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Technology and Student Retention in Online Courses

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ABSTRACT

This study aimed to evaluate the relationship between factors of technology acceptance and retention of students in online courses. They included the factors: expectation of performance, hedonic motivation, self-efficacy, social influence, system quality, information quality and intention to continue. The results show that there is a positive and statistically significant relationship between student retention and expectation factors, hedonic motivation and information quality. On the other hand, the factors self-efficacy, social influence and quality of the system did not present a significant relationship with retention, contrasting with the assumptions advocated in most of the empirical studies presented in the literature review.

KEYWORDS: Technology acceptance factors, Retention of students, online courses.

INTRODUCTION

Online courses, despite the considerable financial investments they demand, still do not effectively serve the purpose of achieving success, due to the low retention rates of students who present (Abed, 2016). Despite the high growth rates of this market, studies on why many users discontinue online learning after an initial experiment were not exhaustive (Sun, Tsai, Finger, Chen, & Yeh, 2008; Chen, 2011; Joshi & Sharma, 2016).

Advantages to the student as flexibility of place and time, and institutions, such as the possibility of gains in scale, increased the enrollment in Brazil from 49,911 to 1,153,572 between 2003 and 2013 and in 2014 those already enrolled Reached 3.8 million (Abed, 2016). In spite of this evolution, critical factors related to the inadequacy of the technological infrastructure (Surry, Ensminger & Haab, 2005) and the low acceptance and satisfaction of the users related to the technology (Lee, 2010) have led the educational institutions to bear high costs (Elloumi, 2004) and to face difficulties in accepting their courses (Saadé, 2003).

Low levels of student retention impact on the ability to invest and maintain the course, tuition fees, receipt of subsidies from development agencies, as well as on non-financial costs, as negative repercussions on the academic reputation of the educational institution (Laguardia & Portela, 2009).

While there are many reasons that may lead students to stay or drop out of their courses, these reasons for intensive use of technology may be unique to students enrolled in online programs. This peculiarity led several researchers to investigate retention from the perspective of technology acceptance (Saadé & Bahli, 2005; Chen, 2011; Albertin & Bauer, 2012; Garcia, Dujo & Rodrigues, 2014; Sharma, Joshi & Sharma, 2016).

Consistent with retention-oriented theories and dedicated to providing a comprehensive theoretical framework that explains why students remain on course, technology acceptance theories are based on behavioral intentions shaped by beliefs and attitudes (Willging & Johnson, 2009). Among these theories we used as the basis, the Unified Theory of Acceptance and Use of Technology (UTAUT), by Venkatesh, Morris, Davis and Davis (2003), a theoretical perspective consolidated within the field of information system, adoption and diffusion of information technology (Williams, Rana, Dwivedi, & Lal, 2011). In addition, the DeLone and McLean (D & M) Success Model (Delone & Mclean 2003), which seeks to explain causal relationships involving the development, implementation, and evaluation process of an information system success, also served as the basis for the study.

Both theories belong to the theoretical frameworks that explain the acceptance and use of technology (Premkumar & Bhattacherjee, 2008, Mohamadali & Garibaldi, 2010). The UTAUT model takes into account the beliefs and attitudes that influence the behavior of the individual, but neglects other factors, such as the design of the artifact (Benbasat & Zmud, 2003, Wixom & Todd, 2005), resulting in a shortage of project improvement recommendations (Delone & Mclean, 2003; Wixom & Todd, 2005; Benbasat & Barki, 2007). The D & M Model, on the other hand, considers aspects of the artifact, such as the quality of the system and the quality of the information as antecedents of the intention of use of the individuals.

Thus, the joint analysis of technology acceptance factors of different theoretical conceptions was done so that, in a complementary way, they could broaden the understanding about the aspects related to the acceptance of the technology, as suggested in the studies of Wixom and Todd (2005), Zhao and Kurnia (2014), Yuliasari (2014) and Al-Khowaiter, Dwivedi and Williams (2014), and to retention, as proposed by Sun et al. (2008), Lee (2010), Lee and Choi (2013).

From this perspective, the retention, in this work measured by the student's intention to continue the online course, is associated to the acceptance of the technological system used by the student to carry out the online course, as discussed in the works of Chiu, Hsu, Sun, Lin, & Sun (2005), Chiu and Wang (2008), Roca and Gagné (2008), Lee (2010) and Lin (2010).

We recognized that other ways of studying distance are possible, such as courses based on printed material, semipresential or blend learning. However, the online offer of courses is the one that grows the most in Brazil and it is in her that the lowest retention rates are concentrated (Abed, 2016). Likewise, because it is preferable to retention students in online courses, a mode widely supported in technology, it was made the option, as study variables, for factors related to technology acceptance.

It is understood that, despite the relevance of the acceptance of technology to the success of online courses, research has not yet emphasized the joint influence of performance expectancy, hedonic motivation, self-efficacy and social influence predicted in UTAUT theory (Venkatesh et al, 2003), And the quality of information and system quality factors proposed in the D & M model (Delone & Mclean, 1992), on the retention of students in online courses. Testing empirically the joint effects of different theoretical conceptions can promote a more comprehensive analysis of the phenomenon (Wixom & Todd, 2005), in this case, retention.

From the foregoing, the following research question was outlined: **What is the relation between factors of acceptance of technology and the retention of students in online courses?** Studies on the intention to remain in the courses contribute to raising students' satisfaction and frustration factors, helping managers to reduce dropout rates (Levy, 2007). It is

hoped, therefore, to favor the decision-making of the managers of the online courses, broadening the understanding about the variables that can contribute to the retention of students from aspects related to the acceptance of the technology.

LITERATURE REVIEW

Providing online courses provides advantages to HEIs, such as economy of scale and expansion of the market, however, it brings challenges, such as the low student retention rate (Carr, 2000, Diaz, 2002; Berge & Huang, 2007, Patterson & Mcfadden, 2009, Abed, 2016). Retention is defined as the continued participation of the student in a course to completion (Berge & Huang, 2004) and results from the desire to continue the course in order to reach goals (Shin, 2003; Müller, 2008) even under adverse Their stay (Simpson, 2004).

