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PREDICTION OF STUDENT'S BEHAVIORAL INTENTION TO USE SMART LEARNING ENVIRONMENT: A COMBINED MODEL OF SELF-DETERMINATION THEORY AND TECHNOLOGY ACCEPTANCE

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Abstract:

The development of modern technologies facilitated for scholars have examined how the factors affect university student engagement in smart classroom learning environments. This study aims to provide a combined model of accepting and motivating variables for predicting students' behavioral intention to use smart learning environments through the Self-determination theory and the Technology Acceptance model. The study confirms that perceived enjoyment and perceived usefulness play a critical role in predicting and determining students' satisfaction with the smart learning environment. Additionally, students are satisfied and trusted in the system, they are most likely in turn behavioral intention to use the smart learning environment. This study contributes to a deeper understanding of the patterns of interaction and learning when students are motivated to learn in a smart learning environment.

Keywords: *Smart learning environment; Self-determination theory; Technology acceptance model; Vietnamese university students*

1. Introduction

With exponential technology breakthroughs, anything can be instrumented, networked, and infused with intelligent design. Technology has also significantly contributed to the advancement of higher education, making it generally accessible to a wider range of students. In recent years, smart education has drawn much attention. Global educational projects with a focus on smart education have recently been carried out (Chan et al., 2006; Hua et al,, 2012; Zhu et al., 2016). According to Hwang (2014), smart learning environments "not only allow learners to access digital resources and interact with learning systems from any location and at any time, but they also actively provide the necessary learning guidance, hints, supportive tools, or learning suggestions in the right place, at the right time, and in the right form". In order to qualify as "smart," a learning environment must provide "seamless connectivity," which is defined as "continuous service as any device or service connects," as well as "natural contact" with students and a high level of engagement (Zhu et al., 2016). According to Koper (2014), smart learning environments are physical settings that are augmented by digital, context-aware, and flexible technology in order to facilitate better and faster learning. Learners are provided with the necessary assistance, recommendations, or supportive tools in the appropriate format, at the appropriate time, and in the appropriate location when they are in a smart learning environment. Smart learning environments not only permit learners to interact with learning systems and access ubiquitous resources from any location, but they also allow learners to do so from any location. Because of the widespread availability of smart technology, education may take place whenever and wherever it is most convenient for the student. In addition, a typical smart learning environment is outfitted with technologies such as wireless Internet access, interactive whiteboards and projectors for whole-class instruction, mobile devices for both the teachers and students to use, cameras to record and store lectures, sensors and acoustics to control the physical environment, and educational management and assessment tools (Saini & Goel, 2019). Up to now, researchers have been to investigate the interactions between different factors of student's smart learning environment acceptance (Koper, 2014; Liaw & Huang, 2013). There are two significant knowledge gaps that exist in this area of research. First, a population gap is determined since there is an emphasis on examining certain components of a student's academic or social experience in a particular nation or location. This leads to the identification of a population gap. In a similar vein, Huang (2008) remarked that research on higher education is concentrated on a particular student population. The focus of this study is on the student population in Vietnam. Second, there are a few studies on smart learning environment (Bdiwi et al., 2019; Oliveira et al., 2021; Tabuenca et al., 2021). However, In terms of theory development, these studies were primarily based on generic adoption models, for example the Unified Technology Acceptance and Use Theory (UTAUT) proposed by Venkatesh et al. (2003). To the best of our knowledge, up to now few research using Self-determination theory, and the Technology Acceptance Model (TAM) in smart learning environment. Hence this study aims to understand the factors driving Vietnamese university students' self-determination (SDT) to learn through smart learning devices. The purpose of this study is to include motivational factors into technological acceptability. Researchers propose that in order to attain a more inclusive approach to technology acceptance in educational environments, motivating factors should be introduced into technology acceptance models (Pedrotti & Nistor, 2016). In the current study, the SDT motivating components of autonomy, competence, and relatedness were included into TAM, and their effect on perceived ease of use, perceived usefulness, and perceived enjoyment as predictors of behavioral intention to use was investigated. While studies have been conducted in the past that relate SDT to information (Chen & Jang, 2010; Lee et al., 2015; Nikou & Economides, 2017), e-learning and m-learning acceptance (Jeno et al., 2019; Liaw & Huang, 2019), this study is to provide a combined model of accepting and motivating variables for predicting students' behavioral intention to use smart learning environments.

