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The acceptance of Moodle technology by business administration students

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ABSTRACT

The advent of information technologies to Universities has improved the teaching–learning process. Students can increase their learning skills using information technology. Those using the Moodle platform regularly seem to get better grades than those who rarely or never use it.

This paper analyzes students' intention to use Moodle platforms to improve the teaching–learning process. Its main focus is to analyze the use of the Moodle platform by University students, identifying factors which might influence the intention to use it. Understanding the factors influencing the intention to use Moodle will allow us to determine which actions might be carried out to boost its use by University students, to therefore, improve both their skills and grades.

The theoretical grounding for this research is the Technology Acceptance Model (TAM). TAM specifies the causal relationships between perceived usefulness, perceived ease of use and actual usage behavior. The proposed model has six constructs and nine hypotheses have been generated from the connections between these six constructs. These constructs include perceived compatibility with student tasks, perceived usefulness for professors, and training. Our results provide support for a number of relationships in the hypothesized model. In light of these findings, implications for theory and practice are discussed.

1. Introduction

Information technology (IT) adoption and diffusion has been studied in great detail by researchers in the information system area (Cornell, Eining, & Hu, 2011; Dasgupta, Granger, & McGarry, 2002a,b). IT acceptance in education remains a central concern of information systems research and practice. Although IT is playing an increasingly important role in contemporary education, resistance to IT remains significant in the education sector (Xu & Yu, 2004). Understanding the conditions under which IT are or are not accepted and used by students continues to be an important issue.

IT is being incorporated into the teaching/learning process, not only through the availability of online courses, but also to support and assist student learning (Gutiérrez, Trenas, Ramos, Corbera, & Romero, 2010; Martin & Serrano, 2009; Romero, Ventura, & García, 2008). The pace of e-learning is getting high since most of the higher education institutions are using web-based instruction system for teaching their online courses. Technological advances in both hardware and software have facilitated new forms of information processing and created new structures (hyper-textual and hyper-media), which will not only complement Universities, but will also transform them. Thus, when new technologies are included in the University context, virtual classrooms emerge in a dramatic fashion. This concept is currently bringing together the possibilities of teaching–learning based upon a communication system using computers (Ciudad, 2010).

New technologies (the Internet, in particular) provide faculty with the tools for teaching–learning, including the web-based applications known as e-learning platforms (Kaminski, 2005). E-learning platforms have transformed the ways professors teach and students learn (Fillion, Limayem, Laferrière, & Mantha, 2007). This transition has made it possible for students to protagonize their learning process, while the role of the teacher is that of "conductor", orchestrating and guiding students their education (Ciudad, 2010). Within this framework, University professors have had to modify the subjects and methodology involved in teaching/learning. Students must actively collaborate in learning, participating and collaborating with their teachers (Clausen, 2005; Reichert & Tauch, 2003).

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Over recent years, e-learning platforms are becoming increasingly sophisticated, showing potential as an effective way for improving the learning process. A number of these e-learning platforms exist; some require paying for access to the software, while in others this is not required. The following are in the first category: WebCT, Blackboard, and TopClasse; Moodle, Ilias, and Claroline are free (Martin & Serrano, 2009; Romero et al., 2008). They are considered open-source software (De Pablos, López, & Santos, 2010).

The most frequently used of all of these is the Moodle platform, since it is easy to use, and offers a wide range of services (chat, forums, questionnaires, etc.). All course materials are introduced using this tool; it is simple for teachers to change or increase its contents. Students can gradually connect to the information as the course progresses (Bergeren et al., 2005; Rice, 2006).

In 2011, Moodle is being used in 211 countries, and is translated into 78 languages, with 41.5 million users, of which 1.2 million are teachers. Worldwide, Spain ranks second in terms of registered institutions (high schools, schools, and Universities), and is used by nearly all Spanish public and private Universities (Moodle, 2011).

Thanks to Moodle-type platforms, University professors have gone from the conventional publishing of documents in HTML or PDF on their personal web page to designing and developing training courses or programs that combine the offer of an online tutorial with classroom sessions between the students and the teaching staff. Distance and virtual educational courses or programs, supporting communication exclusively between the teacher and students using data transmission networks, have also been developed. As a result, the learning–teaching process has improved notably (Ciudad, 2010).

Students can increase their learning skills using IT. Those using the Moodle platform regularly throughout the school year seem to get better grades than those who rarely or never use it (Martin & Serrano, 2009). However, to implement e-learning environments, students' acceptance of this technology is a very important issue.

