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Computer Based Assessment Acceptance: A Cross-cultural Study in Greece and Mexico

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ABSTRACT

The user's acceptance of Computer Based Assessment (CBA) Systems is examined with the help of the Computer Based Assessment Acceptance Model (CBAAM) in the two different cultures of Greece and Mexico. The study was conducted by delivering the same CBA system to students of identical courses in Greece and Mexico. The research data were analyzed using Partial Least Squares (PLS). The results indicate that the CBAAM is valid for both countries in overall. However, there are some cultural differences. Greek students' behavioral intention is triggered mainly by Perceived Playfulness and Perceived Ease of Use, while Mexican students' behavioral intention is caused by Perceived Playfulness and Perceived Usefulness. This study is a first step towards a cross-cultural analysis regarding CBA's acceptance and use.

Keywords

Computer based assessment, Technology acceptance, Cross-culture comparison, Hofstede's cultural dimension, Perceived playfulness

Introduction

Learning Management Systems (LMS) became a valuable tool for teachers and learners worldwide. The increased use of LMS drove to globalized educational software such as Blackboard and Moodle, that help teachers to provide high quality LMS to their learners. Globalization can also be found in computer based test and assessments such as Test Of English as a Foreign Language (TOEFL), Graduate Management Admission Test (GMAT) and Graduate Record Examination (GRE). Many students around the world take these exams and are prepared using simulated Computer Based Assessment systems.

Computer Based Assessment (CBA) is an integral service which comes along with LMS or alone. It provides many advantages to teachers and learners. Learners can find CBA very useful because they can practice in any lesson or specific task they want in order to ameliorate their weaknesses and to evaluate their performance (Joosten-ten Brinke et al., 2007; Kaklauskas et al., 2010). On the other hand, educators savor other advantages such as: test security, reduction of time and cost, automation of records and distance learning/marking (Gvozdenko & Chambers, 2007; Smith & Caputi, 2007).

Despite the increased use of CBA, many learners are against using CBAs (Frankola, 2000). Thus, Researchers are trying to identify the factors that affect learners to use CBA. Researchers, based on models regarding Information Technology (IT) acceptance, e.g., Technology Acceptance Model (TAM) (Davis, 1989), developed many models to explain learner's acceptance and intention to use learning management systems (LMS) or CBA. Regarding CBA, Computer Based Assessment Acceptance Model (CBAAM) (Figure 1) is a model that includes many important variables to explain learner's acceptance on CBA (Terzis & Economides, 2011).

However, CBA's globalization questioned the invariance of CBAAM in other cultures around the world. Cultural differences that exist among different countries may affect CBAAM's effectiveness or the factors that affect learner's intentions to use CBA.

Thus, this paper aims to examine possible differences in computer based assessment acceptance between different cultures by applying CBAAM to Greek and Mexican students.

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Section 2 presents previous studies that shed light on CBA acceptance or cultural effect on IT acceptance. Section 3 describes the methodology. Section 4 provides the data analysis and the results. Finally, sections 5 and 6 discuss the results and present the conclusions of this study respectively.

Literature review

Computer based assessment acceptance

Technology Acceptance Model (TAM) is the first and the most dominant model regarding IT acceptance (Davis, 1989). Davis developed TAM based on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). Another model that explains user's intentions is the Theory of Planned Behaviour (TPB) (Ajzen, 1991). Taylor and Todd (1995) presented a hybrid model which combined TAM and TPB. Unified Theory of Acceptance and Use of Technology (UTUAT) came to integrate previous models regarding IT acceptance (Venkatesh, Morris, Davis, & F. D. Davis, 2003).

LMS and CBA acceptance studies such as CBAAM have adopted variables from these previous models. From TAM, CBAAM and other studies have adopted Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) (Landry, Griffeth & Hartman, 2006; Lee, 2008; Ong, Lai & Wang 2004; Ong & Lai, 2006; Padilla-Melendez, Garrido-Moreno & Del Aguila-Obra, 2008; Teo, 2009; Van Raaij & Schepers, 2008; Yi & Hwang, 2003). From Unified Theory of Acceptance and Use of Technology (UTUAT), CBAAM and other LMS acceptance studies used Facilitating Conditions (Teo, 2009; Teo, Lee, & Chai, 2008) or Social Influence in their research models (Van Raaij & Schepers, 2008; Wang, Wu & Wang, 2009).

Furthermore, CBAAM included variables which were found to be more relevant with the context of learning and assessment acceptance. It adopted Perceived Playfulness (Moon and Kim, 2001; Wang et al., 2009). It proposed firstly Goal Expectancy which is based on Self-Management of Learning (Wang et al., 2009) and secondly Content (Shee & Wang, 2008; Wang, 2003).