2. Literature review

2.1. Self-Determination Theory (SDT)

According to Ryan and Deci's self-determination theory (SDT), individuals have an innate propensity for psychological development, and as a result, they have a desire to acquire new skills, become more knowledgeable, and form relationships with other people. People's natural motivational inclinations toward learning and growth and how they might be supported is the primary emphasis of SDT as a human development theory with substantial implications for education (Ryan & Deci, 2020). SDT is expressed as a human development theory with important implications for education. People, according to SDT, have innate wants to be effective, independent, and socially linked, which come from their fundamental psychological needs in the form of competence, autonomy, and relatedness (Ryan & Deci, 2000). These requirements are derived from people's basic psychological needs in the form of competence, autonomy, and relatedness. According to Ryan et al. (2019), in order to guarantee that an individual will have a healthy growth, that individual need get assistance for their fundamental psychological needs. An individual's purpose to interact successfully with his or her surroundings and a sense of expertise are necessary in order to feel the sense of competence while completing a task. Competence is an expression of this goal. Autonomy may be defined as an individual's deep-seated yearning as well as their sense of initiative to engage in a pursuit in which they have a sense of choice and independence. In conclusion, relatedness is a concept that places an emphasis on an individual's sense of belonging and the urge to connect with individuals in a social or professional situation (Deci & Ryan, 2000; Ryan & Deci, 2020).

2.2. Technology acceptance model (TAM)

The TAM is a specific model developed to explain and predict users' computer usage behaviour. Derived from the TRA, it predicts user acceptance based on the influence of two use beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEU). Both PU and PEU are posited as having significant impact on a user's attitude toward using the system. Behavioural Intentions (BI) to use is jointly determined by a person's attitude toward using the system and its perceived usefulness. BI then determines the actual use of the system. TAM, with its reliable and robust structure which has been demonstrated in various studies conducted with many different samples and in various settings (e.g. Lu et al., 2019; Şahin et al., 2022), is among the leading models that have formed the basis of numerous studies in the field of education (Davis et al., 1989). TAM presents a reliable and robust structure (Davis et al., 1989).

3. Hypotheses development and Conceptual framework

3.1. Autonomy

According to Ryan & Deci (2000), social contextual factors that promote one's emotions of competence, autonomy, and relatedness are the foundation for enhancing extrinsic and intrinsic motivations, which leads to higher performance. Perceived autonomy is defined as "the degree of having control over one's own actions" (Yoon & Rolland, 2012). According to Karahanna & Straub (1999) psychological theory is the origins of usefulness and ease of use. (Roca & Gagné, 2008) said that the contextual component of autonomy support will improve perceived usefulness. In the literature, positive relationships between autonomy and perceived usefulness, autonomy and perceived ease of use has been reported (Fathali & Okada, 2018; Lu et al., 2019; Nikou & Economides, 2017; Racero et al., 2020). As a result, the following hypotheses are proposed:

H1. Autonomy support has a positive effect on perceived usefulness.

H2. Autonomy support has a positive effect on perceived ease of use

3.2. Competence

Perceived competence is "an individual's belief that he or she can effectively perform a particular task or behavior." (Yoon & Rolland, 2012). Utilizing e-learning technology requires a certain level of digital competence. Perceived competence measures the level of confidence in using e-learning technology (Teo et al., 2009) . In order to make the most of the resources available to them and to create the most favorable learning environment possible, students must possess this competence. Once students have reached a particular degree of competence, they will view the systems as valuable, and they will be more willing to incorporate the technology in their future use (Fleming et al., 2007) and to enjoy learning. Previous studies has demonstrated the relationship between competence and perceived usefulness, perceived enjoyment (Sørebø et al., 2009; Fathali & Okada, 2018; Lu et al., 2019; Nikou & Economides, 2017). As a result, the following hypotheses are proposed:

H3. Competence has a positive effect on perceived ease of use

H4. Competence has a positive effect on perceived usefulness

H5. Competence has a positive effect on perceived enjoyment

3.3. Relatedness

Perceived relatedness in this study is defined as "the sense of identification or connectedness an individual feels with other humans" (Yoon & Rolland, 2012). Students may do tasks even if they are not naturally interesting or pleasurable because they are appreciated by relevant persons to whom they feel attached (i.e., teachers, classmates, or university). According to the SDT, people are more likely to support the aims of their group when they feel related to other members of the group. This is true even if autonomy and competence have a significant impact on motivation. As a result, people are more motivated when they are in an environment that encourages autonomy and gives them a sense of relatedness (Ryan & Deci, 2000). Researchers have empirically tested the positive relationship between perceived relatedness and perceived usefulness in learning context (Sahin & Sahin, 2022; Racero et al., 2020, Roca & Gagne (2008); perceived relatedness and perceived playfulness (Roca & Gagne, 2008). As a result, the following hypotheses are proposed:

H6. Relatedness has a positive effect on perceived usefulness of the smart learning environment.

