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Discovering the Motivations of Students when Using an Online Learning Tool

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Abstract

In an educational setting, the use of online learning tools impacts student performance. Motivation and beliefs play an important role in predicting student decisions to use these learning tools. However, IT-personality entailing playfulness on the web, perceived personal innovativeness, and enjoyment may have an impact on **motivations**. In this study, we investigate the influence of IT-personality traits on motivation and beliefs. The study includes 95 participants. A survey was conducted after using the learning tool for one semester. Assessment of the psychometric properties of the scales proved acceptable and confirmatory factor analysis supported the proposed hypotheses. With the exception of the impact of enjoyment on motivation, all other hypotheses demonstrate behavior different from other contexts: playfulness on the web and perceived personal innovativeness have little to no impact on motivation; motivation in turn has the opposite strong and significant effect on beliefs. Specifically, we found that motivation has a strong impact on students' attitudes and consequently attitudes were found to determine intentions where the variance explained is 50% (attitude) and 28% (intentions). These results give way to interesting interpretations as they relate to learning.

Keywords: Online, learning, extrinsic motivation, intrinsic motivation, playfulness on web, enjoyment, personal innovativeness

Introduction

This past decade has seen a dramatic increase in interest relating to online learning or, more generically speaking, technology mediated learning. Online learning and technology mediated learning are utilized synonymously; however, it is important to stress that there is a significant different between the two. "Online learning" is a term that should apply to courses that are fully online with no face-to-face interaction. Technology mediated learning is the use of technology in a setup where face-to-face interaction (professor to student and student to student) does occur. These two contexts differ with many respects and the use of Information Technology (IT) in each reveals different constructs to the learning process. For example, in a fully no interaction course, self-directed learning is pronounced and stu-

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dents are expected to manage and coordinate their own schedule. In a classroom setup, self-directed learning is required to a much lesser extent. Other differentiating constructs could be student confidence in IT usage and IT savvyness.

The value of technology-mediated learning has become widely recognized and accepted as an approach to enhance the classroom environment. This is especially true due to increasing classroom sizes, reduced classroom space, and budget cuts. In this respect, expected learning gains and benefits to students, instructors and academic institutions delivered by various learning technologies cannot be realized unless they are effectively developed, maintained and governed – a proposition that has yet to be validated. Acceptance has been identified as a critical issue in the successful usage of the learning technologies; however, this perspective is naïve, superficial, and narrow in scope. However, acceptance of learning tools for enhanced learning experience is not likely to reach its potential unless students not only perceive it to be useful but also are motivated to do so.

In this study, three individual traits related to IT experience are studied – perceived personal innovativeness (PPI), playfulness on the web (PW), and enjoyment (E) – to assess their impact on student motivation and beliefs.

Our study involved 95 students who used a learning tool (developed in-house) as part of a course requirement. The course is an undergraduate management of information systems in a business school in Canada. Our goal was to study the effects on motivation and beliefs caused by perceived personal innovativeness, playfulness on the web, and enjoyment (personal experiences). Prior research in information systems has investigated the constructs mentioned herein to understand individual reactions to computer systems (Agarwal & Karahanna, 2000; Chinchanachokchai, Duff, & Sar, 2015; Venkatesh, 1999); however, few studies, in any, have used web-based learning tools as the target technology and have directly compared and contrasted the constructs to understand the impact of IT personality experience on user motivations and beliefs.

Understanding how motivation plays a role in shaping student's beliefs about 'online learning tools' would be of substantial value to students, institutions, businesses and instructors alike. It would also provide valuable insight for the successful design, implementation, and deployment of such systems in academic and corporate environments. By understanding the role that motivation plays in shaping the perceptions and attitudes of students, instructors may target their online activities to more effectively meet specific learning objectives. These activities in turn have implications on the design of the 'online learning tools'.

The present research is grounded in the theories of reasoned actions (TRA) and technology acceptance (TAM) (Davis, 1986). The TRA and TAM were adopted in this study as the basic framework to understand IT-usage personality, motivational, and belief factors while students are using an 'online learning tool'. The TAM is a widely used model to study computer technology acceptance in the information systems (IS) field. It was adapted from the TRA (Lee, Park, & Ahn, 2001) and identified the relationships between perceived ease of use (an intrinsic motivator), perceived usefulness (an extrinsic motivator), attitudes, and behavioral intentions (beliefs) towards a target system (Hackbarth, Grover, & Yi, 2003).

