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Technology Acceptance Factors 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 expectation of performance, hedonic motivation, self-efficacy, social influence, system quality, information quality and intention to continue, belonging to the Unified Theory of Acceptance and Use of Technology and the Information Systems Success Factors. We studied 231 students of free courses offered online by a public educational institution. The results show that there is a definite and statistically significant relationship between student retention and expectation factors, hedonic motivation and information quality. The factors self-efficacy, social influence and quality of the system did not present significant relationship with retention, contrasting with the assumptions advocated in some of the empirical studies. The results contribute to the understanding that the retention of students in online courses can be obtained mainly from investments in the quality of content made available to students.

Key words*: Distance Learning; online education; retention; technology acceptance; information system.*

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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 (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; Sharma, Joshi, & Sharma, 2016).

Advantages to the student, including the flexibility of place, time, and institutions and 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, & Jones, 2002) 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 enrollment (Saadé, 2003).

Low levels of student retention impact the ability of an educational institution to invest in and maintain the courses. Tuition fees, receipts of subsidies from development agencies, and non-financial costs also have negative repercussions on the academic reputation of these institutions (Laguardia & Portela, 2009).

While many factors may lead students to stay in 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 behavioural intentions shaped by beliefs and attitudes (Willging & Johnson, 2009). We chose 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 the information system, adoption, and diffusion of information technology (Williams, Rana, Dwivedi, & Lal, 2011). We also used 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, and it 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 behaviour of the individual but neglects other factors, such as the design of the artifact (Benbasat & Zmud, 2003; Wixom & Todd, 2005). It results 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 by 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, retention

is associated with 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).

From the preceding, 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 favour the decision-making of the managers of 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, 2004; 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 to reach goals (Shin, 2003; Müller, 2008) even under adverse circumstances (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 behaviours of students regarding the technologies and resources of learning environments are explanatory factors of the permanence in the courses (Laguardia & Portela, 2009). 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).

The reasons that lead students to stay in the course are based on behavioural 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 evidence 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.

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 Behaviour 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: the 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 favour 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 with the use of technology (Venkatesh et al., 2003). Based on extrinsic motivations, the expectation of performance turns to behaviours 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 expectations as a strong predictor of the individual's intention to use new technology in the workplace. We found evidence that indicates that there is a relationship 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, the 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 behavioural 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 could be predicted by the perceived utility, the 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 null hypothesis to be tested in this research:

> *H_{01} – There will be no positive relationship 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 shown to be the strongest indicator of the behavioural 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 behavioural intention of the individual (Venkatesh, Thong, & Xu, 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 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 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, when 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 participate in online learning when interest and pleasure are involved (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 from 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 the prolonged use of the system (Van Der Heijden, 2004). From the above, the second null hypothesis is devloped:

> *H_{02} - There will be no 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 ability to 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 higlighted in the literature indicate that students

with low technological self-efficacy are less likely to continue using the online learning system. It happens because the 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 require specialized learning skills, such as technological ones, which are not 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 a consensus among researchers that students' beliefs, attitudes and positive behaviours 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 null hypothesis:

> *H_{03} - There will be no 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 to their close relations that they use the technology (Venkatesh et al., 2003). It reflects the explicit or implicit notion that individual behaviour is influenced by a third-party assessment of technology use (Thompson, Higgins, & Howell, 1991) and impacts individual behaviour 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 & Benbasat, 1996). It happens because of the characteristics of online courses; social influence reflects the power of third parties within the social environment (e.g., 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. Also, 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 null hypothesis is:

> *H_{04} - There will be no 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 influenced by it or not influenced by it. This series of influences includes the reception, evaluation, and application of information, leading to a change in recipient behaviour and a change in organizational performance (Mason, 1978). In this sense, information runs a series of phases from production to use influence individual and organizational performance, and it had 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 allocating 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. It transfers responsibility for maintaining the relationship between student and system 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 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 (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 favours a better experience with the use of the system, intensifying its use (Hong, Thong, & Wong, 2002). We can see it especially when it is updated in the system, as regarding course announcements, and well elaborated about 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 that as soon as:

H_{05} - There will be no 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 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 unfavourable 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 graphics 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 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 null hypothesis is formulated:

> *H_{06} - There will be no positive relationship between the quality of the system and the retention of students in online courses.*

Method

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 include 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.