H7. Relatedness has a positive effect on perceived enjoyment of the smart learning environment.

3.4. Perceived ease of use, perceived usefulness and perceived enjoyment

Perceived usefulness (PCU) refers to “the degree to which a person believes that using a particular system would enhance his or her job performance” (Davis, 1989, p.320). Perceived usefulness is found to be the primary motivator of first- time acceptance or so called initial acceptance in smart learning environment by previous research (e.g Ong et al., 2004; Van Raaij & Schepers, 2008). Different studies have used the construct PEOU as antecedent of e-satisfaction (Barnes and Vidgen, 2000; Jeong and Lambert, 2001). In an e-learning context, students that perceive the system to be easy to use, develop better attitudes toward e-learning (Saade & Kira, 2009).

Perceived ease of use (PEOU) refers to the extent to which an individual perceived that using a system is easy or effortless (Davis, 1989). Previous studies revealed that if an individual perceives a system to be easy to use, he/she is more likely to perceive the system to be useful. In addition, if an individual perceives the system to be easy to use, the individual is more likely to use the system, especially among novice users. Usefulness has also been used by different researchers as predictors of e-satisfaction within online context such as Yang et al. (2003). With the acceptance research (Davis et al., 1989; Davis, 1989), perceived usefulness and ease of use are the two main factors influencing how users feel about using learning technology.

Perceived enjoyment (PCE) is described as the degree to which the user perceives a technology as enjoyable independently of any external reward (Ryan & Deci, 2000). Nusair and Kandampully (2008) discovered playfulness as the devises that attract the attention of the online system users with enjoyable inputs, it might include features such as animation, music, video, and other multimedia effects. They further argued that perceived enjoyment is essential in attracting, satisfying, and retaining users. Alain Yee (2013) also stated that perceived ease of use, perceived usefulness and perceived enjoyment are positive affect to satisfaction.

As a result, the following hypotheses are proposed:

H8. Perceived ease of use has a positive effect on satisfaction.

H9. Perceived usefulness has a positive effect on satisfaction.

H10. Perceived enjoyment has a positive effect on satisfaction.

3.5. Satisfaction

Consistent with Keller (1983), this study defines learning satisfaction as the perception of being able to achieve success and positive feelings about achieved outcomes. Satisfaction will positively affect learners’ behaviors, such as learners’ behavioral intention or self-regulation of using smart learning.

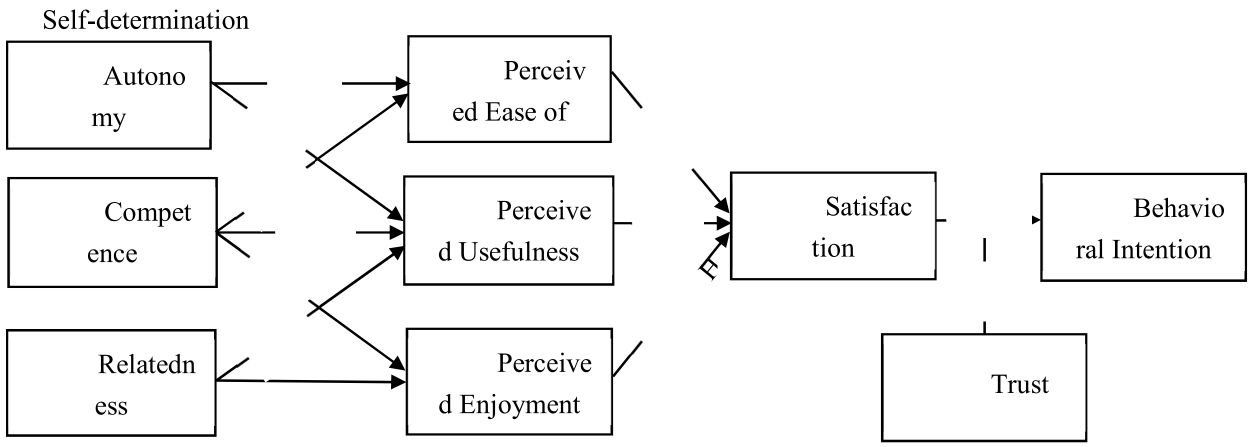
Acording to Wu et al. (2015), perceived satisfaction have a positive influence on continuing learning intention. If perceived satisfaction increases, then the goal of continuing is likely to learn will also increase. On the other hand, a decline in the intention to continue learning will occur if the perceived learning satisfaction is undesirable. As a result, the following hypotheses are proposed:

H11. Satisfaction has a positive affect to behavioral intention in the smart learning environment.