In the context of the present study, perceived usefulness is viewed as extrinsic motivation (EM). EM can be defined as the degree to which a student believes that using an 'online learning tool' could enhance his/her performance in the course. Enhanced course performance implies that the student can obtain a better grade by using the online learning tool (Saadé, 2007). Student perception of enhanced performance affects attitudes. In other words, students who perceive the system to be of use to their course grade develop better attitudes towards the online learning tool, as reported by previous studies (Saadé, Kira, & Nebebe, 2013). Intrinsic motivation (IM), on the other hand, which encompasses perceived ease of use, can be described as the degree to which a student believes that using an online learning tool would be free of effort and therefore allowing

him/her to complete the learning tasks successfully. Previous research has demonstrated that students are more likely to use a new technology. In the present context, this would be an online learning tool, if they perceive that it is easy to use. Moreover, students would be more motivated to regularly and more often use the online learning tool if it is not difficult to use. Subsequently, TRA and TAM have demonstrated that extrinsic and intrinsic motivations influence beliefs and eventual usage. Therefore the usage of an online learning tool would be determined by intention which, in turn, is affected by student attitudes towards using the online learning tool. Additionally, TAM suggests that an intention is also influenced directly by PU and PEU.

In this research work, we expand our knowledge of student learning using online learning tools across two directions (both of which are studied relatively little): the impact of technology-related personality traits (perceived personal innovativeness, computer playfulness, and enjoyment); and the validation of the theories of reasoned action and technology acceptance constructs in the context of online learning tools.

This study, therefore, proposes a research model, presented below, for student learning using an online tool that explains technology-related personality traits affecting motivations, which in turn affect beliefs. To that end, our research presented in this article has the following major goals:

- To validate previously studied factors in the context of online learning tool.
- To identify the factors that explain student behavior and beliefs while using online tools for their learning.
- To identify the relationships between student technology-related traits and what motivates them to use online learning tools for their learning.
- To explore a proposed model that would explain a causal effect of student learning in online learning environments.

Research Model and Hypotheses

The research model used in this study is shown in Figure 1. The model differs from the typical TRA and TAM in three respects. The first difference is that our model excludes the construct actual behavior; the second is that perceived usefulness is represented as extrinsic motivation (EM), and the third is that perceived ease of use is represented as intrinsic motivation (IM) (Shroff & Vogel, 2009), all of which are more appropriate due to the nature of the study context. To stress that point, perceived usefulness, for example, as it was used in its original conception where individuals used information technologies, such as software in the working environment, is very different from perceived usefulness when students use online learning tools where this tool has not only the goal of passing the course, but actual learning in order to achieve success (Saadé, Kira, & Nebebe, 2012). In the present context, this construct is more complex than what it was originally created for. We define and elaborate on the constructs presented in our research model and then we state the hypotheses posited by the model (Table 1).

Attitudes (ATT) and intentions (I): Empirical evidence suggests that direct experience leads to the formation of an attitude (Triandis, 1980; Davis, 1989; Punnoose, 2012). Many information systems studies have examined the attitudes and intentions on usage and have found these to be important determinants of self-reported system use. Attitude towards using learning tools was found to predict intentions and itself predicted by motivational mechanisms (Saadé, 2007).

Extrinsic motivation (EM): In the context of this study, EM differs from perceived usefulness in the sense where EM is the student's perception that by using the learning tool he/she will obtain a better grade in the course due to the learning process facilitated by the online learning tool (for such reasons as the format of the final exam being the same as that presented in the tool, or that the questions would be of similar nature). Perceived usefulness, as it was conceived, is the stu-

dent's perception that by using the learning tool he/she will score higher on the tasks required to succeed in the course. EM is a direct perception towards a better grade for the course as a whole and due to enhanced learning, while perceived usefulness is a perception of getting better grades simply by virtue of using the learning tool. EM is a learning goal driven perception while perceived usefulness is a task driven perception.

