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UTAUT Model for Blended Learning: The Role of Gender and Age in the Intention to Use Webinars

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Abstract

The purpose of the paper was to determine the factors that explain the acceptance of a webinar system (Elluminate) in a blended learning course by students. The effects of gender and age as moderating variables were also studied. Our hypotheses were based on the unified theory of acceptance and use of the technology model, which was proven to be able to better explain the variance in usage intention than previous acceptance models. In total, 114 students enrolled in a blended information systems course at Laval University in Quebec-Canada answered 37 questions of seven-point Likert-type scale. Results have shown that the intention to use a webinar was directly influenced by performance expectancy (practical academic performance), effort expectancy (ease of use), and facilitating conditions (technical and organizational support). Only the age variable had a moderating effect.

The obtained results will not only add scientific evidence to the literature about blended learning, webinars, and technology adoption, but it could also lead to a better practical understanding of the factors that may incite or discourage students to use webinar technologies in blended higher education. Faculty members and administrators should use these results to develop strategies to align users' expectations with technology use for learning.

Keywords: blended learning, webinar, Elluminate, technology acceptance model, gender, age.

Introduction

Asynchronous information and communication tools like discussion forums, electronic mails, blogs, and wikis have been used for several decades in many fields. In the education context, asynchronous electronic means were used to reinforce interactions between students and teachers. In 2009, more than 74% of

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American higher educational institutions agreed that online education is an important component of their long-term strategy (Allen & Seaman, 2010). Even though the results about the acceptance of online instruction by faculties are mixed, Allen and Seaman (2010) have confirmed that the percentage of chief academic officers that think that students' retention is a greater problem for online courses was twice as large as those who disagree.

According to some authors (Allen, Bourhis, Burrel, & Mabry, 2002; Muilenburg & Berge, 2001), interaction is known to be a sine qua non condition to students' satisfaction and retention. Synchronous tools were, therefore, seen as an additional component to strengthen live communication between the different stakeholders of the distance-learning environment (Johnson, 2006). The accessibility and ease of use of both asynchronous and synchronous technologies made it easier to respond to various students' needs by providing courses and even programs fully online.

In the last decade, there has been a great amount of interest in mixing the advantages of online courses with those of face-to-face courses by offering another type of course delivery mode called blended learning. Blended learning consists of blending face-to-face and online delivery in order to reinforce the interaction and direct contact of students with the other participants in a course (Allen et al., 2002). To do so, technologies like webinars offer support to instructors by ensuring efficient synchronous communications. As technologies represent the spearhead of blended learning, their acceptance by students is essential to the success of their use. However, empirical studies that have tried to evaluate the acceptance of webinars by students are not abundant. We deem it important to explore this avenue because student readiness is one of the success factors of blended learning (Graham, 2006). In this study, we aim to identify factors that motivate students to use webinars in a blended learning course. These factors were further analyzed according to age and sex. Obtained results will not only add scientific evidence to the literature about blended learning, webinars, and technology adoption, but they could also lead to a better practical understanding of the factors that may incite or discourage students to use webinar technologies in blended higher education.

The following section includes a background about blended learning, the webinar concept, and the acceptance models used in the information systems field. The research objective and questions are then proposed, followed by the research model, variables, and hypotheses. The description of the sample and the procedure is provided before presenting and discussing the results.

Background

Blended Learning

According to Graham (2006), blended learning is a "buzzword" that is still ambiguous. Most authors agree on the definition of blended learning systems as a combination of face-to-face instruction with computer-mediated instruction (Graham, 2006; Rooney, 2003; Young, 2002). This definition overrides the broad vision of blended learning as a combination of instructional modalities or methods. As such, blended learning is the result of the convergence of two archetypal learning environments: distributed environments that have been strengthened thanks to the communication and interaction features of new technologies (synchronous and asynchronous) and the traditional face-to-face learning environment (Graham, 2006). These environments were matched in different forms and combinations in order to facilitate teaching and learning (Duhaney, 2004). The mixture of these environments was expressed by Garrison and Vaughan (2008) as "the organic integration of thoughtfully selected and complementary face-to-face and online approaches and technologies" (p. 148).

Even if we have found a consensus on the definition of blending learning, there is no agreement on the forms that blended instruction can take. Indeed, computer-mediated instructional elements

embrace several levels of integration with the traditional face-to-face learning experience on a four-dimension continuum: space (physical/face-to-face vs. distributed), time (live/synchronous vs. asynchronous), fidelity (rich/all senses vs. text only), and humanness (high human/no machine vs. no human/high machine) (Graham, 2006). For example, to become blended, an online course can keep its distributed space structure but add synchronous distributed interactions through communication technologies, such as live chats, acting then on the time dimension. Fidelity can be enhanced by audio recordings, and humanness can be strengthened by virtual communities or virtual messaging. As these four dimensions change value, blended instruction may take various forms.

The course that we used in this research to study the acceptance of the webinar system was offered only online. However, a webinar was added to the range of technologies implemented in order to bring the course closer to a blended form. Considering Graham's continuum, students were able to attend physical/face-to-face meetings through classroom sessions, to listen to live/synchronous interventions through audio live broadcasting, to use a richer media (i.e., audio recordings), and to profit from the human presence of the teacher. However, as blending was not compulsory, these dimensions were used to different degrees, which made students embrace various forms of blended instructions. The flexibility offered to students to adopt different blended forms was intended because we aimed to allow them to profit from all of the advantages that they may find along the continuum between the presence in class and the online courses.