Studies on retention in online courses emphasize the importance of the role of information and communication technologies (ICTs) as suppressors of presence. Positive attitudes and behaviors of students regarding the technologies and resources of learning environments are explanatory factors of the permanence in the courses (Laguardia & Portela, 2009). Studies on retention in online courses emphasize the importance of the role of information and communication technologies (ICTs) as suppressors of presence. Positive attitudes and behaviors of students regarding the technologies and resources of learning environments are explanatory factors of the permanence in the courses. The intention of users to continue to use the technology of the course is considered one of the main determinants of the success of the online mode (King & He, 2006, Mohammadi, 2015), as well as to understand the factors that influence the intention of the user to continue using The course system is a critical issue for researchers and practitioners (Chiu et al., 2005).

The reasons that lead students to stay in the course are based on behavioral intentions shaped by beliefs and attitudes, consistent with theories of acceptance of technology (Willging & Johnson, 2009). In fact, there is a consensus about the positive relation between the acceptance of the technology and the increase of the intention of the users to continue the course (Chiu et al., 2005; Roca, Chiu & Martínez, 2006, King & He, 2006, Mohammadi, 2015).

Acceptance of Technology

Studies on the intention to use the technology have resulted in models with explanatory power usually not greater than 40%, leaving room for the insertion of new antecedents of acceptance by the users (Legris, Ingham & Collerette, 2003). Several researchers were willing to expand or refine such models, making the knowledge of this field dispersed (Davis, Bagozzi & Warshaw, 1992; Ajzen,1991; Rogers, 1995; Taylor & Todd, 1995). Different from the cited researchers, Venkatesh et al. (2003), with the purpose of structuring the evidences found, made an empirical comparison between several models of technology acceptance and proposed the convergence of eight of them, resulting in the development of a new theory, the aforementioned UTAUT theory.

Originally, the UTAUT theory model was designed to verify the acceptance and use of technology in the workplace context. The theory holds that four fundamental constructs - expectation of performance, expectation of effort, social influence and facilitating conditions - are direct determinants of the intention to use and the use behavior of an information system. A later revision of the model by Venkatesh, Thong, and Xu (2012) added hedonic motivation, price, and habit as new constructs.

According to the theoretical framework, that studies the acceptance of technology, DeLone and McLean (1992) revisited the published literature from 1981 to 1987 to develop a taxonomy on success factors in information systems. This taxonomy was based on the Information Theory

(Shannon & Weaver, 1949) and suggests that the evaluation of an organization's success in its investments in technology and information systems comes from six dimensions: system quality, information quality, satisfaction of user, IT use, individual impact and organizational impact (Delone & Mclean, 1992).

Research on the adoption of technology sometimes produces conflicting results. A potential reason for this inconsistency may be the focus on a single theory, disregarding other possibly important determinants (Chen, Gillenson & Sherrell, 2002). In this way, it becomes relevant to observe the joint effect of factors of different theoretical conceptions in order to increase the explanatory power of the phenomena (Wixom & Todd, 2005).

Other studies of partial or total integration of the variables of the UTAUT and D & M models have already been carried out in order to provide a more comprehensive understanding of the behavioral processes related to the use of technology. These proposals include Cheng et al. (2008) who used the UTAUT model and the quality constructs of the D & M model to identify the factors that determine the customer acceptance of internet banking services in China. Yahya, Nadzar and Rahman (2012) also tested the variables of the UTAUT and D & M models to evaluate the use of government virtual services in Malaysia. Alshehri, Freeze, Lane, & Wen (2012) also used them to analyze virtual government services in Saudi Arabia.

In the educational area, Motaghian, Hassanzadeh and Moghadam (2013) used UTAUT and D & M variables to assess their influence on the intent and use of web-based learning systems in Iran. Osubor and Chiemeke (2014) used them to analyze Behavior of technological innovations proposed by e learning in Nigeria. Mohammadi (2015) introduced the integrated model to predict the use of an e-learning system in Iran.

These studies, carried out in China, Malaysia, Saudi Arabia, Iran and Nigeria, although using UTAUT and D & M models together, did not involve a joint analysis of the proposed factors: expectation of performance, hedonic motivation , Self-efficacy, social influence, quality of information and system quality. Moreover, even when directed to the educational area (Motaghian et al., 2013, Osubor & Chiemeke, 2014; Mohammadi, 2015), his focus did not favor retention of students in online courses.

Based on the specificities that characterize the online teaching modality, it was proposed to observe the joint effects of performance expectancy, hedonic motivation, self-efficacy, social influence of the UTAUT model, and the quality of the system and information of the D & M model described next.

Technology Acceptance Factors

The Performance Expectation (PE) factor refers to the level at which the individual believes that he or she will achieve higher productivity when performing their tasks from the use of technology (Venkatesh et al., 2003). Based on extrinsic motivations, the expectation of performance turns to behaviors that seek reward or recognition from other people. The decision to use technology is determined, in part, by a rational calculation of the benefits to be gained from its use (Lee, Cheung & Chen, 2005, Roca et al., 2006).

Venkatesh et al. (2003) identified performance expectation as a strong predictor of the individual's intention to use a new technology in the workplace. Evidence found in the literature indicates that there is a rational calculation between the decision to remain in technology-based activity and the benefits to be gained from its use (Taylor & Todd, 1995; Venkatesh & Davis, 1996; Venkatesh & Davis, 2000; Venkatesh, 2000; Gupta, Dasgupta & Gupta, 2008).

In technology-mediated projects, such as the systems used by online courses, the reason students use this modality involves the perception that the system improves their learning performance. More specifically, performance expectancy is focused on improving academic performance, speed in understanding content, utility of the system, and increasing student

productivity. As far as retention is concerned, the literature points out that performance expectancy is one of the strongest determinants of student's attitude to staying in the course (Arbaugh, 2005; Sumak, HeričKo & PušNik, 2011; Akbar, 2013; Nguyen, Nguyen & Cao, 2014). This causal relationship has already been validated empirically in several studies of user acceptance (Taylor & Todd, 1995, Venkatesh & Davis, 1996; Venkatesh & Davis, 2000, Venkatesh, 2000; Gupta et al., 2008; Garcia et al., 2014).