CBAAM suggests that user's intentions to use a CBA are defined by Perceived Playfulness and Perceived Ease of Use. Perceived Usefulness is significantly attributed by Goal Expectancy, Content, Social Influence and Perceived Ease of Use. Usefulness, Content, Ease of Use and Goal Expectancy explain Perceived Playfulness Furthermore, Perceived Ease of Use explained by Computer Self Efficacy and Facilitating Conditions (Figure 1).

User acceptance across cultures

The need to clearly understand the individual acceptance drives many researchers to a cross cultural analysis regarding acceptance. Several previous studies added a cross-cultural dimension by comparing the efficiency of an acceptance model such as TAM or by adding variables that are distinguishing the cultures.

Cultural differences showed that the culture has an impact on IT acceptance (Straub, Keil & Brenner, 1997; Straub et al., 2002). Specifically, Straub (1997) found through a three-country study that TAM did not remain invariant across different countries. Another cross-cultural analysis was applied in the context of pre-services teachers regarding TAM (Teo, Luan & Sing, 2008). Cross-cultural application of the TAM was performed also in the global consumer acceptance of international web sites among Brazilians, Germans, and Taiwanese (Singh, Fassott, Chao & Hoffmann, 2006). Other researchers applied TAM to countries that have many cultural differences with west such as Saudi Arabia (Al-Gahtani, Hubona & Wang, 2007) and People's Republic of China (Huang, Lu & Wong, 2003). In addition, UTUAT was also used to examine cultural differences in IT acceptance (Taksa & Flomenbaum, 2009; Im, Hong, & Kang, 2011). Cross-cultural analysis regarding IT acceptance was applied also in other contexts such as prepayment metering systems (Bandyopadhyay, K. & Bandyopadhyay, S., 2008), and e-learning (Keller, Hrastinski & Carlsson, 2007).

On the other hand, some studies extended TAM with cultural value-dimensions (eg. Zakour, 2004; Li et al., 2009) based on previous researches (Hofstede & Bond, 1988; Hofstede, 2001; Trompenaars, Hampden-Turner, 1988; Hall,

1989) regarding cultural differences. Finally, Gaspay, Dardan, & Legorreta (2007) delivered a very useful meta-analysis regarding the implementation of Hofstede's cultural dimensions in IT research.

This paper explores the cultural effect on CBA and highlight possible differences by applying CBAAM to Greek and Mexican students. Greece was selected as a European country, while Mexico as a Latin American country. In addition, the cultural values of these two countries indicated that the analysis will provide interesting results regarding the differences and similarities between different cultures and their effects on CBA's acceptance (Hofstede, 2001). Particularly, regarding differences between countries, Greece has the highest value regarding Uncertainty Avoidance, while Mexico is twentieth among sixty six (66) countries. Moreover, Mexico has one of the highest values (fifth) regarding Power Distance, while Greece is fortieth. Another smaller difference between the two countries is their values regarding Masculinity. Mexico is eighth in this cultural dimension while Greece is twenty-third. On the contrary, the fourth cultural dimension "Individualism" is almost the same for the two countries. The aforementioned differences and similarities between Greece and Mexico will provide useful insights regarding the effect of cultural dimensions on CBA's acceptance.

Thus, the present research is the first at examining the influence of national culture on the acceptance and use of CBA.

Methodology

Data collection

The survey study was conducted at two universities in Greece and Mexico. In order to eliminate any other effect except cultural, the questionnaire was distributed to first year students that were attending similar courses in the two universities. The course was an introductory informatics course. Students were educated regarding general concepts of Information Technology and basic use of internet and word processing.

The CBA includes questions from this course. The participation in the CBA was voluntary. 117 first-year Greek students, 45 males (38%) and 72 females (62%), signed up and appeared to the procedure. The average age of Greek students was 19.2 (SD = 1.03). In addition, 51 first-year Mexican students, 19 males (37%) and 32 females (63%), participated to the procedure. The average age of Mexican students was 18.9 (SD = 1.05). Furthermore, from the mean and standard deviation of the Computer Self Efficacy variable, we are able to understand that students from both countries felt confident regarding their computer skills (Table 1).

The CBA was a summative test in order to prepare students regarding their final examination for the introductory informatics course. Therefore, it was delivered two weeks after the end of the courses in order to give to the students the opportunity to be prepared for the procedure. The procedure was administered in January 2011 for both countries.

The CBA has the same characteristics for both groups. The only difference was the questions' language. Mexican students used the CBA in Spanish, while Greek students in Greek.

The CBA system is very simple. The questions appearance was randomized. Each question was appeared with four possible answers and a "next" button, which allowed the students to move to the next question after he/she answered the present question first. The CBA was build in a Windows XP machine using JavaScript with Perl CGI on Apache web server with MySQL (Moridis & Economides, 2009).

After the end of the procedure, the student has to answer the questionnaire survey (CBAAM). CBAAM consists of 30 items in order to measure its 9 latent variables. We used the seven point Likert-type scale with 1 = "strongly disagree" to 7 = "strongly agree", in order to measure the items.