As many authors have reported, students who have experienced blended learning appreciate this course delivery mode because it adds other advantages in addition to the flexibility and ubiquity of online courses, such as direct interaction, learning support, and motivation (Fabry, 2012; Fearson, Starr, & McLaughlin, 2012). In the United Kingdom, students were inclined to enroll in blended learning courses because they were looking for flexibility, more support, motivation, idea sharing, interaction, and better communication (Fearson, Starr, & McLaughlin, 2011). Enhancement of student performance is what American students reported when they compared blended learning courses to traditional ones (Chan, 2011). The Cohere (2011) study results highlighted similar opinions of students trying out blended learning in Canada. For instance, the University of Calgary offered funding to instructors for redesigning their courses to adhere to a blended format. The result of the enquiry after implementing blended learning stated that both students and instructors indicated an increase in the quality and quantity of interactions. At Mount Royal University, blended courses were offered for more than one decade. Students reported an enhanced understanding of course content. Those who participated in blended courses actively obtained the best final course grades. Again, interactive learning technologies were used, such as blogs, wikis, social media sharing, and networking applications were used. The University of Waterloo reported a positive experience with blended courses, as well. Online presentations and activities were matched with online discussion boards and one-hour, face-to-face tutorials. The enthusiasm of students and the interactions between them, and with instructors was shown to have increased throughout the weeks.

Webinars

The webinar is a concept that describes web-based meetings using conferencing systems that some universities have adopted to support blended learning. A webinar offers an interactive learning context distributed across time and space (Karabulut & Correia, 2008). Derived from the words "web" and "seminar," a webinar allows distant participants to enroll in a synchronous session. This participation can be bilateral and in real time, thanks to video or audio broadcasting and recordings, electronic presentations, shared applications, and whiteboards (Wang & Hsu, 2008; Humphrey, LeGrand, & Beard, 2013).

Webinars relying on commercial tools like WebEx, Microsoft GoMeeting, ReadyTalk, and GoToMeeting were first used by organizations for training purposes. Such technologies provided cost and time savings. Afterwards, educational institutions realized that webinars, like Elluminate, were some of the most efficient means to reach a distant audience. A quick Internet search reveals thousands of universities scattered over the six continents using webinars in their courses. However, scientific research about webinar use has been scarce until now. In India, webinars were used to reach rural college students (Verma & Singh, 2009). Usefulness and effectiveness of webinar use were reported by faculty members. As for organizations, cost and time savings were some of the advantages cited in this experience. An evaluation of a series of webinars in the forestry field has shown that most webinars helped to reach new audience members and that participants sought additional information after viewing the webinars (Allred & Smallidge, 2010). Another webinar system was tested in an undergraduate chemistry and biochemistry seminar course (Hamstra, Kemsley, Murray, & Randall, 2011). Most students confirmed that both the virtual presentation and the seminar content were appreciated as much as the traditional "in-person" presentations. In the United States of America, undergraduate students participated in a study where their learning and attitudes were polled after using a webinar platform. Compared to online classes and on-site classes, the participants' grades were shown to be higher, and their attitudes toward the class improved (Myers & Schiltz, 2012). Lakhal, Khechine, and Pascot (2013) evaluated the effect of psychological factors like autonomy on the willingness of business students to use Elluminate as a webinar system in a distance course. Performance expectancy, facilitating conditions, general social influence, and autonomy mediated by performance expectancy have been shown to be the main predictors of the intention to use the webinar system.

Acceptance Models in Higher Education

Technology acceptance in the higher education context was addressed by many authors and in different manners. Most of them have used the technology acceptance model (TAM) of Davis (1989). The most recent ones were Lee, Hsieh, and Chen (2013). They used the TAM model to evaluate employees' attitudes and acceptance of e-learning systems in organizations. They added four variables to the original model in order to fit the study context: organizational support, computer self-efficacy, prior experience, and task equivocality. Al-Busaidi (2013) also used the TAM model and enriched it with other variables, including satisfaction and personal characteristics, to investigate the link between learners' perception of blended learning and full e-learning.

The TAM model is one of the many competing models of the acceptance of technology that have been elaborated and validated in the contemporary information systems literature. However, researchers were confronted with a difficult choice among these various models and among the constructs considered. In 2003, Venkatesh, Morris, Davis, and Davis proposed a unified model, which they called the unified theory of acceptance and use of technology (UTAUT). According to these authors, "UTAUT is a definitive model that synthesizes what is known and provides a foundation to guide future research in this area" (Venkatesh et al., 2003, p. 467). They have also proven that the UTAUT model was able to better explain the variance in usage intention than previous models. These reasons made us confident about the choice of this integrative and global model to explain technology acceptance by its users.

Since 2003, several studies validated the UTAUT model in different environments. The keen interest of the education field in this explaining model began in 2010. For instance, Šumak, Polančič, and Heričko (2010) used it to study the adoption of Moodle, a virtual learning environment by students. It was also used by Pardamean and Susanto (2012) to assess the acceptance of blog technologies for education and learning. Tan (2013) used the same model to evaluate students' adoption and attitudes toward electronic placement tests. Lin, Lu, and Liu (2013) added moderating variables like teaching and learning styles to extend the UTAUT model to what they

called the education behavioral intention model. Lakhal et al. (2013) added the attitude construct to the UTAUT model in order to examine psychological factors that could influence the acceptance of desktop video conferencing in a distance course.

