

The Role of Intrinsic Motivation in System Adoption: A Cross-Cultural Perspective

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Abstract

There are relatively few empirical studies that examine cultural differences in students' motivation and acceptance to use web-based learning systems. Asian and Western countries have different systems of thought, which are rooted in their respective national culture. Although there are a number of theories to explain individuals' behavior within different cultures, few studies have been published on web-based learning differences. In this study, we investigate the motivational differences among Chinese and Canadian online learners. We enhance the body of knowledge by analyzing the effects of intrinsic motivation on the technology acceptance model, its applicability to the two cultural groups, and the use of the theory of "cognitive systems of thought" to gain insight.

Keywords: Web-based Learning System, Extrinsic Motivation, Intentions, China, Intrinsic Motivation, Enjoyment, Cognitive Systems of Thought, Culture, Technology Acceptance Model

Introduction

Gaining knowledge is the primary focus of all stakeholders in higher educational institutions because it is fundamental to the learning process of students. Maximizing the ability to gain knowledge implies that continued efforts should be kept to progressively enhance the learning process. This is one of the major challenges facing contemporary universities today, especially today with more and more universities offering web-based distance courses: a learning environment which many find unfamiliar and very different from the traditional face-to-face classroom. It is accepted today, however, that some of the more important advantages of web-based learning are that it gives students more study flexibility and broader accessibility, improves students' performance, enhances their learning experiences, and increases their computer self-efficacy (M. K. O. Lee, Cheung, & Chen, 2005; Piccoli, Ahmad, & Ives, 2001; Saadé, Tan, & Nebebe, 2008). Academic institutions also benefit by reducing costs and increasing revenues.

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Researchers have noted that designers can successfully enhance the learning process by directly incorporating strategies to change learner's attitudes and behaviors. Additionally, perceptions of learners about their learning experiences are shaped through their learning activities and formal and informal interaction with their fellow learners. Their mind-

sets are strong and embedded in their cultural context, which influences the outcomes of their efforts for an enhanced learning experience. To that effect and especially in the context of web-based learning systems (WLSs), designers (and institutions) must find ways to encourage learners to be active participants. According to expectancy theory (Vroom, 1964), the more positive outcomes are perceived to be associated with a given action, the more inclined individuals will be to perform that action. From the perspective of WLSs, extrinsic motivation has been shown to significantly affect student participation (Fenwick & Olson, 1986; Saadé & Bahli, 2005). Furthermore, previous studies have reported that increased intrinsic motivation has been associated with learners' willingness to create positive attitudes, resulting in increased learning and inclination to participate voluntarily (Saadé & Bahli, 2005). However, although several studies argue that motivation factors are crucial determinants of learners' behavioral intentions, there is no significant body of empirical research that assesses the different roles of extrinsic and intrinsic motivation in influencing behavioral intentions to use WLSs and as experienced within a social context.

There has been a large number of research studies published on WLSs. These studies however are all descriptive in nature and purely qualitative, presenting general accounts of students' experiences while taking an online course. An important number of these works were done using the technology acceptance model (TAM) to understand individuals' acceptance/adoption/intentions-to-use various technologies (mobile, web-based, software, etc.). Considering the large body of publications using the TAM, relatively few are in the domain of web-based learning (M. K. O. Lee et al., 2005; Saadé, 2007; Saadé & Kira, in press; Straub, Keil, & Brenner, 1997; Taylor & Todd, 1995). The viability of TAM to explain acceptance behavior of WLS has been confirmed in Saadé, Nabebe, and Tan (2007).

Most literature on TAM studies indicate that the technology acceptance model has a dominant emphasis on notions of instrumentality, focusing mainly on functional or extrinsic motivational drivers, which is not necessarily a dominant construct in the context of WLSs (Agarwal & Karahanna, 2000). Some recent studies have included intrinsic motivation constructs, representing a student's subjective feelings of joy, elation, pleasure, and positive holistic experience, as an important construct that may play a critical role in explaining user acceptance and usage behavior in WLSs (M. K. O. Lee et al., 2005; Saadé & Bahli, 2005; Saadé et al., 2008).

It is generally agreed that TAM research should acknowledge cultural differences. Previous research has indicated that values on information technology differ across cultural backgrounds (Veiga, Kohno, & Potter, 2001) and that the power of different theories/models vary between cultures (Straub et al., 1997). Although previous works have studied the relationship between IS usage satisfaction on their acceptance (Ives, Hamilton, & Davis, 1980), few have studied the role of cultural factors in these relationships, and research in that domain is small and fragmented.

This study contributes to the advancement of the body of knowledge in the following ways:

1. The applicability of the technology acceptance model in the context of a Chinese student group using a WLS in China,
2. The validation of the technology acceptance model with the inclusion of intrinsic motivation in two contexts, Chinese and Canadian Groups, and
3. The use of the theory of "cognitive systems of thought" (Nisbett, Peng, Choi, & Nirenzayan, 2001) to explain 'technology acceptance model'-based studies.

Theoretical Background

The theoretical background of our social-context/culture work draws on the theory of reasoned action (the basis of the TAM (F. D. Davis, 1989)), intrinsic motivation and the cognitive-system-of-thought for culture studies. We provide a brief review of these theories/concepts herein.

The Technology Acceptance Model

The TAM proposes that perceived ease of use (PEU) and perceived usefulness (PU) influence attitudes towards and, consequently, behavioral intentions (BI) to use a specific technology. In the context of the present study, perceived ease of use refers to the degree to which a student believes that using the WLS will be free from cognitive effort, whereas perceived usefulness can be defined as the degree to which an individual believes that using the WLS will enhance his/her performance in the course. The definition of PU in TAM can be viewed as a measure of outcome expectations, which in the present case can lead to better grades. Similarly, the definition of PEU in TAM can be viewed as a measure of perceived self-efficacy -- the extent to which the student expects a specific system to be easy to learn and use (F. D. Davis, 1989; Venkatesh, 1999). Therefore both PEU and PU could be considered as extrinsic motivational drivers.