Intrinsic (IM): Intrinsic motivation in Venkatesh, Speier, and Morris (2002) was proposed to have a causal link towards intrinsic motivation. They argued that those who are more intrinsically motivated to use computer technologies, such as online learning tools, are expected to indulge in using it just for the sake of using it, in addition to using it for specific positive outcomes associated with use. The authors continue by explaining that those intrinsically motivated tended to underestimate the difficulty associated with using a new technology because they enjoy the process and did not perceive it as being effortful compared to those who have less intrinsic motivation. In the context of the present research work, students are very much concerned about how they should study for the course and about their final grade. Including an online learning tool as part of the course requirements introduces the notion of technology challenge. The perception of this challenge varies dramatically due to each student's technology-related traits (PW, PPI). To that effect, a new ingredient is introduced into the perception/belief system. Students show resistance to using learning technologies, and this resistance depends on their demographics and technology perceptions and experiences as a whole. Students would be more intrinsically motivated to use any learning technology within a course if that technology would help them learn the content. The definition of intrinsic motivation needs to be refined to fit within the present context. As such, we believe that students would be more intrinsically motivated if the learning technology is easy to use, at least just enough not to make them worry less about navigation issues and help them focus on the learning task at hand.

Enjoyment (E): Although TAM's emphasis is on the behavior of a student towards using information technology (Szajna, 1996), little is still known about the student technology-related traits as they influence their learning experience while using the technology; in this case, the learning tool (Trevino & Webster, 1992; Saadé & Bahli, 2005; Saadé, Morin, & Thomas, 2012). The holistic approach includes capturing constructs such as the individual's level of enjoyment while interacting with the learning tool. Such constructs were found to be significant predictors to outcomes related to technology use and acceptance (Saadé, Nebebe, & Mak, 2009; Thompson, Higgins, & Howell, 1999). Previous work suggested that there are positive outcomes from a holistic type of engagement (Ghani & Deshpande, 1994). These may include more positive attitudes towards learning tools. The enjoyment factor stems from the concept of cognitive absorption (CA). The CA variables represent one form or another of intrinsic motivation, where "a behavior is performed for itself, in order to experience pleasure and satisfaction inherent in the activity" (Vallerand, 1997). While in a state of CA, the student will be experiencing gratification and pleasure from the task of interacting with the learning tool. Therefore, through the heightened enjoyment dimension, a state of cognitive absorption is expected to influence perceived usefulness. In essence, the student rationalizes "I am spending a lot of time on this and enjoying it, therefore it must be truly useful".

Perceived personal innovativeness (PPI): Perceived personal innovativeness is an individual trait reflecting the willingness to try out any new technology. It would be expected that students who are more willing to experiment and learn new computer applications might have stronger feelings about the usefulness of these computer applications. It is probably their sense of usefulness of these computer applications that motivates them to try them out. Or possibly, it could be the students' feeling to discover new applications useful for their studies and careers. The relatively few studies that have been done on PPI include its study in the context of mobile applications and ecommerce (Aharony, 2014; Lu, 2014; Thakur & Srivastava, 2014).

Playfulness on the Web (PW): Computer playfulness (Bateson & Nettle, 2014) refers to a students' tendency to interact spontaneously with a computer (Webster & Martocchio, 1993). This construct can be viewed as a cognitive state experience by the student while interacting with the learning tool, or a characteristic of the student. While a student may be considered playful in the way he/she uses the computer, the specific level of playfulness towards the learning tool may differ. This is consistent with Yager, Kappleman, Maples, and Prybutok (1997). When students first use the learning tool, they may feel uncomfortable and stressed with the environment; hence, their degree of playfulness is low. However, as they become familiar with the learning tool, they become more spontaneous in interacting with it. Venkatesh (1999) demonstrated that game-based training induced a higher level of playfulness and enhanced users' intrinsic motivation, which is a form of perceived usefulness.