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 a legal base Presidential Decree No. 5,154, on 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.

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 behavioural 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). Table 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.

Table 1:
Dimensions variables, questions, scales and authors of the data collection instrument

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 favours 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 (SQ)	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.				

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 agree."

The questionnaire was divided into two parts. The first one was made up of demographic data (particular questions about the interviewee, such as sex, age, schooling, profession, the course of study and previous experience in online courses). The second was 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) in 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, Feroz, Moon, & Jeung (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) in 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). Lin and Want (2012), who studied the acceptance of e-learning in Taiwan, by Lewis, Fretwell, Ryan, & Parham (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 attempted to be ensured 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 technology must be adjusted to its context (Davis Bagozzi, & Warshaw, 1989), the generic name of "system," suggested in the original instruments, has been replaced by the word "Moodle," more specific. For example, we 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.

We made another adaptation in order to characterize the educational environment better 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 address the Hedonic Motivation construct by Venkatesh et al. (2012), we added the following question: "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, to address the Intention to Continue construct 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 postgraduate students in Accounting and Administration were supported. All of them had practical experience in teaching, and two of them were experienced in teaching in the EAD mode. After the feedback was received, the adjustments were made, and the results can be observed in Table 2 in the sequential order of the questionnaire.

Table 2:
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.

After the analysis of the suggestions, the English teacher was 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, tuition free and specialization courses. The first contact with the institution was by telephone, followed by an 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 students, 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 to demonstrate the observations in a summarized and grouped form (Rowntree, 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. The 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 3.

Table 3:
Reliability tests

Construct	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

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 to it were met: absence of heteroscedasticity, serial autocorrelation, multicollinearity and data normality.

Results and Discussion

The results of the descriptive analysis pertaining to the various constructs are presented in Table 4.

Table 4:
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				

The sample was composed by students of short courses of a 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. With the exception of social influence, which reflects how much third-party opinions are important to the student's intention to continue the online course, the other constructs obtained a high average: intention to continue the online course,

quality of information, the expectation of performance, system quality, and hedonic motivation.

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. It also indicates that they intend to continue the online course until the conclusion, that the information is relevant, reliable, accurate and error-free. Finally, they believe that the use of the course system brings them better performance in learning activities, that the system loads quickly and has tools that favour learning, and that course system is pleasurable to use. The results of the regression analysis are presented in Table 5.

Table 5:
Regression results

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

The R^2 evaluates the accuracy of the predictive model. The model presented consistent results, with an adjusted R^2 of 0.697, showing that the model explains 69.7% of the student's intention to continue the online course. This value, in behavioural research, is considered large (R^2> 26%) for Cohen (1988) and, according to Hair et al. (2014), for the area of applied social sciences, the effect is considered moderate (0.50) and robust (0.75). The behaviour of the explanatory variables is presented in Table 6.

Table 6:
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

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 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 on performance expectancy (represented by the perceived utility) and behavioural intention to use e-learning. The 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) that found the performance expectancy construct was the most important influence factor in e-learning environments, indicating that students expecting extrinsic benefits are more willing to use the system itself.

About 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, and 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). It indicates that aspects related to course content, such as information that is easy to understand, relevant to learning, reliable regarding source and content, updated, accurate, error-free, and sufficient for learning, have been relevant for retention of the student in the online course.

Our results are consistent with those proposed by 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 behaviour. 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 about 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.

Concerning 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 regarding quality, 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 and interesting, making the student perceive time passing quickly, 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 evidence 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. (2005) found 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 an antecedent of intention to remain in educational modalities such as e-learning.

Roca and Gagné (2008) found that playfulness (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.

Concerning 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 explore online learning when there experience interest and pleasure in doing it.

As for the theory, the results reached to 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 information that would not have been present if the models were used in isolation.

Conclusion

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 because 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 which new courses are implemented.

The quality of the information had significant positive effects on the students' 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 behaviour (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 because 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.

References

ABED. Pesquisa SEMESP 2015 - *O ensino superior e a EAD*. Disponível em http://abed.org.br/arquivos/Pesquisa_Semesp_D2L-1.pdf. Acesso em 28 ago. 2016.