The research of Ong, Lai and Wang (2004) provides empirical support for the relationship between performance expectancy (perceived utility) and behavioral intention to use e-learning, by indicating that this factor, because it refers to the efficiency of the system, Encourages the students to remain in the activity they are doing. Likewise, Arbaugh (2005) also identified that success in online courses can be predicted by perceived utility, variable encompassing expectation of performance.

Roca et al. (2006) verified that the maintenance of users' intention to continue online activity is determined by performance expectancy and Chiu and Wang (2008) found that performance expectancy is positively related to intention-based web-based learning continuity. Van Raaij and Schepers (2008) have identified that the expectation of students' performance regarding the virtual learning system is relevant to their stay in the activity. Sumak et al. (2011) concluded that performance expectancy was the strongest determinant of the student's attitude to staying in e-learning.

Based on these theoretical assumptions, we have the first hypothesis to be tested in this research:

H1 - There is a positive relation between the expectation of performance and the retention of students in online courses.

The UTAUT model, in its original conception of 2003, emphasizes utility value for productivity (extrinsic motivation). The utility-linked construct, performance expectancy, is generally shown to be the strongest indicator of the behavioral intention to use the technology (Ong et al., 2004; Mahmod, Dahlan, Ramayah, Karia, & Asaari, 2005). From the UTAUT2 (2012) model, a new perspective extolling the intrinsic value, Hedonic Motivation (MH), was incorporated as an indicator of influence on the behavioral intention of the individual (Venkatesh, et al., 2012).

The hedonic motivation reflects an unusual experience (Yim, Yoo, Sauer, & Seo, 2014) and represents a gratification or pleasure received from the experience of use (Zhang & Zhang, 2009, Moore & Lee, 2012). Hedonic needs are related to sensory pleasure and to cognitive and innovative stimulation. There is an increasing search for goods, services and hedonic experiences, aimed at pleasure and feelings of well-being (Hoyer & MacInnis, 2011).

Hedonic information systems encourage the extended use of technology (Van Der Heijden, 2004) as a function of the fun or pleasure derived from an experience (Brown & Venkatesh, 2005; Venkatesh et al., 2012). Hedonic results, such as pleasure, fun, games and happiness, are intrinsic motivators of the adoption of the system that, considered a reward (Venkatesh et al., 2012), collaborate for the permanence of the user in the activity in which it is involved (Bagozzi, Gopinath & Nyer, 1999).

In education, students are intrinsically motivated to online learning when there is interest and pleasure in doing it (Chiu & Wang, 2008). Students intrinsically interested in the topics covered in their course are more likely to undertake similar courses in the future (Bong, 2001). From the hedonistic perspective, it is understood that emotional motives can stand out for utilitarian motives, attributing a subjective meaning that complements concrete attributes, turning to imaginative constructions of reality (Hill & Gardner, 1987).

Regarding retention in online courses, studies suggest that the inclusion of content, such as animated images, focus on colors, sounds and aesthetically appealing layouts, is important to encourage prolonged use of the system (Van Der Heijden, 2004).

From the above, the second research hypothesis arises:

H2 - There is a positive relationship between hedonic motivation and the retention of students in online courses.

The self-efficacy factor (SE) conceptualized and operationalized from the studies of Bandura (1977, 1986), is one of the elements that compose the psychological structures of motivation. Beliefs of self-efficacy refer to the "judgment about one's ability to perform courses of action required to achieve a certain degree of performance" (Bandura, 1986: 391), or individual beliefs, confidence, and expectations about one's own Perform a specific task (Venkatesh et al., 2003).

From the growth of the educational modalities offered online, the technological knowledge required of the students has increased considerably, making it difficult to succeed in web-based learning environments without the presence of solid technical skills (Osika & Sharp, 2002).

Regarding retention, results pointed out in the literature indicate that students with low technological self-efficacy are less likely to continue using the online learning system due to lack of self-confidence and, consequently, decrease the intention to continue in the course (Gong, Xu & Yu, 2004, Ong et al., 2004; Livingstone & Helsper, 2010, Shi, Chen & Tian, 2011).

The success and persistence of students in online courses requires specialized learning skills, such as technological ones, which are less essential for the student in the classroom (Kerr, Rynearson & Kerr, 2006). Among the possible explanations for interruptions in courses is the lack of self-confidence in the use of the system (Tsai, Chuang, Liang, & Tsai, 2011), which leads to low aspirations and reduced efforts to remain in the activity they are performing (Bandura, 1986).

In general, there is consensus among researchers that students 'beliefs, attitudes and positive behaviors regarding their ability to use the technologies and resources of learning environments are explanatory factors of students' stay in the courses (Laguardia & Portela, 2009). Understanding self-efficacy such as an individual's confidence in their ability to perform tasks using the online course system presents the third research hypothesis: *H3 - There is a positive relationship between self-efficacy and student retention in online courses.*

The Social Influence (SI) factor reflects a normative character and indicates the degree of perception of an individual on how important it is for people close and relevant, that he uses the technology (Venkatesh et al., 2003). It reflects the explicit or implicit notion that individual behavior is influenced by third-party assessment of technology use (Thompson, Higgins, & Howell, 1991) and impacts individual behavior through three mechanisms: compliance, internalization and identification (Warshaw, 1980). The first one reflects the change in the intention of an individual in response to the pressure suffered. The latter two refer to the structural change in an individual's belief making him more likely to meet the expectations of others when he realizes the possibility of reward (Warshaw, 1980).

Previous studies indicate that social influence is significant in determining an individual's intention to use new technologies (Moore et al., 1991; In relation to online courses, social influence reflects the power of third parties within the social environment (eg other students, teachers, friends and superiors) and their beliefs about the use of e-learning (Decman, 2015).

Under the retention perspective, individuals are more likely to stay in online courses if they realize that this decision is appreciated by bosses and peers. In addition, they will remain in the course if it is relevant to their professional development or notice that their colleagues and friends have obtained better jobs or promotions after the course (Mohammadyari & Singh, 2015). As a consequence, the fourth research hypothesis is formulated:

H4 - There is a positive relationship between social influence and student retention in online courses.