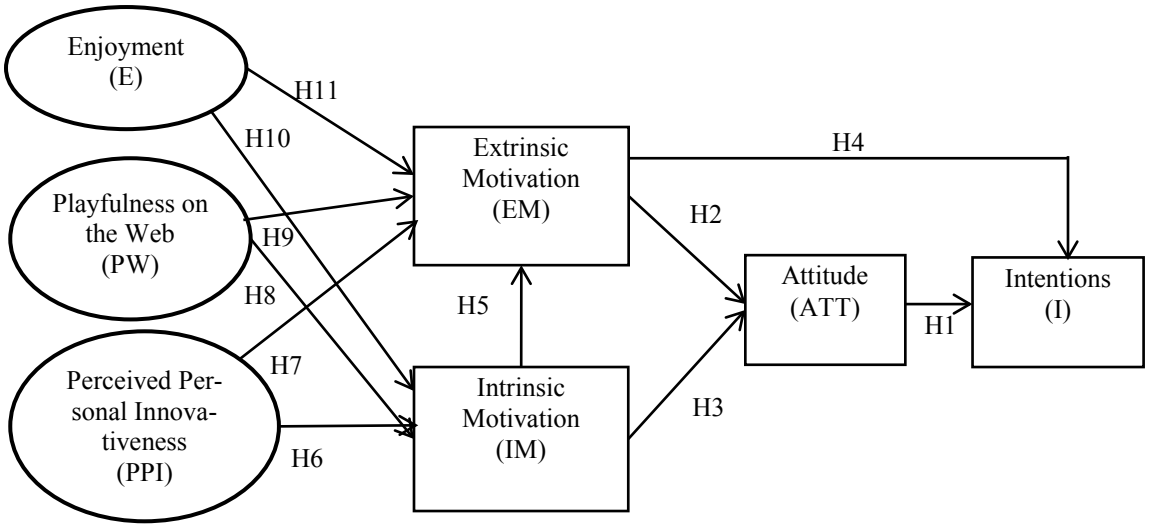

Figure 1: The research model

Table 1: Research hypotheses

	Relationship	Hypotheses
H1	ATT-I	Attitudes towards using the learning tool will influence student intentions to use it in the future.
H2	EM-ATT	Student extrinsic motivation to use the learning tool will influence intentions to use it in the future.
H3	IM-ATT	Student intrinsic motivation to use the learning tool will influence intentions to use it in the future.
H4	EM-I	Student extrinsic motivation to use the learning tool will influence student intentions to use it in the future.
H5	IM-EM	Intrinsic motivation will influence extrinsic motivation.
H6	PPI-IM	Student perceived personal innovativeness will influence their intrinsic motivation to use the learning tool.
H7	PPI-EM	Student perceived personal innovativeness will influence their extrinsic motivation to use the learning tool.
H8	PW-IM	Student playfulness on the web will influence their intrinsic motivation to use the learning tool.
H9	PW-EM	Student playfulness on the web will influence their extrinsic motivation to use the learning tool.
H10	E-IM	Student enjoyment while using the online learning tool will influence their intrinsic motivation to use it.
H11	E-EM	Student enjoyment while using the online learning tool will influence their extrinsic motivation to use it.

Methods

Study Sample

The study was conducted in an undergraduate course setting spanning one semester, using an online learning tool (developed in-house) as the target system. Throughout one semester, students in an introductory undergraduate management information systems course at a major university in Montreal, Canada, used the learning tool as part of the course requirement. The objective of the online learning tool was to help them understand course topics by practicing multiple choice and true or false questions. The learning tool is web-based such that students were able to access it anywhere, anytime, and was independent of the platform used – PC or Apple. The system monitored the students' activities by storing the time spent on the system, the chapters practiced, and corresponding scores.

Students taking the undergraduate MIS course were surveyed at the end of the semester. The course is required as part of their undergraduate bachelors degree. Students in the course may be majoring in finance, marketing, international businesses, accounting, MIS, management, human resources, or administration. The sample, therefore, represents a cross-section of all the majors in the John Molson School of Business. Many of the students need to obtain at least a B- in the course if they are to enter some accredited program such as the CA (charted accountants) and CPA (certified professional accountants) for accounting.

Students were provided this learning tool to count for 10% of their final mark. The online learning tool interface was simple with no distractions of menus on top or bottom, or graphics or animations. It consisted of two parts. The first part allowed students to practice questions without being scored. In this part, the students were given their scores but the information is not stored in the database. When the students felt that they had practiced enough questions, they could go to the second part where they would do a summative assessment of their knowledge of the topic they had just practiced.