ABED. *Anuário estatístico de educação aberta e a distância*, 2014/2015. Disponível em: http://www.abed.org.br/site/pt/midiateca/censo_ead/. Acesso em: 18 jun. 2016.

Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour. In *Action control* (pp. 11-39). Springer Berlin Heidelberg.

Akbar, F. (2013). What affects students' acceptance and use of technology?.*Dietrich College Honors Theses* - Carnegie Mellon University, Qatar campus, 2013.

Albertin, A. L., & Brauer, M. (2012). Resistência à educação a distância na educação corporativa. *Revista de Administração Pública*, *46*(5), 1367-1389. doi:10.1590/S0034-76122012000500009

Alenezi, A. R., Karim, A. M. A., & Veloo, A. (2010). An Empirical investigation into the role of enjoyment, computer anxiety, computer self-efficacy and internet experience in influencing the students' intention to use e-learning: A case study from Saudi Arabian Governmental Universities. *TOJET: The Turkish Online Journal of Educational Technology*, *9*(4).

Ali, M., Yaacob, R. A. I. B. R., & Endut, M. N. A. A. B. (2016). Understanding the academic use of social media: integration of personality with TAM. *Journal of Theoretical and Applied Information Technology*, *90*(1), 1. doi: 10.1016/j.jksuci.2016.10.002.

Al-Khowaiter, W., Dwivedi, Y., & Williams, M. (2014, April). Examining The Adoption Of Human Resource Information System In The Context Of Saudi Arabia. In: *British Academy of Management (UKAIS) Conference, Oxford, UK*.

Alshare, K. A., Freeze, R. D., Lane, P. L., & Wen, H. J. (2011). The impacts of system and human factors on online learning systems use and learner satisfaction. *Decision Sciences Journal of Innovative Education*, *9*(3), 437-461. doi: 10.1111/j.1540-4609.2011.00321.x

Arbaugh, J. B. (2005). Is there an optimal design for online MBA courses?. *Academy of Management Learning & Education*, *4*(2), 135-149.

Bagozzi, R. P., Gopinath, M., & Nyer, P. U. (1999). The role of emotions in marketing. *Journal of the Academy of Marketing Science*, *27*(2), 184-206. doi: 10.1177/0092070399272005

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioural change. *Psychological Review*, *84*(2), 191. doi: 10.1037/0033-295X.84.2.191

Bandura, A. (1986). *Social foundations of thought and acti*on. Prentice-Hall, Inc..

Benbasat, I., & Barki, H. (2007). Quo vadis TAM?. *Journal of the Association for Information Systems*, *8*(4), 7.

Benbasat, I., & Zmud, R. W. (2003). The identity crisis within the IS discipline: Defining and communicating the discipline's core properties. *MIS Quarterly*, 183-194. doi: 10.2307/30036527

Berge, Z. L., & Huang, Y. (2004). A model for sustainable student retention: A holistic perspective on the student dropout problem with special attention to e-learning. *Deosnews*, 13 (5), 1-26.

Bernardo, M., Marimon, F., & Alonso-Almeida, M. (2012). Functional quality and hedonic quality: A study of the dimensions of e-service quality in online travel agencies. *Information & Management*, *49*(7), 342-347. doi: 10.1016/j.im.2012.06.005

Bong, M. (2001). Role of self-efficacy and task-value in predicting college students' course performance and future enrollment intentions. *Contemporary Educational Psychology*, *26*(4), 553-570. doi: 10.1006/ceps.2000.1048

Brown, S. A., & Venkatesh, V. (2005). Model of adoption of technology in households: A baseline model test and extension incorporating household life cycle. *MIS Quarterly*, 399-426.

Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *Chronicle of Higher Education*, *46*(23).