The Information Quality (IQ) is evaluated as the message produced by a communication system. The system creates the information and communicates it to the recipient who is then or not influenced by it. This series of influences includes the reception of information, its evaluation and application, leading to a change in recipient behavior and a change in organizational

performance (Mason, 1978). In this sense, information per- runs a series of phases, from production to use, influences individual and / or organizational performance, and has proven to be strongly associated with the intent and use of the system (Delone & Mclean, 2003).

Despite the subjective criterion inherent to the concept of information quality, there are universally accepted indicators that allow to allocate this factor in some categories. The first one refers to the intrinsic quality, which represents the value of information alone, regardless of its form of diffusion, conception or target audience. In this category, scientific accuracy, integrity, objectivity and accuracy are observed. The second category refers to the contextual quality of the information and its adequacy to the student's learning needs. Criteria such as relevance, value, timeliness, usefulness and adequacy of the information are observed here. The last category is related to the presentation of information and involves technical and structural aspects, such as format, clarity, conciseness, compatibility, design and homogeneity of the data (Pinto, 2007).

In online courses, the system is the primary, if not the only, way for the student to access course content. This transfers responsibility for maintaining the student / information relationship to this channel. In this modality, the quality of the information is perceived by the accuracy, integrity, ease of comprehension and relevance of the materials exposed in the online course system (Chiu, Chiu & Chang, 2007). Access to supportive materials and learning concepts are essential students' needs. It is not enough to provide students with friendly online learning systems. It is more important to provide them with high quality information (Roca et al., 2006, Alshare et al., 2011). Students tend to value the quality of content by observing their organization, presentation, interactivity, clarity, adequate quantity, utility, flexibility and ability to provide an adequate degree of knowledge (Shee & Wang, 2008).

As for retention, the quality of the information is often seen as a fundamental antecedent for the intention of using the online course system (Cheng, 2012, Ramayah, Ahmad & Lo, 2010, Wang & Chiu, 2011). The quality of the information favors a better experience with the use of the system, intensifying its use (Hong, Thong & Wong, 2002), especially when it is updated in the system, as for example in terms of course announcements, and well elaborated In relation to teaching materials and preparation for evaluations (Lin & Wang, 2012). The quality of information has significant positive effects on student satisfaction, which in turn plays a relevant role in students' intention to continue web-based learning (Lin & Wang, 2012). One can conjecture as soon as:

H5 - There is a positive relationship between the information quality and the retention of students in online courses.

The system quality factor (SQ) is defined by the desired performance characteristics of the system itself that produces the information (Delone & Mclean, 1992). It comes from the comparison between what the user expects from the system and what was actually offered (Shu et al, 2004). Numerous reasons contribute to the acceptance or non-acceptance of information systems by users. These include unfriendly interfaces, poor design, unsuitable systems, lack of training and support, and the student's inability to understand the tools of the new communication channel (Frankola, 2001).

Regarding online courses, even if the adopted system is composed of complete and adequate information, the student can have an unfavorable experience in the use of the system, reducing the fulfillment of their expectations and reducing their use. In general, the use of the system requires a friendly interface, ease of use, functionality, reliability, flexibility, portability and integrability (Delone & Mclean, 2003).

Online course providers are aware of the technological implications of their activities and are investing time and money in the development of new instruments directly related to interfaces and applications (Dominici & Palumbo, 2013).

Regarding retention, empirical studies indicate that software platforms based on a variety of clear and efficient media that facilitate interaction between participants and the institution are

positively associated with effective results for web-based courses (Arbaugh, 2005). On the other hand, the difficulty of finding information, the existence of poor graphic designs, the unintended use of graphic animations, excessive banners, pages "under construction", disabled links and programs that execute with error distract users (Rosenfield & Morvile, 1998).

Empirical studies on the use of technology evaluate the quality of the system by freely adopting variables that they consider appropriate either to their contexts, to the purpose of their study, to the organizational context or to the characteristics of the evaluated information system (Delone & Mclean, 1992). Among the ones that have been used in online course environments are: personalization (Wang, 2003), security (Ong et al. (2004), adaptability (Tobing, Hamzah, Sura, & Amin, 2008), functionality, navigation (Wu, Hsia, Liao & Tennyson, 2008), accessibility, communicability, reliability, feedback, (Sun et al., 2008), interface design (Cho, Cheng & Lai, 2009) and synchronicity (Johnson, Gueutal & Falbe, 2009).

From this perspective, the sixth research hypothesis is formulated:
H6 - There is a positive relationship between the quality of the system and the retention of students in online courses.

METHODS

The research is characterized as descriptive and quantitative, using a hypothetical-deductive approach through primary data. They represent the research population, students of free courses, offered online by a public educational institution. The choice of the institution was based on the fact that the courses offered included the requirements for the study proposal: to be offered online, in which technology acts as the only mediator between the student, the content and the institution, allowing the verification of the behavior Of the course system and the relationship of such behavior to retention.

Free courses represent a modality of non-formal education, of variable duration, designed to provide the interested person with the skills to be able to become professional, to qualify and to update themselves for work, without the previous schooling requirement (Abed, 2016). They have as legal base Presidential Decree No. 5,154, of July 23, 2004, Arts. 1 and 3, and Ordinance No. 008 of June 25, 2002, published in the Official Gazette of Santa Catarina No. 16,935, dated June 27, 2002.

As for the size of the universe and the sample, the population was represented by the 805 students who took some online course on the date of sending the questionnaire (May 4, 2016). The questionnaire was available for 30 days (until June 4, 2016). The sample, obtained by accessibility, was composed of the 231 students who answered the questionnaire.

The constructs that make up the model proposed by the UTAUT theory focus on behavioral criteria, such as performance expectancy, hedonic motivation, self-efficacy and social influence (Venkatesh et al., 2003; Venkatesh et al., 2012). However, the D & M constructs focus on technical factors such as information quality and system quality (Delone & Mclean, 1992). It was decided to carry out a joint analysis of these factors belonging to different models so that, in a complementary way, they could provide a broader understanding (Mardiana, Tjakraatmadja & Aprianingsih, 2015) on the aspects related to the retention of students in online courses.

