles of motivation to learn and e-learning. Five first principles of motivation and volition that characterize learning systems that effectively motivate students are introduced in this article</p>	<p>(Conceptual contributions)</p>	
<p>Kemp (2002)</p>	<p>Persistence of adult learners in distance education The purpose of this study was to investigate the relationship between persistence, life events, external commitments, and resiliency in undergraduate distance education.</p>	<p>121 First-time undergraduate distance students at Athabasca University, Canada.</p>	<p>The Resiliency Attitudes Scale and the Life Events Inventory, as well as a study-specific questionnaire, were utilized to collect data.</p>
<p>Kuo et al. (2013)</p>	<p>A predictive study of student satisfaction in online education programs. This study examined the unique contribution of key predictor variables in explaining the variation of student satisfaction scores. The purpose of this study was to investigate academic locus of control and student satisfaction and their influence on student dropout from e-learning courses.</p>	<p>111 undergraduate and graduate students enrolled in summer-session online courses from the College of Education at a western university.</p>	<p>The Internet self-efficacy scale developed by Eastin and LaRose (2000)</p>
<p>Lee & Choi (2011)</p>	<p>A review of online course dropout research: Implications for practice and future research This article reviewed the existing empirical studies on online course dropouts in post-secondary education</p>	<p>(Conceptual contributions)</p>	
<p>Lee, Choi & Kim (2013)</p>	<p>Discriminating factors between completers of and dropouts from online learning courses. This study examined the differences between persistent and dropout students enrolled in an online course with five factors: support from family and work, academic locus of control, academic self-efficacy, time and environment management skills, and metacognitive self-regulation skills.</p>	<p>The participants were 344 adult students enrolled in an online "Distance Learning" course offered at the Korea National Open University</p>	<p>Online surveys adopted from the Motivated Strategies for Learning Questionnaire (MSLQ) and Holder's (2007) Fiscal and Emotional Support instrument</p>
<p>Leeds et al. (2013)</p>	<p>The impact of student retention strategies: an empirical study. This study investigated the impact of student retention strategies on retention rates in an online information systems course.</p>	<p>A total of 162 students participated in the experiment.</p>	<p>2 online surveys</p>

<p>Levy (2007)</p>	<p>Comparing dropouts and persistence in e-learning courses The purpose of this study was to investigate academic locus of control and student satisfaction and their influence on student dropout from e-learning courses.</p>	<p>108 students who completed a course and 25 students who did not complete a course from 18 undergraduate and graduate e-learning courses at a major state university in the Southeastern United States.</p>	<p>The questionnaire was developed based on Trice's (1985) Academic Locus of Control and adapted from Bures et al.'s (2000) instrument measuring student satisfaction.</p>
<p>Li et al. (2022)</p>	<p>Effects of first-time experiences and self-regulation on college students' online learning motivation: Based on a national survey during COVID-19. This study measured three essential constructs of online learning (self-regulated learning, perceived presences, and learning motivation)</p>	<p>12,826 undergraduate respondents from Hubei</p>	<p>A questionnaire adopted from Barnard and Lan (2008), Arbaugh et al. (2008) and Lin et al. (2020)</p>
<p>Liu, Gomez, & Yen, 2009</p>	<p>Community college online course retention and final grade: Predictability of social presence 1. Can social presence predict online course retention in a community college? 2. Can social presence predict online course final grade in a community college?</p>	<p>A convenience sample of 108 students enrolled in one or more online courses at a suburban community college in Maryland</p>	<p>The Social Presence and Privacy Questionnaire (SPPQ) developed by Tu (2000) were used to measure social readiness.</p>
<p>Ludwig-Hardman & Dunlap (2003)</p>	<p>Learner support services for online students: scaffolding for success. This article describes the types of learner support services strategies that can effectively address these retention challenges</p>	<p>(Conceptual contributions)</p>	
<p>Martinez (2003)</p>	<p>High attrition rates in e-learning: challenges, predictors, and solutions. This article provides background information needed to apply these personalization principles and to develop an attrition management plan for e-Learning</p>	<p>(Conceptual contributions)</p>	
