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REVIEW PAPER

A missing theoretical element of online higher education student attrition, retention, and progress: a systematic literature review

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Abstract

Online learning technologies have facilitated higher education in many ways, making it more flexible and available for learners with multiple life and work responsibilities. Yet information regarding graduation rates suggests that the vast majority of online learners drop out. By systematically analysing 30 empirical studies published between 2009 and 2020, this paper aims to highlight factors critical for online students' attrition, retention, or progress, focusing on the adult student population. Four groups of factors influencing adult students' online learning were identified: (a) student factors, (b) course factors, (c) social factors, and (d) support factors. These four groups are analysed and discussed in light of selected theoretical models on student attrition, retention, and progress. The results show that student support remains a missing element in these models. Finally, recommendations based on the study findings are offered.

Keywords Attrition · Retention · Student progress · Adult learning · Distance education · Online higher education · Systematic literature review

Abbreviations
GPA Grade point average
OU   Open university

Introduction

Online education is an attractive option for students with multiple responsibilities due to its flexible structure, lower costs, and opportunity to learn as suits the individual (Ilgaz and Gülbahar 2015; Ladell-Thomas 2012; Muljana and

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Luo 2019). However, these benefits are not always realised, and the majority of online learners do not graduate (Woodley and Simpson 2014).

Although precise figures on dropout rates in online higher education are not available, the literature suggests that graduation rates in online programmes are much lower compared to those in a traditional setting. Simpson (2013) and Woodley and Simpson (2014) pointed out that in the UK, graduation rates from online programmes vary from 0.5 to 20%. The University of Phoenix in the US and the University of South Africa have 5% and 6% graduation rates, respectively (Woodley and Simpson 2014). The lower graduation rates from online programmes indicate what Simpson (2013) calls a "distance education deficit" (p. 105). Research on the dropout phenomenon is ongoing, and the issue remains an "elephant in the room" (Woodley and Simpson 2014, p. 462). Many studies have examined online learners' experiences and perceptions to understand what contributes to their learning progress and success (see Hart 2012; Park and Choi 2009; Simpson 2004). Scholars emphasise the diversity of online students in regard to their backgrounds, personal characteristics and skills, and the complexity of factors that influence their online learning experience and behaviour. This paper brings together empirical evidence of students' learning experiences in online higher education and discusses the result of a systematic literature review in relation to selected theoretical models on student attrition, retention, and progress.

While online education provides multiple benefits for learners (see Coomley and Stephenson's 2001 meta-analysis) and offers unprecedented opportunities for students to learn from where they are and at their own pace, that opportunity comes with high risk. Failure to complete the first online course may lead students to experience lower self-confidence or self-esteem, and discourage them from registering for other online courses (Moore and Kearsley 1996). Dropout experience can cause social isolation, economic loss (Rumberger 1987), and marginalisation (Sosu and Pheunpha 2019). An examination of theoretical models of student attrition, retention, and progress through the discussion of new empirical evidence can reveal weaknesses of these models and shed light on the problem of online students dropping out. To do this, this study addressed the following research questions:

1. What factors affect adult student attrition, retention, or progress in online higher education?
2. Which of these factors are underrepresented in the theoretical models selected for the analysis?

The scope of the article is limited in two ways. Firstly, it looks at the adult student cohort in online higher education. The focus on adult students is justified by the great proportion of mature students enrolled in pre-COVID-19 online programmes (Pozdnyakova and Pozdnyakov 2017). Secondly, this paper focused on factors of student retention, attrition, and progress, rather than dropout factors, through the analysis of adults' experiences of online learning.

Theoretical background

There have been numerous attempts to systematically explain the processes of student learning and decision making through theoretical models of attrition, retention, and progress. Among the most recognised, there are the models of Spady (1970), Tinto (1975), Bean and Metzner (1985), Kember (1995), and Rovai (2003), and Falcone (2011).

Two of the early theoretical models developed by Spady (1970) and Tinto (1975) draw on Durkheim's theory of suicide (Durkheim 1951). Durkheim argued that suicide is a result of the individual's "malintegration" into society due to the dissonance of values or an "insufficient collective affiliation" (Tinto 1975, p. 91). Both Spady (1970) and Tinto (1975) found an analogy between Durkheim's concept of suicide and student dropout. Spady's (1970) Model of Undergraduate Dropout Process contains the following elements: students' background, normative congruence, academic potential, friendship support, grade performance, intellectual development, social integration, satisfaction, and institutional commitment. This model suggests that the decision to drop out depends on a student's lack of successful integration into the life of the educational institution, which is determined by social and academic factors.