Research Objective and Questions

Successful stories of blended learning were certainly not experienced without hurdles. Renes and Strange (2011) argued that the human factor, rather than technology, contributes to limiting the adoption of the technology in the learning environment. The transition from a traditional experience or an online course to a blended one is a process that requires overcoming many challenges. The interactions of students with their colleagues and with faculty staff and their acceptance of the content of the course and its delivery mode have to be rethought for blended instruction. As Cohere (2011) suggested, institutions have to understand blended learning in order to expand the willingness for it to be adopted by faculty. However, we think that this understanding cannot be achieved without questioning the actual users of blended learning - the students - about their acceptance of the technological means used to support this kind of instruction. To address this concern, we aimed in this research to determine the factors that could explain the acceptance and intention of the use of technologies, like webinar systems, in blended courses by academic students. We went further by analyzing the effects of gender and age as moderating variables because we think that it is important to discern users' behavior according to the characteristics of these users.

The background review allowed us to assert that, to our knowledge, no previous study has tried to explore students' acceptance of webinars in a blended learning environment while considering age and gender. We propose to deepen this specific issue by answering two research questions:

1. What are the factors that influence the intention of students to use webinars in a blended learning course?
2. Are the effects of these factors on the intention of students to use webinars moderated by gender and age?

In the context of this study, Elluminate was the webinar system that we used to answer these research questions.

Research Model, Variables, and Hypotheses

For the purpose of this study, we relied on the UTAUT model for many reasons. First, this model has not yet been widely used to evaluate the adoption of webinar systems in blended learning contexts. Second, this model needs to be tested in several environments to consolidate its empirical basis, especially in the learning one. Third, for a decade, whether it was applied to the educational (Zhang, Fang, Wei, & Wang, 2012), banking (AbuShanab, Pearson, & Setterstrom, 2010), organizational (Brown, Dennis, & Venkatesh, 2010), tourism (San Martin & Herrero, 2012), or forestry field (Allred & Smallidge, 2010), this new model was proven to give a better explained variance of the intention to use technologies than previous models (Theory of Research Action of Fishbein and Ajzen (1975), Technology Acceptance Model of Davis (1989), Theory of Planned Behavior of Azjen (1991), and Innovation Diffusion Theory of Moore and Benbasat (1991)).

From the UTAUT model, we retained its five main constructs (one dependent variable and four independent constructs) and two moderating variables (Venkatesh et al., 2003). The definitions of these variables and the hypotheses related to them are presented in the following paragraphs. The research model is depicted in Figure 1.

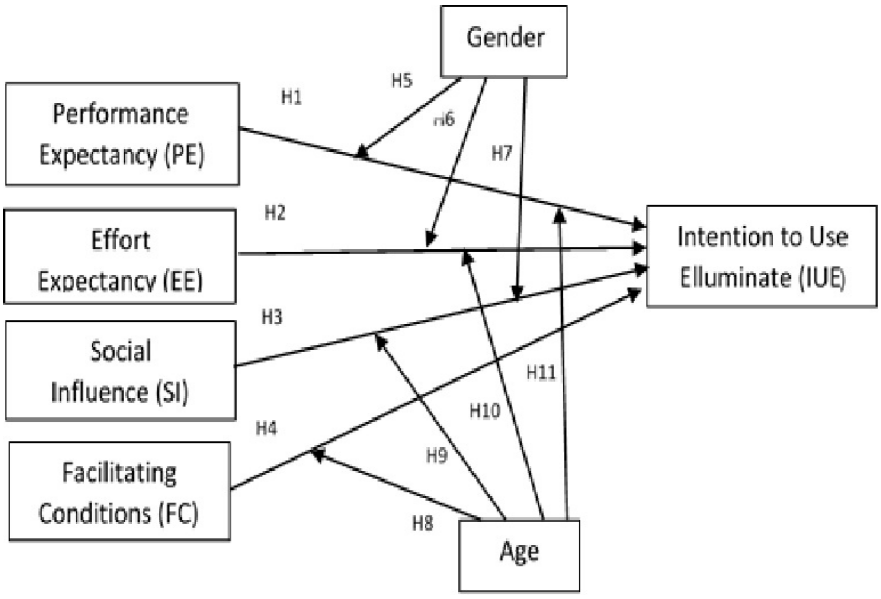

Figure 1. Research model

The dependent variable was the **intention to use Elluminate (IUE)**. Elluminate is the webinar system that we tested in this study. According to Ajzen (1991), "Intentions are assumed to capture the motivational factors that influence behavior. They are indications of how hard people are willing to try, of how much of an effort they are planning to exert in order to perform the behavior." In this context, the dependent variable is the intention of the students to use Elluminate.

The first independent variable was **performance expectancy (PE)**. It was defined as the degree to which a student believes that using the system will help him attain gains in academic performance. This construct was proven to be the strongest predictor of behavioral intention (Venkatesh et al., 2003). Its relationship with the intention to use the technology or the system was shown to be positive most of the time (AbuShanab et al., 2010; Eckhardt, Laumer, & Weitzel, 2009; San Martin & Herrero, 2012; Venkatesh et al., 2003). In the context of Elluminate use, we propose the 1st hypothesis as follows:

> **H1:** Performance expectancy (PE) has a positive effect on the intention to use Elluminate (IUE).

Effort expectancy (EE), the second independent variable, referred to the degree of ease in using the system. In the earlier stages of a new behavior, users can feel that there are some obstacles related to the use of a technology (Davis, Bagozzi, & Warshaw, 1989; Thompson, Higgins, & Howel, 1991; Venkatesh et al., 2003). Once users become accustomed to the technology, the perceived ease of use becomes stronger. However, Elluminate is an easy-to-use and a user-friendly software. We expect that the ease of use of the webinar system will stimulate students to adopt it. The 2nd hypothesis was the following:

> **H2:** Effort expectancy (EE) has a positive effect on the intention to use Elluminate (IUE).