From pedagogical and cognitive perspectives, there are three critical elements to the effectiveness of this approach. First, the questions for practice, as well as for the assessment, are used from the same pool in the database. This information is shared with the students and, as such, students would tend to engage proactively to learn the questions, print them, copy and paste them, and so forth, to maximize their scores. This requires the students to use their cognitive skills such as short-term memory, working memory, recognition, recollection, and active participation, to build strategy. The second element of the online learning tool is that the assessment can be done multiple times. More specifically, the student has the choice to practice again and be re-assessed. The final assessment mark is calculated as the average of all the assessments taken; in other words, the student sees the running score. For example, if a student obtains a 70% on the first assessment and then takes two more assessments scoring 75% and 90% respectively, then the final assessment mark for the chapter is 78.33%. The same applies for all the other topics of the course. The final element to using the online learning tool is the presence of a few wrong question/answer sets per topic, and students are encouraged to find them and report them to the teacher. If they report correctly, then a student can capture more points towards his/her final grade.

This learning strategy to encourage students to use the online learning tool draws upon both intrinsic as well as extrinsic motivation. Students are extrinsically motivated to use the learning tool due to the fact that it counts for 10% of the course final grade. Intrinsic motivation is not straightforward in this case but can be justified by looking at where the students will perceive their gain will be. The efforts required practicing then doing the assessment and, in most cases, re-assessments for 18 topics imply that the student needs to review the content, do the exercises, and cross-examine the results with the book and notes. These efforts are only possible if done system-

atically throughout the semester and surely the amount of effort input into this activity did not justify the 10%. Yet most students applied themselves and committed to the required effort (to different degrees) for the simple reason that they perceived their efforts to enhance their performance in the course via the midterm and final exam and not the 10% allocated to the learning activity.

Study Instrument

At the end of the semester, a survey was administered. Ninety-five students participated in this study. Respondents were 52% female and 48% male with a mean age of 23 years. The respondents had an average of 2 years of experience, use the Internet close to one hour a day and claim to have strong knowledge of basic software utilization.

Items shown in Table 2 and used to measure the constructs were adopted from prior research work; namely, Venkatesh and Davis (2000) and Saadé (2007). The items were validated in a pilot study and some wording was changed to account for the context of using online learning tools. All items were measured using a 5-point Likert-type scale with anchors from "Strongly disagree" to "Strongly agree".

Table 2: Measures of study variables

Construct	Item	Measure
Extrinsic Motivation (EM)	EM1	Using the 'learning tool' reduces my ability to perform well in the course.
	EM2	Using the 'learning tool' in the course enables me to accomplish better grades.
	EM3	Using the 'learning tool' enhances my performance in the course.
Intrinsic Motivation (IM)	IM1	Learning to use the 'learning tool' is hard for me.
	IM2	Navigating through the 'learning tool' was easy for me.
	IM3	It would be easy to become skillful at using the 'learning tool'.
	IM4	I find the 'learning tool' easy to use?
Attitudes (ATT)	ATT1	The advantages of the 'learning tool' outweigh the disadvantages.
	ATT2	Learning tools are not helpful for understanding better the course content.
Enjoyment (E)	E1	I have fun interacting with the 'learning tool'.
	E2	Using the 'learning tool' bores me.
	E3	I enjoy using the 'learning tool'.
Perceived Personal Innovativeness (PPI)	PPI1	If I heard about a new information technology, I would look for ways to experiment with it.
	PPI2	In general, I am hesitant to try out new information technologies.
	PPI3	I like to experiment with new information technologies.
Playfulness on the Web (PW)	PW1	When using the web I am imaginative.
	PW2	When using the web I am playful.
	PW3	When using the web I am inventive.
	PW4	When using the web I am creative.
Intention to Use (I)	I1	I intend to take more courses using online 'learning tool' in the future.
	I2	I intend to show others this 'learning tool'.

Analysis

Construct validity

The 95 usable questionnaires were examined for missing data. They showed a few missing values and a mean substitution was used to generate replacement values for all the missing data. The Cronbach's alpha coefficient for internal consistency reliability was assessed. Convergent validity is a representation of the correlation strength between the theoretically related items of a specific construct. A composite reliability equal to 0.70 or more is acceptable. As summarized in Table 3, the reliability of all constructs (with the exception of I) are acceptable with reliabilities ranging from 0.82 to 0.89 (Rivard, 1988).