Tinto's (1975) Model of Dropout Behaviour synthesised research on student attrition and Durkheim's study, and depicted student learning as a process of social and academic interactions moving towards student integration. The model presumes that students' backgrounds and personal characteristics determine their ability to integrate into the learning environment, interact with others, and this affects their social and academic outcomes (Eaton and Bean 1995). Tinto distinguished two types of student withdrawal or dropout: voluntary and forced. The difficulty with the application of Tinto's model to the analysis of student dropout in online education is in that he considers forced withdrawal to be a result of "insufficient levels of academic performance (poor grades)" or "the breaking of established rules concerning proper social and academic behaviour" (p. 92). What he does not include in the model are the external factors that are likely to be faced by the online student population, primarily represented by adult students.

Addressing this limitation, Bean and Metzner (1985) proposed a Model of Non-traditional Undergraduate Student Attrition, which stressed the influence of the external environment, e.g. financial or familial difficulties, professional workload, adult student socialisation, persistence, and level of goal commitment. This model contains the following elements: student background, academic characteristics, environmental factors, and academic and psychological outcomes. Due to the focus on the non-traditional student cohort, Bean and Metzner accounted for environmental factors, suggesting that barriers associated with the external environment can influence adult student integration.

Another comprehensive theoretical framework of adult student progress in distance education was developed by Kember (1995). He drew on Tinto's work, his own research, and an extensive literature review to theoretically explain the connections between the factors presented in the model. Pointing to the specific

context of Tinto's model, Kember argued that adult students often have additional family and work responsibilities, and face different barriers in their studies. Similarly to Tinto, Kember distinguished two types of integration—social and academic. Social integration is the ability to integrate learning with other life and work responsibilities, and academic integration is associated with integration to the programme and the relationship between the educational institution and the learner. To represent adults' competing demands, Kember added individual characteristics into the model, such as gender, prior work and learning experience, and family status. He argued that these greatly impact retention or attrition. Kember's model has been tested in several quantitative studies within different national settings (Woodley et al. 2001). Although the quantitative tests run by Kember showed the model is reliable (Kember 1995), Woodley et al. (2001) pointed out weaknesses in Kember's inventory instrument. They argued that the individual items used in the instrument did not measure the intended concept and concluded that the model could not adequately explain adult student progress in distance education.

Another model, the Composite Persistence Model, was proposed by Rovai (2003). He synthesised the models of Tinto, and Bean and Metzner. Rovai's model consists of four elements: student characteristics, student skills, external factors, and internal factors.

Finally, a detailed conceptual model was developed by Falcone (2011), where additional elements were added: self-efficacy (or habitus); social, economic, cultural, and other forms of capital; and different levels of belongings to communities within and beyond the educational institution. The latter element shapes students' goals and educational and social commitments. All these elements influence students' learning experiences, the perceptions of their academic fit, and behaviour regarding learning processes and progress.

These theoretical models provide a useful conceptual framework to discuss factors identified through the systematic literature review, rather than limiting the analysis by the direct application of a particular theoretical model.

Approach to the literature review

The purpose of this article is to identify factors or elements that influence student learning experiences and analyse them against the considered theoretical models. To achieve this aim, I reviewed existing studies that reported empirical research results from 2009 to 2020. The Scopus database was used to search for relevant studies. The variety of key words and word combinations, such as "adult student", "non-traditional student", "online higher education", "online education", and "distance education" were used as search terms. Only studies published in the English language were reviewed. Additional studies were identified through a "snowball" method by using reference lists of the selected articles (Webster and Watson 2002). Initially, I identified 144 studies. From these, I excluded the following studies: (a) conducted in a K-12 setting; (b) were not empirical, e.g. opinion or conceptual papers; (c) doctoral theses; (d) conference papers; and (e) papers, publications in magazines, and

reports which were not peer reviewed. Consequently, I selected 30 empirical studies on students' experiences in online higher education that had been published in peer-reviewed journals. In the quantitative studies, only factors that were suggested as statistically significant have been considered. In the qualitative studies, factors that were critical for online students' experience were included in the analysis.

To distinguish and group factors, I employed the Constant Comparative Method for the analysis (Lincoln and Guba 1985). Below, I provide an explanation of the steps of the analysis. First, a large number of factors were selected from the reviewed studies according to their specific features. The label of each factor has been either borrowed from the study where it was reported or was created to reflect main features of the factor. The second step involved the comparison of the factors. The goal of the comparison was to distinguish conceptual similarities and differences between them (Boeije 2002). From the initial number of factors, I selected one and allocated it to the first category (e.g. individual characteristics). Then, I chose another factor and compared it to the first one, to decide whether this factor can be added to the first category or represents a new theme. In this way, all identified factors have been evaluated until I had 15 categories which were further combined into four groups (see Table 1).