The main objective of this paper is to analyze the use of the Moodle platform by University students, identifying factors which might influence use. Understanding the factors influencing the intention to use Moodle provides the opportunity to explore which actions might be carried out to boost its utilization by University students, and therefore, achieve their skills and grades.

TAM (Davis, 1989, 1993) has been generally used to analyze the individuals' acceptance of IT (Dasgupta et al., 2002a,b). TAM has become well-established as a robust, powerful and parsimonious model for predicting user acceptance (Cornell et al., 2011; Venkatesh & Davis, 2000). In spite of the documented empirical applicability of TAM, additional efforts are needed to validate existing research results, particularly those involving different technologies, users, and/or organizational contexts, in order to extend the model's theoretical validity and empirical applicability. Apart from the abovementioned aims, this analysis will validate the TAM in the context of e-learning platforms while also identifying new external variables which affect the constructs of perceived usefulness and ease of use.

Therefore, the theoretical contribution of this paper includes the validation of TAM for explaining or predicting University students' acceptance of Moodle e-learning platform. Furthermore, we analyze additional key determinants influencing the intention to use Moodle and the acceptance of this technology by students. The aim is to identify important practical implications for Moodle acceptance and develops understandings about how improve the intention to use Moodle.

The remainder of the paper proceeds as follows. In the next section, we provide a theoretical background of the TAM and posit the hypotheses. Then, we describe the research methodology and present data analysis and results. Finally, we include the discussion section and implications for future research.

2. Theory and hypotheses

2.1. Technology acceptance model

The theoretical grounding for TAM is the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). The TRA is based on the concept that beliefs influence attitudes, which lead to intentions, which generate behavior. TAM specifies the causal relationships between systems design features, perceived usefulness, perceived ease of use, attitude toward using, and actual usage behavior (Davis, 1993) (Fig. 1).

The basic premise of this model is that the more accepting users are of new systems, the more they are willing to make changes in their practices and use their time and effort to actually start using the system (Jones, McCarthy, & Halawi, 2010). TAM proposes two important determinants to analyze what causes people to accept or reject information technology: perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance. On the other hand, perceived ease of use refers to the degree to which a person believes that using a particular system would be free of effort (Davis, Bagozzi, & Warshaw, 1989).

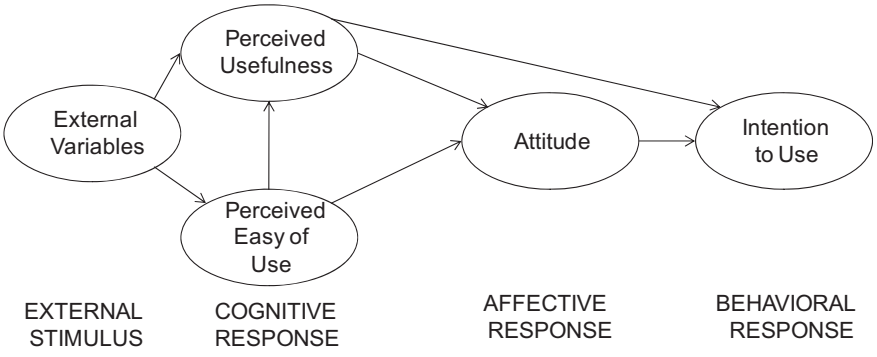

Fig. 1. Technology Aceptante model.

TAM addresses the issue of how users accept and use a technology (Teo & Noyes, 2011). Several papers have demonstrated the usefulness of TAM for analyzing user behavior as well as intention of use of a wide range of IT (Chau & Hu, 2002; Chin & Gopal, 1995; Gefen & Straub, 1997; Hu, Chau, Sheng, & Tam, 1999; Igbaria, Parasuramen, & Baroudi, 1996).

Significant progress has been made over the last decades in explaining and predicting user acceptance of IT. In particular, substantial theoretical and empirical support has accumulated in favor of the TAM and this model compares favorably with alternative models such as the TRA and the Theory of Planned Behaviour (Venkatesh, 1999; Venkatesh & Davis, 2000).

During the last two decades TAM has been used to predict user acceptance of a technology. This model has been used to explain intention of use by different types of users, including an analysis of the conditions in which technology is used (Venkatesh, 2000), gender aspects (Gefen & Straub, 1997; Venkatesh & Morris, 2000), and cultural factors (Teo, Lee, & Chai, 2008). A number of studies have been carried out in the context of education, with different types of students and faculty (Davis et al., 1989; Szajna, 1996), often with significant results.