Social influence (SI) was the third independent variable. It described the degree to which a student perceives that important people believe he should use the system. Important people are friends, colleagues, or family members. It was shown, through the UTAUT model and previous models, that this perception had a positive relationship with the behavioral intention to use a

technology (AbuShanab et al., 2010; Eckhardt et al., 2009; San Martin & Herrero, 2012; Venkatesh et al., 2003). Consequently, we made the following assumption:

H3: Social influence (SI) has a positive effect on the intention to use Elluminate (IUE).

The last independent variable was **facilitating conditions (FC)**. This was defined as the degree to which a student believes that an organizational and technical structure exists to support the use of the system. Some evidence has shown that when users feel that they are well supported in a variety of ways, they will be more inclined to use the system (AbuShanab et al., 2010; Eckhardt et al., 2009; San Martin & Herrero, 2012). In the context of this study, students were provided with an online tutorial, an onsite help desk, and a regularly updated technological infrastructure related to Elluminate. Therefore, for the 4th hypothesis, we assumed that:

H4: Facilitating conditions (FC) have a positive effect on the intention to use Elluminate (IUE).

To the main constructs of the UTAUT model, we added two moderating variables: gender and age. They would contribute to evaluate the strength of the relationships between the independent and the dependent variables according to the intrinsic characteristics of the students (Baron & Kenny, 1986). As Venkatesh et al. (2003) reported, when considered as moderating variables, gender and age play an important role in the relationships between the psychological constructs of the UTAUT model and the intention to use a technology.

According to many research results (e.g., Bandyopadhyay & Fraccastoro, 2007; Venkatesh et al., 2003), **gender** has a moderating effect on the relationship between the explaining constructs performance expectancy (PE), effort expectancy (EE), and social influence (SI), and the dependent variable behavioral intention. For the first construct (PE), the effect was stronger for men (Venkatesh & Morris, 2000), while for the two other constructs (EE and SI), the effects were more salient for women (Cheng, Yu, Huang, Yu, & Yu, 2011; Venkatesh & Morris, 2000). We can then infer that performance is a significant concern for male students, whereas female students are more worried about ease of use and others' opinions. The hypotheses related to the moderating effects of gender were the following:

H5: The positive effect of performance expectancy on the intention to use Elluminate is moderated by **gender,** such that the effect is stronger for men.

H6: The positive effect of effort expectancy on the intention to use Elluminate is moderated by **gender,** such that the effect is stronger for women.

H7: The positive effect of social influence on the intention to use Elluminate is moderated by **gender,** such that the effect is stronger for women.

Age was proven to moderate the links between performance expectancy (PE), effort expectancy (EE), social influence (SI), and the dependent construct behavioral intention (Lu, Yu, & Liu, 2009; Venkatesh et al., 2003). The effect of performance expectancy on intentions was stronger for younger people, but the effects of effort expectancy and social influence were more salient for older people (Venkatesh et al., 2003). It has been claimed that older people attach more importance to help and support in the job context, known as facilitating conditions (FC) (Hall & Mansfield, 1975). In the case of Elluminate use, we assume that younger students are more concerned with enhancing their performance when using the technology, while older students worry more about ease of use, what others would think about them, and what the multiple avenues of assistance are. Hypotheses related to the moderating effects of age were formulated as follows:

H8: The positive effect of performance expectancy on the intention to use Elluminate is moderated by **age,** such that the effect is stronger for younger students.

H9: The positive effect of effort expectancy on the intention to use Elluminate is moderated by **age,** such that the effect is stronger for older students.

H10: The positive effect of social influence on the intention to use Elluminate is moderated by **age,** such that the effect is stronger for older students.

H11: The positive effect of facilitating conditions on the intention to use Elluminate is moderated by **age,** such that the effect is stronger for older students.

Sample and Procedure

The study sample was made up of North American students enrolled in an undergraduate information systems management course in the business administration program at Laval University in Quebec. All of the necessary materials were available online. Students used the WebCT platform to get all of the information about the course (online readings, PowerPoint presentations, and instructions for the homework). It was also possible for them to interact via discussion forums and e-mails. In addition, for every week, the teacher scheduled a complementary classroom session that was broadcasted live and recorded via Elluminate. In these classroom sessions, the teacher explained the material available online and answered students' questions. Questions can be asked by students present in the classroom or connected with Elluminate using the live chat or their microphone. If students wanted to listen to these recordings later, they had to log in to the Elluminate platform. MP3 and MP4 versions of the recordings could also be generated. Neither the presence in class nor the listening to the live broadcasting or recordings was compulsory.

Among the 470 students enrolled in the 2012 winter session, 114 filled out the online questionnaire, confirming their use of Elluminate (a response rate of approximately 24.25%). Data collection began almost two weeks before the final exam and lasted five weeks, just in time to make final grades available to the students. We chose the end of the semester for data collection to be sure that students had experienced the technology enough (at least 10 weeks) and that they were able to make an informed decision about their intention to use Elluminate for future courses. The questionnaire was composed of 27 items obtained from previous research that had used the UTAUT model. We needed to translate the questionnaire into French and to adapt its items to the technological context (Elluminate). Except for gender, age, and years of computer use, all of the other items were measured on a seven-point Likert-type scale (from 1 = strongly disagree to 7 = strongly agree). The list of items before translation is presented in the Appendix. Gender was coded 1 for male and 2 for female. Age was a free entry field. Years of computer use was a categorical variable with 5 values ranging from < 1 year to > 4 years.