Results

The review of the literature resulted in the differentiation of four groups of factors that have been suggested as critical for students' online learning experience and contributed to either students' attrition, retention, or progress. The four groups of factors are: student factors, course factors, social factors, and support factors. Table 1 provides a description of attributes of the identified categories of factors and their composite sub-factors.

In the following part of the paper, I explain the role of each group of factors and its composite sub-factors on adult students' online learning as they have been described in the empirical studies. I then analyse these factors in their relation to the considered theoretical models.

Student factors

Individual characteristics

Evidence of the influence of students' individual characteristics on their attrition, retention, or learning progress is mixed. For instance, Park and Choi (2009) found no significant difference between the students' individual characteristics and their learning behaviour. They also concluded that gender, age, previous education and work experience have no significant impact on students' attrition. Xu and Jaggars (2014) and Cochran et al. (2014) suggest students' gender is a significant predictor of online students' retention. Xu and Jaggars (2014) found that persistence and learning outcomes vary significantly among students of a different gender, race as

Table 1 Factors suggested as being critical for adult students' online learning

Factor	Sub-factor	Factor attributes
Student factors	Individual characteristics	Individual characteristics (Xu and Jaggars 2014; Martin and Bolliger 2018)
	Academic background	GPA (Willging and Johnson 2009; Knestrick et al. 2016; Cochran et al. 2014)
	Relevant experiences	No experience of successful completion of any previous online courses (Hachey et al. 2012)
		Prior experience of withdrawal (Cochran et al. 2014)
Student factors	Skills	Self-regulation skills (Lee et al. 2013; Geduld 2014)
		Self-efficacy (Geduld 2014; Backs 2017; Reilly et al. 2012; Harnett et al. 2011; Joo et al. 2015; Cox 2018)
		Self-regulation, and self-discipline (Lee et al. 2013)
		Competency in using information communication technologies (Beqiri et al. 2009; Pena and Yeung 2010; Cole et al. 2014)
		Time management (Cox 2018; Holder 2007; Ilgaz and Gülbahar 2015)
	Students' expectations	Students' expectations about the difficulty of the course (Bourdeaux and Schoenack 2016; Pierrakeas et al. 2004)
		Expectations of the instructor's feedback (Gaytan 2015; Martin and Bolliger 2018)
	Psychological attributes	Persistence (Park and Choi 2009; Yang et al. 2017)
		Satisfaction with the course (Chyung et al. 1998; Noel-Levitz 2011)
		Students' motivation (Kim and Frick 2011; Zaborova et al. 2017)
		Locus of control (Lee et al. 2013)
Course factors	Course design	Course design (Li et al. 2017; Rienties and Toetenel 2016)
	Course flexibility	The flexibility of online learning (Sorensen and Donovan 2017)
		Online modality (Wladis et al. 2014)
		Integration of learning with working experience (Kahu 2013)
	Relevancy of the course	Relevancy of the course for personal needs (Yang et al. 2017)
		Higher importance of career development or personal development goals (Stoessel et al. 2015)
		Interest in and the utility of the programme for the student's professional career (Yang et al. 2017) or personal development (Stoessel et al. 2015; Knestrick et al. 2016)

Table 1 (continued)

Factor	Sub-factor	Factor attributes
Social factors	Interactions	Successful online interactions and relationships with other students (Baxter 2012; Burns 2013)
		Collaborative learning activities (Nistor and Neubauer 2010)
		Lack of interaction (Cole et al. 2012)
		Othering (Phirangee and Malec 2017)
		Online interactions (Phirangee and Malec 2017; Kuo and Belland 2016; Cole et al. 2014; Kuo et al. 2014)
	Engagement	The amount of time spent on communication activities (Rienties and Toetenel 2016)
		Engagement (Martin and Bolliger 2018; Banna et al. 2015; Britt et al. 2015; Meyer 2014; Backs, 2017; Wlodkowski 2008; Chametzky 2013; Stone and O'Shea 2019)
	Connectedness	Connectedness (Boyle et al. 2010; Johnson 2014)
		Teacher connection (Stone and O'Shea 2019)
	Social presence	Social presence (Richardson et al. 2017)
Support factors	Institutional support	Proactive support (Simpson 2013; Russo-Gleicher 2013)
		Tutors' support and guidance (Brown and Wilsom 2016)
		Targeted, promoted, appropriate, and easily available support (Stone and O'Shea 2019)
		Instruction and feedback (Gaytan 2015)
		Embedded within the curriculum support (Stone 2017)
	External support	Support from family and at the workplace (Park and Choi 2009; Pierrakeas et al. 2004; Lee et al. 2013)