Several studies have provided considerable support to the formulation of TAM in a web based learning context where they affirm the validity of the influence of perceived ease of use and perceived usefulness on students' behavioral intention to use WLSs. Saadé and Bahli (2005), for example, found that perceived usefulness of an internet-based learning system has a significant impact on behavioral intention, and that perceived ease of use is a predictor of perceived usefulness and behavioral intentions. Similar findings were replicated by Lee and colleagues (2005) in a study of investigating roles of motivation on intentions to use an internet-based learning medium and by Yi & Hwang (2003) in a study to extend the TAM in the context of a web-based class management system.

The Motivation Dimension

Motivation is a key factor determining human behavior and action (Lin, 2007). An unmotivated person feels no impetus or inspiration to act, whereas when he/she is engaged in some activities toward an end, he/she is considered motivated. Some researchers suggest that individuals may have different amounts, as well as different types of orientations of motivation (Deci, 1975). Two broad classes of motivation – extrinsic and intrinsic – have been defined and examined across various contexts and studies. Extrinsic motivation refers to the performance of an activity because it leads to instrumental rewards (such as the PU in TAM) (Saadé, 2007; Venkatesh, 1999); intrinsic motivation refers to the performance of an activity for its inherent interests and enjoyment other than a separable outcome (Deci, 1972).

The TAM mainly emphasizes extrinsic perspective (M. K. O. Lee et al., 2005) and only recently researchers began to address the role of intrinsic motivation in TAM studies in order to provide a broader view and a better explanation of IT adoption (Agarwal & Karahanna, 2000; Heijden, 2003; Hsu & Lu, 2004; Moon & Kim, 2001; Saadé & Bahli, 2005). The capturing of intrinsic motivation while using the WLS was found to be a significant predictor of outcomes related to its use and acceptance (Ghani & Deshpande, 1994; Saade, 2007; Thompson, Higgins, & Howell, 1991).

A critical review of TAM performed by Lee and colleagues (2005) revealed that there is a need to include other components, such as intrinsic motivation, for a better explanation of IT adoption. More recently there has been an increase in studies of TAM and intrinsic motivation (Chung & Tan, 2004; S. Davis & Wiedenbeck, 2001; M. K. O. Lee et al., 2005; Saadé, 2006; Saadé, 2007; Saadé & Bahli, 2005; Teo, Lim, & Laia, 1999; Venkatesh, Speier, & Morris, 2002; Yi & Huang, 2003). Enjoyment, which has been defined as the extent to which the activity of using a computer system (in the present context, the WLS) is perceived to be personally enjoyable in its own right aside from the instrumental value of the technology (F. D. Davis, Bagozzi, & Warshaw, 1992), could be regarded as a form of intrinsic motivation. The effect of enjoyment on PEU and intentions has been recently studied (Yi & Huang, 2003), but the effect of enjoyment on perceived use-

fulness remains unknown. Venkatesh & Davis (2000) showed that enjoyment influenced usefulness via ease of use, without assessing its direct effect.

The above considerations lead us to the notion that PU is a construct of enhancement, which can be considered as a measure of extrinsic motivation, while enjoyment, which can be also viewed as a construct of enhancement, is a measure of intrinsic motivation.

The Social Context Dimension and TAM

Culture is a complex, multidimensional construct that can be studied from international, national, regional, business, and organizational perspectives. Each individual (within a specific culture) is influenced by cultural factors such as ethnic, organizational, and national (Duart & Snyder, 2001). Culture has been defined as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (Hofstede, 1991). Two frameworks that define culture according to a small number of dimensions (Hall, 1983; Hofstede, 1991) have been studied in the past two decades, but neither of these seems sufficient to capture the complexity of the cultural context where it is implied that few dimensions can explain beliefs and values. But there is a paucity of articles in this area, and a review of these studies is found in Shachaf, (2008).

Very little previous empirical research on the use of WLSs for online learning has addressed cultural diversity. Researchers have identified differences in *technology use* and *perception of task technology fit* between eastern and western cultures (O. Lee, 2002; Massey, Hung, Montoya-Weiss, & Ramesh, 2001). Some of their findings are: different patterns of e-mail use and significant differences in the perception of task technology fit between virtual team members from the United States, Asia, and Europe.

A culture theory developed one decade after Hofstede’s (1991) was proposed by Nisbett and colleagues (2001). They proposed a theory of how systems of thought arise on the basis of differing cultural practices. More importantly to our study, and hence our interest in their theory, is that they argue that the theory accounts for substantial differences in East Asian and Western thought processes. The assumption of universality of cognitive processes across cultures and the application of this assumption to the computer had been adopted by mainstream psychology of the 20th century (Nisbett et al., 2001). This assumption presumes that information processing such as categorization, reasoning, and inductive and deductive inferencing is the same among all human groups (Nisbett et al., 2001).

In their article Nisbett and colleagues (2001) found East Asians to be more holistic, attending to the entire field and assigning causality to it, making relatively little use of categories and formal logic and relying on “dialectical” reasoning. Westerners however, were found to be more analytic, paying attention primarily to the object and the categories to which it belongs and using rules, including formal logic, to understand its behavior.

In their article, Nisbett and colleagues (2001) elaborate that the ways at which inferential rules and reasoning are followed appear to be malleable. Significant differences were found to exist in knowledge of the use of inferential rules and cognitive processes. Cognitive processes were found to be embedded into the social fabric of different world views and social behavior of different cultures. An example (although limited in its generalizability) would be the Chinese and Greek cultures. While Greeks (that may represent western cultures) emphasize individualism, Chinese perceive themselves as part of a closely knit collective group whose primary need is the reciprocal social obligation and meeting the expectations of the group (Munro, 1985).