<p>Meşe & Sevilen (2021)</p>	<p>Factors influencing EFL students' motivation in online learning: A qualitative case study. The study was conducted in order to explore students' perceptions of online teaching and how it affects their motivation over a period of a seven-week-course.</p>	<p>12 students from an intact classroom</p>	<p>The data was collected through semi-structured interviews and creative writing samples</p>
<p>Moallem (2003)</p>	<p>An interactive online course: A collaborative design model. The purpose of this paper is to describe the evaluation results of using an interactive design model for the development of an online course.</p>	<p>A total of 24 students</p>	<p>A questionnaire in which they responded to a list of questions (both open-ended and closed-ended items) about the course design specifications and student chat logs and postings in small- and large-group discussions</p>
<p>Moore & Fetzner (2009)</p>	<p>The road to retention: A closer look at institutions that achieve high course completion rate. This issue presents studies that suggest certain practices contribute to student success.</p>	<p>(Conceptual contributions)</p>	
<p>Moore & Greenland (2017)</p>	<p>Employment driven online student attrition and the assessment policy divide: An Australian open access higher education perspective This study identifies the main driver of online student attrition in an Australian open-access education context.</p>	<p>226 students studying at Australia's largest online tertiary education organisation, Open Universities Australia</p>	<p>Telephone interviews</p>

<p>Morris, Finnegan, & Wu, 2005</p>	<p>Tracking student behavior, persistence, and achievement in online courses</p> <p>1. What is the relationship of student participation to student persistence and achievement online?</p> <p>2. What are the differences and similarities between completers and withdrawers in various measures of student behavior online?</p>	<p>Participants were 423 students enrolled in for three online courses at the University System of Georgia</p>	<p>Participation was evaluated through student behavior and engagement</p>
<p>Muilenburg & Berge (2005)</p>	<p>Student barriers to online learning: A factor analytic study.</p> <p>This article reports on a large-scale exploratory factor analysis study that determined the underlying constructs that comprise student barriers to online learning.</p>	<p>1056 online learners</p>	<p>The initial survey items were drawn from a review of literature, from previous studies on barriers conducted by Muilenburg and Berge (2001), and from content analyses of selected case studies (Berge & Mrozowski, 2001).</p>
<p>Muirhead (2004)</p>	<p>Encouraging interaction in online classes</p> <p>The article explores instructional strategies to foster online interaction.</p>	<p>(Conceptual contributions)</p>	
<p>Müller, 2008</p>	<p>Persistence of women in online degree-completion programs</p> <p>1. Why do women persist in online courses?</p> <p>2. Why do they fail to persist or stop out?</p> <p>3. How do factors affect women learners' persistence?</p>	<p>A purposive sample of 20 female online students from undergraduate (n=9) and graduate degree (n=11) completion programs at a college in the northeastern United States</p>	<p>Interviews</p>
<p>Nichols (2010)</p>	<p>Student perceptions of support services and the influence of targeted interventions on retention in distance education.</p> <p>This study compares the retention statistics for first-time student outcomes across two semesters, one without and one with specific course retention interventions</p>	<p>Students who had withdrawn or not completed at least one course in semester 1 of 2008 (n = 51) were surveyed.</p>	<p>Statistical data from the SDR (single data return2) of Laidlaw College was analysed and compared with New Zealand-wide data, sourced from the Ministry of Education</p>
<p>Nistor (2010)</p>	<p>From participation to dropout: Quantitative participation patterns in online university courses</p> <p>The present study aims at identifying quantitative participation patterns and exploring the interrelation between participation and later persistence in online academic courses.</p>	<p>A total of 209 students took part in the studied courses</p>	<p>Measuring participation was based on observation during the entire course duration. The operationalization of the quantitative participation construct was built on the online course didactics.</p>
<p>O'Neill & Sai (2014)</p>	<p>Why not? Examining college students' reasons for avoiding an online course.</p> <p>This study contributes to scholarly understanding of online education by examining for the first time why students may choose to take a large lecture course face-to-face, when they know that the same course is offered by their institution online.</p>	<p>48 students in a face-to-face offering of an introductory Educational Psychology course</p>	<p>Survey</p>