well as level of academic preparation. Martin and Bolliger (2018) also analysed how gender, age, and previous online learning experience influence students' perceptions of engagement strategies, which were associated with learning progress. In regard to gender, they found that the use of additional online resources for learning was more important for female than for male students. Regarding age, it was more important for younger students to receive regular updates or email reminders from the instructor than it was for older students. Similarly, Knestrick et al. (2016) named age among four important variables that can explain students' leaving or withdrawal, reporting that students who are over 40 years old are twice more likely to leave their study programme before graduation. Surprisingly, another study suggested that students aged 50 years and over are at a lower risk of attrition due to their learning goal orientation towards personal development, and greater value of the opportunity for personal growth and development through learning (Stoessel et al. 2015). Overall, there is no consensus on the effect of the individual characteristics, academic background on the students' attrition, retention, or progress. Yet, the student characteristics element is presented in all theoretical models selected for the analysis in this paper.

Academic background

The effect of students' academic background on their learning is also not clear as the results of the analysed empirical studies are contradictory (see Willging and Johnson 2009; Knestrick et al. 2016; Cochran et al. 2014). Xu and Jaggars (2014) and Cochran et al. (2014) suggested that academic preparation and prior academic performance are significant predictors of online students' retention. Knestrick et al. (2016) found that four variables, namely grade point average (GPA), specialty of the programme, student status (full time or part time), and age (younger than or over 40 years old) explain 27% of the absence or withdrawal from study. They also found that the number of earned credits is a significant predictor of absence and withdrawal. Interestingly, Willging and Johnson (2009) found that dropped out students tend to have a higher GPA, and students with the high employment status, e.g. director or manager, are less likely to discontinue their study. Although this study was conducted in the context of a single online program, these conclusions suggest that the effect of academic background on the learning progress in the context of online education should be further explored.

Relevant experiences

Past research demonstrated that students with little or no online learning experience are at greater risk of attrition (Cochran et al. 2014; Xu and Jaggars 2014). Xu and Jaggars (2014) argued that previous experience of dropout from online courses is a significant predictor of online students' retention. They found that students with weaker academic backgrounds have "significantly stronger negative coefficients for online learning compared with their peers, in terms of both course persistence and course grade" (Xu and Jaggars 2014, p. 23). Hachey et al. (2012) revealed that

students who had not successfully completed any previous online courses had low retention rates compared to those who successfully completed prior online classes, suggesting that previously unsuccessful online learners require additional support. Yet, Willging and Johnson (2009) found that students who completed their first two courses are more at risk of dropout.

Li et al. (2017), in their investigation of learning experiences of new and continuing students, found that there is a dramatic difference in how online learning environments are experienced between the two groups. Specifically, continuing learners expressed much lower satisfaction (70% less than new students) if their learning was not aligned with their wider professional development aims.

An overall recommendation from the research is that there is a need to identify and support online learners at risk, namely freshmen, those with lower GPA, and those with prior experience of attrition.

Student skills

There is substantial evidence for the effect of student skills on student attrition, retention, and online learning progress. This ranges from the ability to effectively allocate time and make realistic timetables, to academic self-efficacy, self-regulation, and self-discipline. Findings from qualitative studies suggest that competency in using information communication technologies is related to a greater satisfaction (Beqiri et al. 2009; Pena and Yeung 2010), which influences academic progress (Cole et al. 2014). Lai (2011) determined that the readiness for self-direction is a critical element of mature students' learning progress. Hashim et al. (2015) argued that adult students, despite their assumed self-direction, require the same level of guidance and motivation as their younger peers (Hashim et al. 2015). Geduld (2014) showed that higher achieving students are more self-regulated, whereas those students who are lacking self-regulation are at a greater risk of attrition.

Research has also shown the impact of time management skills on students' academic progress (Cox 2018; Ilgaz and Gülbahar 2015). Students who are able to effectively allocate time and set up realistic timetables are more likely to be satisfied with their studies and successfully progress in an online course (Ilgaz and Gülbahar 2015). The lack of awareness of the effort required for online learning was the main cause of attrition for time-poor adult students (Romero and Barbera 2011).

Another important concept that has been emphasised in the literature in relation to online learning is academic self-efficacy—a student's confidence in their ability to perform the tasks successfully (Bandura 1997; Geduld 2014). Research indicates that a lack of self-efficacy negatively affects students' academic progress (Shen et al. 2013), and may cause emotional stress, feelings of isolation (Betts 2009) and frustration (Artino and Stephens 2009). In a similar way, Backs (2017) pointed out the substantial negative impact of low levels of self-efficacy, arguing that students with a lack of self-efficacy for learning in an online environment are at risk of disengagement and attrition and, emphasising the communication with instructors and peers as an important support strategy.