3.6. Trust

Gefen et al., (2000) defined trust as "individual willingness to rely based on beliefs in ability, benevolence, and integrity". The interactions that take place inside any society are predicated on trust, and this includes virtual ones. Trust is a strategy that individuals employ to reduce the fears that come along with adopting a new system, and it has been very extensively explored in the preceding literature as a mechanism for doing so (Alalwan & Williams, 2014; Gao and Bai, 2014). Therefore, this study suggests the following hypothesis:

H12. Trust has a positive influence to behavioral intention in the smart learning environment



g. 1. The proposed framework

4. Research methodology

The data collection tool consists of two sections, including the demographic form and scale items. The first section consists of questions about personal information, and the second section comprises a 7-point likert type scale (1 = *strongly disagree*; 7 = *strongly agree*) consisting of 44 items (Table 1). The minimal sample size was also calculated using G*Power version 3.1, which has a statistical power of 0.8, a margin error of 0.05, an effect size of 0.15, and eight predictors (Christopher, 2010). 350 participants were Vietnamese students who have been utilized smart learning to participate in the study.

Table 1

Measurement Items and references.

Items	Measurement Items	Sources
Perceived Ease of Use (PEOU)	PEOU1: Learning how to use smart learning environment is easy for me. PEOU2: I find smart learning environment easy to use. PEOU3: It is easy to become skillful at using smart learning environment.	(Alain Yee, 2013; Hew & Kadir, 2016)
Perceived Usefulness (PCU)	PCU1: Using smart learning environment helps me accomplish things quickly. PCU2: I find smart learning environment useful in my life. PCU3: I believe smart learning environment contents are informative. PCU4: I intend to use smart learning environment to improve my learning motivation.	(Liaw & Huang, 2013; Sørebø et al., 2009)
Perceived Enjoyment (PCE)	PCE1: Using smart learning environment is enjoyable. PCE2: Using smart learning environment is pleasurable. PCE3: I have fun using smart learning environment.	(Alain Yee-, 2013)
Autonomy (AUT)	AUT1: I feel a sense of choice and freedom while participating in the smart learning environment. AUT2: I can find something interesting to do at smart learning. AUT3: Smart learning environment provides me with interesting options and choices. AUT4: I am free to express my ideas and opinions on using smart learning environment in my learning program. AUT5: I feel like I can pretty much use smart learning environment as I want to at school. COM1: I think I am pretty good at smart learning environment. COM2: I think I pretty well at smart learning compared to other students. COM3: After using smart learning, I felt pretty competent COM4: I am satisfied with my performance at smart learning environment. COM5: I was pretty skilled at smart learning environment.	(Hanrahan, 1998; Jeno et al., 2019)

Competence (COM)	COM1: I think I am pretty good at smart learning environment. COM2: I think I did pretty well at smart learning environment compared to other students. COM3: After using smart learning environment, I felt pretty competent COM4: I am satisfied with my performance at smart learning environment. COM5: I was pretty skilled at smart learning environment.	(Jeno et al., 2019)
Relatedness (REL)	REL1: I feel really like the people I learn with. REL2: I feel close to others when I participate in the smart learning environment. REL3: I consider the people I work with to be my friends. REL4: I have the opportunity to be close to others when I participate in the smart learning environment. REL5: I feel connected with my classmates when I participate in the smart learning environment.	(Baard et al., 2004; McAuley et al., 1989; Sørebø et al., 2009)
Trust (TRT)	TRT1: I think that privacy on smart learning environment is well protected. TRT2: I think the smart learning environment is secure. TRT3: I think the smart learning environment is reliable. TRT4: I think the smart learning environment is trustworthy.	(Hew & Kadir, 2016)
Satisfaction (SAT)	SAT1: I am satisfied with using smart learning environment as a learning assisted tool. SAT2: I am satisfied with using smart learning environment functions. SAT3: I am satisfied with smart learning environment contents. SAT4: I am satisfied with multimedia instruction. SAT5: I am satisfied with interactive smart learning environment functions.	(Liaw & Huang, 2013)
Behavioral intention (BHI)	BHI1: I plan to use smart learning environment in my studies. BHI2: I predict that I will use smart learning environment frequently. BHI3: I intend to use smart learning environment in the future. BHI4: I believe I will use smart learning in the future. BHI5: I would recommend others to use smart learning.	(Abu-Al-Aish & Love, 2013; Koper, 2014)

5. Results

5.1. Respondent' demographic

Males made up 34.9% while females made up 65.1%. The majority of the sampled students were junior students (63.4%), and freshman students (8.6%), sophomore students (14.6%), senior students (13.4%). The great majority of students who responded to the survey reported time using a smart learning environment is more than 2 years (68.6%). The majority frequency of using smart learning is from five times to ten times (times per week) (41.7%). The bulk of them (87.7%) is using smart learning environment.