Table 3: Cronbach alpha reliability assessment

	Cronbach alpha	Mean	SD
Extrinsic Motivation (EM)	0.82	3.76	0.67
Intrinsic Motivation (IM)	0.89	3.16	0.48
Attitude (ATT)	0.82	3.16	0.48
Enjoyment (E)	0.86	3.36	0.82
Intentions (I)	0.62	2.90	0.90
Playfulness on the Web (PW)	0.79	3.68	0.70
Perceived Personal Innovativeness (PPI)	0.89	3.56	0.88

Second, reliabilities of individual items were assessed by examining the loadings of the items on their respective constructs presented in Table 4.

Table 4: Factor analysis

Item	Loadings
PU1	**0.558**
PU2	**0.880**
PU3	**0.814**
PEU	**0.812**
PEU	**0.824**
PEU	**0.912**
PEU	**0.826**
ATT1	**-0.536**
ATT2	**-0.728**
E1	**0.852**
E2	**0.700**
E3	**0.709**
I1	**0.858**
I2	**0.841**
PPI1	**0.798**
PPI2	**0.622**
PPI3	**0.841**
PW1	**0.695**
PW2	**0.863**
PW3	**0.865**
PW4	**0.725**

These loadings should be higher than 0.5, following the criterion indicated by Rivard (1988), to indicate that significant variance was shared between each item and the construct. It is expected that the loadings of all items within a construct should be high on that construct, indicating high convergent validity, and low on the others. The factors, underlying variables that reflect combinations of observable variables, were extracted using the principal components method (varimax rotation), which is an optimum approach to condensation prior to rotation (Hackbarth et al., 2003). Table 4 clearly shows that the seven-factor solution is appropriate and the items display desirable convergent and discriminant validity.

Thirdly, discriminant validity was performed. Discriminant validity is the extent to which the construct is not a reflection of some other variable. Table 5 shows evidence of discriminant validity of the constructs verified by the squared root of the average variance extracted (AVE) for each construct. This value of the AVE should be higher than the correlations between it and all other constructs. The results presented in Table 5 suggest an adequate discriminant validity of the measurements.

Table 5: Discriminant analysis

	PU	PEU	ATT	I	E	PW	PPI
PU	***0.87***						
PEU	0.35	***0.84***					
ATT	0.68	0.42	***0.89***				
I	0.45	0.36	0.51	***0.87***			
E	0.64	0.46	0.66	0.59	***0.92***		
PW	0.29	0.38	0.43	0.38	0.44	***0.78***	
PPI	0.61	0.34	0.42	0.49	0.31	0.32	***0.92***

The structural model

The partial least-squares (PLS) method was used to test the 11 hypotheses of the theoretical model proposed earlier. Figure 2 shows the results; namely, the path coefficients and variances. All path coefficients are significant to <0.05.

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In order to compare the results, we consider that any relationship of 0.3 and over to be strong; between 0.1 and 0.3 moderate strength; and less than 0.1 to be weak. Considering this, results from Figure 2 indicate that PPI's influence on IM and EM (H6 = -0.01and H7 = -0.05 respectively) are negligible. PW, on the other hand, has a moderate impact on IM and EM (H8 = -0.21 and H9 = -0.14 respectively); however, this impact is negative where the influence is as such where

students who perceive themselves more playful on the web are less motivated to due to their less perception of the online learning tool usefulness and ease of use. This is contrary to what we would expect but may be explained as follows: a student being playful on the web (or with IT in general) means that he/she takes risks (downloads videos, downloads music, installs many plugins and software, and similar behavior), and with risks computer problems arise. This PW state of usage, and resulting cause and effect is natural; if one is not careful, computer problems arise. In the context of learning, where the stakes are high, PW will reduce motivation because of fear of computer problems that will have negative effects on the student performance in the course. On the other side of the coin, a student who is not playful would be more cautious in using the online learning tool and therefore have higher motivation.