Of importance to our work, we consider these cognitive differences under the label of holistic and analytic thought (Nisbett et al., 2001; Peng & Nisbett, 1999). Holistic thought is defined as in-

volving an orientation to the context or field as a whole, including attention to relationships between a focal object and the field, and a preference for explaining and predicting events on the basis of such relationships. Holistic approaches rely on experience-based knowledge rather than abstract logic and are dialectical, meaning that there is an emphasis on change, recognition of contradiction and the need for multiple perspectives, and a search for the “middle way” between opposing propositions. Analytic thought, on the other hand, is defined as involving detachment of the object from its context, a tendency to focus on attributes of the object in order to assign it to categories, and a preference for using rules about the categories to explain and predict the object’s behavior (Nisbett et al., 2001). Holistic thought can be considered associative and its computations reflect similarity and contiguity, while analytic thought recruits symbolic representational system and its computations reflect rule structure (Sloman, 1996; Witkin et al., 1974), or “rational cause and effect paradigm to create perceptions” (Brown, 2002).

In relation to the social context/cultural perspective of our study, the purpose was to investigate how cultural diversity (specifically between Canadian and Chinese students) within WLS experiences impacted motivations and beliefs — whether the effect of cultural diversity on the relationship between motivation and beliefs was reduced, similar, or amplified. More specifically, we hoped to answer the question:

“How does cultural diversity (Canadian and Chinese students) using a WLS influence the relationship between motivation and beliefs?”

Methodology

Research Model and Hypotheses

Figure 1 presents the proposed research model used in this study. This model introduces the aspect of intrinsic motivation into the TAM. Although reviewed in the previous section, we briefly contextualize the research model constructs here. Perceived usefulness is defined as a student’s expectation that using the WLS will enhance his/her course performance (F. D. Davis, 1989). From the motivational perspective, since a student’s behavior comes from his/her expectation from performance outcome, it represents an extrinsic factor (F. D. Davis et al., 1992). Using the WLS, students can access and download course materials freely, practice domain specific questions interactively, and compare their efforts and performance with the student group, using the web from any location. Thus, it could be expected that students would believe in a use-performance relationship with the WLS.

Based on Bandura’s Social Cognitive Theory (1986), PEU is related to self-efficacy by capturing student’s beliefs about their ability to perform the required task with the least cognitive burden (F. D. Davis et al., 1992). When students’ assessment of their interaction with the system is relatively easy (free of cognitive burden), one would expect that they would perceive the WLS useful and would have the intention to spend time and effort to carry out the learning tasks.

Intrinsic motivation supports the idea that students will spend more time and effort using the WLS if they are enjoying the activity. In this study intrinsic motivation is measured in terms of enjoyment representing a reward apart from any performance consequences that may be anticipated (F. D. Davis et al., 1992). Venkatesh and colleagues (2002) suggest that intrinsically motivated computer users have a tendency for lower perception of difficulty associated with using a new technology. Enjoyment seems to decrease the perception of effort to use a specific technology. Based on the above discussion we posit the following hypotheses and research model:

- H1: Intrinsic motivation will have a positive influence on perceived ease of use*
H2: Intrinsic motivation will have a positive influence on perceived usefulness

H3: *Intrinsic motivation will have positive influence on behavioral intention*

Original TAM hypotheses:

H4: *Perceived ease of use will have a positive influence on perceived usefulness*

H5: *Perceived usefulness will have a positive influence on behavioral intention*

H6: *Perceived ease of use will have a positive influence on behavioral intention*

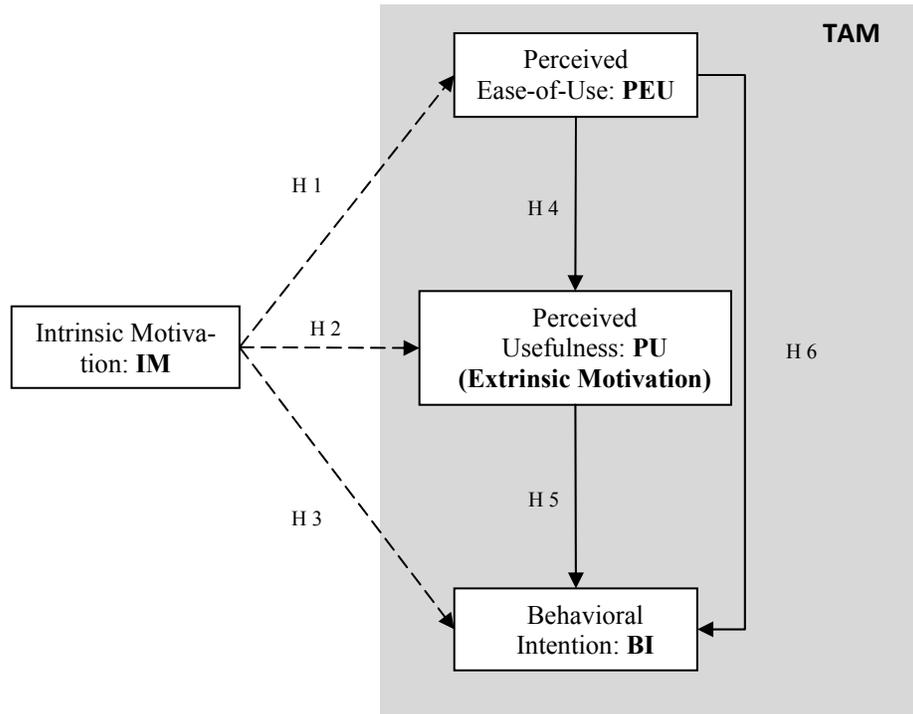


Figure 1. Proposed research model.

The Web-based Learning Management System

Two universities participated in this study; one in Canada and the other in China. Each university used a different WLS. However, they both had the following common features:

- Common course subject of ‘management information systems’
- The use of a web-based system to manage a course
- The use of the Internet by students to practice multiple choice questions
- Immediate feedback provided
- The use of the system was throughout the course
- Both WLSs (Canada and China) were developed primarily as a simple hyperlinked environment

Detailed information about the system used in China (such as screen captures) were not done. Each WLS was in its own language (Chinese in China and English in Canada). The WLS used in Canada (Saadé, 2003) included a multiple choice (MCQ) practice engine used for rehearsing content domain knowledge. As shown in Figure 2, the student is first asked to input his/her user name and password. The student then enters the main panel of the course where the system guided navigation tool is found. The student follows a three-step process of pre-assessment, practice, and post-assessment. The practice engine randomly selects a set of 5 questions at a time and

presents them to the student. Multiple-choice and true or false questions are used. Once the student answers the questions, he/she can submit the answers for evaluation and feedback. The student then can request another set of questions and so on. At the end of the interactive session, the student can request a report, proceed to the post-assessment test, or exit the system. The student has the flexibility to decide when he/she is ready to take the post-assessment test.