Chen, J. L. (2011). The effects of education compatibility and technological expectancy on e-learning acceptance. *Computers & Education*, *57*(2), 1501-1511. doi: 10.1016/j.compedu.2011.02.009

Chen, L. S. L., Kuan, C. J., Lee, Y. H., & Huang, H. L. (2011, June). Applicability of the UTAUT model in playing online game through mobile phones: Moderating effects of user experience. In *Technology Management Conference (ITMC), 2011 IEEE International* (pp. 625-629). IEEE. doi: 10.1109/ITMC.2011.5996035

Cheng, Y. M. (2012). Effects of quality antecedents on e-learning acceptance. *Internet Research*, *22*(3), 361-390. doi: 10.1108/10662241211235699

Chiu, C. M., Hsu, M. H., Sun, S. Y., Lin, T. C., & Sun, P. C. (2005). Usability, quality, value and e-learning continuance decisions. *Computers & Education*, *45*(4), 399-416. doi: /10.1016/j.compedu.2004.06.001

Chiu, C. M., Chiu, C. S., & Chang, H. C. (2007). Examining the integrated influence of fairness and quality on learners' satisfaction and Web-based learning continuance intention. *Information Systems Journal*, *17*(3), 271-287.

Chiu, C. M., & Wang, E. T. (2008). Understanding Web-based learning continuance intention: The role of subjective task value. *Information & Management*, *45*(3), 194-201. doi: 10.1016/j.im.2008.02.003

Cho, V., Cheng, T. E., & Lai, W. J. (2009). The role of perceived user-interface design in continued usage intention of self-paced e-learning tools. *Computers & Education*, *53*(2), 216-227. doi: 10.1016/j.compedu.2009.01.014

Cohen, J. (1988). Statistical power analysis for the behavioural sciences Lawrence Earlbaum Associates. *Hillsdale, NJ*, 20-26. doi: 10.1016/C2013-0-10517-X

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, *35*(8), 982-1003. doi: 10.1287/mnsc.35.8.982

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace1. *Journal of applied social psychology*, *22*(14), 1111-1132. doi: 10.1111/j.1559-1816.1992.tb00945.x

Dečman, M. (2015). Modeling the acceptance of e-learning in mandatory environments of higher education: The influence of previous education and gender. *Computers in Human Behaviour*, *49*, 272-281. doi: 10.1016/j.chb.2015.03.022

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, *3*(1), 60-95. doi: 10.1287/isre.3.1.60

Delone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, *19*(4), 9-30. doi: 10.1080/07421222.2003.11045748

Diaz, D. P. (2002). Online drop rates revisited. *The Technology Source*, *3*.

Dominici, G., & Palumbo, F. (2013). How to build an e-learning product: Factors for student/customer satisfaction. *Business Horizons*, *56*(1), 87-96. doi: 10.1016/j.bushor.2012.09.011

Duarte, A. L. F., Vieira, P. R. D. C., & da Silva, A. C. M. (2015). Satisfação do usuário de sistema de informação acadêmica: pesquisa com utilização de indicadores formativos. *Revista Adm. MADE*, *18*(3), 97-121.

Elloumi, F. (2004). Value chain analysis: A strategic approach to online learning. *Theory and Practice of Online Learning*, 61. doi: 10.5539/ijbm.v6n11p206

Frankola, K. (2001). Why online learners drop out. *Workforce*, *80*(10), 53-59.

Frezatti, F., De Aguiar, A. B., & Rezende, A. J. (2008). Relacionamento entre atributos da contabilidade gerencial e satisfação do usuário. *Revista de Administração Mackenzie (Mackenzie Management Review)*, *8*(2).

Gong, M., Xu, Y., & Yu, Y. (2004). An enhanced technology acceptance model for web-based learning. *Journal of Information Systems Education*, *15*(4), 365.

Gupta, B., Dasgupta, S., & Gupta, A. (2008). Adoption of ICT in a government organization in a developing country: An empirical study. *The Journal of Strategic Information Systems*, *17*(2), 140-154. doi: 10.1016/j.jsis.2007.12.004

Hair, J., Babin, B., Money, A., & Samouel, P. (2014). *Fundamentos de métodos de pesquisa em administração*. Bookman Companhia Ed.