Enjoyment has a strong influence on both IM and EM (H10 = 0.58 and H11 = 0.38 respectively). It is clear from the results that the more students are enjoying the online learning tool, the more motivated they are to using it. Hypothesis 5 is negligible (H5 = 0.03) indicating that intrinsic motivation does not have influence on extrinsic motivation. This lack of impact is in fact welcomed due to the notion that students need to learn for the sake of learning and personal development. Moreover, ATT is affected by IM and EM but, with increased motivation, attitudes decrease. Finally, intentions are affected by EM and ATT where the strength is 0.18 and 0.38 respectively. To that effect, EM and ATT explain 28% of I; ATT is explained by EM and IM at 50%; E, PW, and PPI explain IM by 24% and EM by 44%.

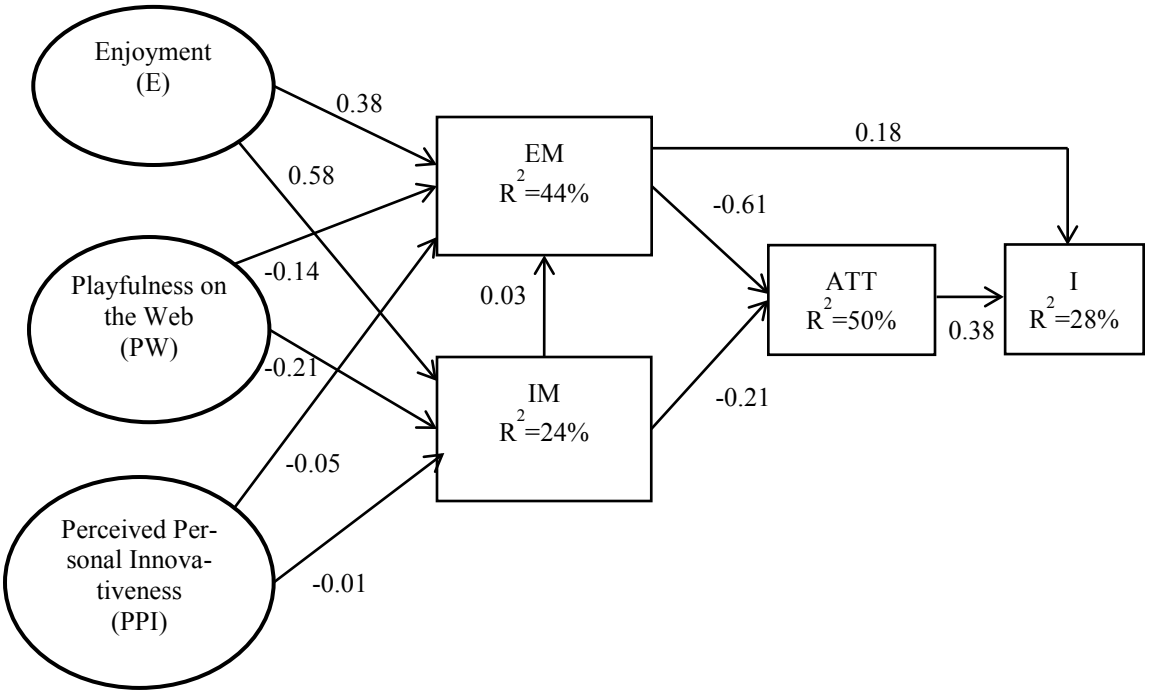

Figure 2: Research model results

Discussion and Conclusions

The beliefs and motivational constructs were conceived to explain technology acceptance and satisfaction in the context of knowledge workers in organizations (Davis, 1986) (e.g. secretaries using word processing software). The present context differs in context at which these constructs are adapted and applied – the context being online learning. Whereas the target system at that time was word processing software, in the present case the target system is a web-based learning

tool. Not only is the target system different, but so is the motivational mechanism to use the target technology. In the case of the secretary, his/her motivation is how the word processing software can make daily life at work more manageable and less cognitively demanding – the focus is on reducing the consumption of energy and effort. In the case of the student, the motivation is to learn and it is expected that working hard is necessary to fulfill the course requirements. This is a fundamental difference on how the TRA and TAM constructs are used for assessment.