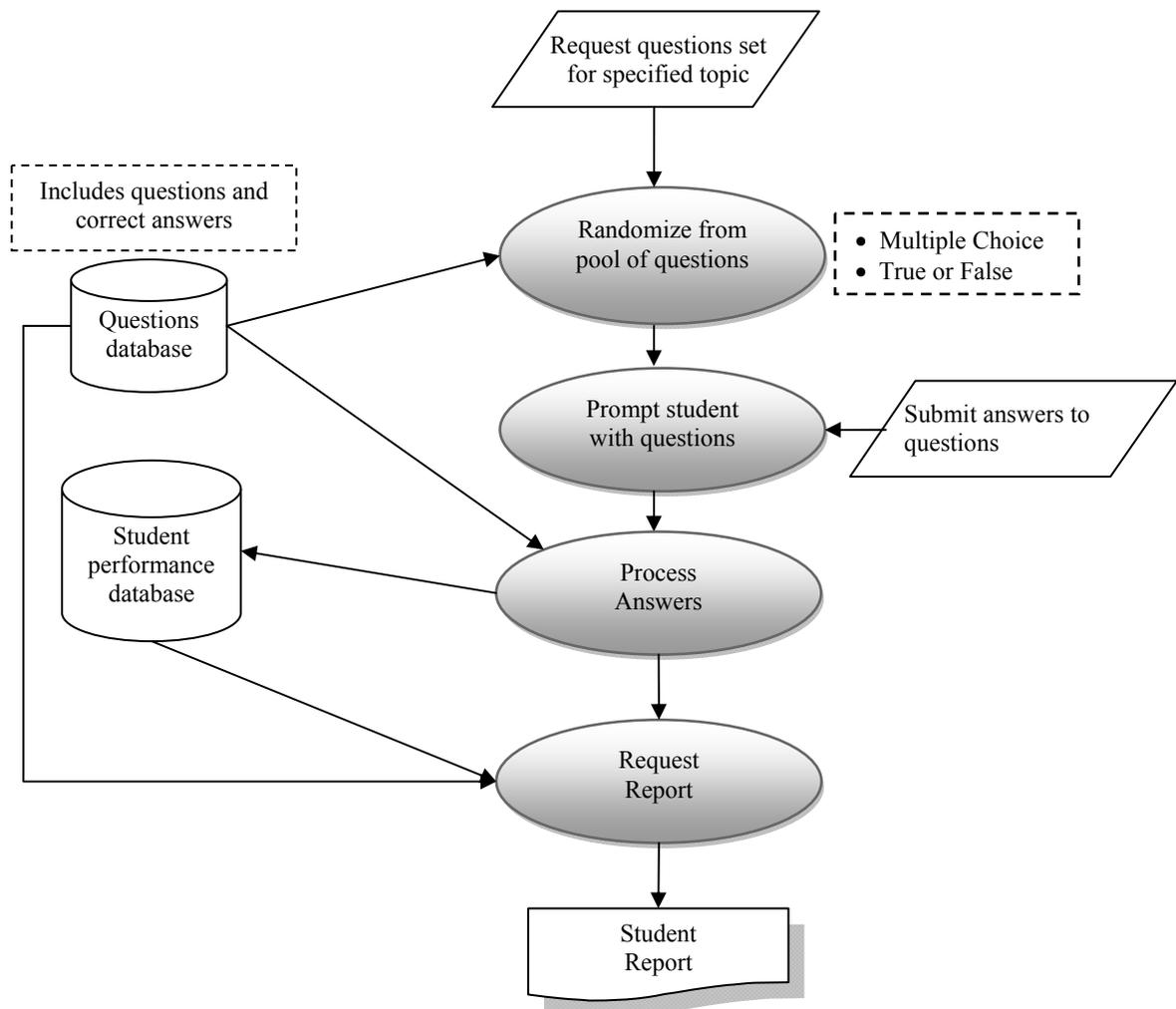


Figure 2. Practice question engine.

In the present context, the design of the learning tool includes a limited number of questions for each chapter. For example, Chapter 1 includes 38 questions while Chapter 2 may include 112. Students are presented with a set of five questions at a time. After that the five questions are answered, the student can click on 'evaluate' and the system will show the correct/wrong answer with a green/red button on the side of each question. The student can then click on 'next' to request another randomized set of questions. This design allows the repetition of the questions, combined with immediate feedback requiring the use of short-term memory, recognition, and recollection skills. A second attempt to answer a question reinforces the students' understanding of the question and of the concept at hand regardless of the outcome of the question the first time it was answered. Students are asked to do a minimum of 20 questions but encouraged to do as many as they feel necessary. They are asked to develop their own strategies for using this tool and are

allowed to practice in groups and refer to any resource. The objective is more to have them engaged in processing domain content rather than to test them.

Survey

A survey (shown in Table 1 below) was administered at two universities, one in China and the other in Canada. In both countries, students of a business college taking a core business course were asked to use a simple WLS to help them understand content material and rehearse for questions that may appear in the midterm and final exams. A total of 362 users in Canada and 120 students in China completed the survey.

All the items used to measure the constructs were adapted from prior studies with modification to fit the specific context of the WLS. Both PU and PEU are measured by four items (adapted from F. D. Davis, 1989), while two items are used to measure behavioral intention (adapted from Ajzen & Fishbein, 1980). Intrinsic motivation is measured using three items (adapted from F. D. Davis et al., 1992). All items used a five-point Likert-type scale with anchors from “Strongly disagree” to “Strongly agree”.