Research model and hypotheses

The proposed research model (Figure 1), CBAAM, was applied to Greek and Mexican students in order to examine the acceptance and use of CBA (Terzis & Economides, 2011). This section describes the CBAAM's variables and hypotheses.

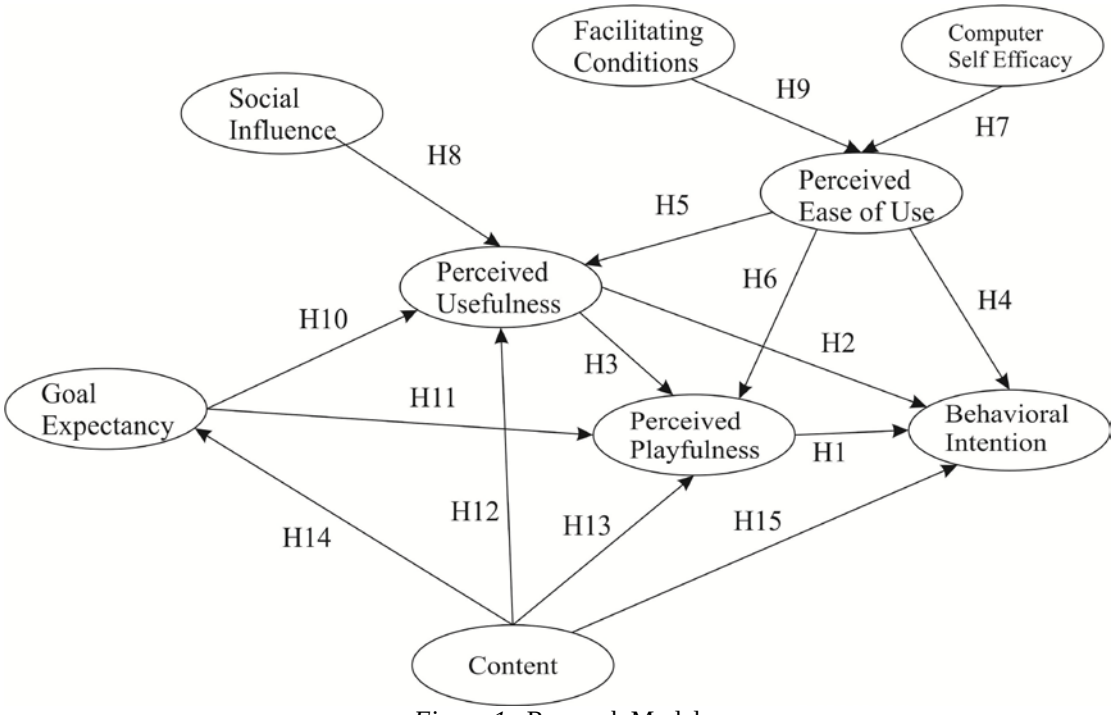


Figure 1. Research Model

Perceived playfulness

Perceived Playfulness (PP) is an intrinsic significant belief that is formed from the individual's subjective experience with the system (Moon & Kim, 2001). Moon and Kim described PP as a variable defined by three dimensions such as concentration, curiosity and enjoyment. These dimensions are very essential for user's acceptance of a CBA. Previous studies showed that Perceived Playfulness is one of the most important determinants to use a CBA (Terzis & Economides, 2011).

Therefore we hypothesized:
H1: Greek and Mexican students' Perceived Playfulness will have a positive effect on their Behavioural Intention to use CBA.

Perceived usefulness

The degree to which a user considers that using a specific system will improve his/her job performance is Perceived Usefulness (PU) (Davis, 1989). LMS acceptance models highlighted Perceived Usefulness as a very important factor of behavioral intention to use an e-learning system (e.g. Lee, 2008; Ong & Lai, 2006; Van Raaij & Schepers, 2008). Furthermore, Perceived Usefulness is also an essential determinant of Perceived Playfulness (Terzis & Economides, 2011). Therefore, we hypothesized:

H2: Greek and Mexican students' Perceived Usefulness will have a positive effect on their Behavioural Intention to use CBA.
H3: Greek and Mexican students' Perceived Usefulness will have a positive effect on their Perceived Playfulness.

Perceived ease of use

The degree to which a user considers that using a system would be free of effort is Perceived Ease of Use (PEOU) (Davis, 1989). LMS acceptance models showed that the Perceived Ease of Use influences positively and directly the Perceived Playfulness, Perceived Usefulness and Behavioral Intention to Use (Venkatesh, 1999; Venkatesh & Davis, 1996).

H4: Greek and Mexican students' Perceived Ease of Use will have a positive effect on their Behavioural Intention to use CBA.
H5: Greek and Mexican students' Perceived Ease of Use will have a positive effect on their Perceived Usefulness.
H6: Greek and Mexican students' Perceived Ease of Use will have a positive effect on their Perceived Playfulness.