<p>Osborn (2001)</p>	<p>Identifying at-risk students in videoconferencing and Web-based distance education.</p> <p>This study centers on a method of assessing the ability of a student to complete a distance learning course.</p>	<p>501 students enrolled at the University of North Texas during the summer and fall semesters of 1999</p>	<p>A survey consisting of twenty-eight Likert-scale items and seven interval, or ratio-level, items</p>
<p>Packham et al. (2004)</p>	<p>E-learning and retention: Key factors influencing student withdrawal.</p> <p>This study examines the causes for student withdrawals experienced in the E-College Wales BA Enterprise programme.</p>	<p>20 students taking part in E-College Wales (ECW) - a project designed by the University of Glamorgan</p>	<p>A semi-structured questionnaire</p>
<p>Palmer & Holt (2009)</p>	<p>Examining student satisfaction with wholly online learning</p> <p>This study was undertaken to gauge students' perceptions of studying in the wholly online mode.</p>	<p>761 students enrolled in a wide range of wholly online units at Deakin University</p>	<p>ELO questionnaire developed from previous similar survey instruments used at Deakin University</p>

Parkes et al. (2015)	Bringing people together while learning apart: Creating online learning environments to support the needs of rural and remote students.	5 lecturers at the University of New England	Focus group interviews
	The study sought to explore the experience of five lecturers concerning issues associated with online teaching to students in rural and remote areas.		
Park & Choi (2009)	Factors influencing adult learners' decision to drop out or persist in online learning	147 students who either completed or dropped out of one of three online courses offered by a large Midwestern university.	Study-specific instrument to measure family and organizational support; Satisfaction and relevance based on Keller's (1987) Instructional Materials Motivation Survey
	1. Do the dropouts and persistent learners of online courses show differences in their individual characteristics, external factors, and internal factors? 2. What factors are significant to predict learners' decision to drop out of online courses?		
Pittenger & Doering (2010)	Influence of motivational design on completion rates in online self-study pharmacy-content courses.	650 students for fall 2007 and 811 students for spring 2008 in 4 online courses	The validated Instructional Materials Motivation Survey [IMMS] (Keller, 1987) and an open-ended survey based on Keller's (1987) ARCS components were used
	This study evaluated four self-study online pharmacy courses with a history of very high completion rates for motivational design features, as an explanation for the difference in completion rates between these classes and those reported in the literature.		
Qayyum, Zipf, Gungor & Dillon (2019)	Financial aid and student persistence in online education in the United States.	This study involved providing distance education students' financial aid in the form of institutional scholarships (N = 545) at Penn State University in the United States.	Up to 45 data items for each student. Data were examined for missing values, outliers, and accuracy using a random check of items.
	The purpose of the study was to test if receiving financial aid was related to students' persistence.		
Raju & Schumacker (2015)	Exploring student characteristics of retention that lead to graduation in higher education using data mining models.	Data was analyzed for first-time full time freshmen students entering the university from the fall semester of 1995 until the fall semester of 2005.	Pre-college and college datasets
	This study explores important student characteristics associated with retention leading to graduation.		
Reilly & Mcbrearty (2007)	Well, it's messy sometimes...': Barriers to building a learning community and dynamic assessment as a system intervention.	8 students in the Master's program	Interviews
	This article describes the perceived barriers to building learning communities		
Rovai (2003)	In search of higher persistence rates in distance education online programmes.	(Conceptual contributions)	
	This article synthesizes a composite model to better explain persistence and attrition among the largely nontraditional students that enroll in online courses.		
Shaw et al. (2016)	Factors that influence student attrition in online courses.	(Conceptual contributions)	
	Results demonstrated that verbal and physical learning styles and personal attributes such as procrastination increase the likelihood for attrition, while clear reasons for pursuing a degree and typing skills decrease the likelihood for attrition.		