Table 1: Items used in the survey

Construct	Item	Measure
Perceived Usefulness (PU)	PU1	Using the web-based learning system would improve my performance in the course
	PU2	Using the web-based learning system in the course would increase my productivity
	PU3	Using the web-based learning system would enhance my effectiveness in the course
	PU4	I would find the web-based learning system useful in my study
Perceived Ease of Use (PEU)	PEU1	Learning to operate the web-based learning system would be easy for me
	PEU2	I would find it easy to get the web-based learning system to do what I want it to do
	PEU3	It would be easy for me to become skillful at using the web-based learning system
	PEU4	I would find the web-based learning system easy to use
Behavioral Intention (BI)	BI1	I intend to take more courses using the web-based learning system in the future
	BI2	I intend to show others this web-based learning system
Intrinsic Motivation	IM1	I find the web-based learning system enjoyable
	IM2	The actual process of using the web-based learning system was pleasant
	IM3	I had fun using the web-based learning system

Instrument Validity

In this study, we separately analyzed the two datasets in a two-step analytical procedure. We first examined the measurement model and then the structural model. The measurement model was assessed in terms of convergent validity, internal consistency, and discriminant validity. The structural model and hypotheses were investigated by examining the path coefficients represented as standardized betas, β . The explained variance in the dependent constructs was assessed as an

indication of the overall predictive strength of the model. The measurement model results were reproduced by LISREL, version 8.3.

Convergent validity (Table 2) represents the extent to which the indicators of a measurement are theoretically related and should correlate highly (Gefen & Straub, 2005). A composite reliability of 0.7 or above and an average variance extracted (AVE) of greater than 0.7 are acceptable (Fornell & Larcker, 1981). In addition, we introduced Cronbach's alpha to test reliability. All statistical measures were calculated for both datasets separately, since the data for each group is to be analyzed separately, and then compared. Table 2 summarizes the above parameters in our models for each group. All the measures fulfill the recommended levels, with the composite reliabilities higher than 0.9, AVE ranges from 0.70 to 0.89. In both cases, alpha was greater than 0.7 for all constructs, thus demonstrating reliability.

Table 2. Reliability and Convergent validity

Construct	Composite Reliability		AVE		Cronbach Alpha	
	<i>China(CN)</i>	<i>Canada(CA)</i>	<i>CN</i>	<i>CA</i>	<i>CN</i>	<i>CA</i>
BI	0.91	0.93	0.83	0.87	0.79	0.85
PU	0.92	0.94	0.75	0.81	0.89	0.92
PEU	0.90	0.94	0.70	0.89	0.86	0.88
IM	0.92	0.94	0.79	0.79	0.86	0.91

Discriminant validity is the extent to which the measure is not a reflection of some other variable. Discriminant validity is validated when two things happen: (1) the squared root of the average variance extracted for each construct is higher than the correlation between it and all other constructs (Fornell & Larcker, 1981); and (2) if items have factor loading greater than 0.5 on their own construct, and much less than their loading on other constructs. When both cases occur then discriminant validity is supported (Gefen & Straub, 2005). All the measures for discriminant validity were calculated higher than the recommended levels.

Findings

The research model and hypothesized relationships were empirically tested by using the structural equation modeling (SEM) approach, supported by LISREL 8.3 software. The findings of this study provide a theoretical basis and empirical evidence of likely directions for explaining motivation in cultural type of studies. From a managerial perspective, given the importance of WLS in contemporary higher education institutions, the findings herein are designed to enable designers and policy-makers to formulate appropriate processes to ensure the effective and efficient development and use of WLSs.

The Structural Model

The structural equation model results are illustrated in Figure 3 in two parts: (3a) shows the results to validate the TAM without IM, for both cultures and (3b) shows the results of the proposed research model hypotheses. Each hypothesis was studied by considering the path coefficients, β . The estimated path effects (represented by the coefficient β) are given along with their degree of significance, p . In Figures 3a and 3b, the results are presented by identifying the hypotheses as defined in the proposed research model (Figure 1). The hypotheses results are superimposed in Figures 3a and 3b and are presented in three lines as follows:

H#	→ Ex. H4 : hypotheses 4
$\beta\# = \beta_{\text{Canada}} / \beta_{\text{china}}$	→ Ex. $\beta_4 = 0.67/0.63$: Path coefficient β for hypothesis 4 with value for Canada group = 0.67 and value for China group = 0.63
$T\text{-value} = T_{\text{canada}}(p_{\text{canada}}) / T_{\text{china}}(p_{\text{china}})$	→ Ex. T-Value = $9.94(p=0.001) / 7.95(p=0.001)$: The T-statistics value for Canada group is 9.94 with significance of 0.001 and for China group is 7.95 with significance of 0.001.

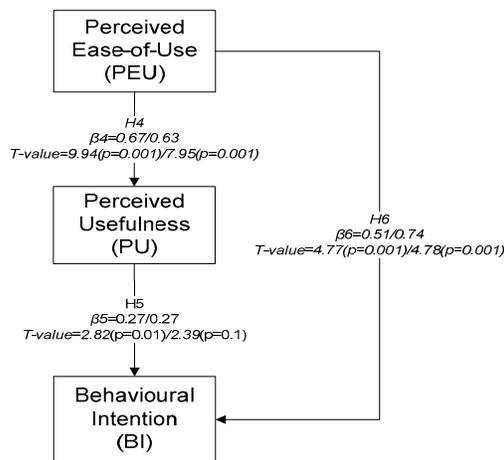


Figure 3a. TAM model for both cultures

Figure 3a shows the TAM portion of the proposed research model represented by hypotheses 4 (PEU→PU), 5 (PU→BI) and 6 (PEU→BI). This figure shows positive significant correlations between the constructs thereby suggesting that there were grounds for expecting significant effects between them. Hypothesis 4 shows that there is a strong positive relationship between PEU and PU for both cultures ($\beta = 0.67$ for Canada and $\beta = 0.63$ for China). The strength of this relationship for both cultures is nearly the same magnitude. Hypothesis 5 showed a positive relationship between PU and BI with the same strength for both Canada and China ($\beta = 0.27$), although the relationship is not statistically significant for the Chinese sample.