For data analysis, we used the SPSS software. It allowed us to obtain the descriptive statistics and to ensure the reliability of the measurement instrument. Hypotheses were tested using multiple regression analysis. We deemed it unnecessary to use the PLS software, as it gave us the same results as SPSS.

Results and Discussion

Sample Description and Reliability

The first step in the data analysis was the descriptive statistics. As presented in Table 1, both genders were well represented in the sample with a slightly higher number of male students. They represented 57.9% of the sample against 42.1% for female students.

Table 1. Gender distribution

	Frequency	Percentage
Male	66	57.9%
Female	48	42.1%
Total	114	100%

Concerning age, 78.1% of the students in the sample were between 19 and 23 years old. Only 10.5% of the students were more than 30 years old. Figure 2 depicts the distribution for age in percentages.

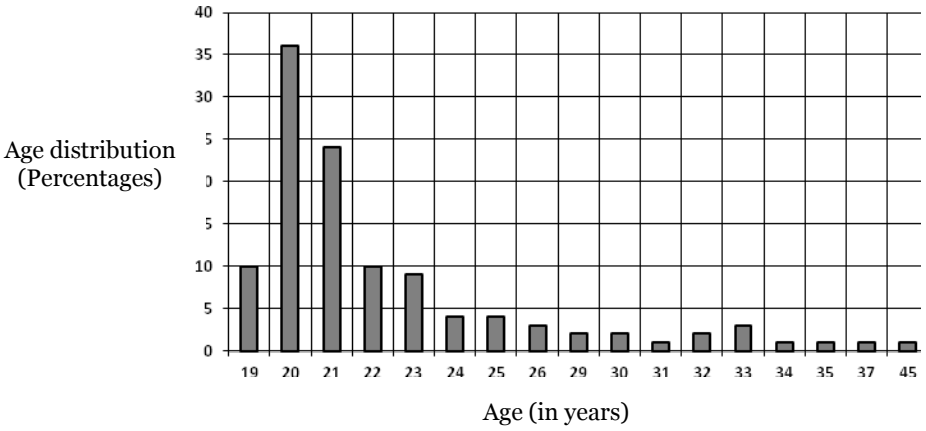

Figure 2. Age distribution

Because most students were young, it was not surprising to find that most of them (almost 94%) had experience with computers for at least four years. In Figure 3, we can see that few students were inexperienced with computer use. This experience can suggest a sense of openness to new technologies.

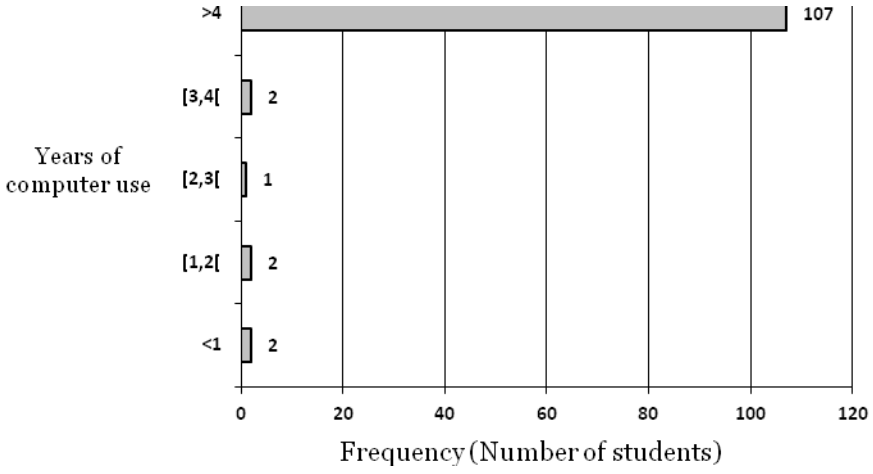

Figure 3. Frequency distribution of computer use

The second step of the data analysis was to assess reliability by means of a confirmatory factor analysis and item loadings. The results showed that item loadings were strong (>0.5, as recommended by Nunnally (1978)), except for two items that we dropped from the social influence and facilitating conditions constructs. After conducting a reliability analysis, we dropped two other items from the facilitating conditions construct to ensure a good reliability coefficient. As shown in Table 2, the Cronbach Alphas for all constructs were satisfactory, as they were greater than 0.7 (Nunnally, 1978). These results made us confident about the reliability of the measurement instruments.

Table 2. Constructs reliability

Constructs	Construct Reliability Cronbach Alpha
Performance Expectancy (PE)	0.954
Effort Expectancy (EE)	0.893
Social Influence (SI)	0.814
Facilitating Conditions (FC)	0.737
Intention to Use Elluminate (IUE)	0.965

Hypotheses Testing – Direct Links

We used multiple regression analysis to test the research hypotheses. As Table 3 demonstrates, the regression coefficients were significant for the direct links between three independent variables (PE, SI, and FC) and the dependent variable the intention to use Elluminate. *P-values* detailed in Table 3 were adjusted for unidirectionality because the study hypotheses were tested at a unilateral significance level of 0.05. The R^2 value was 0.514, which means that more than 51% of the variance in the intention to use Elluminate construct was explained by the three independent constructs.