Psychological attributes

Persistence, satisfaction with the course, motivation, locus of control and love of learning are important contributing factors for online student retention and learning progress.

Persistence proved to be a strong predictor of students' retention in online education (Yang et al. 2017). Yang et al. (2017) categorise persistence attributes into individual and programme factors. They emphasised the relevance of the course as an important programme attribute.

Learning satisfaction is also an important indicator of online learning progress (Cole et al. 2014; Ilgaz and Gülbahar 2015; Lee 2014), although not all research supports this finding. For instance, Rienties and Toetenel (2016) did not find a significant relationship between satisfaction and online student retention, arguing that online learning is not necessarily a pleasant experience.

Bourdeaux and Schoenack (2016) found that adult students' satisfaction can be negatively affected when tutors do not meet their expectations, use pedagogical tools poorly, do not provide instructional clarity or show a lack of respect. Feedback from instructors was an important expectation of online learners (Gaytan 2015; Martin and Bolliger 2018). Specifically, students expect timely, meaningful, and clear and comprehensive feedback from their tutors so that they can improve their academic performance and make stable progress. Online students appreciate a development of more personal relationships with their tutors (Martin and Bolliger 2018).

Another important psychological attribute is motivation (Kim and Frick 2011). Such factors as external commitments, lower tuition fees, an opportunity and flexibility to combine work and study, influence students' motivation for learning, and, as a result, their retention (Zaborova et al. 2017). Harnett et al. (2011) argued that the level of students' motivation for learning depends on a combination of factors, both internal and external. Among the internal factors for online student progress they identified interaction with instructors and tasks that are interesting, relevant, and applicable. Important external factors are family and work-related commitments.

Locus of control, or a student's perception of the causes or control over their learning, is another psychological factor that is critical for online student progress (Lee and Choi 2011). Based on the analysis of differences between successful and dropout students, Lee et al. (2013) found that successful online learners have a high level of locus of control, a greater feeling of responsibility for their learning, and are more self-regulated.

Course factors

Course design

In a study on the influence of online programme design on the learning progress, Lee and Rha (2009) reported two main findings: learners who participated in a structured course expressed their satisfaction with the structure of the course, whereas learners who participated in the interactive course were more satisfied with interpersonal

communication. Li et al. (2017) compared the learning experiences of a large sample of students (99,976 continuing students and 16,670 new students) and concluded that such design elements as assessment, learning materials, workload, and focus on career development strongly correlate with student retention. Another large study by Rienties and Toetenel (2016) also looked at the impact of the online course design on students' ($n=111{,}256$) satisfaction, learning behaviour and academic progress. The results provided insights for online educators on the importance of the social side of learning that goes in parallel with cognitive development. As Ladell-Thomas (2012) emphasised, structured content with diverse social activities and authentic tasks is an important expectation of online students.

Course flexibility

The flexibility of online learning mode is commonly presented as a benefit. Adult learners who choose such study have greater opportunities to combine their learning and other responsibilities (Kahu 2013). Nevertheless, the flexibility feature of online learning may be misinterpreted as learning that requires less commitment. Based on the responses from 396 dropout students, Sorensen and Donovan (2017) found that those who valued flexibility of online learning, specifically as an opportunity to work following an individualised schedule, were more likely to discontinue their study due to the difficulty to combine learning with other commitments. These findings suggest that online learning might not be suitable for those individuals who misjudge the concept of flexibility and struggle to juggle multiple responsibilities. Instead, more guided instruction and support may be needed for these learners. A similar insight on the need for more structure and guidance has been offered by Farrell et al. (2016). They argued that to enhance participation in online learning, students should be provided with comprehensive information regarding the programme schedule and required commitments.

Relevance of the course

The relevancy of the course has been highlighted as a critical factor for student progress in the analysed studies. Yang et al. (2017) found that the course relevance for students' professional or personal needs have a significant impact on their persistence and progress. The importance of personal development as a result of learning has been also associated with student academic progress (Stoessel et al. 2015; Knestrick et al. 2016). As Stoessel et al. (2015) concluded, the alignment of learning with career development or personal development goals lowers the risk of online student attrition.

Social factors

Engagement

A higher level of engagement enhances satisfaction with and motivation for learning, eliminates feelings of isolation, and positively impacts academic progress

(Martin and Bolliger 2018). Banna et al. (2015), Britt (2015) and Meyer (2014) also emphasised that greater engagement leads to better academic progress due to the cognitive commitment and effort required for students' cognitive development. Banna et al. (2015) stressed that while the quality of the content of learning materials played the main role in the past, for the successful self-directed learning engagement is more crucial.