Hypothesis 6 tested the relationship between PEU and BI. The results shown in Figure 3a indicate that this relationship is approximately 25% less strong for Canada ($\beta = 0.51$) than that for China ($\beta = 0.74$). Therefore, all TAM hypotheses are supported for both cultures (Figure 3a) with the exception of H5 for China.

Figure 3b illustrates the SEM results of the proposed research model for both cultures. This figure shows the influence of IM on TAM. In other words, we can look at how H4, H5, and H6 (from Figure 3a) changed due to the introduction of IM. Additionally, the results in Figure 3b are used to test the proposed model fit to both cultures.

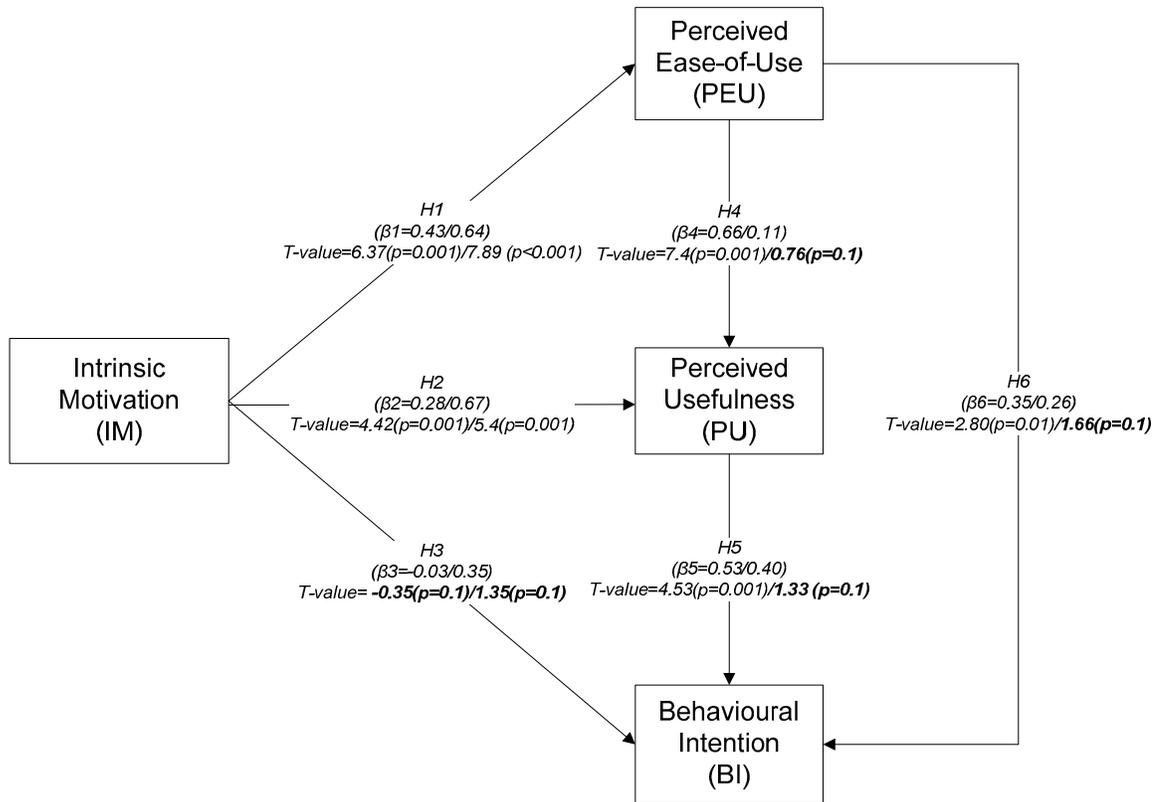


Figure 3b. TAM model with IM - for both cultures

Note: The values in bold are to highlight that the results are not significant.

Figure 3. SEM simulations results (Canada/China).

Influence of IM on TAM

For the Canadian group, the path coefficient β for hypothesis H4 was practically unchanged: β for H5 practically doubled from 0.27 to 0.53, while β for H6 decreased from 0.51 to 0.35. These results imply that the inclusion of IM into the TAM enhances the role of PU but reduces that of PEU. For the China group however, all TAM hypotheses became not significant. We can possibly draw from the theory of “cognitive systems of thought” (discussed earlier) to explain this outcome. Since the TAM represents a cognitive model based on rational cause and effect paradigm (Anandarajan, Igbaria, & Anakwe, 2002), we can consider it to be misaligned with the social context of Chinese culture that is not analytical (cognitively oriented) but holistic. These results provide us with our first and second findings:

- Finding 1: That an intrinsic motivation perspective to the TAM (and in the context of WLSs) is not applicable for the China group, and
- Finding 2: That by considering IM in the TAM, the role of PU is heightened in both cultures with both respects: strength (β) and significance (p).

Testing the Proposed Model

The influence of IM on PEU, H1 (Canada $\beta_1 = 0.43$, China $\beta_1 = 0.64$) and PU, H2 (Canada $\beta_2 = 0.28$, China $\beta_2 = 0.67$) is significantly stronger for the Chinese students. Both hypotheses 1 and 2 are supported for both cultures. It seems that IM plays a more important role in Chinese students' perceptions of ease of use and usefulness of the WLS than Canadian students. This leads us to the third, fourth, and fifth findings:

- Finding 3: That for students from both cultures, the more they enjoy using the WLS, the more they perceive it easy to use (H1) and useful (H2).
- Finding 4: That this IM→PEU/PU impact in finding 3 is significantly greater in the Chinese student group than that in the Canadian group: close to 30% more in the IM→PEU (H1) and more than double in the IM→PU (H2) relationship.
- Finding 5: That the impact of IM on PEU and PU does not have a causal impact chain (i.e., IM→PEU (H1) followed by PEU→PU (H4)) for the Canadian students but a strong negative one on the Chinese students. This is evident from the results shown where β_4 is the same with (Figure 3a) and without (Figure 3b) the influence of IM.