Computer self efficacy

The degree to which a user perceives his/her capacity to use computers is Computer Self Efficacy (CSE) (Compeau & Higgins, 1995). CSE affects students during CBA. Individuals with higher CSE find the CBA system easier and consequently they have higher intentions to use the CBA system. The direct causal effect of CSE on PEOU and the indirect on Behavioral intention in the context of LMS or CBA acceptance are supported by previous studies (Agarwal, Sambamurthy, & Stair, 2000; Padilla-Melendez, Garrido-Moreno, & Del Aguila-Obra, 2008; Terzis & Economides, 2011).

H7: Greek and Mexican students' Computer Self Efficacy will have a positive effect on their Perceived Ease of Use.

Social influence

Social Influence (SI) is a variable to measure the effect of other opinions on person behaviour and beliefs (Taylor & Todd, 1995). Social Influence consists of three dimensions: Subjective Norm, Image and Voluntariness (Karahanna & Straub, 1999). UTUAT combined the three dimensions and delivered Social Influence as one of the four key determinants of Behavioral Intention (Venkatesh et al., 2003). Social Influence was also found as a major determinant of behavioral intention in LMS and CBA contexts (e.g., Wang et al., 2009; Terzis & Economides, 2011).

H8: Social Influence will have a positive effect on Greek and Mexican students' Perceived Usefulness.

Facilitating conditions

Facilitating Conditions (FC) are the system's characteristics or technical support that facilitate individuals to use a system. FC are delivered by help buttons, menus, Frequently Asked Questions (FAQ) and other facilities that may help users to interact with the system more effectively. Moreover, FC could be provided by the organization's staff. In CBA, tutors play an important role to proper delivery of the system to the students. So, we hypothesized a positive effect of FC on PEOU.

H9: Facilitating Conditions will have a positive effect on Greek and Mexican students' Perceived Ease of Use.

Goal expectancy

Goal Expectancy (GE) is a construct that impacts an individual's belief that he/she is prepared properly to use the CBA system. GE has two dimensions. The first dimension is the student's beliefs regarding their preparation to answer the CBA's questions. The second dimension is the student's expectations and aspirations regarding the level of success. Previous studies showed that GE is a significant determinant of Perceived Usefulness and Perceived Playfulness (Terzis & Economides, 2011).

H10: Goal Expectancy will have a positive effect on Greek and Mexican students' Perceived Usefulness.
H11: Goal Expectancy will have a positive effect on Greek and Mexican students' Perceived Playfulness.

Content

Content is a variable that measures user's perceptions regarding the CBA's corresponding course and CBA's questions. Course's content is an important factor for student's intentions to use the CBA. Students with higher

interest for a particular course will have higher intentions to use the corresponding CBA. In addition, the design of the CBA's questions is also essential regarding the user's beliefs and intentions. CBAs provided with questions that are higher in quality (understandable, relative with the course, innovative) and probably quantity are more likely to be used by the students. Therefore, we hypothesized:

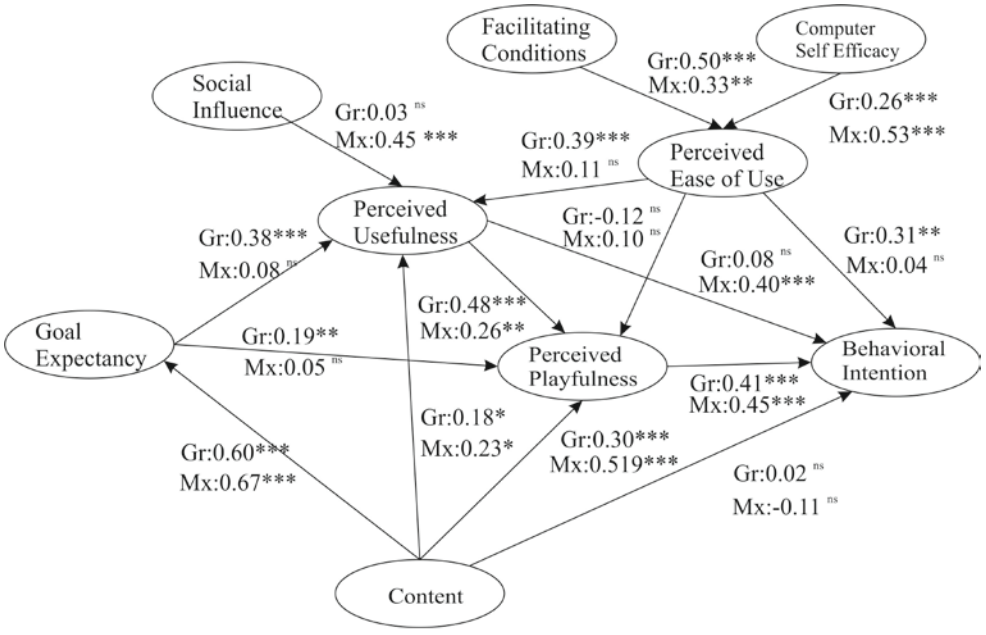
H12: Content will have a positive effect on Greek and Mexican students' Perceived Usefulness.
H13: Content will have a positive effect on Greek and Mexican students' Perceived Playfulness.
H14: Content will have a positive effect on Greek and Mexican students' Goal Expectancy.
H15: Content will have a positive effect on Greek and Mexican students' Behavioral Intention to Use CBA.

