EXTERNAL FACTORS AFFECTING BLACKBOARD LEARNING MANAGEMENT SYSTEM ADOPTION BY STUDENTS: EVIDENCE FROM A HISTORICALLY DISADVANTAGED HIGHER EDUCATION INSTITUTION IN SOUTH AFRICA

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ABSTRACT

Learning Management Systems (LMS) have the ability to transform learning experiences of students in Higher Education Institutions (HEI). In addition to the developmental benefits, LMS assist teaching and learning during student unrests, a common feature in historically disadvantaged institutions in South Africa. Regardless of the benefits of LMS platforms such as Blackboard, the utilisation by university students at the institution under study has been very low. Applying cross sectional electronic survey, this study identifies the key factors influencing technology adoption, as identified in the General Extended Technology Acceptance Model for E-Learning (GETAMEL), behind perceived ease of use and perceived usefulness in the adoption of technology. A sample of 125 students at a historically disadvantaged institution in South Africa was considered for the study. Data was collected to understand their perceptions on use of Blackboard Learning Management System (BB) for learning. Data was analysed with SmartPLS statistical analysis software. Results show that perceived ease of use of BB is influenced by computer self-efficacy, computer amusement and computer anxiety whilst perceived usefulness of BB is influenced by subjective norm and computer enjoyment. The findings also show computer

experience to significantly affect computer self-efficacy and computer self-efficacy to affect computer enjoyment. The article presents the external factors that affect the usage of LMS at one of the historically disadvantaged HEI in South Africa. HEI leadership has to prioritise the identified external factors to increase chances of acceptance and utilisation of Blackboard by learners.

Keywords: Learning Management System, General Extended Technology Acceptance Model for E-Learning, e-learning, external adoption factors, technology acceptance

INTRODUCTION

The role of ICT in teaching and learning is greatly evident among university students (Matarirano et al. 2018). The benefits of ICT in education include; increase student morale, critical thinking and learning interest (Dede 1998). ICTs help facilitate collaborative learning among students and also provide accessibility of vast problem solving activities (Forcheri and Molfino 2000). Considering that many HEI students are "digital natives", the usage of technology in teaching and learning is vital (Hussein 2017). Higher Education Institutions (HEIs) have embraced and benefited from implemented teaching and learning technologies (Walker, Prytherch, and Turner 2013; Alturki, Aldraiweesh, and Kinshuck 2016), however, previously disadvantaged HEIs still face challenges in fully adopting Learning Management Systems (Matarirano et al. 2021; Sehoole and De Wit 2014; Zaharias and Pappas 2016). There is no doubt that technology improves student collaboration as it allows students to learn anytime and anywhere (Ching-Ter, Hajiyev, and Su 2017). In the 21st century, ICTs are mandatory in the preparation of students for skills they will require in the working environment (Dawson, Heathcote, and Poole 2010). Current students are hoped to effectively utilise ICTs regardless of the study discipline (Andreu and Nussbaum 2009) and there is added expectation by employers from graduates to possess remarkable ICT skills and be very dynamic (Delgado-Almonte, Andreu, and Pedraja-Rejas 2010). Unfortunately, HEIs in South Africa experience several challenges that influence technology usage (Matarirano et al. 2021). Most of the adoption challenges are faced by historically disadvantaged HEIs (Chetty and Pather 2015; Mekoa 2018).

It is against this backdrop that a study on external factors affecting Blackboard (BB) Learning Management System (LMS) adoption by students was conducted. LMS essentially provides content with multiple functionalities (Uziak et al. 2018). The General Extended Technology Acceptance Model for education postulated by Abdullah, Ward, and Ahmed (2016) was used as a guiding framework for the study. The authors concluded that the students at the selected historically disadvantaged HEI come from poor background and present unique social and cultural characteristics which are critical for LMS utilisation (Matarirano et al. 2021). The article addresses this research question: What are the external factors that affect the adoption of

BB by students at a particular HEI. This article consists of related literature, techniques used, findings and overall discussion of sections.