This further confirms that Canadian students seem to follow “rational cause and effect to create perceptions” (Anandarajan et al., 2002) such that increasing their enjoyment of using the system will not alter their perception of usefulness of the WLS based on how easy to use the WLS. In other words, whether a Canadian student is enjoying the WLS or not has no influence on their perception of its usefulness. Contrary to that, it seems that when a Chinese student is enjoying the WLS, he/she would feel that it is not useful.

Hypothesis 3, which posits that there will be a strong positive relationship between IM and BI is not supported in both Canadian and Chinese groups. The path of the IM→BI hypothesis for the China group is 0.35 but is not significant. Therefore,

Finding 6: That IM does not have a direct impact on BI but an indirect one, possibly via PU.

Overall, the results of the proposed research model suggest that Canadian student's intrinsic motivation seems to play a limited role in explaining their behavior using the WLS. Limited in the sense that IM has a strong impact only on PEU as evidenced by β_1 of H1. In the Chinese culture however, IM seems to have a strong impact in two respects: (1) on PEU (see H1) and PU (see H2) more than their Canadian counterparts, and (2) on TAM by making its hypotheses not significant, possibly indicating its reduced role as a factor within a cognitive model as represented by TAM.

Discussion of Results

In this paper we have argued that the considerable social differences that exist among different cultures affect not only their beliefs about specific aspects of the world but also the nature of their cognitive processes - the ways by which they know the world. More specifically we extracted six findings from statistical analysis comparing two groups: one from China and the other from Canada. Two of these findings merit special attention because of their significance to our understanding of Chinese culture in online learning. We approach our discussion by going back to the origin of Chinese culture today rooted deep in Confucianism.

Culture can be defined as “the collective programming of the mind which distinguishes the members of one group or category of people from another” (Hofstede, 1980). Implied in this definition is the mind (including cognition), which plays an important role in shaping cultural behavior. All definitions of culture imply that it entails the establishment of cognitive processes set to operate

within a value framework. Chinese students' educational culture has developed over thousands of years and its pedagogy was influenced by Confucius (551-479 BCE). Confucius' influence on Chinese culture is similar to that of Socrates' (470-399 BCE) on Western culture. Confucius' thoughts were recognized, valued, and inherited into Chinese daily lives, and have become the ethical and social norms of their society for generations (Yick & Gupta, 2002). Evidently, Confucius' thoughts also shaped the Chinese educational values in six ways (Kember, 1999): reliance on rote learning (studying that focuses on memorization); extrinsic motivation; high levels of achievement motivation; high achievement; excellence in group projects; and willingness to invest in education.

Many cross-cultural researchers have identified important differences between the East and the West. Early Chinese research studies were dominated by Western scholars, the biggest of which is that of Hofstede (1980, 1991). The Western style of Hofstede's (1980) survey was challenged by The Chinese Culture Connection led by Michael H. Bond. These researchers constructed a Chinese Value Survey and found four dimensions of cultural valuing: integration, Confucian work dynamism, human-heartedness, and moral discipline. While the research on Chinese cultural values is still rare (Wang, 2005), the few studies have contributed the following:

- Chinese have social orientation represented as four sub-orientations (Yang, 1993):
 - Family orientation
 - Relationship orientation
 - Authority orientation
 - Otherness orientation
- At the same time, Chinese society also seems to desire change from tradition by demonstrating a strong tendency of moving toward utilitarian individualism in value orientation and social relationship (Lu, 1998).

Today, the Chinese education emphasis is still made on memorizing ideas, formulas, and theories rather than developing practical skills and critical thinking. The passive and receptive learning style of Chinese students has been observed by many Western researchers (Kember, 1999; Pratt, 1992; Watkins & Biggs, 1999) and includes:

- Abiding by the teacher with strong emphasis on affective and personal relationship established through informal interactions after the class (Ho, 2001)
- Relying on rote learning
- Being motivated extrinsically accompanied by an intention to seek understanding such that the achievement motivation has a more collective nature (Kember, 1999)
- Being diligent
- Being good at group projects.

In online learning we find the following process taking place. Students are given the course requirements on the first day of classes. They then have to understand those requirements alone or in discussion with friends and integrate that into their daily life planning. During the semester, students need to sit in front of the computer. Since there is no fixed time to do that, students need to decide when is the best time for them to sit in front of a computer and study. In the online course, students are not given a day to day or week by week plan. Students are given access to learning tools entailing a variety of media. There is a large burden on the student that all the media types work on the computer they are using. If not, then they need to debug it and somehow make it work. Otherwise, they will perceive that they are missing on learning opportunities and on teaching. Students have communications facility within the course but this communication does not occur in real time. The text is generally the only material used for communications which adds yet another layer of cognitive processing to deal with asynchronous communications

protocol, language barriers, and operational challenges. Non-verbal cues are absent and contact with the teacher is limited at best. The entire course requires autonomous students who have independent learning skills and abilities. *Practically every aspect in this process is contrary to the confuciansitic values of Chinese education and reveals a handful of causes for conflict with Chinese students' learning styles.*

We also refer to a study done on “school-fun conflict” (Basseches, 1984). One everyday life scenario was provided for participants to analyze. This scenario entailed a conflict between having fun and going to school. The text for the study scenario was as follows:

“Kent, James and Matt are college juniors. They are feeling very frustrated about their three years of routine tests, paper assignments, and grades. They complain that going through this process has taken its toll, undermining the fun of learning. How did it happen and what should they do?”

This was the text used for a study on ‘dialectical resolution of social contradiction’ on Eastern and Western students. Participants from both cultures were asked to write down what they thought about two everyday life contradictions, including the origin and resolution of the conflict. The Chinese responses were mostly dialectical, meaning that they attributed the cause of the problem to both sides and attempted to reconcile the contradiction (whereas non-dialectical responses generally found exclusive fault with one side or the other). Results of this study show that three times more Chinese than Americans tried to resolve the school-fun conflict, as shown in Figure 4.