Shea (2007)	Bridges and barriers to teaching online college courses: A study of experienced online faculty in thirty-six colleges.	36 colleges in a large state university system	Data from 386 faculty teaching online
	This paper reports on initial findings from a research study of factors that enable and constrain faculty participation in online teaching and learning environments.		

Sheridan & Kelly (2010)	The indicators of instructor presence that are important to students in online courses.	65 graduate and undergraduate students enrolled in several online courses offered by the education departments at either of two large universities in the Midwest.	Scales of the Community of Inquiry (CoI) instrument by Garrison et al. (2000)
	The research presented in this paper addressed this issue by examining which indicators of instructor presence were most important to students in online courses and how those indicators were interrelated.		
Smailes & Gannon-Leary (2011)	Peer mentoring - Is a virtual form of support a viable alternative?	451 Northumbria University students	Online survey
	This article describes a literature review and case study that considers the advantages and disadvantages of three potential virtual models to facilitate a peer mentoring scheme.		
Stanford-Bowers (2008)	Persistence in online classes: A study of perceptions among community college stakeholders	39 volunteers from 10 community colleges in Alabama	Open-ended question in which participants listed factors perceived to support persistence.
	1. Which factors regarding persistence are most important among faculty, administrators, and students? 2. Where do perceptions of persistence among the three groups of stakeholders converge?		
Stephen, Rockinson-Szapkiw, & Dubay (2020)	Persistence model of non-traditional online learners: Self-efficacy, self-regulation, and self-direction.	82 nontraditional learners enrolled in online undergraduate degree level courses during the Fall semester of the 2018–2019 academic year at a private higher education institution in the Southeast region of the United States	Instrument developed from Online Learning Self-Efficacy Scale (OLSES), Self-Rating Scale of Self-Directed Learning (SRSSDL), Online Self-Regulated Learning Questionnaire (OSLQ)
	This study examined the associations among the predictor variables of first year, first semester nontraditional online learners' self-regulation, self-direction, and self-efficacy with the criterion variable of semester-to-semester persistence.		
Tello (2007)	An analysis of student persistence in online education.	The population for this study included 1569 undergraduate and 51 graduate students enrolled in 76 online courses offered in the Fall 2001 semester	Surveys
	The purpose of this study was to examine the impact of instructional interaction on student persistence among adult students in online courses.		
Terry (2007)	Assessing instruction modes for master of business administration (MBA) courses	359 MBA students at a Southwestern US university	Student survey
	This study presents empirical results concerning the effectiveness of campus, online, and hybrid instruction in business education		
Thurmond et al. (2002)	Evaluation of student satisfaction: Determining the impact of a web-based environment by controlling for student characteristics.	A total of 120 students, from seven Web-based nursing courses, completed the evaluation questionnaires.	The researchers selected and developed items from the Current Student Inventory, a database of items maintained by the Flashlight Program
	In this article, the authors discuss research findings of an evaluation of Web-based courses in which the researcher controlled for student input information-using Alexander Astin's (1993) Input-Environment-Outcome assessment model.		
Traver et al. (2014)	Correlating community college students' perceptions of community of inquiry presences with their completion of blended courses.	Community college students enrolled in 17 different classes at Queensborough Community College	Shea and Bidjerano's (2010) CoI survey instrument
	The study applies the CoI framework to the subject of community college students' course completion.		
Willging & Johnson (2004)	Factors that influence students' decision to drop out of online courses.	Students who dropped out of the HRE Online master's degree program at the University of Illinois	The questionnaire was developed based on a review of the literature, with particular attention to other questionnaires that examined factors related to attrition.
	This study explores reasons why students dropout of college online courses.		

Wladis, Conway & Hachey (2014)	An investigation of course-level factors as predictors of online STEM course outcomes.	This study used a sample of 3,599 students at a large urban community college in the Northeast who took one of a particular set of matched STEM courses either online or face-to-face between 2004 and 2012	Binary logistic regression was used.