The development of the scales to measure each construct was made based on the seminal studies of Venkatesh et al. (2003); Venkatesh et al. (2012) and Delone and Mclean (1992) and later studies such as those of Bernardo, Marimon and Alonso-Almeida (2012), Roca et al. (2006), Lin and Wang (2012). Picture 1 shows, sequentially, the dimensions of the UTAUT and D & M technology acceptance models, the variables investigated and their definitions, the questions adapted for this study, the metrics used and the authors that served as the basis for the study.

Picture 1 – Dimensions, variáveis, questions, scales e authors do instrument de coleta de dados

Dimension	Variable	Question	Scale	Authors
UTAUT FACTORS	Performance expectancy (PE)	PE1: Using moodle in this course improves my performance in my learning activities. PE2: Using the moodle of this course helps me understand the contents of the courses more quickly. PE3: I consider the moodle of this course useful for my learning activities. PE4: Using moodle's resources in my learning activities increases my productivity.	Likert 7 points (1: totally disagree 7: I totally agree).	Venkatesh et al. (2003). (Adapted)
	Hedonic Motivation (HM)	HM1: Using moodle for this course is fun. HM 2: Using moodle from this course is nice. HM 3: Using moodle for this course is interesting. HM 4: Using moodle for this course is enjoyable. HM 5: When I interact with the moodle of this course, I do not even realize the time passes.	Likert 7 points (1: totally disagree 7: I totally agree).	Venkatesh et al. (2012). (Adapted) Bernardo et al. (2012). (Adapted)
	Self-efficacy (SE)	SE1: I trust in my ability to participate in the evaluations contained in the moodle of this course. SE2: I trust in my ability to access the texts and videos contained in the moodle of this course. SE3: - I rely on my ability to navigate following the moodle course icons.	Likert 7 points (1: totally disagree 7: I totally agree).	Roca et al. (2006). (Adapted)
	Social influence (SI)	SI1: My co-workers encouraged me to take this course. SI 2: My superiors (chiefs, coordinators, etc.) encouraged me to take this course. SI 3: Taking this course will help in promoting my image to my co-workers. SI 4: Taking this course will help in promoting my image to my superiors.	Likert 7 points (1: totally disagree 7: I totally agree).	Venkatesh et al. (2003). (Adapted)
	Intention to continue (IC)	IC1: I intend to continue using moodle to conduct other distance learning courses. IC2: I intend to increase the frequency of use of moodle while studying at this institution. IC3: Moodle favors my intention to stay in this course until completion. IC4: I intend to enroll in other phases of this course, if any. IC5: I intend to complete this course.	Likert 7 points (1: totally disagree 7: I totally agree).	Venkatesh et al. (2003). (Adapted) Lin and Wang (2012). (Adapted)

FATORES D&M	**Information Quality (IQ)**	IQ1: The information contained in this course's moodle is accurate and error-free. IQ2: The information contained in this course's moodle is reliable in terms of source and content. IQ3: The information contained in the moodle of this course is relevant to my learning. IQ4: The information contained in the moodle of this course is sufficient for my learning. IQ5: The information contained in the moodle of this course is easy to understand. IQ6: The information contained in the moodle of this course is updated.	Likert 7 points (1: totally disagree 7: I totally agree).	Delone and Mclean (1992). (Adapted)
	System Quality	SQ1: The moodle of this course has tools that allow me to interact with the institution or colleagues, glue-boring to my learning. SQ2: I believe moodle will keep my information secure. SQ3: I consider the moodle learning tools (videos, texts, forums, chats, etc.) suitable for the students of this course. SQ4: The moodle of this course is easy to use. SQ5: The moodle of this course is stable (always available). SQ6: The moodle of this course is visually pleasing. SQ7: The moodle of this course has a user-friendly interface (the icons follow a simple and intuitive logic). SQ8: The moodle of this course has tools that help me find the information I need. SQ9: The moodle pages and features of this course load quickly. SQ10: I already thought about giving up this course due to difficulties with moodle.	Likert 7 points (1: totally disagree 7: I totally agree).	Delone and Mclean (1992). (Adapted)

Structural equations: EP -> IC, HM -> IC, SE -> IC, SI -> IC, SQ -> IC, IQ -> IC.

Source: Prepared by the authors.

The developed instrument is characterized as a questionnaire structured with multiple-choice questions and affirmative questions measured by the 7-point Likert scale, the same rule adopted by the original scales, varying between (1) "totally disagree" and (7) "I totally agree ".

The questionnaire was divided into two parts. The first one, made up of demographic data (particular questions about the interviewee, such as: sex, age, schooling, profession, course of study and previous experience in online courses). The second, formed by 37 questions that represent the six constructs researched, adapted from previously validated instruments in previous studies, discussed in the literature review and described below.

The expectation of performance and social influence constructs were measured by four questions each, originating from the study by Venkatesh et al. (2003) who used them to analyze the organizational context. These questions have already been adapted to the educational context by authors, such as Wang, Wang and Shee (2007), to study the acceptance of e-learning in China, and by Ramírez-Correa, Rondán-Cataluña and Arenas-Gaitán (2010). Chile, and translated into Portuguese by authors such as Albertin and Brauer (2012), who studied resistance to distance learning in Brazil.

The hedonic motivation construct was measured by five questions based on the studies of Venkatesh et al. (2012) and Bernardo et al. (2012), who investigated contexts related to consumption. The adaptation to the online education context has already been carried out by authors such as Maldonado (2011), Peru, Raman and Don (2013) in Malaysia, and Dečman (2015) in Slovenia. In Brazil, the issues have already been translated by Faria (2014) and adapted to the educational context by Oliveira, Ramos, Andrade, Souza Neto & Dias (2014).

The self-efficacy construct, measured by three questions, originated from the work of Bandura (1986) and was later adapted to the educational context by authors such as Roca et al. (2006) in Spain, Chiu and Wang (2008) Taiwan, and Albertin and Brauer (2012) in Brazil.

The constructs quality of the system and quality of information, composed respectively of six and ten questions each, originated from the work of Delone and Mclean (1992) who used them in an organizational context. The issues have already been adapted to the educational context by the authors Holsapple and Lee-Post (2006) in the United States, and Wang et al. (2007) in Taiwan. In Brazil, issues have already been translated and adapted by Frezatti, Aguiar and Rezende (2008) and Duarte, Vieira and Silva (2015).