Table 3. Regression coefficients and significance without moderating variables

	Path Coefficient	t-value	Sig.
Intention to Use Elluminate (IUE)		***R^2 = 51.4%***	
PE	0.445	5.143	.000***
EE	0.078	0.912	.364
SI	0.237	2.624	.010* two-tailed .005** one-tailed
FC	0.159	1.916	.058 two-tailed .029* one-tailed

*** $p \leq .001$ **$p \leq .01$ * $p \leq .05$

The performance expectancy (PE) construct positively affected the intention to use Elluminate (IUE), a result that supported the 1st hypothesis and was consistent with other research results (Al-Gahtani, Hubona, & Wang, 2007; Pardamean & Susanto, 2012; Venkatesh et al., 2003). The path coefficient was $\beta = 0.445$, and the Sig. = .000 ($p \leq 0.001$). Moreover, performance expectancy was the strongest predictor of the intention to use Elluminate. This finding was consistent with the results reported by previous research (Anderson, Schwager, & Kerns, 2006; Khechine, Lakhal, Bytha, & Pascot, 2013; Venkatesh et al., 2003) and can be explained by the young age of the respondents. According to our experience in business schools, students enrolled in undergraduate programs have demonstrated that performance was the first concern for most of them be-

cause their chances of being accepted for a job or in a graduate program (i.e., MBA) depend greatly on their academic results. They could, then, see in Elluminate a technological tool that could support them in reaching their performance objectives. Understanding the most important predictor of user acceptance will be of great usefulness for academics and experts in pedagogy in higher education. This knowledge can help administrators make sound decisions about the technology to implement in order to support blended courses. For instance, webinar designers can promote the effectiveness of such a system in enhancing learners' performance, which will make the students more willing to use it. However, they have to think about the suitable design of the webinar sessions in order to ensure this effectiveness.

The effort expectancy construct was not a predictor of the intention to use Elluminate, which made us reject the 2nd hypothesis. This finding can be explained by three factors. The first one is the availability of support for the use of the technology. Indeed, documentation and training videos about this webinar were translated and designed in the native language of the users. The second factor is the culture of the course and of the program to which the course belongs. The use of innovative technologies forms part of the core of the pedagogical strategy of the program. Indeed, for the past fifteen years, students of the faculty have gone through several technological innovations in teaching, beginning with intranets, discussion forums, online courses via WebCT, and podcasts. The prevailing learning and teaching culture was then impregnated with the technological trend. The third factor is related to students' characteristics. As almost 94% of the students in the sample had been using computers for at least four years, they were accustomed enough with technologies. This trend was reinforced by the cultural issues of North American students who are constantly exposed to relevant technologies in learning and teaching contexts.

For the social influence construct, the path coefficient ($\beta = 0.237$) was significant (Sig. = 0.005 one-tailed, $p \leq 0.01$), thus supporting the 3rd hypothesis, which was consistent with Pardamean and Susanto (2012)'s and Šumak et al. (2010)'s results. Others' opinions concerning the use of Elluminate were important for students. The more favorable that important people, such as friends, family, teachers, and peers, are to the use of Elluminate, the more likely students are to adopt it (Martins & Kellermanns, 2004). Thus, a first path for the success of blended learning is to convince people around students in the university (e.g., colleagues and teachers) about the efficiency and the effectiveness of tools like webinar systems for their learning.

The 4th hypothesis was supported with a path coefficient $\beta = 0.159$ (Sig. = 0.029 one-tailed, $p \leq 0.05$). Facilitating conditions were proven to make students more willing to use Elluminate. The technological and organizational infrastructure that supported the use of Elluminate was impressive. Supportive and knowledgeable staff members were available five days a week - not only to answer students' questions quickly but also to strive to meet their demands, such as creating live sessions for group work. Therefore, an effective implementation of a webinar system in any learning environment could not be successful without good support from technicians or documentation that may help students master the technology and override any difficulties that they may encounter.

Hypotheses Testing – Moderating Variables

The results of the moderating effects of gender and age are presented in Table 4. Only age has moderated the relationship between the two independent variables performance expectancy and facilitating conditions and the dependent construct the intention to use Elluminate. In various studies (Al-Gahtani et al., 2007; Lin, Chan, & Jin, 2004), gender did not exhibit significant interactions with any predictor latent variable. However, in the first study that used the UTAUT model in a work context (Venkatesh et al., 2003), gender showed some moderating effects. The environment in which the experiment was carried out could explain this difference in the results. Indeed, unlike the work environment, in the educational context and especially in business schools,

male and female students have roughly the same characteristics in terms of learning objectives, experience with the technology, and the attention that they pay to the opinions of their peers.

Table 4. Regression coefficients and significance with moderating variables

	Path Coefficient	t-value	Sig.
Intention to Use Elluminate (IUE)		**R^2= 72.7%**	
PExGender	0.056	0.262	.794
EExGender	-0.024	-0.123	.902
SIxGender	-0.055	-0.219	.827
PExAge	0.393	1.834	.069 two-tailed .034 one-tailed*
EExAge	0.098	0.496	.621
SIxAge	0.301	1.243	.217
FCxAge	0.164	1.907	.059 two-tailed .029 one tailed*