Thus, this paper aims to examine the CBAAM's efficiency in different cultures by testing the aforementioned hypotheses in Greece and Mexico.

Data analysis and results

Partial least-squares (PLS) analysis was used to measure the structural and the measurement model (Chin, 1998; Falk & Miller, 1992; Wold, 1992). The samples for both groups are large enough, since they surpass the minimum limit which is at least 10 times the largest number of independent variables impacting a dependent variable (Chin, 1998). In our model, the largest number of independent variables impacting a dependent variable is four (PU, PP, PEOU and C to BI). Thus, both the Greek and the Mexican samples are large enough since they are higher than 40.

Reliability and validity for the measurement model are measured through internal consistency, convergent validity and discriminant validity (Barclay, Higgins & Thompson, 1995; Wixon & Watson, 2001). Table 1 displays the items' reliabilities (Cronbach's alpha, Composite Reliability), Average Variance Extracted (AVE) and factor loadings, while Table 2 displays the variables' correlations and Square Roots of AVEs. The minimum values for these criteria are presented in Tables 1 and 2. Specifically: (1) Table 1 confirms convergent validity, (2) Tables 2 and 3 confirms discriminant validity for Greece and Mexico respectively. Thus, the results support the measurement model since they exceed the minimum values for both countries (Table 1, 2, 3). The only inconsistency is the second item regarding CSE which has factor loading lower than the minimum value (Table 1). Thus, CSE2 was omitted from the core construct regarding Mexico.



*p < 0.1, **p < 0.05, ***p < 0.01, ns: not significant.

Figure 2. Path coefficients of the research model.

The structural model is evaluated by examining the variance measured (R^2) by the antecedent constructs. Values of the variance equal to 0.02, 0.13 and 0.26 are considered as small, medium and large respectively (Cohen, 1988). Secondly, t-values or p-values through the bootstrapping procedure are used in order to evaluate the significance of the path coefficients and total effects. Table 4 and figure 2 summarize the results for the hypotheses and R^2. R^2 regarding Behavioral Intention and the most important model's variables such as Perceived Playfulness, Perceived Usefulness and Perceived Ease of Use are considered as large for both countries. In addition, most of the hypotheses are significant for both countries with some exemptions. The results are thoroughly discussed at the Discussions section.

Finally, Goodness of Fit (GoF) provides an overall prediction performance of the research model by taking into consideration the measurement and the structural models. The GoF is determined as the geometric mean of the average communality in the measurement model (AVE) and the average R^2 of the endogenous variables (Tenenhaus, Vinzi, Chatelin, & Lauro, 2005). GoF is defined as small (0.10), medium (0.25) and large (0.36) (Wetzels, Odekerken-Schröder, & van Oppen, 2009). GoF is 0.60 and 0.61 for Greece and Mexico respectively. This means that the CBAAM is a reliable model to predict Behavioral Intention to use a CBA for both countries. The software for the data analysis was SmartPLS 2.0 (Ringle, Wende, & Will, 2005).

Table 1. Results for the Measurement Model

Construct Items	Mean		Standard Deviation		Factor Loading (> 0.7)[a]		Cronbach a (> 0.7) [a]		Composite Reliability (> 0.7) [a]		Average variance extracted(> 0.5) [a]	
	GR	MX	GR	MX	GR	MX	GR	MX	GR	MX	GR	MX
Perceived Playfulness	4.95	5.34	1.15	0.84			0.86	0.80	0.91	0.87	0.71	0.62
PP1					0.77	0.80						
PP2					0.87	0.82						
PP3					0.86	0.77						
PP4					0.87	0.76						
Perceived Usefulness	5.09	5.24	1.18	1.04			0.88	0.88	0.93	0.92	0.82	0.80
PU1					0.90	0.91						
PU2					0.93	0.93						
PU3					0.88	0.85						
Perceived Ease of Use	5.56	5.55	1.15	0.98			0.77	0.72	0.87	0.84	0.69	0.64
PEOU1					0.84	0.88						
PEOU2					0.87	0.72						
PEOU3					0.77	0.78						
Computer Self Efficacy	5.33	5.91	1.00	0.82			0.84	0.7	0.89	0.82	0.67	0.61
CSE1					0.83	0.79						
CSE2					0.82	0.20						
CSE3					0.77	0.73						
CSE4					0.86	0.82						
Social Influence	5.81	4.57	0.96	1.01			0.83	0.77	0.89	0.85	0.66	0.59
SI1					0.78	0.70						
SI2					0.85	0.85						
SI3					0.81	0.80						
SI4					0.81	0.73						
Facilitating Conditions	5.96	5.20	0.91	1.02			0.80	0.70	0.91	0.87	0.83	0.76
FC1					0.89	0.91						
FC2					0.93	0.84						