Shen and Eder (2009) examined students' intentions to use the virtual world Second Life for education, and explored factors associated with their intentions. Results suggested that perceived ease of use affects user's intention to adopt Second Life through perceived usefulness. Computer self-efficacy and computer playfulness were also significant antecedents to perceived ease of use of virtual worlds. Lately, Wu and Gao (2011) identified perceived enjoyment as a factor in predicting attitude and behavioral intentions to the use of clickers in student learning.

Dasgupta et al. (2002a,b) analyzed the acceptance of a courseware management technology (e-collaboration tool) by undergraduate students. They found that user level is a significant determinant of the use of this technology. Al-hawari and Mouakket (2010) analyzed the significance of TAM factors in the light of some external factors on students' e-retention and the mediating role of e-satisfaction within e-learning context. They found significant relationships between these factors and pointed out that further testing across different countries is needed to identify other external factor that might influence IT acceptance.

Elwood, Changchit, and Cutshall (2006) investigated students' perceptions on laptop initiative in higher education. They found that the external factor "perceived change" is relevant to understand the technology acceptance within the university environment. Khaled and Alkhateeb (2008) predicted students' usage of Internet in emerging economies using an extended TAM. The results showed that perceived usefulness, gender and income level were significant predictors of students' Internet usage. Drennan, Kennedy, and Pisarski (2005) examined the factors affecting student satisfaction with flexible online learning and identified two key student attributes of student satisfaction: positive perceptions of technology in terms of ease of access and use of online flexible learning material and autonomous and innovative learning styles.

Gibson, Harris, and Colaric (2008) determined the degree to which TAM was able to adequately explain faculty acceptance of online education. Results indicate that perceived usefulness is a strong indicator of faculty acceptance; however, perceived ease of use offers little additional predictive power beyond that contributed by perceived usefulness of online education technology. Waheed and Jam (2010) tested the teacher's acceptance of implementing web-based learning environment based on TAM. The results of the study support that teachers are accepting to implement the new virtual based learning system for better productivity of teachers, students and institution. Recently, Teo and Noyes (2011) examined the influence of perceived enjoyment on pre-service teachers' intention to use technology. Results showed that perceived enjoyment was a significant predictor of perceived usefulness, perceived ease of use, and intention to use technology.

Therefore, TAM can be considered valuable and useful for explaining or predicting user acceptance of IT, particularly among students (Amin, 2007; Hu et al., 1999). This study attempts to identify additional key determinants influencing the intention to use Moodle and the acceptance of e-learning platforms at Universities.

2.2. Hypotheses

TAM arises from the theory that perceived ease of use of a technology has an effect on the perceived usefulness. Several studies have confirmed this relationship (Liaw & Huang, 2003; Shang, Chen, & Shen, 2005), others have rejected it (Agarwall & Prasad, 1999; Venkatesh & Morris, 2000), while others do not take it into account (Gefen & Straub, 1997; Liu & Wei, 2003). The intensity or direction of this relationship is not always the same, depending on the degree of innovation of the technology (Peffers & Dos Santos, 1996). A technology viewed by people to be easier to use and/or to have higher usefulness is more likely to be accepted. TAM establishes that perceived ease of use and usefulness affect the intention to use. The first three hypotheses in the proposed model are based on three basic relationships set up in TAM (Davis, 1989; Davis et al., 1989). Therefore, the first set of hypotheses for this study is stated as follows:

H1. Perceived ease of use has a significant effect on the perceived usefulness of Moodle.

H2. Perceived ease of use has a significant effect on the intention to use Moodle.

H3. Perceived usefulness has a significant effect on the intention to use Moodle.

Perceived ease of use and perceived usefulness have traditionally been used as determinants of individual technology adoption (Koufaris, 2002; Szajna, 1994). However, these two variables do not fully reflect student motivation to adopt Moodle. To complete the proposed model, we include three external variables which might be relevant for students to adopt Moodle. These external variables influence a student attitude toward a behavior indirectly by influencing the salient beliefs about the consequences of performing the behavior (Fishbein & Ajzen, 1975).