Online interactions

Previous research relates academic progress in online higher education to factors that increase feelings of disconnection and isolation, including the lack of interaction between students (Phirangee and Malec 2017; Kuo and Belland 2016). Cole et al. (2014) determined that the rarity of interactions negatively affects learning. Similarly, Kuo and Belland (2016) identified that learner–content interactions and learner–instructor interactions were significant predictors of student satisfaction and retention in an online course. Martin and Bolliger (2018) found that students, particularly those who liked to work on collaborative group activities or assignments, valued interactions with peers and reported enjoying being involved in group discussions. Despite the importance of online interactions, there is evidence that online learners may face challenges to maintaining interactions in their courses, and do not always adapt well to the constructivist learning activities often used in online learning environments (Backs 2017).

Connectedness

Belongingness to the community, which implies a connection to a group or an institution, is critical for decreasing attrition rates (Boyle et al. 2010; Rovai 2003). Closely linked to the sense of belonging to the community is connectedness (Hart et al. 2011; Shackelford and Maxwell 2012). In the study conducted by Boyle et al. (2010), students reported little sense of connection and belonging to the learning community, and, as a result, dissatisfaction with learning and a lack of progress. Johnson (2014) also found that in an online environment that facilitating connectedness is critical for student retention as in an online learning environment there is a risk for a student to feel disconnected (Johnson 2014). Past research divided the concept of 'connectedness' into three themes: continuity (i.e. course tutor meeting with students at each study day); structure (university regulations, dates, and deadlines); and a 'human touch' (genuineness, caring, and commitment to students) (Carnwell et al. 2001) and suggest that if these aspects of connectedness are realised, disconnectedness and student attrition can be significantly reduced.

Social presence

It is argued that instructors should aim to foster social presence in order to support student retention and facilitate their learning progress. Richardson et al. (2017) suggest that social presence has an influence on students' motivation and participation in online

learning environment and may accurately predict student satisfaction. Moreover, Richardson et al. (2017) found that social presence may influence students' online learning progress. A study conducted by Arbaugh (2014) also confirmed that social presence, in this study measured as a learning behaviour associated with an active perception of others, can carefully predict student satisfaction with learning, and consequently, their academic progress.

Support factors

Institutional support

Research suggests that institutional support plays a critical role in ensuring student retention and progress (Simpson 2013). Stone (2017) and Stone and O'Shea (2019) stress the importance of the learning support that is "embedded within the curriculum as much as possible, hence delivering it where and when it is most needed" (Stone 2017, p.10). This may include support with academic skills, technological and personal services embedded into the course design. In other words, Stone (2017) advocates the inclusion of support elements into the content of the discipline, "integrated within the classroom task, and usually within the assessment task". (Stone 2017, p. 10). Brown and Wilson (2016) found that less proactive students rely strongly on a study handbook, and guidance and support from the instructor in order to develop adequate skills and successfully progress in their learning. Russo-Gleicher (2013) proposed that instructors can contribute to students' retention by merely monitoring and redirecting students to appropriate support services. This is in line with Jones (2010) who argues that academic caring is important for learners who study online and with Farrell et al. (2016) who state that online participation can be enhanced if the learners are provided with adequate information, guidance, and schedule.

External support

Scholars within the field of online and adult education often claim that although students are drawn to online learning for flexibility and convenience, some of them struggle to balance multiple priorities and require external support (see for instance Park and Choi 2009; Sorensen and Donovan 2017). However, Lee et al. (2013) did not find correlation between the completion of the online programme and existing support from family or an employer. The authors explain this contradiction by a possible influence of other variables that have been included in their analysis. Thus, external support may positively impact online student retention and progress, but its form and effect on students' learning should be better explored (Simpson 2003).

Synthesis of the literature

This section provides a synthesis of the reviewed literature. Past research generates findings on multiple reasons for online student attrition, retention, and progress which are associated with student-related, program-related, social, and support factors. Although considered factors are discussed individually, this is done for the simplicity of analysis. The contradictory results of the past research promote the idea that these factors are interrelated and intertwined in their influence on online student learning.

Some scholars found that student factors influence their preferences towards the course structure (Rienties et al. 2012; Ladell-Thomas 2012). The relation between student factors (e.g. student skills, academic background, experience in learning at a distance) and course factors is particularly noticeable within the misconception about the taken-for-granted flexibility of online learning. Although online students have an opportunity to study at any time and from any geographical location, they still must comply with course requirements and assessment deadlines. Furthermore, despite the proffered flexibility of online education, more structured courses suggested to improve student retention (Sorensen and Donovan 2017; Farrell et al. 2016). Not only the structure of the course, but the quality and relevance of the content determines the influence of social factors. For instance, the alignment of online learning objectives with career development or personal development needs of the learner may enhance student engagement and social presence (Stoessel et al. 2015). Therefore, the barriers associated with student factors can be eliminated by paying closer attention to course factors.