Goal Expectancy	5.20	5.18	1.06	1.07			0.83	0.80	0.90	0.88	0.75	0.71
GE1					0.88	0.82						
GE2					0.86	0.87						
GE3					0.86	0.85						
Content	5.41	5.68	1.09	0.90			0.83	0.82	0.89	0.88	0.67	0.65
C1					0.87	0.86						
C2					0.85	0.77						
C3					0.73	0.78						
C4					0.80	0.82						
Behavioral Intention to Use	5.47	5.30	1.20	1.06			0.89	0.78	0.93	0.87	0.81	0.69
BI1					0.92	0.86						
BI2					0.88	0.74						
BI3					0.92	0.87						

a: Indicates an acceptable level of reliability and validity, GR: Greece, MX: Mexico.

Table 2. Discriminant validity for the measurement model in Greece

Constructs	BI	C	CSE	FC	GE	PEOU	PP	PU	SI
BI	**0.90**								
C	0.54	**0.82**							
CSE	0.24	0.32	**0.82**						
FC	0.34	0.49	0.17	**0.91**					
GE	0.41	0.60	0.41	0.23	**0.86**				
PEOU	0.57	0.61	0.34	0.54	0.40	**0.82**			
PP	0.63	0.65	0.34	0.30	0.63	0.46	**0.84**		
PU	0.60	0.65	0.31	0.33	0.65	0.66	0.72	**0.90**	
SI	0.48	0.50	0.27	0.54	0.44	0.48	0.41	0.46	**0.81**

Bold values: the square root of the average variance extracted (AVE) of each construct.

Table 3. Discriminant validity for the measurement model in Mexico

Constructs	BI	C	CSE	FC	GE	PEOU	PP	PU	SI
BI	**0.83**								
C	0.51	**0.81**							
CSE	0.16	0.42	**0.78**						
FC	0.18	0.56	0.36	**0.87**					
GE	0.44	0.67	0.53	0.45	**0.84**				
PEOU	0.46	0.69	0.65	0.52	0.59	**0.80**			
PP	0.65	0.78	0.33	0.54	0.60	0.63	**0.79**		
PU	0.65	0.61	0.39	0.32	0.51	0.55	0.66	**0.90**	
SI	0.44	0.55	0.38	0.52	0.47	0.51	0.63	0.67	**0.77**

Bold values: the square root of the average variance extracted (AVE) of each construct.

Table 4. Greece and Mexico results in relationships

		Greece (n= 117)			Mexico (n = 51)		
		R_{Gr}^2	β_{Gr}		R_{Mx}^2	β_{Mx}	
	BI	0.52			0.51		
	PP	0.60			0.68		
	PU	0.62			0.55		
	PEOU	0.36			0.51		
	GE	0.36			0.45		
H1	PP → BI		0.41***	support		0.45***	support
H2	PU → BI		0.08ns	not support		0.40***	support

H3	PU → PP		0.48***	support		0.26**	support
H4	PEOU → BI		0.31**	support		0.04ns	not support
H5	PEOU → PU		0.39***	support		0.11ns	not support
H6	PEOU → PP		-0.12ns	not support		0.10ns	not support
H7	CSE → PEOU		0.26***	support		0.53***	support
H8	SI → PU		0.03ns	not support		0.45***	support
H9	FC → PEOU		0.50***	support		0.33**	support
H10	GE → PU		0.38***	support		0.08ns	not support
H11	GE → PP		0.19**	support		0.05ns	not support
H12	C → PU		0.18*	support		0.23*	support
H13	C → PP		0.30***	support		0.52***	support
H14	C → GE		0.60***	support		0.67***	support
H15	C → BI		0.02ns	not support		-0.11ns	not support