2.2.1. Perceived compatibility with student tasks

Despite the Moodle platform has many potential benefits, resistance to change must be taken into account in order to achieve the desired results, which is a common challenge face by the implementation of IT (Jones, 2003; Lippert & Davis, 2006). The use of new technologies normally implies changes in the way tasks are carried out, in certain cases creating a feeling of reticence in those involved. Students are faced with acquiring new skills on a steep learning curve (Thuemmler, Buchanan, Fekri, & Lawson, 2009), which is not always in line with the way they usually work. This can often be frustrating for professors; having prepared the class on the Moodle platform, their students may not accept it as it is not consistent with their usual way of working. We can state these two hypotheses:

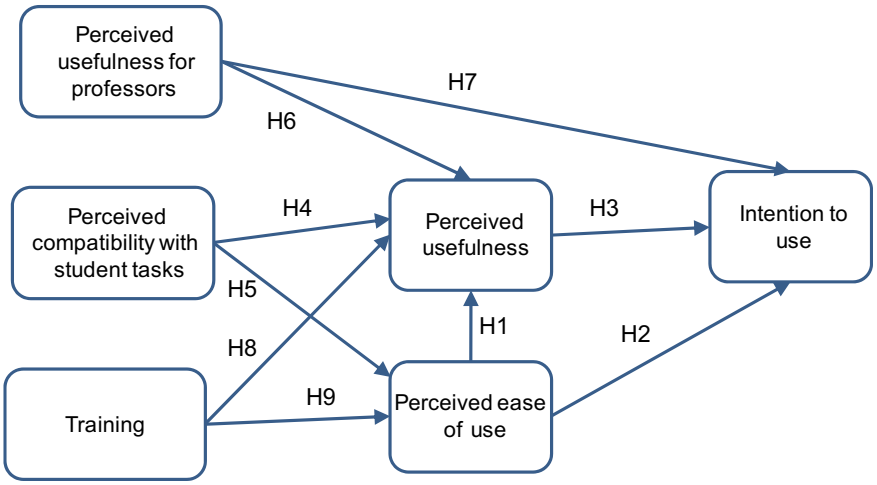

Fig. 2. Research model, relations and hypotheses of different constructs.

H4. Perceived compatibility with student tasks has a significant effect on perceived usefulness of Moodle.

H5. Perceived compatibility with student tasks has a significant effect on perceived ease of use of Moodle.

2.2.2. Perceived usefulness for professors

In the above discussion of perceived usefulness by users, the possibility of altering their intention of use was mentioned because users consider the technology use to be necessary (Klopping & McKinney, 2004). Perceived usefulness refers to the extent to which a person believes that using technology will enhance his/her productivity (Davis et al., 1989). However, students might not only consider Moodle's usefulness to improve learning, but also observe its usefulness in enhancing their professors' productivity, making tasks such as the evaluation and control of student activity simpler. The perceived usefulness by students, and therefore, intention of use, is closely related to their perception of Moodle's usefulness to professors. The next hypotheses can be stated:

H6. Perceived usefulness for professors has a significant effect on perceived usefulness of Moodle.

H7. Perceived usefulness for professors has a significant effect on the intention to use Moodle.

2.2.3. Training

Effective innovation implementation often requires hefty investments of time and money in technology start-up, training, and user support (Katherine & Knight, 2005). Training provided to students can have a significant influence on the perceived ease of use and perceived usefulness of the Moodle platform. Training can facilitate learning processes, making the relative advantages of technology in

Table 1
Items loading.

Construct	Indicator	Loading
Perceived usefulness for professors (PUP)	PUP1. Moodle platforms and their databases and data analysis capacities can help professors to evaluate students.	0.8219
	PUP2. Moodle reduces the time invested by professors in student evaluation.	0.8428
	PUP3. Moodle enables professors improve quality of control activities.	0.8729
	PUP4. Moodle allows professors to accomplish more work than would otherwise be possible.	0.8359
Perceived compatibility with student tasks (PC)	FC1. Using Moodle is not compatible with aspects of my studies.	0.6951
	FC2. Using Moodle is not completely compatible with my current situation.	0.7468
	FC3. I think that using Moodle do not fit well with the way I like to study.	0.8938
	FC4. Using Moodle does not fit into my work style.	0.9066
Training (T)	T1. The kind of training provided to me about Moodle was complete.	0.9049
	T2. My level of understanding about Moodle was substantially improved after going through the training program.	0.9014
	T3. The training gave me confidence in Moodle.	0.8940
	T4. The trainers were knowledgeable and aided me in my understanding of Moodle	0.8542
Perceived usefulness (PU)	PUE1. Using Moodle saves me time.	0.7906
	PUE2. Using Moodle allows me to accomplish more work than would otherwise be possible.	0.8545
	PUE3. Using Moodle reduces the time I spend on unproductive activities.	0.8610
	PUE4. Using Moodle enhances my effectiveness on the studies.	0.8436
Perceived ease of use (PEU)	PEU1. I don't make mistakes when using the Moodle platform.	0.7839
	PEU2. Interacting with Moodle is often pleasant.	0.8323
	PEU3. I do not need to consult the user manual often when using Moodle.	0.8301
	PEU4. Interacting with Moodle does not require a lot of mental effort.	0.8059
Intention to use (IU)	IU1. I intend to use Moodle in my studies when it becomes available in all subjects.	0.9416
	IU2. I intend to use Moodle in my studies as often as needed.	0.9045
	IU3. To the extent possible, I would use Moodle to do different things (blogs, e-mails, chats…).	0.8524

Table 2
Composite reliability, AVE and Cronbach coefficient alpha.