The majority of the contents used smart learning (40.6%) in language study. Most of the major places used smart learning in the university (58.9%). Smart learning knowledge to be judged is good (56.3%).

5.2. Measurement Model Assessment

Convergent validity was proved by the average variance extracted (AVE) of each concept being over 0.50 (Fornell & Larcker, 2016) (Table 2). In addition, the squared AVE (square root of average variance derived from each construct) was bigger than the correlation coefficient, as shown by Table 3. The findings in Table 2 further show that the AVE values are greater than the suggested value of 0.5 (Hair et al., 2017), with values ranging from 0.607 to 0.667. In addition, this study examined discriminant validity (DV) by using the Heterotrait-Monotrait (HTMT) ratio of correlations (Henseler et al., 2015). Based on Table 3, DV was established as all value are within the threshold criterion of 0.85 (HTMT <0.85).

Table 2

Composite reliability, and Average variance extracted.

Constructs/Items	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AUT	0.838	0.838	0.885	0.607
BHI	0.85	0.851	0.893	0.625
COM	0.851	0.851	0.893	0.626
PCE	0.735	0.741	0.85	0.654
PCU	0.809	0.809	0.875	0.635
PEOU	0.743	0.752	0.854	0.661
REL	0.875	0.876	0.909	0.667
SAT	0.848	0.848	0.892	0.622
TRT	0.798	0.799	0.869	0.623

Note: AUT-Autonomy, BHI-Behavioral Intention, COM-Competence, PCE-Perceived Enjoyment, PCU-Perceived Usefulness, PEOU-Perceived Ease of Use, REL-Relatedness, SAT-Satisfaction, TRT-Trust.

Table 3. Heterotrait-Monotrait assessment.

Constructs	Original sample (O)	Sample mean (M)	Bias	2.50%	97.50%
BHI <-> AUT	1.007	1.008	0.001	0.967	1.043
COM <-> AUT	0.997	0.999	0.002	0.949	1.041
COM <-> BHI	0.987	0.988	0.001	0.933	1.031
PCE <-> AUT	1.07	1.074	0.004	1.028	1.128
PCE <-> BHI	1.005	1.006	0.001	0.954	1.05
PCE <-> COM	0.961	0.962	0.002	0.869	1.028
PCU <-> AUT	0.954	0.959	0.005	0.831	1.033
PCU <-> BHI	0.956	0.961	0.005	0.831	1.037
PCU <-> COM	0.868	0.871	0.003	0.749	0.962
PCU <-> PCE	1.036	1.04	0.005	0.957	1.108
PEOU <-> AUT	0.864	0.869	0.005	0.632	0.991
PEOU <-> BHI	0.87	0.876	0.006	0.629	1.002
PEOU <-> COM	0.867	0.873	0.006	0.649	0.992
PEOU <-> PCE	0.908	0.911	0.003	0.716	1.027
PEOU <-> PCU	0.968	0.969	0.001	0.893	1.023

Constructs	Original sample (O)	Sample mean (M)	Bias	2.50%	97.50%
REL <-> AUT	0.972	0.972	0	0.924	1.007
REL <-> BHI	0.955	0.955	0	0.872	1.004
REL <-> COM	0.982	0.982	0	0.931	1.02
REL <-> PCE	0.974	0.976	0.002	0.902	1.036
REL <-> PCU	0.86	0.862	0.002	0.728	0.95
REL <-> PEOU	0.82	0.823	0.003	0.614	0.944
SAT <-> AUT	1.016	1.018	0.002	0.979	1.054
SAT <-> BHI	1.032	1.034	0.002	1.004	1.069
SAT <-> COM	0.964	0.964	0	0.908	1.004
SAT <-> PCE	1.003	1.005	0.002	0.949	1.047
SAT <-> PCU	0.936	0.94	0.003	0.815	1.012
SAT <-> PEOU	0.86	0.863	0.003	0.61	0.987
SAT <-> REL	0.95	0.95	-0.001	0.876	0.999
TRT <-> AUT	1.045	1.049	0.004	1.004	1.1
TRT <-> BHI	1.018	1.02	0.002	0.959	1.077
TRT <-> COM	1.034	1.038	0.004	0.996	1.085
TRT <-> PCE	1.03	1.033	0.003	0.971	1.09
TRT <-> PCU	0.948	0.952	0.004	0.823	1.03
TRT <-> PEOU	0.903	0.91	0.007	0.664	1.042
TRT <-> REL	0.985	0.987	0.002	0.913	1.037
TRT <-> SAT	1.037	1.04	0.002	0.998	1.087