The intention-to-continue construct was composed of five questions, also from the study by Venkatesh et al. (2003), later adapted to the educational area by Lin and Wang (2012) who studied the acceptance of e-learning in Taiwan; By Lewis et al. (2013) in the United States; By Roca et al. (2006), in Spain; and by Albertin and Brauer (2012) in Brazil.

The issues that measure the constructs cited were originally conceived in the English language. However, as already presented, several Brazilian researchers, such as Frezatti et al. (2008), Albertin and Brauer (2012) and Duarte et al. (2015) have already translated them into Portuguese and adapted them to the educational context. Despite this validation, it was decided to subject the original questionnaires again to two English-language specialists for content validity. In this way, it was tried to ensure, from the translation and reverse translation, the preservation of the semantic, idiomatic, cultural and conceptual equivalences of the scales (Reichenheim & Moraes, 2007).

Since the analysis of the acceptance of a technology must be adjusted to its context (Davis et al., 1989), the generic name of "system", suggested in the original instruments, has been replaced by the word "moodle", more specific. For example: changed "Use system improves my performance" to "Using moodle improves my performance". Thus, as suggested by Tate, Evermann and Gable (2015), the insertion of specific technology in place of the generic word "system", provided in the original instrument, allows the new construction to represent the searched context.

Another adaptation made in order to better characterize the educational environment involved the addition of the expression "learning activities" in the questions: "ED1 - Using the moodle of the course improves my performance in my learning activities", "ED3 - I consider the course moodle Useful for my learning activities "and" ED4 - Using the course moodle in my learning activities increases my productivity ", as proposed in the study by Roca et al.(2006).

Finally, to the construct Hedonic Motivation, Venkatesh et al. (2012), the question was added "MH5 - When I interact with the Moodle of the course, I do not even feel the time to pass" proposed by Bernardo et al. (2012). Likewise, the construct Intention to Continue, by Venkatesh et al. (2003), we adapted questions for the educational area as proposed by Lin and Wang (2012).

Once the adaptations were made, we then sought to verify the suitability of the questionnaire in the context of the research. To this end, eight strictu sensu postgraduate students in Accounting and Administration were supported, all with practical experience in teaching, two of them being experienced in teaching in the EAD mode. After the feedback received, the adjustments were made and the results can be observed in Table 1, in the sequential order of the questionnaire.

Table 1 - Suggested questions and suggestions

Items	Questions	Suggestions
PE4	I think the course moodle ...	Two doctoral students suggested changing the question I started with "I think" by: "I consider".
SE1 to SE3	I feel safe in ...	Three doctoral students suggested changing all questions that began with "I feel secure" by: "I feel confident" or "I trust my ability to."
Profile	Age, Sex, Experience.	Everyone also asked to ask: schooling, profession and course.

Source: Prepared by the authors

After the analysis of the suggestions, the English teacher again consulted, which concluded that the changes in the instrument in Portuguese maintained the equivalence to the English language.

Data were collected in a public educational institution offering technical, technological, free and specialization courses. The first contact with the institution was by telephone, followed by exchange of e-mails for further clarification on the purpose of the research and the referral of the instrument of data collection. Data were collected between the dates of May 04 and June 4, 2016. During that period, the questionnaire link was sent to Google Docs to the enrolled ones, along with an invitation to participate and information on the Objective of the research, and guaranteeing the confidentiality of both the use of the information for academic purposes and the preservation of the anonymity of the respondents.

The online research method was used as the only way to reach the respondents, due to the peculiarity of the teaching modality. The possibility of duplicate entries was eliminated by selecting this option in Google docs, ensuring that the student could only submit the questionnaire once. The method proves effective for reaching all the students enrolled in the courses, since the e-mail of each one is requested in the enrollment; However, there is always the risk that the email will be invalid or fall into the spam folder. After returning the completed questionnaires, the data were exported to an Excel spreadsheet so that they were subsequently treated statistically.

Data Analysis Procedures

The first procedure adopted for data analysis, as recommended by Hair Jr., Babin, Money and Samouel (2014), was the verification of missing data. It should be noted that no missing values were identified in the data collected, due to the mandatory response imposed on the search engine used (Google docs). Thus, the 231 questionnaires received were analyzed.

Afterwards, the information was presented through descriptive statistics in order to demonstrate the observations in a summarized and grouped form (Rowntree & O'hehir, 1981). Statistical Package for the Social Sciences (SPSS) software was used to perform the frequency analysis of the data collected, using mean, median, standard deviation, variance, asymmetry and kurtosis calculations, which allowed us to know the items And better evaluated constructs, as well as the normality of the data.

The following procedures included the accomplishment of the confirmatory factorial analysis for the refinement of the dimensions and the evaluation of the relations of the proposed model, through Multiple Linear Regression. Confirmatory factorial analysis was used to verify the adequacy of the questionnaire to the proposed model.

NFI (0.840), RFI (0.812), IFI (0.893), TLI (0.874), CFI (0.892) and RMSEA (0.084) were used to verify which questions should be excluded from the final questionnaire, with satisfactory results . The Cronbach AVE and Alpha of each construct were also verified. The final

questionnaire with the respective Cronbach AVE and Alpha of each construct are described in Table 2.

Table 2 - Reliability tests

Constructo	Questions	AVE	Alpha Cronbach
SE	SE 1, SE 2, SE 3	0,56	0,78
PE	PE 1, PE 2, PE 3, PE 4	0,63	0,87
SQ	QS1, QS 3, QS 4, QS 7	0,60	0,87
HM	HM 2, HM 3, HM MH4	0,79	0,92
IQ	IQ 2, IQ 3, IQ 4, IQ 5, IQ 6,	0,50	0,83
SI	SI 2, SI 3, SI 4,	0,63	0,78
IC	IC2, IC3, IC4	0,58	0,81

Source: survey data

Finally, for the construction of each construct, the simple arithmetic mean of each of the questions within the construct was made. With the completed questionnaire, linear regression analysis was performed, and all the assumptions inherent thereto were met: absence of heteroscedasticity, serial autocorrelation, multicollinearity and data normality.