Construct	Composite reliability	AVE	Cronbach alpha
Perceived usefulness for professors (PUP)	0.907978	0.711644	0.865019
Perceived compatibility with student tasks (PC)	0.887078	0.665440	0.837901
Training (T)	0.937681	0.790073	0.912697
Perceived usefulness (PU)	0.903982	0.702050	0.858518
Perceived ease of use (PEU)	0.886497	0.661447	0.826890
Intention to use (IU)	0.927583	0.810488	0.879861

order to improve intention to use (Cooner & Rumelt, 1991; Robinson, Marshall, & Stamps, 2005). One of the most frequently cited barriers to using technology was lack of training (Keil, Beranek, & Konsynski, 1995). Consequently, the final group of hypotheses is:

H8. Training has a significant effect on perceived usefulness of Moodle.

H9. Training has a significant effect on perceived ease of use of Moodle.

The proposed model has six constructs and nine hypotheses have been generated from the relations of these six contructs (Fig. 2).

3. Methodology

This research is based on a regression analysis of latent variables using the optimization technique of the Partial Least Squares (PLS) to develop a model that represents the relationships among the six proposed constructs measured by many items. The PLS is a multivariate technique to test structural models (Wold, 1985). The PLS method estimates the model parameters which minimize the residual variance of the whole model dependent variables (Hsu, Chen, & Hsieh, 2006), does not require any parametric conditions (Chin, 1998) and is recommended for small samples (Hulland, 1999).

The study took place among second-year students of Business Administration in a Spanish public University. The students use the Moodle platform for nearly all their subjects. Students have access to the computers located in the University's IT room, and are also able to loan out laptops to be used at home, if necessary. Data were collected in April of 2011, with a total of 162 valid replies collected. Of 162 students responding, 58 were men and 104 women; 159 had PCs at home, while 153 had active profiles on social networking sites (Facebook, Twitter,…).

The questionnaire has several items related to each of the constructs included in the model. The survey items were measured using a seven-point Likert scale. All items ranged from 1 (strongly disagree) to 7 (strongly agree). Theoretical constructs were operationalized using validated items from prior research. Perceived ease of use, perceived usefulness and intention to use Moodle were measured using items adapted from Davis (1989, 1993), Davis et al. (1989) and Mathieson (1991). The measurement of "Perceived compatibility with student tasks" was adapted from Dasgupta, Agarwal, Ioannidis, and Gopalakrishnan (1999) and Moore and Benbasat (1991). "Training" items' measures drew their inspiration from Carr, Zhang, Klopping, and Min (2010). Items for "Perceived usefulness for professors" were developed for this research.

4. Data analysis and results

The analysis of data took place through a two-stage methodology, in which the measurement model first is developed and evaluated separately from the full structural equation model (Gerbing & Anderson, 1988). Therefore, the first step involves establishing individual reliability for each item and the convergent and discriminate validity of the constructs.

The individual reliability for each item is given by loadings or correlations between the item and the construct. The convergent validity of each construct is acceptable for a loading higher than 0.505 (Falk & Miller, 1992). Table 1 indicates the loadings for each item. They all comply with established conditions.

Reliability makes it possible to measure internal coherence of all the indicators in relationship to constructs. So as to verify the realibility of indicators, the Cronbach coefficient alpha (Cronbach, 1970) and the composite reliabilities coefficient (Werts, Linn, & Jöreskog, 1974) were utilized, which range from 0 (no similarities) and 1 (maximum similarities). Both parameters are taken into account, as the first considers the contribution made by each indicator to be similar, while the second takes the respective indicators into account. Table 2 indicates the values of each coefficient. Composite reliabilities are over the minimum acceptable limit of 0.70 (Gefen, Straub, & Boudreau, 2000; Nunnally, 1978). The Cronbach coefficient alpha levels are also shown in Table 2. They were all above 0.70, which is recommended for confirmatory research (Churchill, 1979).

Convergent validity represents the common variance between the indicators and their construct. It is measured by the Average Variance Extracted (AVE), and the acceptable thereshold should be higher than 0.50 (Fornell & Laker, 1981). Table 2 presents the AVE scores achieved for each of the six constructs employed, which in all cases surpasses the minimum desirable value.