Hill, R. P., & Gardner, M. P. (1987). The buying process: Effects of and on consumer mood states. *NA-Advances in Consumer Research, Volume 14.*

Holsapple, C. W., & Lee-Post, A. (2006). Defining, assessing, and promoting e-learning success: An information systems perspective. *Decision Sciences Journal of Innovative Education*, *4*(1), 67-85. doi: 10.1111/j.1540-4609.2006.00102.x

Hong, W., Thong, J. Y., & Wong, K. Y. T. (2002). Determinants of user acceptance of digital libraries: an empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*, *18*(3), 97-124. doi: 10.1080/07421222.2002.11045692

Hoyer, W. D.; MacInnis, D. J. (2011). *Comportamento do Consumidor*. São Paulo: Cengage Learning.

Johnson, R. D., Gueutal, H., & Falbe, C. M. (2009). Technology, trainees, metacognitive activity and e-learning effectiveness. *Journal of Managerial Psychology*, *24*(6), 545-566. doi: 10.1108/02683940910974125

Kerr, M. S., Rynearson, K., & Kerr, M. C. (2006). Student characteristics for online learning success. *The Internet and Higher Education*, *9*(2), 91-105. doi: 10.1016/j.iheduc.2006.03.002

Laguardia, J., & Portela, M. (2009). Evasão na educação a distância. Dropout in distance education. *Educação Temática Digital*, *11*(1), 349. doi: 10.20396/etd.v11i1.929

Lee, J. W. (2010). Online support service quality, online learning acceptance, and student satisfaction. *The Internet and Higher Education*, *13*(4), 277-283. doi: 10.1016/j.iheduc.2010.08.002

Lee, M. K., Cheung, C. M., & Chen, Z. (2005). Acceptance of Internet-based learning medium: the role of extrinsic and intrinsic motivation. *Information & Management*, *42*(8), 1095-1104. doi: 10.1016/j.im.2003.10.007

Lee, Y., & Choi, J. (2013). A structural equation model of predictors of online learning retention. *The Internet and Higher Education*, *16*, 36-42. doi: 10.1016/j.iheduc.2012.01.005

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, *40*(3), 191-204. doi: doi.org/10.1016/S0378-7206(01)00143-4

Levy, Y. (2007). Comparing dropouts and persistence in e-learning courses. *Computers & Education*, *48*(2), 185-204. doi: 10.1016/j.compedu.2004.12.004

Lewis, C. C., Fretwell, C. E., Ryan, J., & Parham, J. B. (2013). Faculty Use of Established and Emerging Technologies in Higher Education: A Unified Theory of Acceptance and Use of Technology Perspective. *International Journal of Higher Education*, *2*(2), 22-34. doi: 10.5430/ijhe.v2n2p22

Livingstone, S., & Helsper, E. (2010). Balancing opportunities and risks in teenagers' use of the internet: The role of online skills and internet self-efficacy. *New Media & Society*, *12*(2), 309-329. doi: 10.1177/1461444809342697

Machado-Da-Silva, F. N. (2013). *Fatores antecedentes da satisfação do aluno e do uso de sistemas virtuais de aprendizagem. 2013* (Doctoral dissertation, Dissertação (Mestrado em Administração). Escola de Administração de Empresas de São Paulo. São Paulo, 2013.

Mahmod, R., Dahlan, N., Ramayah, T., Karia, N., & Asaari, M. H. A. H. (2005). Attitudinal Belief on Adoption of e-MBA Program in Malaysia. *Turkish Online Journal of Distance Education*, v.6, n. 2, 2005.

Maldonado, U., Feroz, G., Moon, J., & Jeung R. J. (2011). E-learning motivation and educational portal acceptance in developing countries. *Online Information Review*, *35*(1), 66-85. doi: 10.1108/14684521111113597

Mardiana, S., Tjakraatmadja, J. H., & Aprianingsih, A. (2015). DeLone-McLean information system success model revisited: The separation of intention to use-use and the integration of technology acceptance models. *International Journal of Economics and Financial Issues*, *5*(1S).