RESULTS

Table 3 presents the result of the descriptive analysis of the constructs.

Table 3 - Descriptive analysis of the constructs

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
SE	231	2,00	7,00	6,24	,88
PE	231	1,75	7,00	5,70	1,08
SQ	231	1,80	7,00	5,65	1,10
HM	231	1,00	7,00	5,28	1,40
IQ	231	1,60	7,00	5,71	,99
SI	231	1,00	7,00	3,99	1,77
Age	231	19,00	60,00	37,23	9,18
Courses Completed	231	,00	5,00	2,16	1,96
IC	231	1,00	7,00	5,81	1,19
Valid N (listwise)	231				

Source: survey data.

The sample was composed by students of short courses of short duration related to diverse areas, such as socio-environmental responsibility, pedagogical training for teaching, languages and management. The students had an average age of 37 years and completed at least two online courses before the one they were performing at the moment of data collection. Regarding the constructs, the independent self-efficacy variable (6,24) stood out as the highest, evidencing the confidence that students have in their ability to use the technological tools necessary for the online course. Except for social influence, which obtained the lowest mean (3.99) and reflects how much third opinion is important for the student's intention to continue the online course, the other constructs obtained a high average: intention to continue the online course

(5.81), quality of information (5.71), expectation of performance (5.70), system quality (5.65) and hedonic motivation (5.28).

In general, the averages of all variables were high, indicating a high level of agreement among the students that they feel confident in the use of the system tools, that they intend to continue the online course until the conclusion, that the information is relevant, Reliable, accurate and error-free, that the use of the course system brings them a better performance in learning activities, which the system loads quickly and has tools that favor learning and which course system is pleasurable to use.

The regression showed the following results.

Table 4 - Regression results

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
,842[a]	,709	,697	,65523

Source: survey data.

The R² evaluates the accuracy of the predictive model. The model presented consistent results, with an adjusted R² of 0.697, showing that the model explains 69.7% of the student's intention to continue the online course. This value, in behavioral research, is considered large (R²> 26%) for Cohen (1988) and, according to Hair Jr. et al. (2014), for the area of applied social sciences, the effect is considered moderate (0.50) and robust (0.75).
The explanatory variables had the following behavior:

Table 5 - Analysis of the model

Coefficients[a]			
	B	t	Sig
(Constant)	,206	,535	,594
SE	,042	,598	,550
PE	,471	6,060	,000
SQ	,108	1,263	,208
HM	,158	2,727	,007
IQ	,212	2,828	,005
SI	-,001	-,029	,976
Sex	,002	,024	,981
Age	,001	,176	,860
Courses Completed	-,008	-,364	,716

Source: survey data.

The p-value indicated three factors with positive and significant relationships with the intention of continuing the online course: performance expectancy (0.471, p = 0.000), information quality (0.212, p = 0.550) and hedonic motivation (0.158, p = 0.007). On the other hand, self-efficacy (0.042, p = 0.865), system quality (0.108, p = 0.208) and social influence (-0.001, p = 976) were not significantly related to the intention to continue the online course (Hair Jr. et al., 2014).

Similarly, according to Hair Jr. et al. (2014), the ratios must have t-test values above 1.96 to correspond to p-values <0.05. Consistent with the p-value results, except for self-efficacy

(0.535), system quality (1,263) and social influence (-0.029), the other factors met this criterion: performance expectancy (6,060), quality of information (2,828) and hedonic motivation (2,727).

According to the path coefficients, it is observed that the most intense relationship occurred between the expectation of performance and the intention of the student to continue the online course (0.471, p = 0.000). This result validates the assumption that students expect utilitarian benefits from the system to continue the course. Criteria such as performance, agility, utility and productivity obtained through the use of the online course system are the most important indicators for student retention in the course. These results confirm the evidence pointed out by Venkatesh et al. (2003) and Venkatesh et al. (2012). For these authors, the expectation of performance, related to time gain, agility and practicality obtained with the use of the system is a strong predictor of the individual's intention to use a technology or system.

In addition to the seminal studies, similar conclusions were obtained by Ong et al. (2004), by Chiu and Wang (2008), Oliveira et al. (2014) and Dečman (2015) related to the student's intention to continue online courses, e-learning or web learning. Ong et al. (2004) have identified a significant positive effect between performance expectancy (represented by perceived utility) and behavioral intention to use e-learning. Positive relationship between performance expectancy and intention to continue web-based learning was also found by Chiu and Wang (2008) alongside university students in online continuing learning courses.

The importance of extrinsic factors, such as performance expectancy, was confirmed by Oliveira et al. (2014), by qualitatively analyzing the factors influencing the adoption of online training courses by public servants. Dečman (2015) found the performance expectancy construct as the most important influence factor in e-learning environments, indicating that students expecting extrinsic benefits are more willing to use the system itself.

With regard to the practical contribution, this result indicates that institutions should focus on creating efficient systems that improve student achievement and achievement of goals. Simplify system use by eliminating distractions, filtering information to reduce browsing time, bringing to the fore only necessary and timely information on the particular content. Facilitating learning by exposing information on different platforms or applications also proves useful by bringing convenience and portability.

The second most important relation occurred between the quality of the information and the student's intention to continue the online course (0.212, p = 0.550). This indicates that aspects related to course content, such as information that is easy to understand, relevant to learning, reliable in terms of source and content, updated, accurate, error-free, and sufficient for learning, have been relevant for retention of the student in the online course.

These findings are consistent with those proposed by the main authors, DeLone and McLean (1992), and confirm empirical evidence reported in studies that relate the quality of information to the intention to continue the online course, such as Alshare et al. 2011), Saba (2012), Machado-da-Silva (2013), Mohammadi (2015) and Ali, Yaacob and Endut (2016).

Alshare et al. (2011) verified, together with e-learning students, that the quality of information was the most influential factor in the use of the system. Saba (2012) has identified that the quality of information affects both the use of the online course system and user satisfaction and student learning behavior. Machado-da-Silva (2013) verified, together with online course students from all regions of Brazil, that the information quality factor had the greatest impact on the satisfaction and use of the course system. Likewise, Mohammadi (2015) verified with students from four universities in Iran that the quality of information was one of the main factors influencing the intention and satisfaction of users in relation to e-learning. Already, Ali et al. (2016) identified that information quality was the most influential variable for the use of social networks for educational purposes.