Table 3
Discriminant validity of constructs.

	PUP	PC	T	PU	PEU	IU
PUP	**0.844**					
PC	−0.254	**0.816**				
T	0.221	0.118	**0.888**			
PU	0.606	−0.274	0.239	**0.838**		
PEU	0.288	−0.522	0.045	0.311	**0.813**	
IU	0.535	−0.284	0.272	0.623	0.410	**0.900**

Table 4
Factor structure matrix of loadings and cross-loadings.

	PUP	PC	T	PU	PEU	IU
PUP1	**0.8219**	−0.1522	0.1859	0.4342	0.1929	0.4603
PUP2	**0.8428**	−0.2805	0.2303	0.5818	0.2391	0.5076
PUP3	**0.8729**	−0.1457	0.1645	0.4814	0.2099	0.4087
PUP4	**0.8359**	−0.2613	0.1565	0.5291	0.3260	0.4166
PC1	−0.1056	**0.6951**	0.1779	−0.0363	−0.2527	−0.0606
PC2	−0.1377	**0.7468**	0.1489	−0.1520	−0.3638	−0.0880
PC3	−0.2345	**0.8938**	0.1087	−0.2558	−0.4769	−0.3104
PC4	−0.2849	**0.9066**	0.0295	−0.3333	−0.5245	−0.3389
T1	0.1962	0.0882	**0.9050**	0.2640	0.0351	0.2840
T2	0.2097	0.1015	**0.9014**	0.2073	0.0613	0.2403
T3	0.2187	0.1286	**0.8940**	0.1512	0.0443	0.2465
T4	0.1654	0.1144	**0.8542**	0.1991	0.0194	0.1862
PUE1	0.4898	−0.3032	0.1166	**0.7906**	0.3162	0.5573
PUE2	0.5384	−0.2186	0.2840	**0.8545**	0.2466	0.5507
PUE3	0.4849	−0.1387	0.1363	**0.8610**	0.2027	0.4560
PUE4	0.5106	−0.2467	0.2525	**0.8436**	0.2684	0.5123
PEU1	0.1879	−0.3610	0.1192	0.2509	**0.7839**	0.3431
PEU2	0.2165	−0.5133	0.0327	0.2721	**0.8323**	0.3366
PEU3	0.2349	−0.4141	−0.0275	0.2299	**0.8301**	0.3046
PEU4	0.3007	−0.3967	0.0208	0.2555	**0.8059**	0.3472
IU1	0.5088	−0.2510	0.2786	0.6041	0.3811	**0.9416**
IU2	0.4167	−0.2272	0.1538	0.4970	0.3261	**0.9045**
IU3	0.5073	−0.2831	0.2884	0.5708	0.3916	**0.8524**

In order to confirm the discriminant validity among constructs the AVE square root must be superior to the correlation between constructs (Fornell & Laker, 1981). Table 3 indicates the square roots of the AVE (bold numbers in the diagonal) and the correlation between constructs. It suggests adecuate discriminat validity of the measurements.

In order to complete the analysis of the convergent and discriminant validity of the measurements, the factor structure matrix of loadings and cross-loadings were analyzed (Table 4). Items measuring the same construct indicate prominently and distinctly higher factor loadings on a single construct (bold numbers) than on other construct. This is also an indication of the convergent and discriminate validity of the measurement.

After the individual reliability for each item and the convergent and discriminate validity of the constructs have been established, the structural model is examined. To test H1 through H9, a PLS analysis was perform. The regression coefficients are based on a bootstrapping of 500 samples and not on samples estimator. It permits the generalization of the results and the computation of the t-student for each hypothesis (Lévy, Valenciano, & Michal, 2009). The results presented in Fig. 3 and Table 5 summarize the relationships between the different constructs. The predictive capability of the model is satisfactory because all R-Squares are higher than 0.10 (Falk & Miller, 1992).

5. Discussion

TAM theory suggests that there is a significant positive relationship between perceived ease of use and perceived usefulness. Based on our structural equation model, this relationship (H1) is positive but not significant, so therefore the hypothesis is not supported. A possible