Note: AUT-Autonomy, BHI-Behavioral Intention, COM-Competence, PCE-Perceived Enjoyment, PCU-Perceived Usefulness, PEOU-Perceived Ease of Use, REL-Relatedness, SAT-Satisfaction, TRT-Trust**.**

5.3. Structural Model Assessment

Thirteen direct hypotheses between the constructs are presented in this study. Table 4 displays the findings. It demonstrates that the predicted pathways' t-statistics are created using the SmartPLS bootstrapping function at a substantial level. The nine relationships are determined to have a t-statistics value at a significant level of $p < 0.05$ based on the analysis of the path coefficient reported in Table 4 and depicted in Fig. 1. The thirteen relationships are found to have a t – statistics value at a significant level of $p < 0.05$. The predictors of H1, H2, H3, H5, H6, H7, H9, H11, H12 are supported. On the other hand, the predictors of H4, H8, H10 are not supported.

Table 4 The results of hypotheses testing.

Hypothesis	Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Test result
H1	AUT -> PCU	0.541	0.535	0.08	6.724	0.000	Supported
H2	AUT -> PEOU	0.354	0.355	0.09	3.958	0.000	Supported
H3	COM -> PCE	0.312	0.309	0.096	3.242	0.001	Supported
H4	COM -> PCU	0.119	0.118	0.106	1.118	0.264	Not Supported
H5	COM -> PEOU	0.392	0.393	0.077	5.100	0.000	Supported
H6	PCE -> SAT	0.344	0.331	0.119	2.883	0.004	Supported
H7	PCU -> SAT	0.379	0.384	0.071	5.334	0.000	Supported
H8	PEOU -> SAT	0.177	0.186	0.093	1.908	0.056	Not Supported
H9	REL -> PCE	0.483	0.485	0.093	5.207	0.000	Supported
H10	REL -> PCU	0.174	0.181	0.092	1.897	0.058	Not Supported
H11	SAT -> BHI	0.472	0.468	0.056	8.512	0.000	Supported
H12	TRT -> BHI	0.242	0.24	0.064	3.776	0.000	Supported
	TRT x SAT -> BHI	-0.068	-0.07	0.016	4.260	0.000	Supported

6. Discussion

The goal of the present study is to examine the applicability of self-determination theory to explain the role of intrinsic and extrinsic motivation in the acceptance intention of the smart learning environment. The present study explores the role of autonomy, competence and relatedness in explaining the influence of intrinsic and extrinsic motivation to student's intention in learning through smart learning environment. Intrinsic and extrinsic motivation are operationalized using the TAM constructs of and PU, PEOU and PCE.

The findings suggest that SDT is useful for conceptualizing the influence of factors in studnet's motivation. It appears that students are satisfied and intensive to learning in smart environment when they feel autonomous, competent and related. In a learning setting, an autonomy-supportive context is able to enhance students' extrinsic and intrinsic motivation to use smart learning environments because they perceive learning systems to be easier to use and more useful to achieve their goals and they enjoy using them more. Perceived competence, operationalized through internet self-efficacy and computer self-efficacy, had a strong influence on perceived ease of use, and perceived enjoyment. Consistent with SDT, individuals tend to be more motivated to perform a task when they feel competent in it (Deci & Ryan, 1985). Also in line with previous studies using TAM, when users feel self-efficacious, they tend to perceive the system as easier to use (Agarwal et al., 2000).

Perceived relatedness, the third fundamental need, was found to have a correlation with PCE and PCU. When students are taught in an atmosphere that emphasizes relatedness, there is a greater chance that they will be motivated to utilize the system. Because the SDT postulates that a climate of relatedness is more likely to foster the growth of intrinsic motivation, and individuals are likely to participate in behaviors that are not inherently interesting when they are valued by significant others to whom they feel connected (Deci & Ryan, 2000), as well as when they feel the system is useful. The study also confirms that perceived enjoyment and perceived usefulness play a critical role in predicting and determining students' satisfaction with the smart learning environment. Additionally, the finding shows that students are satisfied and trusted in the system, they are most likely in turn behavioral intention to use the smart learning environment.

7. Conclusion

This study investigated the causes of why individuals use smart learning environments to study. The self-determination theory and TAM serve as theoretical foundations. In addition, the impacts of motivation in connection with a smart learning environment were investigated in this study. This article offers a deeper comprehension of its underlying reasons from the point of view of students. The findings contribute significantly to the body of knowledge by inspiring students to do their academic work in digitally enhanced learning environments.