	This study focused on the following research questions: <ul style="list-style-type: none"> • What relationship do course-level factors have to outcomes in online versus face-to-face STEM courses? • To what extent can any differences in successful completion rates by course be explained by the characteristics of the students who choose to enroll in different types of online STEM courses? 		
Wojciechowski & Palmer (2005)	Individual student characteristics: can any be predictors of success in online classes?	179 students taking an online business course offered through a small, rural community college in western Michigan	Information on student characteristics were extracted from a main campus database
	This study examined various student characteristics to determine their relationship to success in an online undergraduate business course at a community college		
Wuellner (2013)	Student learning and instructor investment in online and face-to-face natural resources courses	(Conceptual contributions)	
	This study was conducted to determine whether differences in student learning outcomes and satisfaction and instructor investment existed		
Xu & Jaggars (2011)	The effectiveness of distance education across Virginia's community colleges: Evidence from introductory college-level Math and English courses.	24,000 students from 23 community colleges in Virginia	A data set containing nearly 24,000 students from 23 community colleges in Virginia
	The study estimates the effects of taking one's first college-level math or English course online rather than face to face, in terms of both course retention and course performance.		
Xu & Jaggars (2013)	The impact of online learning on students' course outcomes: Evidence from a large community and technical college system.	Students who enrolled in one of Washington State's 34 two-year public community or technical college	Large administrative dataset from Washington State's community and technical college system
	This study estimates the impact of online versus face-to-face course delivery on student course performance.		
Zheng et al. (2016)	The relationship between Chinese university students' conceptions of language learning and their online self-regulation.	293 Chinese university students	Two questionnaires, Online Language Learning Motivation (OLLM) and Online Self-regulated English Learning (OSEL)
	This study presents a structural relationship model that integrates English language learners' motivation with their online self-regulation.		

SỰ KIÊN TRÌ CỦA NGƯỜI HỌC TRONG HỌC TẬP TRỰC TUYẾN: TỔNG QUAN NGHIÊN CỨU

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Tóm tắt: Những lợi thế của việc học trực tuyến đã cho phép người học tham gia các khóa học giúp họ thuận tiện nâng cao kiến thức và kỹ năng của mình. Tuy nhiên, một trong những thách thức mà các chương trình trực tuyến phải đối mặt là giữ chân sinh viên và giải quyết vấn đề tỷ lệ bỏ học cao. Bài viết này xem xét các tài liệu để xác định các yếu tố ảnh hưởng đến sự kiên trì của người học trong các chương trình trực tuyến và tìm hiểu các giải pháp để giảm tỷ lệ bỏ học. 90 bài báo trên các tạp chí được phân biệt xuất bản từ năm 2000 đến năm 2022 đã được xem xét và đưa vào bài tổng quan tài liệu. Các tiêu chí lựa chọn bao gồm mức độ liên quan của chủ đề, các nghiên cứu có dữ liệu thực nghiệm và năm xuất bản. Quy trình phân tích bao gồm việc tìm kiếm cơ sở dữ liệu, sàng lọc bài tóm tắt, phân tích toàn bộ văn bản và tổng hợp. Các yếu tố góp phần vào sự kiên trì của học sinh trong việc học trực tuyến bao gồm các yếu tố bên trong (như: động lực, sự hài lòng và sự tin tưởng vào khả năng của bản thân), các yếu tố bên ngoài (như: hỗ trợ tài chính, hỗ trợ từ bạn bè và gia đình) và kỹ năng của học sinh (như: kỹ năng quản lý thời gian và kỹ năng tự điều chỉnh). Một số giải pháp khả thi bao gồm: cung cấp các chương trình định hướng, tạo môi trường học tập hợp tác và tăng cường hỗ trợ giảng viên. Bài tổng quan tài liệu này tạo nền tảng cho nghiên cứu sâu hơn về vấn đề giữ chân người học trong các chương trình trực tuyến.

Từ khóa: học tập trực tuyến, sự kiên trì, giữ chân người học, bỏ học