Mason, R. O. (1978). Measuring information output: A communication systems approach. *Information & Management*, *1*(4), 219-234. doi: 10.1016/0378-7206(78)90028-9

Mohamadali, N. A. K., & Garibaldi, J. M. (2010). A Novel Evaluation Model of user Acceptance of Software Technology in Healthcare Sector. In: *Healthinf* (pp. 392-397). doi: 10.15294/sji.v4i2.12012

Mohammadi, H. (2015). Investigating users' perspectives on e-learning: An integration of TAM and IS success model. *Computers in Human Behaviour*, *45*, 359-374. doi: 10.1016/j.chb.2014.07.044

Mohammadyari, S., & Singh, H. (2015). Understanding the effect of e-learning on individual performance: The role of digital literacy. *Computers & Education*, *82*, 11-25. doi: 10.1016/j.compedu.2014.10.025

Moore, D. J., & Lee, S. P. (2012). How advertising influences consumption impulses. *Journal of Advertising*, *41*(3), 107-120. doi: 10.2753/JOA0091-3367410307

Moore, G. C., & Benbasat, I. (1996). Integrating diffusion of innovations and theory of reasoned action models to predict utilization of information technology by end-users. In *Diffusion and adoption of information technology* (pp. 132-146). Springer US. doi: 10.1007/978-0-387-34982-4_10

Motaghian, H., Hassanzadeh, A., & Moghadam, D. K. (2013). Factors affecting university instructors' adoption of web-based learning systems: Case study of Iran. *Computers & Education*, *61*, 158-167. doi: 10.1016/j.compedu.2012.09.016

Müller, T. (2008). Persistence of women in online degree-completion programs. *The International Review of Research in Open and Distributed Learning*, *9*(2).

Murray, K. B., & Bellman, S. (2011). Productive play time: the effect of practice on consumer demand for hedonic experiences. *Journal of the Academy of Marketing Science*, *39*(3), 376-391. doi: 10.1007/s11747-010-0205-6

Nguyen, T. D., Nguyen, D. T., & Cao, T. H. (2014). Acceptance and Use of Information System: E-Learning Based on Cloud Computing in Vietnam. In: *ICT-EurAsia* (pp. 139-149). doi: 10.1007/978-3-642-55032-4_72

Oliveira, B. M. K., Ramos, A. S. M., Andrade, A. P. V., Souza Neto, R. A. D., & Dias, G. F. (2014). A visão de servidores públicos estaduais quanto aos fatores que afetam a adoção de cursos de capacitação à distância: um estudo qualitativo. *Anais***...** XVII Seminários de Administração – SEMEAD.

Ong, C. S., Lai, J. Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information & Management*, *41*(6), 795-804. doi: 10.1016/j.im.2003.08.012

Osika, E. R., & Sharp, D. P. (2002). Minimum technical competencies for distance learning students. Journal of Research on Technology in Education, 34(3), 318-325. doi: 10.1080/15391523.2002.10782352

Osubor, V. O.; Chiemeke, S. C. (2014). A Study of Learning Stakeholders' Usage and Continuous Intention in Using *E-learning* Innovations in Teaching-Learning Activities: A case study of Nigeria Universities. *Computing, Information Systems, Development Informatics & Allied Research Journal. 5*(4).

Patterson, B., & McFadden, C. (2009). Attrition in online and campus degree programs. *Online Journal of Distance Learning Administration*, *12*(2), n2.

Pedrotti, M., & Nistor, N. (2016, September). User Motivation and Technology Acceptance in Online Learning Environments. In *European Conference on Technology Enhanced Learning* (pp. 472-477). Springer International Publishing.

Pinto, M. (2007). Evaluación de la cálidad de recursos electrónicos educativos para el aprendizaje significativo. *Cadernos SACAUSEF*, *2*, 25-43.

Premkumar, G., & Bhattacherjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega*, *36*(1), 64-75. doi: 10.1016/j.omega.2005.12.002

Raman, A., & Don, Y. (2013). Preservice teachers' acceptance of Learning Management Software: An application of the UTAUT2 model. *International Education Studies*, *6*(7).doi: 10.5539/ies.v6n7p157

Ramayah, T., Ahmad, N. H., & Lo, M. C. (2010). The role of quality factors in intention to continue using an e-learning system in Malaysia. *Procedia-Social and Behavioural Sciences*, *2*(2), 5422-5426. doi: 10.1016/j.sbspro.2010.03.885