References

Abu-Al-Aish, A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *International Review of Research in Open and Distance Learning*, *14*(5), 82–107. https://doi.org/10.19173/irrodl.v14i5.1631

Agarwal, R., & Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. *MIS Quarterly: Management Information Systems*, *24*(4), 665–694. https://doi.org/10.2307/3250951

Alain Yee, L. C. (2013). Understanding mobile commerce continuance intentions: An empirical analysis of chinese consumers. *Journal of Computer Information Systems*, *53*(4), 22–30.

Alalwan, A., & Williams, M. (2014). Examining Factors Affecting Customer Intention And Adoption Of Internet Banking In Jordan. *UK Academy for Information Systems Conference*, *April 2020*, 3. http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1002&context=ukais2014

Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic Need Satisfaction: A Motivational Basis of Performance and Weil-Being in Two Work Settings. *Journal of Applied Social Psychology*, *34*, 2045–2068. https://doi.org/10.1016/S0008-6215(00)84345-1

Bdiwi, R., de Runz, C., Faiz, S., & Cherif, A. A. (2019). Smart learning environment: Teacher's role in assessing classroom attention. *Research in Learning Technology*, *27*(1063519), 1–14.

Chan, T., Roschelle, J., Hsi, S., et al. (2006). One-To-One Technology-Enhanced Learning: an Opportunity for Global Research Collaboration. *Research and Practice in Technology Enhanced Learning*, *01*(01), 3–29. https://doi.org/10.1142/s1793206806000032

Chau, P. Y. K. (2001). Influence of computer attitude and self-efficacy on IT usage behavior. *Journal of End User Computing*, *13*(1), 26–33.

Chen, K. C., & Jang, S. J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior*, *26*(4), 741–752.

Christopher Westland, J. (2010). Lower bounds on sample size in structural equation modeling. *Electronic Commerce Research and Applications*, *9*(6), 476–487.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, *35*(8), 982–1002.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339.

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104

Fathali, S., & Okada, T. (2018). Technology acceptance model in technology-enhanced OCLL contexts: A self-determination theory approach. Australasian Journal of Educational Technology, 34(4).

Fleming, L., Motamedi, V., & May, L. (2007). Predicting Preservice Teacher Competence in Computer Technology: Modeling and Application in Training Environments. Journal of Technology and Teacher Education, 15, 207-231.

Fornell, C., & Larcker, D. F. (2016). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research This*, *18*(1), 39–50.

Gao, L. and Bai, X. (2014). An empirical study on continuance intention of mobile social networking services: integrating the IS success model, network externalities and flow theory. *Asia Pacific Journal of Marketing and Logistics*, *16*(3), 168–189.

Gefen, D., Straub, D. and Boudreau, M. C. (. (2000). Structural equation modeling and regression: guidelines for research practice. *Communications of the Association for Information Systems*, *4*(1), 7–28.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Thousand Oaks. *Sage*, 165.

Hanrahan, M. (1998). The effect of learning environment factors on students' motivation and learning. *International Journal of Science Education*, *20*(6), 737–753.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135.

Hew, T. S., & Kadir, S. L. S. A. (2016). Predicting the acceptance of cloud-based virtual learning environment: The roles of Self Determination and Channel Expansion Theory. *Telematics and Informatics*, *33*(4), 990–1013. https://doi.org/10.1016/j.tele.2016.01.004

Hua, M. T. A. (2012). Promises and threats: IN2015 masterplan to pervasive computing in Singapore. *Science, Technology and Society*, *17*(1), 37–56. https://doi.org/10.1177/097172181101700103

Huang, R. (2008). Mapping educational tourists': Experience in the UK: Understanding international students. *Third World Quarterly*, *29*(5), 1003–1020.

Hwang, G. J. (2014). Definition, framework and research issues of smart learning environments - a context-aware ubiquitous learning perspective. *Smart Learning Environments*, *1*(1), 1–14.

Jeno, L. M., Adachi, P. J. C., Grytnes, J. A., Vandvik, V., & Deci, E. L. (2019). The effects of m-learning on motivation, achievement and well-being: A Self-Determination Theory approach. *British Journal of Educational Technology*, *50*(2), 669–683.

Jeong, M. and Lambert, C. (2001). Adaptation of an information quality framework to measure customers' behavioral intentions to use lodging web sites. *International Journal of Hospitality Management*, 20(2), 129-46

Karahanna, E., & Straub, D. W. (1999). *The psychological origins of perceived usefulness and ease of use. Information and Management*. *35*(4), 237–250.