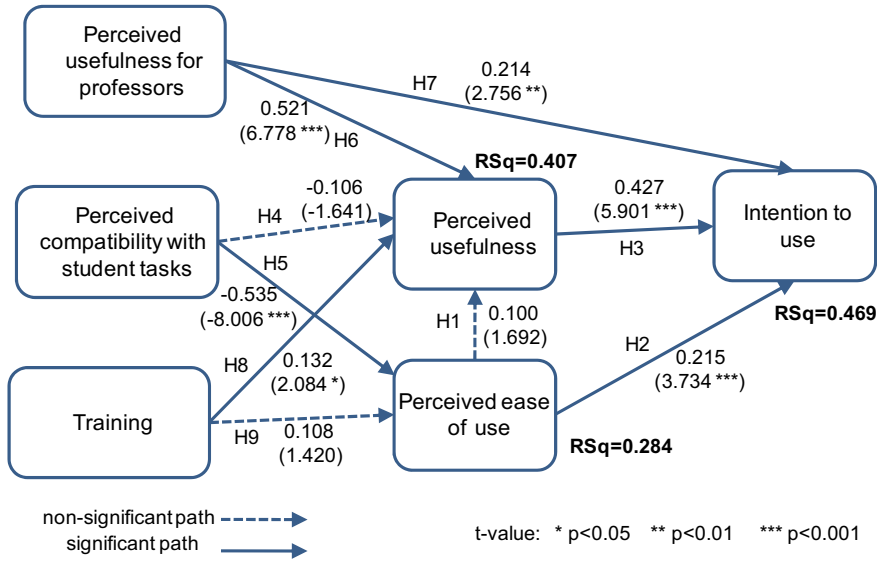

Fig. 3. Results of testing model.

Table 5
Summary of test results for the structural model.

Hypothesis	Path	Standardized path coefficient	t-value	Supported?	Construct	R-squared
H1	PEU → PU	0.1000	1.6917	No	Perceived usefulness	0.407
H4	PC → PU	−0.1060	−1.6410	No		
H6	PUP → PU	0.5210	6.7778	Yes, $p < 0.001$		
H8	T → PU	0.1320	2.0839	Yes, $p < 0.05$		
H5	PC → PEU	−0.5350	−8.0062	Yes, $p < 0.001$	Perceived ease of use	0.284
H9	T → PEU	0.1080	1.4199	No		
H2	PEU → IU	0.2150	3.7339	Yes, $p < 0.001$	Intention to use	0.469
H3	PU → IU	0.4270	5.9014	Yes, $p < 0.001$		
H7	PUP → IU	0.2140	2.7559	Yes, $p < 0.01$		

explanation might be the learning which takes place after a new information technology application (Peffers & Dos Santos, 1996). The result obtained might be based on the fact that nearly all the students included in the study are habituated to using social media platforms (Facebook, Twitter, …), which are similar to the Moodle platform. They have a higher rate of learning, which might indicate that perceived ease of use is not a determining factor in perceived usefulness. The process of adapting to and accepting new technologies which are similar to others with which the users are familiar may not be the same when technology is totally unfamiliar, in which case the perceived ease of use might indeed exert more influence on perceived usefulness. Taylor and Todd (1995) found that those users without experience may focus first on ease of use, and as experience increases, users presumably overcome concerns about ease of use and may focus their attention on perceived usefulness. This suggests that the path from perceived ease of use to perceived usefulness will be stronger for inexperienced users. Our findings were consistent with this; because of the 162 students responding, 159 had PCs at home, while 153 had active profiles on social networking sites.

The results obtained support the theory that the perception of Moodle platform as easy to use or learn has a positive influence on the intention to use it (H2, $p < 0.001$). In this case, the fact that the Moodle platform presents no serious challenges to student use, due to its similarity to other platforms with which they are already familiar, provides added value instigating its use. According to literature, results indicate that perceived usefulness has a positive and significant relationship with intention to use Moodle (H3, $p < 0.001$).

Concerning Moodle's perceived compatibility with student tasks, a significant relationship between this external variable and perceived ease of use was noted (H5, $p < 0.001$). Thus, the fit between student tasks and the Moodle platform might further contribute to perceived ease of use. This is an interesting, attention-getting relationship for professors. During the process of digitalizing subjects using e-learning platforms, professors might adapt the students' tasks to the new work environment, in order to ensure a good fit. If students perceive incompatibility between their tasks and the Moodle platform, the tool is then considered hard to use, with intention of use declining.

Contrary to expectations, no significant relationship between the perceived compatibility of Moodle with student tasks and perceived usefulness was found (H4). It indicates that student's resistance to change may not be a serious cause for concern in utilizing e-learning platforms. Sometimes, resistance to change implies that users do not perceive the usefulness of technology if it does not fit with the way they like to work or with their work style. However, this relationship is not significant in this research. A possible explanation of this finding could be that the students' resistance to IT change is lower that other populations' resistance because it is not difficult for them to use this kind of social media platforms and they have a high IT learning rate.