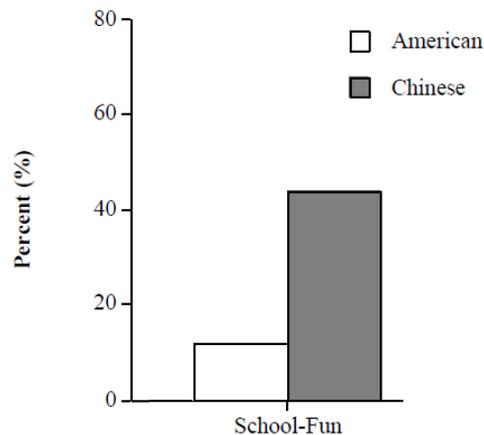


Figure 4. Comparison of students who tried to resolve School-Fun conflict

It is expected that TAM (an extrinsic motivation-based model) alone would explain the Chinese students because they are extrinsically motivated and have intentions for high achievement (as influenced by Confucian thought) (Kember, 1999). Results, though, showed that explaining the influence of perceived usefulness on intentions for the Chinese culture by TAM was limited, contrary to the findings for Canadians. Moreover, when IM is introduced to the TAM, all TAM relationships fail to explain Chinese behavior.

In conclusion, when it comes to the impact of intrinsic motivation in an online learning context, several conflicts seem to arise from the Confucian perspective (and supported by Hofstede’s and Chinese Value Survey studies):

1. Online learning is based on interactive participation to learn content – contrary to the Confucian reliance on rote learning.
2. The professor in an online course is a facilitator – contrary to the Confucian Chinese student authority orientation.
3. Communicating with the professor and classmates is virtual in an online course – far from the Confucian motivation of Chinese student's intentions to seek understanding via a strong emphasis on affective relationship through informal relationships (with professor and classmates) after the class.
4. Authority orientation: Chinese students would be waiting for the guidance of an authority and building relationship with that authority. Instead, they find a facilitator with an environment where relationships are established without visual and verbal queues.
5. Online pedagogies, such as learning by exploration or by inquiry, require efforts very different from those used for rote learning: the Confucian approach to learning.
6. Online learning is learning-objective centered versus the Confucian expected high-achievement centered.
7. With the cognitive system of Chinese culture emphasizing memorization of ideas, formulas, and theories, students will find themselves removed from their Confucian environment and placed in one requiring self-directedness and critical thinking. Enjoyment fosters self-directedness and nurtures critical thinking, and as such, Chinese students enter into conflict with regards to achievement.

All of the above indicate the Chinese student's state of mind in an online learning environment – *that of cognitive dissonance*. Cognitive dissonance occurs when an individual holds two contradictory ideas/beliefs at the same time. In this case, it is the contradiction between Confucian-style learning and the online environment for learning. Chinese students therefore have a motivational drive to reduce dissonance by changing their attitudes, perceptions, and intentions. This desire for change or the actual process of changing, which occurs in the mind of the Chinese students, may be the fundamental reason, to the TAM's limited ability and to the IM-TAM's failure, to explain Chinese student's intentions in an online learning context.

Limitations & Suggestions for Future Research

A few limitations to this study exist and should be noted. These limitations can be grouped under methodology and system design. First, the questionnaire entails the element of subjectivity in the respondents. Respondent's reactions change in time and may depend on the environment such as the classroom location, time of course, and the environmental characteristics at the time the questionnaire was being administered. Second, caution must to be taken in generalizing the results due to the fact that participants in this study were from different cultural backgrounds with different cultural beliefs influencing their perceptions and attitudes. From an instrument measurement point of view, IM was measured as enjoyment and there are many other sub-dimensions that may represent IM. This may lead to possible misinterpretation and misuse. Also, previous studies have shown that perceptions and attitudes differ between mandatory or voluntary use of information technology (in this case, the WLS). This study is limited with that respect because it did not differentiate between the two settings.

With respect to system design, the two WLSs are not the same. Therefore the student's experiences with their respective WLSs include a variables that cannot and were not measured – for example that of interface and internet infrastructure (network speed). Although an attempt was made to keep the interface elements relatively the same (such as hyperlinked environment, sim-

ple, and excluding any features other than the practice of questions), other elements such as color and layout are not controlled and may influence the results.

However, limitations are opportunities and challenges for future research. The body of knowledge in acceptance and use of different information systems across cultures and identifying critical design variables is weak and requires much more effort and research. We can summarize some ideas for future research:

1. Use the exact same WLS for both cultures. The challenge is to have the same WLS in both English and Chinese languages. This would require an acceptable methodology to test that the translation of the items are done properly.
2. Make sure that the design of the experiment is the same:
 - a. Same course
 - b. Same setting (WLS mandatory or not)
 - c. Same time frame
 - d. Same practice question base
 - e. Etc...
3. Test other sub-dimensions to intrinsic motivation such as learning goal orientation.
4. Include in the research model the construct of effort and performance.

Web-based learning management systems are part of the e-learning trend. This trend is in hyper-mode because of all the advantages it offers. The primary problem with this trillion dollar industry is that of quality and richness in student experience. All the results, limitations, and recommendations in this article provide the critical elements that managers, financial officers, deans, and teachers need to address to successfully develop and implement such systems. What is the use of the WLS if it provides the institution with large amount of savings and revenues when it has negative impact on student experience and learning? An important aspect of this study is the global reach of WLSs. Any student from any country can take any course in any language any time. Not bad for an educational business proposition. The point of this article is that we need to better understand what students experience in that process and how we can use what we learned to develop and deliver quality, efficient and effective WLSs across the various cultures.

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Role of Intrinsic Motivation in System Adoption

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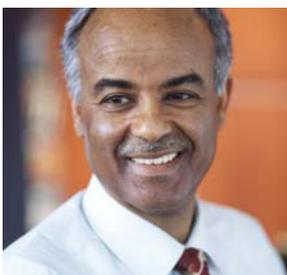
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