With respect to the practical part, this result contributes to indicate to online course managers the importance of concentrating investment decisions on the development of

instructional materials and clear, well-written and relevant contents. There is a need for the content to make decisions jointly with the system designer, since the formatting of this information takes place from interfaces and languages not always familiar to the content developer (Sousa & Coutinho, 2009). When it comes to information quality, not only teaching materials and contents need to be valued. The evaluations and communication of the institution with the students, through the bulletin board of the system, e-mails etc., are also understood as information and evaluated in terms of quality, requiring attention, clarity and detail in its elaboration (Lin & Wang, 2012).

The third most important relation occurred between the hedonic motivation factor and the student's intention to continue the online course (0,158, p = 0.007). This result suggests that being pleasant, pleasant, interesting, making the student, or perceiving the time passing and being fun are criteria of the online course system that have a positive and significant relationship with the retention of students in the online course.

These findings indicated consistency to those recommended by the base authors, Venkatesh et al. (2003) and Venkatesh et al. (2012). They also corroborate the evidences pointed out in empirical studies that relate online courses and hedonic motivation, such as), Lee et al. (2005), Chiu and Wang (2008), Zhang, Zhao and Tan (2008), Roca and Gagné (2008) and Nguyen et al. (2014).

Lee et al. (2005found that hedonic motivation directly and significantly impacted the intent of Hong Kong university students to use an internet-based learning system. Chiu and Wang (2008) found that intrinsic value (enjoyment with use) was the strongest predictor of Taiwanese university students' continued use of web-based learning. Zhang et al. (2008) identified with 121 respondents of online courses in China that the teaching-related pleasure variable improves the explanatory power of the original models, indicating the importance of pleasure as a antecedent of intention to remain in Educational modalities such as e-learning.

Roca and Gagné (2008) found that ludicity (hedonic motivation) is indicated to predict the intention to stay in online courses. Alenezi et al. (2010) have shown that pleasure in using technology influences students' intention to use e-learning in Saudi Arabia. Likewise, Nguyen et al. (2014) investigated the importance of hedonic motivation in the acceptance and use of e-learning by students in Vietnam.

An important factor to be observed is the fact that the sample of this study is made up of students who are experienced in online courses, which may have increased hedonic motivation. According to Murray and Bellman (2011), previous knowledge affects hedonic experiences, since they allow the user to focus only on their interests, without having to learn mechanized steps to use the system.

With respect to practical contributions, web-based course site developers and designers should employ ways to reduce monotony and explore playful features by providing well-designed tools or mechanisms that meet this perspective pointed out in the search results. According to Chiu and Wang (2008), students are intrinsically motivated to online learning when there is interest and pleasure in doing it.

As for the theory, the results reached confirm the importance of performance expectation, information quality and hedonic motivation in the users' stay in the activity they are carrying out in educational contexts, confirming empirical results already recommended in the literature. As a theoretical contribution, it was verified that the proposal to associate technology acceptance variables with retention in online courses is plausible. Both factors of the UTAUT Theory, represented by the expectation of performance and hedonic motivation, as well as the information quality factor of the Model D & M, are positively related to the retention of students in the online courses. In other words, the joint analysis of different theories indicated new non-privileged construct formation if the models were used in isolation.

DISCUSSION AND CONCLUSIONS

This study aimed to evaluate the relationship between factors of acceptance of technology and the retention of students in online courses. An explained variance of 69.7% was confirmed in the intention of the student to continue the course by the expectation factors of performance, information quality and hedonic motivation, indicating that much of the explanation of the endogenous construct is associated to the action of these three independent variables of the fashion model.

This result confirmed that the proposal of joint analysis of factors of different theories, in this case UTAUT and D & M, was plausible, since constructs of both were positively related to retention. This joint analysis of factors belonging to different theoretical conceptions is relevant to indicate new possibilities of variables not predicted in the isolated models. Using a model that presents a manageable taxonomy of different variables as a theoretical framework can help managers and researchers broaden the range of options on the factors that lead students to continue the online course, which facilitates the more assertive adoption of techniques and processes by What news are implemented

The quality of the information had significant positive effects on the student's intention to continue the online course, indicating that access to support materials and learning concepts are essential students' needs. It is not enough to provide students with friendly online learning systems. It is more important to provide them with high quality information.

Both the hedonic motivation (intrinsic motivation) and the expectation of performance (extrinsic motivation) were shown to be relevant for the student's stay in the course. Extrinsic and intrinsic motivators are different types of drivers capable of influencing behavior (Lee et al., 2005). The preference for utilitarian or hedonic aspects may help system developers to adopt specific tactics to stimulate their use in online courses. This result poses a great challenge to system developers, since they need to add both playful aspects and animated images, focus on colors, sounds and aesthetically attractive layouts, such as utilitarian layouts that seek to avoid user distraction.

RESEARCH LIMITATIONS

One of the research limitations resided in the choice of the instrument of data collection. The structured questionnaire adopted, although recommended in quantitative approaches, is restricted to obtaining information from the respondent, conditioning him to limit his opinion to predefined questions. Using the perception of respondents, although common, can become a limitation if some of the respondents have limited knowledge about the phenomenon investigated, distorting reality.

Adopting a cross-sectional survey, in which all measurement items are collected at the same time, may limit results because the respondents' perceptions do not always remain unchanged over time. Choosing a non-probabilistic sample, by accessibility, limits the results to that reality, not allowing generalizations regarding the study population (Schillewaert, Langerak & Duhamel, 1998).

The absence of a specific theory about the acceptance of educational technologies (Sumak & Sorgo, 2016, Pedrotti & Nistor, 2016) led to the choice of models originally developed for the analysis of other contexts, such as labor (UTAUT and D & M) and Consumption (UTAUT2). Several aspects could be related to the low retention of students in online courses, such as lack of time, financial issues, lack of self-discipline, etc. (Mueller & Strohmeier, 2011). However, because they did not refer to the acceptance factors of the technology, these criteria were beyond the scope of the study, which is why they were not analyzed.

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