**p < 0.1, **p < 0.05, ***p < 0.01, ns: not significant.*

Discussion

The good fit of the overall model in the two diverse cultures of Greece and Mexico indicates that the CBAAM could be used to explain user's behavior regarding CBA acceptance. The model was similar for both countries on the following effects: (1) Perceived Playfulness has the most important direct positive effect on Behavioral Intention to use the CBA. Previous studies also suggested Perceived Playfulness as a major determinant of Behavioral Intention to use an Information System or a Computer Based Assessment (Moon & Kim, 2001; Wang et al., 2009; Terzis & Economides, 2011), (2) Content has significant positive effect on Perceived Usefulness, on Perceived Playfulness and on Goal Expectancy but not direct significant effect on Behavioral Intention. Therefore, when a CBA's Content is designed wisely, students might experience CBA as useful and playful, and consequently it would be more likely to be used. Moreover, students' Goal Expectancy is affected by the CBA's Content. Course content and CBA's content have to be clear and comprehensible in order to facilitate students regarding their study, and goal estimation. (3) Perceived Usefulness has a significant direct effect on Perceived Playfulness. This means that the level of Perceived Usefulness determines the level of Perceived Playfulness. As we describe Playfulness is a three-dimensional construct which includes concentration, curiosity and enjoyment. Results showed that students' perceptions regarding usefulness for both countries affect positively their perceptions regarding the level of their concentration, curiosity and enjoyment during the CBA. Consequently, it might be assumed that the students use Playfulness to connect Usefulness with Behavioural Intention to Use. (4) Perceived Ease of Use is significantly attributed to Computer Self Efficacy and to Facilitating Conditions. The effect of Computer Self Efficacy indicates that a student who knows how to use computers, probably he/she will find easy to use a Computer Based Assessment that requires basic information technology skills. On the other hand, the effect of Facilitating Conditions suggests that if designers provide technical support through the system and tutors physical support with their presence to answer the students' queries, it is more likely students to find CBA ease of use. (5) On the other hand, the effect of Perceived Ease of Use on Perceived Playfulness was not significant for both countries. This means that the ease of use of the system does not provide any advantage in order to enhance their perceptions regarding the playfulness of the system. This result might be explained by the fact that students from both countries have very large Computer Self Efficacy (Table 1). Therefore, since students are qualified to use basic computer software, ease of use of the system could not affect students' perceptions regarding the playfulness of the system. In this point, we have to mention that these results might be different if our samples were larger or different in age. However, it is believed that users' new generation is computer educated and capable to use a lot of different software; therefore the ease of use might not be a strong determinant of Perceived Playfulness.

However, previous cross-cultural studies showed that acceptance models such as TAM are influenced by culture. Thus, despite the similarities of the two groups (students of identical course and age), the results support the same idea regarding CBAAM. Figure 3 presents the values of Greece and Mexico regarding the five cultural dimensions of Hofstede (Power distance, Individualism, Masculinity Uncertainty avoidance). We used these values to suggest some ideas and explanations regarding our results delivered by the differences between Greek and Mexican students. Specifically: (1) regarding the items only one item of CSE was problematic. This sustains that the questionnaire's items were reliable and valid for measuring the perceptions of Greek and Mexican students regarding our research

constructs. (2) Social Influence determines Perceived Usefulness only in Mexico. This could be supported from Hofstede's findings regarding Power Distance for Greece equals to 60 and for Mexico equals to 81 (Figure 3). The higher Power Distance for Mexico indicates that Mexicans are individuals that are influenced from their superiors' opinions; therefore social influence effect is larger and significant in Mexico. In our research, this means that students' opinions are influenced by their tutors or other academic staff regarding the use of CBA, while Greek students are not significant affected by their professors or other staff. (3) Goal Expectancy has a significant positive effect on Perceived Usefulness and on Perceived Playfulness only in Greece. Goal Expectancy is a variable related with someone's effort to be properly prepared regarding CBA. It is believed that students who avoid uncertainty will also be properly prepared. Uncertainty Avoidance is another cultural dimension (Hofstede, 2001) which is higher in Greece and consequently Goal Expectancy has significant effects in Greece (Figure 3). This means that Greek students with expectations regarding the CBA would be more likely to find it useful and playful. On the other hand, Mexican students did not associate their goal expectations with the usefulness and the playfulness of the system. (4) Perceived Ease of Use defines Perceived Usefulness and Behavioral Intention only in Greece. This result is in line with Srite (2006) results which used Hofstede's (2001) findings to support that cultures that are less masculine might be more concerned with the ease of use of a technology. Hofstede's (2001) findings regarding masculinity for Greece equals with 57 and for Mexico equals with 69, therefore the direct positive effect of Perceived Ease of Use on Behavioral Intention is significant only in Greece. The significant effect of Greek students perceptions regarding Ease of Use on Behavioral Intention to use a CBA and on Perceived Usefulness is in line with previous studies (Terzis & Economides, 2011) (5) Perceived Usefulness explains Behavioral intention only in Mexico. This result could also be explained by Masculinity. In a society with high masculinity such as Mexico, people put more emphasis on goals and tasks, therefore perceived usefulness, a variable that is linked with CBA's capability to reach user's goals and tasks, is an important determinant of behavioral intention to use a CBA in Mexico. The possible cultural effects on relationships among CBAAM's variables are displayed in Figure 4.