When discussing support factors in relation to the other factor categories, an overall recommendation from scholars is a targeted approach of students at risk, meaning those with low GPA and a higher likelihood to withdraw. The discussion about the need for support often runs in parallel with consideration for a particular factor in the reviewed studies. Indeed, online students may require support at different stages of their learning (Rotar 2021) since their retention and progress depends on a combination of both internal and external factors. As Stone (2017), and Stone and O'Shea (2019) emphasise, learning support should be "embedded within the curriculum" (Stone 2017, p. 10), so it can address a wide range of attrition, retention, and progress determinants. Furthermore, the assumption of online students having good self-regulating skills should be questioned (Geduld 2014), contributing to the development of an educational institutions' responsibility for student retention and progress. The assumptions about the self-directedness and self-motivation of adult online learners can lead to accelerating attrition rates in online education.

Social factors also overlap with student factors on the issues of learning community, connectedness, social presence, and engagement. Although communication with instructors and peers is highlighted as an important support strategy (Rotar 2021), Lee and Rha (2009) pointed out that different online learners may have varying needs in the frequency of online interactions. Furthermore, due to the diversity of online students, a more personalised approach (Martin and

Bolliger 2018) and a continuous adjustment of teaching practices are needed to address the negative impact of student factors on learning (Gaytan 2015). Thus, the consideration of social factors is only relevant when discussed in relation to the needs of an individual student. For example, Geduld (2014) states that only students with low self-regulation require additional support, since those who are able to realistically allocate time are more likely to be successful. Similarly, Lee and Rha (2009) argue that not all online students feel satisfied with group participation and would prefer individual work.

Discussion

Existing theoretical models suggest critical elements of students' retention (Tinto 1975), attrition (Bean and Metzner 1985), persistence (Rovai 2003; Falcone 2011) or progress (Kember 1995) in either traditional or a distance learning setting. These well-known models emphasise the importance of academic and social integration for student retention and successful progress in learning. They suggest that unsatisfactory integration of the student into the social life of the educational institution, or an incompatibility with the learning demands are major causes for a student's decision to withdraw from a course of study. Each model provides a comprehensive list of elements that should be considered when applying a model for analysis of student learning and/or a decision-making process. However, the review of empirical studies revealed new factors that may be associated with student attrition and are critical for students' retention and academic progress in an online environment which are not explicit in the considered theoretical models.

The systematic literature review identified four groups of factors that may influence learners in an online learning environment. Among them are student factors, course factors, social factors, and support factors. The revision of these factors in relation to the existing theoretical models of student attrition, retention, and progress revealed a lack of attention to the importance of student support in the previously formulated models and a weak emphasis on the influence of course factors, particularly the relevance of the course for students' professional and personal development.

All considered models incorporated students' personal characteristics as an important element. The examined literature also suggests that the consideration of individual differences in understanding the students' online learning experience is important and should not be neglected due to the peculiarity of the online student population. The influence of the individual differences with regard to age, gender, and previous educational background, personal characteristics, circumstances, commitments, and so on should be better examined in relation to their effect on students' online learning experience due to the contradictory results in the empirical research.

In all well-known models, the role of course factors is not fully explained. For instance, such a sub-factor as relevance of the course for professional development and student career seems to be missing in the considered theoretical models, despite its importance highlighted in the analysed empirical studies. More importantly, the criticality of support factors is not explicitly mentioned in the reviewed theoretical

model, showing a significant gap in understanding the influence of student support, or its lack, for students' attrition, retention, and progress. Yet, many scholars suggest that institutional support and external support can predict students' persistence in online learning (Park and Choi 2009; Perry et al. 2008; Pierrakeas et al. 2004). A discussion of the need for additional, proactive support emerged from the fact that the majority of online students are adults employed either part or full time, and who possess additional family responsibilities. As a result of their busy lifestyles, online distance learners have fewer opportunities than their younger peers to interact directly with available institutional support services or have less immediate contact with their tutors. Prominent researchers in the field of online education Simpson (2013) and Woodley and Simpson (2014) provide examples of the successful interventions practices and argue that proactive institutional support is one of the effective ways to reduce online students' attrition and improve retention rates. Nevertheless, this element is missing or not explicitly explained in the theoretical models of students' attrition, retention, and progress evaluated in this paper. Such discrepancy may be explained by the fact that, according to Woodley and Simpson (2014), online students tend to blame themselves for their failure and underestimate the role of institutional support for their learning progress and success. Growing research in the area of online and adult learning indicates that for online students predominantly represented by the adult population of different ages and levels of commitments (Street 2010; Buck 2016) a supportive study environment and availability of support services are among the most significant factors of their successful learning (La Padula 2003; Buch 2016; Simpson 2013). Rather than limiting educational opportunities for those students, educational institutions should be ready to provide them with proactive support. Furthermore, when designing an online programme, online students' needs and barriers for progress should be examined rather than assumed, and the role of the external support should be better investigated.