This study has clarified that student perceptions of the Moodle platform's usefulness for teachers has a significant positive relationship, both regarding perceived usefulness (H6, $p < 0.001$) as well as intention to use Moodle (H7, $p < 0.01$). Should Universities and professors choose to support students' use of the Moodle platform, they should stress its usefulness for teachers in order to improve evaluation processes while carrying out a greater number of tasks. Universities can therefore take appropriate steps to positively influence this perceived usefulness for professors that bring more intention to use Moodle by students.

Hypotheses 8 and 9 are concerned with the relationship between training, perceived usefulness and perceived ease of use. One mechanism for influencing intention to use Moodle by students is through training. We found that training positively influences perceived usefulness (H8, $p < 0.05$). However, no significant relationship between training and perceived ease of use was found (H9). Training does not improve the perceived ease of use Moodle. This might also be due to the fact that, since students are already used to web platforms, the training does not improve their perceived ease of use. A possible explanation of this finding, as proposed by Hu et al. (1999), is that students are able to learn new technologies quickly and with less training than other populations because they are used to computers and to this kind of social media platforms. However, training is indeed important for improving the Moodle platform's perceived usefulness. Universities should focus the training aspect on the Moodle platform's usefulness for students, and how it will enhance their productivity, rather than wasting a great deal of time showing how to handle Moodle.

6. Concluding remarks

Over recent years, the role of students in their learning processes has changed significantly, mainly due to the application of ECTs in evaluating University students. This, coupled with the important development of IT applied to teaching, has resulted in active participation of students in the learning–teaching process. Within this framework, the use of e-learning platforms makes it possible to improve the learning–teaching process, since it seems that students using these tools increase their skills while improving their grades. This study has analyzed the Moodle platform's intention of use for University students, identifying factors which might influence its use, in order to understand which actions might be carried out to increase its use by University students, and therefore, make it essential in improving their ability in using it while improving their performance.

This study provides additional evidence about the appropriateness of using the TAM to analyze the acceptance of Moodle platform by University students. It has validated existing research results involving different technologies, users, and/or organizational contexts. TAM was extended in this study, through the consideration of three external variables in the context of Moodle platforms. The addition of

perceived usefulness for professors, perceived compatibility with student tasks, and training does provide specific insight on the adoption of Moodel by business administration students.

Therefore, this research integrates the appropriate information systems literature in order to enhance the knowledge of Moodle platforms from the student's perspective. A further theoretical contribution is the development and validation of survey measures for the constructs examined in this study, particularly for the constructs "perceived compatibility with student tasks" and "perceived usefulness for professors". In a situation where theory is advanced, it is essential to involve the creation and validation of new measures, and such efforts are considered an important contribution to scientific practice in the information systems field (Straub, Boudreau, & Gefen, 2004). These measures can be utilized to examine other emerging technologies within the context of education.

In addition to the theoretical contribution, the research model suggests important practical implications for Moodle platform acceptance and develops an understanding about how to improve intention to use them in Univesities. As opposed to other populations, University students are more and more accustomed to using web platforms such as Facebook and Twitter. In order to exert influence on perceived ease of use, teachers considered that a correct design is much more important that training as far as the tasks expected of students were concerned, to create an ideal fit between student tasks and Moodle characteristics. During the implementation process of e-learning platforms, technology developers and implementation teams might adapt systems to the new work environment, in order to ensure a good fit. If students perceive incompatibility between the tasks to be performed and these e-learning platforms, they might find it difficult to use and/or useless. On the other hand, training processes might not only explain system use, but also illustrate the ability of these platforms to enhance job performance. Training should highlight the Moodle platform's value for increasing productivity, stressing all its useful aspects.

An external variable which seems quite relevant is its perceived usefulness for professors. Stressing Moodle's usefulness for teachers to students could influence perceived usefulness for professors. If students do not have this perception, it is unlikely they will use the platform. Therefore, it is crucial that teachers not simply upload the subject contents on the platform; they should make the effort to impress how useful the Moodle platform and all of its possibilities can be for their learning process.

In summary, this research contributes to the field of e-learning platforms acceptance because it provides insight on factors that contribute to intention to adopt this technology. The findings point out specific actions by faculty that can improve student experience with Moodle and identify other actions that appear to have no effect. These results could be used to direct Universities toward successful paths for supporting communication between teachers and students using Moodle. Further research might investigate the importance of influences such as individual differences, prior experience, level of educations, different countries and the role of technology in Universities in the context of predictors of perceived ease of use and usefulness. More broadly, future research should seek to further extend models of technology acceptance to encompass other important theoretical construct in education.

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