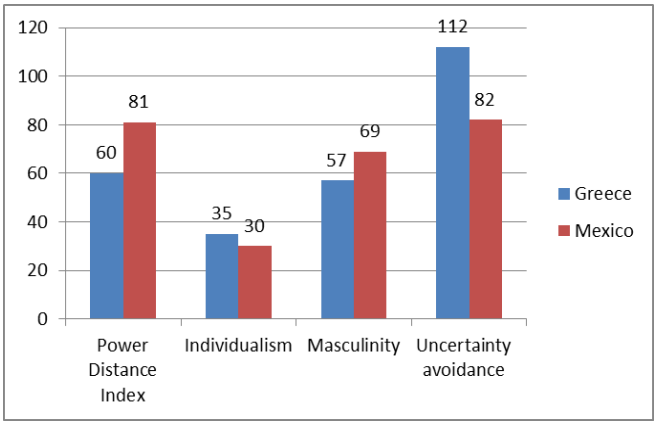


Figure 3. Hofstede's values regarding Greece and Mexico (Hofstede, 2001)

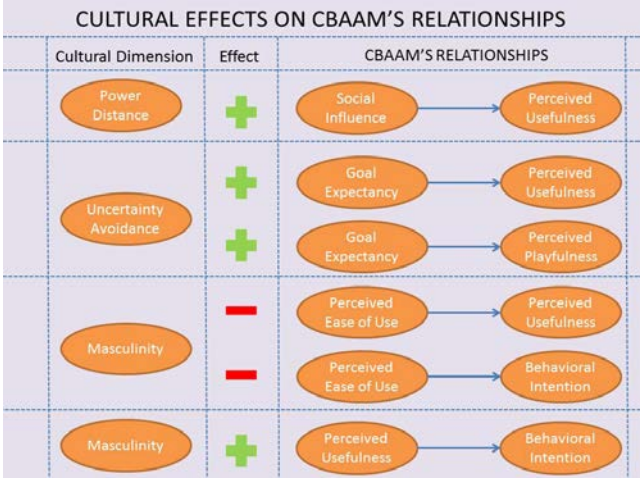


Figure 4. Cultural effects on relationships among CBAAM's variables

Conclusions

This study compares the user's acceptance behavior of a computer based assessment system in two different cultural environments (Greece and Mexico) by applying the CBAAM (Terzis & Economides, 2011) in both cultures. Despite the good model fit in both countries and the aforementioned similarities which indicate a trend to a globalized use of CBA systems, ethnic or national culture plays important role on user's behavioral intentions regarding CBA acceptance.

This research faces some limitations which might have influenced the results. The first limitation is the small number of individuals regarding Mexico's sample. A sample with more students might have provided different and more significant results. Moreover, the sample is very specific. All the participants are first-year undergraduate students in an introductory course to informatics. Similar studies should be applied to other groups with different characteristics regarding age, specialization, nationality and course's content. Thus, the results should be treated as indications and not as proofs.

To conclude, this study provides potential evidences regarding the cultural effect on CBA acceptance. Developers, researchers and educators could found helpful the results and they should take them into consideration for future (1) CBA systems' development, (2) studies regarding the implementation and acceptance of LMS and CBA systems, especially studies interest in cultural dimensions and their effects in education, (3) the implementation of new and more personalized educational practices. Further studies should be towards this direction in order to provide more useful and significant results.

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Appendix 1

Constructs	Items	
Perceived Usefulness		
	PU1	Using the Computer Based Assessment (CBA) will improve my work.
	PU2	Using the Computer Based Assessment (CBA) will enhance my effectiveness.
	PU3	Using the Computer Based Assessment (CBA) will increase my productivity.
Perceived Ease of Use		
	PEOU1	My interaction with the system is clear and understandable.
	PEOU2	It is easy for me to become skilful in using the system.
	PEOU3	I find the system easy to use.
Computer Self Efficacy		
	CSE1	I could complete a job or task using the computer.
	CSE2	I could complete a job or task using the computer if someone showed how to do it first.
	CSE3	I can navigate easily through the Web to find any information I need.
	CSE4	I was fully able to use the computer and Internet before I began using the Computer Based Assessment (CBA).
Social Influence		
	SI1	People who influence my behaviour think that I should use CBA.
	SI2	People who are important to me think that I should use CBA.
	SI3	The seniors in my university have been helpful in the use of CBA.
	SI4	In general, my university has supported the use of CBA.
Facilitating Conditions		
	FC1	When I need help to use the CBA, someone is there to help me.
	FC2	When I need help to learn to use the CBA, system's help support is there to teach me.
Content		
	C1	CBA's questions were clear and understandable.
	C2	CBA's questions were easy to answer.
	C3	CBA's questions were relative to the course's syllabus.
	C4	CBA's questions were useful for my course.
Goal Expectancy		
	GE1	My Course's preparation was sufficient for the CBA
	GE2	My personal preparation for the CBA.
	GE3	My performance expectations for the CBA.
Perceived Playfulness		
	PP1	Using CBA keeps me happy for my task.
	PP2	Using CBA gives me enjoyment for my learning.
	PP3	Using CBA, my curiosity is stimulated.
	PP4	Using CBA will lead to my exploration.
Behavioural Intention to use CBA		
	BI1	I intend to use CBA in the future.
	BI2	I predict I would use CBA in the future.
	BI3	I plan to use CBA in the future.