Ramírez-Correa, P., Rondán-Cataluña, F. J., & Arenas-Gaitán, J. (2010). Influencia del género en la percepción y adopción de e-learning: Estudio exploratorio en una universidad chilena. *Journal of Technology Management & Innovation*, 5(3), 129-141. doi: 10.4067/S0718-27242010000300010

Reichenheim, M. E., & Moraes, C. L. (2007). Operacionalização de adaptação transcultural de instrumentos de aferição usados em epidemiologia. *Rev. Saúde Pública*, *41*(4), 665-73. doi: 10.1590/S0034-89102006005000035

Roca, J. C., Chiu, C. M., & Martínez, F. J. (2006). Understanding e-learning continuance intention: An extension of the Technology Acceptance Model. *International Journal of Human-Computer Studies*, *64*(8), 683-696. doi: 10.1016/j.ijhcs.2006.01.003

Roca, J. C., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behaviour*, *24*(4), 1585-1604. doi: 10.1016/j.chb.2007.06.001

Rogers, E. M. (1995). Diffusion of innovations: modifications of a model for telecommunications. In *Die Diffusion von Innovationen in der Telekommunikation* (pp. 25-38). Springer Berlin Heidelberg.

Rosenfield, L.; Morvile P. (1998). *Information architecture for the world wide web: design*ing large-scale *web* sites. Cambridge: O'Reilly, 197 p.

Rowntree, D. (1981). Statistics without tears: a primer for non - mathematicians, St Ives Pic, England: Clays LtdHar-mondsworth: Penguin.

Saadé, R. G. (2003). Web-based educational information system for enhanced learning, EISEL: Student assessment. *Journal of Information Technology Education*, *2*, 267-277. doi: 10.28945/327

Saadé, R., & Bahli, B. (2005). The impact of cognitive absorption on perceived usefulness and perceived ease of use in online learning: an extension of the technology acceptance model. *Information & Management*, *42*(2), 317-327. doi: 10.1016/j.im.2003.12.013

Saba, T. (2012). Implications of E-learning systems and self-efficiency on students outcomes: a model approach. *Human-Centric Computing and Information Sciences*, *2*(1), 6. doi: /10.1186/2192-1962-3-11.

Schillewaert, N., Langerak, F., & Duhamel, T. (1998). Non-probability sampling for www surveys: a comparison of methods. *International Journal of Market Research*, *40*(4), 307.

Sharma, S. K., Joshi, A., & Sharma, H. (2016). A multi-analytical approach to predict the Facebook usage in higher education. *Computers in Human Behaviour*, *55*, 340-353. doi: 10.1016/j.chb.2015.09.020

Shi, J., Chen, Z., & Tian, M. (2011). Internet self-efficacy, the need for cognition, and sensation seeking as predictors of problematic use of the Internet. *Cyberpsychology, Behaviour, and Social Networking*, *14*(4), 231-234. doi: 10.1089/cyber.2009.0462

Shin, N. (2003). Transactional presence as a critical predictor of success in distance learning. Distance Education, 24(1), 69-86. doi: 10.1080/01587910303048

Simpson, O. (2004). The impact on retention of interventions to support distance learning students. *Open Learning: The Journal of Open, Distance and e-Learning*, *19*(1), 79-95. doi: 10.1080/0268051042000177863

Sousa, A., & Coutinho, C. P. (2009). Conteúdos digitais (interactivos) para educação: questões de nomenclatura, reutilização, qualidade e usabilidade. *Revista Paidéi@, Unimes virtual*, *2*(2).

Sumak, B., & Šorgo, A. (2016). The acceptance and use of interactive whiteboards among teachers: Differences in UTAUT determinants between pre-and post-adopters. *Computers in Human Behaviour*, *64*, 602-620. doi: 10.1016/j.chb.2016.07.037

Sumak, B., HeričKo, M., & PušNik, M. (2011). A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types. *Computers in Human Behaviour*, *27*(6), 2067-2077. doi: 10.1016/j.chb.2011.08.005

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, *50*(4), 1183-1202. doi: 10.1016/j.compedu.2006.11.007

Surry, D. W., Ensminger, D. C., & Jones, M. (2002). A model for integrating instructional technology into higher education. In *Validity and Value in Education Research, 2002 Annual Meeting: American Educational Research Association, New Orleans, LA, 1Á5 April*. doi: 10.1111/j.1467-8535.2005.00461.x

Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information systems research*, *6*(2), 144-176. doi: 10.1287/isre.6.2.144

Tate, M., Evermann, J., & Gable, G. (2015). An integrated framework for theories of individual attitudes toward technology. *Information & Management*, *52*(6), 710-727. doi: 10.1016/j.im.2015.06.005

Thompson, R. L., Higgins, C. A., & Howell, J. M. (1991). Personal computing: toward a conceptual model of utilization. *MIS Quarterly*, 125-143.doi: 10.2307/249443

Tobing, V., Hamzah, M., Sura, S., & Amin, H. (2008). Assessing the acceptability of adaptive e-learning system. In *5th International Conference on eLearning for Knowledge-Based Society*, 16(3).

Tsai, C. C., Chuang, S. C., Liang, J. C., & Tsai, M. J. (2011). Self-efficacy in Internet-based learning environments: A literature review. *Educational Technology & Society*, *14*(4), 222-240.

Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Qquarterly*, 695-704. doi: 10.2307/25148660

Van Raaij, E. M., & Schepers, J. J. (2008). The acceptance and use of a virtual learning environment in China. *Computers & Education*, *50*(3), 838-852. doi: 10.1016/j.compedu.2006.09.001

Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, *11*(4), 342-365. doi: 10.1287/isre.11.4.342.11872

Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, *27*(3), 451-481. doi: 10.1111/j.1540-5915.1996.tb00860.x

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204. doi: /10.1287/mnsc.46.2.186.11926

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478. doi: 10.2307/30036540

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology.

Wang, H. C., & Chiu, Y. F. (2011). Assessing e-learning 2.0 system success. *Computers & Education*, *57*(2), 1790-1800. doi: 10.1016/j.compedu.2011.03.009

Wang, Y. S. (2003). Assessment of learner satisfaction with asynchronous electronic learning systems. *Information & Management*, *41*(1), 75-86. doi: 10.1016/S0378-7206(03)00028-4

Wang, Y. S., Wang, H. Y., & Shee, D. Y. (2007). Measuring e-learning systems success in an organizational context: Scale development and validation. *Computers in Human Behaviour*, *23*(4), 1792-1808. doi: doi.org/10.1016/j.chb.2005.10.006

Willging, P. A., & Johnson, S. D. (2009). Factors that influence students' decision to dropout of online courses. *Journal of Asynchronous Learning Networks*, *13*(3), 115-127.

Williams, M. D., Rana, N. P., Dwivedi, Y. K., & Lal, B. (2011). Is UTAUT really used or just cited for the sake of it? a systematic review of citations of UTAUT's originating article. In *ECIS*.

Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, *16*(1), 85-102. doi: 10.1287/isre.1050.0042

Wu, J. H., Hsia, T. L., Liao, Y. W., & Tennyson, R. (2008). What determinates student learning satisfaction in a blended e-learning system environment?. *PACIS 2008 Proceedings*, 149.

Yim, M. Y. C., Yoo, S. C., Sauer, P. L., & Seo, J. H. (2014). Hedonic shopping motivation and co-shopper influence on utilitarian grocery shopping in superstores. *Journal of the Academy of Marketing Science*, *42*(5), 528-544. doi: 10.1007/s11747-013-0357-2

Yuliasari, E. (2014). Analisis Faktor Determinan Penggunaan Sistem Aplikasi Pemeriksaan Laporan Keuangan dan Implikasinya. *Jurnal Nasional Teknik Elektro dan Teknologi Informasi (JNTETI)*, *3*(2).

Zhang, S., Zhao, J., & Tan, W. (2008). Extending TAM for online learning systems: An intrinsic motivation perspective. *Tsinghua Science & Technology*, *13*(3), 312-317. doi: 10.1016/S1007-0214(08)70050-6

Zhang, X., & Zhang, H. (2009). Transaction information costs in Beijing's housing market based on a Hedonic model [J]. *Journal of Tsinghua University (Science and Technology)*, *3*, 002.

Zhao, Y., & Kurnia, S. (2014). Exploring Mobile Payment Adoption in China. In: *PACIS* (p. 232).