The structural model results demonstrate those differences by considering the motivation-beliefs relationships. EM-ATT and IM-ATT relationships are opposite from the literature providing important implications to the present context. As per these hypotheses, the question that arises is how come the more extrinsically or intrinsically motivated the student is about the online learning tool, the less favorable their attitudes are towards it? After supporting the students on using this online learning tool over a number of years, it seems that students in higher education have high levels of concern and anxieties about their performance (in other words, obtaining good grades) in the course. Today's student works a minimum of 15 hours a week, takes a full work load of classes, and insists on having a social life. This now common student seems to be motivated (more extrinsically than intrinsically as shown by results), yet attitude towards using an online learning tool is low. This points to the existence of a moderating variable such as anxiety or negative affect (Saadé et al., 2013).

We recall that the primary objective of this study was to investigate the impact of perceived personal innovativeness, enjoyment and playfulness on the web, on motivation, attitudes, and intentions in the context of an online learning tool use. The results show that the impact of the three constructs is negligible for PPI, moderate for PW and strong for E. These results have interesting implications as they relate to the type of individual the student is. Openness to experience is a construct from the Big Five Personality Traits that may be used to explain PPI, PW and E. Individuals are open to experience the web, innovate in its use, and take risks to perform desired tasks. This is what we would refer to at the IT-Personality defined PW, PPI and the subsequent enjoyment of its use. Therefore, the PLS results in Figure 2 show that being open to try new things on the web (via PW, PPI) have limited impact on motivations. This may imply that while a student may be open to experiencing new tasks on the web and try to innovate its use, he/she may still not be motivated towards using the online learning tool due to the fact that the price of a mistake or error in its use is too high as compared, of course, to using the web. Naturally, these types of students experience continuous bugs, freezing screens, corrupted files, viruses and so on with their computers. But all these are all of little consequence. Yet, with online learning, the cost of an error is a lower grade. This perspective would make sense in explaining the results.

Finally, it is noteworthy that E had a strong and significant influence on both EM and IM. This implies that students who enjoy using the online learning tool also find it to be easy to use and useful to achieve better performance. The positive influence of E on motivations and beliefs has been studied and documented and the present results follow and further strengthen those findings in the online learning context.

Limitations and Implications

Some limitations to this study exist and should be noted. First, the questionnaire approach is not free from the subjectivity in the respondent and being taken at one point in time. User reactions change over time and may depend on the environment such as the classroom location and time of course. Second, caution must to be taken in generalizing the results due to the fact that participants in this study were from different cultural background with different cultural beliefs influencing their perceptions and attitudes.

Previous studies have shown that perceptions and attitudes differ between the mandatory or voluntary use of information technology (in this case, the online learning tool). This study is limited with that respect because it did not differentiate between the two settings. Simply due to the fact that students had to use the online learning tool for marks makes it mandatory. One may say that it is voluntary but at a price of 10% of the final grade.

Conclusions drawn are based on the use of a specific online learning tool, which was developed in-house. Other learning tools can have different designs, be developed for different platforms (in this case, it was web-based) and used under different settings. This, therefore, may not generalize across a wide set of online learning tools. Moreover, the user interface of the tool was very simple and hyperlinked. Other type of interfaces using more media rich elements and graphics may produce different results.

This research was motivated by an interest in understanding the influence of personal innovativeness, enjoyment and playfulness on motivations and beliefs. Our study shows that enjoyment has a strong significant influence on perceptions of the online learning tool. To that effect, it suggests that learning tools should be designed to include interactivities that are enjoyable. In the context where the learning tool usage is motivated by the score obtained, playfulness and perceived personal innovativeness do not have any important impact. From a practical perspective, this implies that any online learning tool should be designed and implemented with novice IT users in mind.

The findings demonstrate the value of enjoyment to the learning process. With the continuous development of richer and more appealing interfaces, the most important of the experiences that are intrinsically motivating is enjoyment. This construct might dominate as the single most significant factor for enhanced learning - opening new avenues for game-based and immersive learning methods. Course designers and managers who desire to successfully implement new learning tools in a higher education or training context need to be aware of this relationship in order to create an environment supportive to the state of enjoyment.

Another key implication for designers/managers relates to guidelines for the design of online learning tools. Enjoyment is more likely to be experienced with learning tools that are interactive and motivating. Paying close attention and to integrating interactive features in the design of learning tools and providing incentives to motivate its usage would assist those responsible for diffusion of the learning tools via the direct and indirect effects of enjoyment.

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