Conclusion

This study reviewed previous research on online student attrition, retention, and progress through the lens of theoretical models developed by Tinto (1975), Bean and Metzner (1985), Kember (1995), Rovai (2003), and Falcone (2011). The analysis demonstrates that factors which have been proposed to predict or explain student attrition, retention, or progress can be broadly split into four categories: student factors, course factors, social factors, and support factors. In discussing these factors, there is a common agreement that if the appropriate support is offered, some internal and external influences are likely to be mitigated.

The three groups of factors, namely student factors, course factors and social factors, are apparent in the considered theoretical models. The significance of these factors is supported by many studies which employed a variety of research methods. However, the last group of factors, specifically support factors, seems to be neglected as this review revealed that this factor is not presented in the considered models.

The importance of student support is emphasised in the analysed studies in various ways. For instance, when discussing student skills, scholars point out that scaffolding is one way to address the issue of student attrition. The psychological barriers to online learning can also be eliminated by support interventions. Furthermore, since this paper focused on the adult student population, the role of support proved to be even more critical for adults' success due to the presence of multiple commitments in their lives. Online students with multiple responsibilities have various constraints in their learning. While they can successfully manage most of their challenges, student support plays a significant role in affecting (positively or negatively) their learning experience. Although Kember's model (1995) suggests that a supportive environment and encouragement are necessary for successful social integration, support interventions for creating such an environment are not fully investigated. Further research is needed to integrate support factors into the theoretical models of online students' attrition, retention, and progress.

The course factors are also not emphasised in the considered models. This excludes the possibility of addressing the issues of students' misconception around the flexibility of online learning. Furthermore, a lack of awareness of the importance of course and social factors dismiss the need for pedagogical and instructional design training of online educators who should regularly evaluate and develop technological, communication, and facilitation skills.

The flexible nature of online education enables adult students, with a variety of commitments, to integrate more successfully academically, professionally, socially, and psychologically to their learning if they are adequately supported. The absence of support factors in the considered theoretical models requires a re-examination of how we address the problem of student attrition. A popular approach is to assume the influence of a great variety of factors on students' learning experience yet neglect the role of student support. In existing models, it appears to be an unexamined assumption that individual learners are fully responsible for their successful adaptation into the academic and social life of their educational institution.

Based on the identified limitations, the following recommendations can be provided:

1. Online student populations vary significantly in regard to the student factors. Due to this heterogeneity, a more personalised approach, and a continuous adjustment of teaching practices during the teaching and learning process are needed to address the negative impact of student factors on learning.
2. A proffered flexibility of online learning may create misconceptions around the potential academic and time commitments. Thus, to address the negative influence of the course factors an adequate information about the course structure and course requirements should be provided to the prospective students prior to enrolment.
3. A development of technological and pedagogical skills of educators proved to eliminate the negative effect of social and course factors on student learning. Professional development programmes that cover pedagogical and instructional design training should be offered to educators.

4. Student support is only relevant and can address a negative effect of a particular factor if offered on time and at the right stage of learning. Therefore, it is recommended to embed support interventions within different stages of the learning cycle to address the wide variety of internal and external factors.

5. A revision of existing models to include elements of course factors and support factors into their structure is recommended. Inclusion of support and course factors in the theoretical models can be a way forward for addressing the problem of online student attrition and increase retention rates in online classes and programs.

To conclude, current research appears to be moving away from understanding of how to better support online students to a more extensive examination of attrition, retention, and progress factors that constitute different theoretical models. The results of this systematic literature review highlight a fundamental problem of neglecting the role of institutional and external support on student learning in an online learning environment. Given the lack of attention to the element of support in theoretical models, further research needs to explore the importance of proactive institutional and external support in ensuring online students' success.

Limitations

The aim of this paper was to shed light on the structural limitations of the considered theoretical models of students' attrition, retention, and progress. This paper, however, did not intend to examine recommendations developed alongside or on the basis of these models. Following this approach, the results suggest that student support is a missing structural element in the models' architecture. However, the results of the review cannot be generalised for all student groups due to the specific interest of this paper in the adult student population. Finally, it is important to note that the number of the revised studies is limited due to the application of the inclusion and exclusion criteria to maintain the focus of the study.

Declarations

Informed consent Not applicable.

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