*** $p \leq .001$ **$p \leq .01$ * $p \leq .05$

As the study hypotheses were tested at a unilateral significance level of 0.05, the 8th hypothesis was supported. The positive effect of performance expectancy on the intention to use Elluminate was moderated by age, such that the effect was more salient for younger students ($\beta = 0.393$ and Sig. = .034, $p \leq 0.05$). Numerous studies have reported that age was a significant contributor to the performance differences between traditional and online/distance learning students (e.g., Schultz, Schultz, & Round, 2010). In our questionnaire, apart from two general items about the utility of Elluminate and the performance expected from its use, all of the other items used to measure performance expectancy dealt essentially with the rapidity, quality, easiness, efficiency, and productivity of the learning activities. The last item was about the expected grade for the course. Thus, in the present study, younger students seemed to be more concerned with the "practical" effect of the webinar on their activities than older students. By practical effect, we mean that younger students were looking for approaches to allow them to perform tasks in an easy, rapid, and productive way. They may pay less attention to knowledge acquisition and learning outcomes compared to older students. Previous research had also shown that younger workers were proven to be more interested in performance expectancy than older ones (Venkatesh et al., 2003). This result was consistent with our experience as teachers, as we noticed that most of the time, but fortunately not always, knowledge acquisition was of fundamental importance for fewer "young" students. Older students were, indeed, considered more mature and disciplined (Dille & Mezack, 1991). The question that arises here is how to find the "age" of maturity of students in online courses? The answer may lie in the "magic number" for age where effects began to disappear for performance expectancy (Venkatesh et al., 2003). In our sample, this magic number was found to be 24 years old, as a *t*-test analysis between the group of students 24 years old and less (n= 93) and the one 25 years old and more (n= 21) has shown a statistically significant difference of their means. As presented in Table 5, the equality of variances was assumed (Sig. = 0.028, $p \leq 0.05$). Therefore, students 24 years old or more were less concerned with performance expectancy than younger students (Sig. = .031 for a 2-tailed test and Sig. = .015 for a 1-tailed test, $p \leq .05$).

Table 5. Differences in means between two groups of ages for performance expectancy

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PE	Equal variances assumed	4.985	.028	-2.178	112	.031*	-0.517	0.237	-0.988	-0.0467
	Equal variances not assumed			-2.415	33.749	.021	-0.517	0.214	-0.953	-0.0819

* $p \leq .05$

Even though we were unable to propose a field proven method to "guess" this magic number, we suggest that future studies focusing on employee training should consider learning expectancy as a determinant of the intention to use webinars.

Another interesting finding pertained to the facilitating conditions construct. According to the results reported in Table 4, the effect of facilitating conditions on the intention to use Elluminate was statistically significant when moderated by age, such that the effect was more salient for older students ($\beta = 0.164$ and Sig. = .029 for a one-tailed test, $p \leq 0.05$). This result, which allowed for the supporting of the 11th hypothesis, can be interpreted as being due to older students' fears about the use of new technologies. Finding multiple choices for help and support either on the technological side or the pedagogical front would remove impediments to the intention of usage. Once again, we have tried to find the "magic number" for age, where the effects of the facilitating conditions began to appear. As reported in Table 7, there was a significant difference in means for facilitating conditions between students 21 years old or less (n=70) and students older than 22 years (n=44). With the assumption of equality of variances (sig. = .013, $p \leq .05$), the *t*-test has shown a significant difference in the means of the two groups of students (Sig. = .012 for a 2-tailed test and Sig. = .006 for a 1-tailed test, $p \leq .05$). Our interpretation of such a result is that students 21 years old or less probably feel more confident about their capabilities in mastering technologies, as they are still enthusiastic about having started their studies at the university. To be more effective, Elluminate support staff can evaluate students' age before allocating efforts in supporting the different courses.

Table 6. Differences in means between two groups of ages for facilitating conditions

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
FC	Equal variances assumed	6.360	.013	-2.566	112	.012*	-0.481	0.187	-0.853	-0.109
	Equal variances not assumed			-2.874	111.497	.005	-0.481	0.167	-0.813	-0.149

* $p \leq .05$

A summary of the findings of the hypotheses and the moderating effects of age and gender is presented in Table 7.

Table 7. Summary of findings

Hypotheses	Independent constructs	Moderators	Supported
H1	PE		**Yes**
H2	EE		No
H3	SI		**Yes**
H4	FC		**Yes**
H5	PE	Gender	No
H6	EE	Gender	No
H7	SI	Gender	No
H8	PE	Age	**Yes**
H9	EE	Age	No
H10	SI	Age	No
H11	FC	Age	**Yes**

In order to better understand the effects of the moderating variables when introduced to the original model, we analyzed the percentage of variance explained of the dependent variable. The R^2 increased from 51.4% in the model without moderating variables to 72.7% in the model with moderating variables, which is consistent with the results of Venkatesh et al. (2003). Age introduced a better understanding of the phenomena to explain the willingness of students to use Elluminate. These findings could lead to two practical actions. First, the expected performance that younger - that is, younger than the "magic number" - students strive for should be considered to ensure that Elluminate would attain its aimed objectives. Faculty members and administrators in institutions of higher education should evolve strategies to align users' expectations with technology use. Second, the right actions should be taken to offer more facilitating conditions to older students in the form of organizational, technological, and human support.

Conclusion

This research set out a different application of the UTAUT model in the higher education environment. We have chosen a quantitative method with closed-ended questions because the theoretical basis to study technology adoption is well crafted. However, due to its relative novelty, the UTAUT model was seldom used for the web-based conferencing, in particular, webinars. We have chosen it because it is an integrative conception of previous technology acceptance models that have shown, according to Venkatesh et al. (2003), better results than its predecessors.

In this study, we analyzed the predictors of the acceptance of Elluminate use. We have also evaluated the effect of two moderating variables - gender and age - on the relationships between the predictors and the intention to use Elluminate. The results have shown that age played a major role, as younger students were more concerned with their performance, and older students worried more about facilitating conditions.