Koper, R. (2014). Conditions for effective smart learning environments. *Smart Learning Environments*, *1*(1), 1–17. https://doi.org/10.1186/s40561-014-0005-4

Liaw, S. S., & Huang, H. M. (2013). Perceived satisfaction, perceived usefulness and interactive learning environments as predictors to self-regulation in e-learning environments. *Computers and Education*, *60*(1), 14–24. https://doi.org/10.1016/j.compedu.2012.07.015

Lu, Y., Papagiannidis, S., & Alamanos, E. (2019). Exploring the emotional antecedents and outcomes of technology acceptance. *Computers in Human Behavior*, 90, 153–169.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the intrinsic motivation inventoiy in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60*(1), 48–58.

Nikou, S. A., & Economides, A. A. (2017). Mobile-Based Assessment: Integrating acceptance and motivational factors into a combined model of Self-Determination Theory and Technology Acceptance. *Computers in Human Behavior*, *68*, 83–95.

Nusair, K. and Kandampully, J. (2008). The antecedents of customer satisfaction with online travel services: a conceptual model. *European Business Review,* 20(1), 4-19.

Oliveira, E. A., de Barba, P., & Corrin, L. (2021). Enabling Adaptive, Personalised and Context-aware Interaction in a Smart Learning Environment: Piloting the Icollab System. *Australasian Journal of Educational Technology*, *37*(2), 1–23. https://doi.org/10.14742/AJET.6792

Ong, C. S., Lai, J. Y., & Wang, Y. S. (2004). Factors affecting engineers' acceptance of asynchronous e-learning systems in high-tech companies. *Information and Management*, *41*(6), 795–804. https://doi.org/10.1016/j.im.2003.08.012

Pedrotti, M., & Nistor, N. (2016). User motivation and technology acceptance in online learning environments. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *9891 LNCS*, 472–477.

Racero, F. J., Bueno, S., & Gallego, M. D. (2020). Predicting Students' Behavioral Intention to Use Open Source Software: A Combined View of the Technology Acceptance Model and Self-Determination Theory. *Applied Sciences*, 10(8), 2711.

Roca, J. C., & Gagné, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior*, *24*(4), 1585–1604. https://doi.org/10.1016/j.chb.2007.06.001

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, 55(1), 68

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, 61, 101860.

Ryan, R. M., Soenens, B., & Vansteenkiste, M. (2019). Reflections on self-determination theory as an organizing framework for personality psychology: Interfaces, integrations, issues, and unfinished business. *Journal of personality*, 87(1), 115–145

Saade´, R.G. & Kira, D. (2009). Computer anxiety in e-learning: the effect of computer self-efficacy. *Journal of Information Technology Education*, 8, 177-91.

Şahin, F., & Şahin, Y. L. (2022). Drivers of technology adoption during the COVID-19 pandemic: The motivational role of psychological needs and emotions for pre-service teachers. *Social Psychology of Education,* 25, 567–592

Saini, M. K., & Goel, N. (2019). How smart are smart classrooms? A review of smart classroom technologies. *ACM Computing Surveys*, *52*(6). https://doi.org/10.1145/3365757

Sørebø, Ø., Halvari, H., Gulli, V. F., & Kristiansen, R. (2009). The role of self-determination theory in explaining teachers' motivation to continue to use e-learning technology. *Computers and Education*, *53*(4), 1177–1187.

Tabuenca, B., Serrano-Iglesias, S., Martin, A. C., Villa-Torrano, C., Dimitriadis, Y., I. Asensio-Perez, J., Alario-Hoyos, C., Gomez-Sanchez, E., L. Bote-Lorenzo, M., Martinez-Mones, A., & Kloos, C. D. (2021). Affordances and Core Functions of Smart Learning Environments: A Systematic Literature Review. *IEEE Transactions on Learning Technologies*, *14*(2), 129–145. https://doi.org/10.1109/TLT.2021.3067946

Teo, T., Lee, C. B., Chai, C. S., & Choy, D. (2009). Modelling Pre-Service Teachers' Perceived Usefulness of an ICT-Based of an ICT-Based Student-Centred Learning (SCL) Curriculum: A Singapore Study. *Asia Pacific Education Review*, 10, 535-545

Van Raaij, E. M., & Schepers, J. J. L. (2008). The acceptance and use of a virtual learning environment in China. *Computers and Education*, *50*(3), 838–852.

Yang, Z., Peterson, R.T. and Cai, S. (2003). Services quality dimension of internet retailing: an exploratory analysis. *Journal of Services Marketing*, 17, 685-700

Yoon, C., Rolland, E. (2012). Knowledge-sharing in virtual communities: familiarity, anonymity and self-determination theory. *Behaviour and Information Technology*, *31*(11), 1133–1143.

Zhu, Z. T., Yu, M. H., & Riezebos, P. (2016). A research framework of smart education. *Smart Learning Environments*, *3*(1). https://doi.org/10.1186/s40561-016-0026-2

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ISBN: 978-604-79-3782-0

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