The present study had both theoretical and practical implications. On the theoretical side, this study highlighted original results from the UTAUT model that were mostly tested in a work environment. It provided useful insights into technology acceptance in an academic setting. The dif-

ferences that were evident were that gender had no moderating effects and that age intervened mainly with performance expectancy and facilitating conditions. Unlike other study results (Anderson et al., 2006; Venkatesh et al., 2003), the facilitating conditions variable was a predictor of the dependent construct, either moderated or not by age. Overall, this study contributed to enrich the scientific literature with knowledge about the acceptance theory in a blended learning environment with a new technology.

On the practical side, this study allowed us to be more informed about the factors that will encourage students to use webinars. Therefore, a special consideration should be accorded to users' needs in order to meet their expectations. It was proven that effort expectancy was not an important matter for students when using a webinar system. However, the expectancy of performing better in the course incited younger students to use the webinar system. Actions consisting of revisiting live and recorded sessions' content and form should be made to satisfy this expectancy. Teachers have to rethink webinar sessions in order to promote the practical effect expected by students, especially younger ones. For instance, recording shorter sessions that serve to allow the student to revisit the course material every week may help in improving quality, efficiency, and productivity of students. Teachers can also organize special sessions to explain the instructions of the evaluation activities, which can help students perform them more rapidly and easily. Older students asked for facilitating conditions, which suggests the importance of intensifying technological and organizational support for this category of users. Indeed, students might feel more secure if technical staff - made up of techno-pedagogic experts - and organizational infrastructure - such as a free phone number, video tutorials, and an FAQ section - where provided when using webinars. These actions could help teachers and academic practitioners widen webinar use to all classes and fields, especially according to students' age. All of this knowledge could help administrators and instructors make better decisions about the investments that universities are making - or will make - in technologies to reach a wide range of clients all over the world through blended learning.

An explained variance of 72.7% gave us confidence in the validity of our results. However, as Venkatesh et al. (2003) suggested, more explaining constructs should be considered to add to the prediction of intention over what the basic UTAUT model gave. In our future research, we aim to focus on studying other webinar systems that contain different features. We are also considering grafting moderating variables, like personality traits, through the big-five model, and course evaluation modes to the original UTAUT model. Finally, the theme of the course might constitute a variable to control. Other studies need to evaluate and compare students' acceptance of webinars for courses with different topics.

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Appendix

Scale items adapted to the context of the use of Elluminate before translation to french.

Behavioural Intentions

BI1 I intend to use Elluminate in future sessions.
BI2 I predict I will use Elluminate in future sessions.
BI3 I plan to use Elluminate in future sessions.

Performance Expectancy

PE1 Using Elluminate will improve my performance in the course.
PE2 I'll find the system useful in my learning activities.
PE3 Using Elluminate enables me to accomplish my learning activities more quickly.
PE4 Using Elluminate improves the quality of my learning activities.
PE5 Using Elluminate makes my learning activities easier.
PE6 Using Elluminate enhances my effectiveness in my learning activities.
PE7 Using Elluminate increases my productivity in my learning activities.
PE8 If I use the system, I will increase my chances of getting higher marks on tests and exams.

Effort Expectancy

EE1 Learning to operate Elluminate will be easy for me.
EE2 My interaction with Elluminate will be clear and understandable.
EE3 It'll be easy for me to become skillful at using Elluminate.
EE4 I'll find Elluminate easy to use.

Social Influence

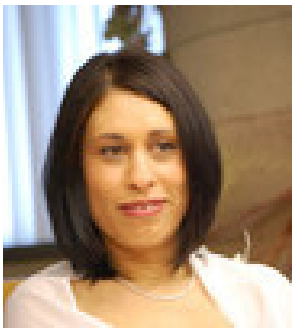
SI1 People who influence my behaviour think I should use Elluminate.
SI2 People who are important to me think I should use Elluminate.
SI3 The teacher of this course has been helpful in the use of Elluminate.
SI4 In general, the Faculty of Business Administration has supported the use of Elluminate.
SI5 In my class, students who use Elluminate enjoy more prestige than those who do not.
SI6 In my class, students who use Elluminate have a high profile.
SI7 Using Elluminate is academically status-enhancing for students.

Facilitating Conditions

FC1 I have the resources necessary to use Elluminate.
FC2 I have the knowledge necessary to use Elluminate.
FC3 Elluminate is not compatible with other systems I use.
FC4 A specific person is available for assistance with Elluminate difficulties
FC5 Using Elluminate fits my learning style.

Biographies

Hager Khechine is an associate professor at the management information systems departmentat Laval University, Canada. She has an MBA in information technology management and a Ph.D. in organizational information systems. Her research and teaching interests mainly relate to the study of the use of information technologies in the fields of the "e-health" and "e-learning". She is also interested in electronic business security, decision support systems and project management.



Sawsen Lakhal is an assistant professor at the department of pedagogy of Sherbrooke University. She acquired a Master of Art in instructional technology and a Ph.D. in administration and evaluation in education at Laval University. Her research interests include applications of technology to business education, assessment and evaluation in higher education, assessment of personality and its influence on academic outcomes, academic success of business students, and online teaching evaluation.

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Alphonse Bytha has worked as a quality manager at Ice Spring water. He studied firstly in France at Villetaneuse's University in Electrical Engineering and Industrial Computing, and then at Pierre et Marie Curie University in Mathematical Statistics field. Later, he integrated a research team of the French Aerospace Lab (ONERA). In 2012 he obtained a MBA in Modeling Decisional Organizational and graduated of Canadian Operational Research at Laval University.