LITERATURE REVIEW

An LMS application is a catalyst for instant communication (Borboa et al. 2014). The commonly mentioned LMSs in literature include Blackboard, Canvas, eCollege, Moodle and Sakai (Green et al. 2006). Blackboard enables learners to get content anytime and engage with one another outside the classroom (Liaw 2008). Features provided by BB give students with various learning needs the flexibility to participate and collaborate in ways most beneficial to them (Borboa et al. 2014). The best LMS should consider the learning styles of the students, their interests, prior knowledge, cognitive levels, comfort zones and socialisation needs (Blackboard 2018, 63). LMS enables teaching and learning to take place electronically, popularly referred to as e-learning. The introduction of technologies in HEIs faces numerous challenges as pointed out by (Andreu and Miguel 2019). There are several studies carried out on factors influencing adoption of LMS at universities such as studies by Abdullah and Ward (2016); Al-Ammary, Al-Sherooqi, and Al-Sherooqi (2014); Awofala et al. (2019); Davis (1989); Hanif, Siddiqi, and Jalil, (2019).

This article considers the current evidence documented on the external factors that influence the adoption of technologies. The next section explains the related theories and technology adoption factors.

THEORETICAL FRAMEWORK

There are numerous theories that were established to understand how technologies and systems are adopted. Amongst them include Theory of Reasoned Action, Theory of Planned Behaviour, Diffusion of Innovation, Task Technology Fit, Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology Acceptance Model (Abdullah and Ward 2016; Fishbein and Ajzen 1975). Of these, the Technology Acceptance Model (TAM) has been the most prominent for understanding user acceptance of technology. TAM postulates perceived usefulness (PU), perceived ease of use (PEOU) and the behavioural intention of the user are key for technology usage. These variables are affected by external factors that influence attitudes towards adoption of technology (Ching-Ter et al. 2017). TAM was postulated by Davis in 1986 and originated from the Theory of Reasoned Action proposed by Fishbein and Ajzen (1975). TAM has since been modified several times and commonly cited modified TAMs include Extended Technology Acceptance Model [ETAM] (Lin, Fofanah, and Liang 2011) and GETAMEL by Abdullah and Ward (2016).

GETAMEL was considered established from over 100 studies that identified popular factors affecting PEOU and PU (Abdullah and Ward 2016). The key factors that affect PEOU included enjoyment, computer experience and subjective norm whilst PU was affected by enjoyment, subjective norm/social influence, computer self-efficacy and computer experience (Abdullah and Ward 2016). The constructs of GETAMEL are the subject of the discussion that follows a number of other elements influencing intention to adopt technology as summarized in the section below:

Factors affecting intention to use technology

The following are some of the commonly discussed factors affecting adoption of technology use.

Perceived usefulness factor (PU)

Perceived usefulness is the magnitude users understand that through using a certain information technology component their job performance would be greatly improved (Davis 1989, 320). Technology that is high in PU is one that is believed to have a positive effect by users in terms of performance (Davis 1989, 320). Research has shown PU influences perceptions on technology and individual interests in willingness to use technology (Yeh and Teng 2012). PU is influenced by technology enjoyment, subject norm, self-efficacy and experience.

Perceived Ease of use factor (PEOU)

PEOU means the capability of an individual to use technology without much assistance (Abdullah and Ward 2016). Davis (1989, 320) defines it as the extent a person is confident to use technology with minimal effort. A technology that is not complex and difficult to understand would increase the rate at which users adopt it as was supported by Joo, So, and Kim (2018); Wu and Chen (2017) and Medyawati, Christiyanti, and Yunanto (2011). In order for students to accept a technology, they must be comfortable and not feel threatened by it (Uziak et al. 2018).

External factors affecting PEOU and PU of technology

Subjective norm/social influence (SN)

Subjective norm (SN) is one's perceived opinions of an individual or group whose beliefs may be critical to a person (Mathieson 1991). It is the extent that persons perceive what other individuals that are more superior to them think about whether to use or not to use a system. In

education, subjective norm is the degree to pressure from the society to use technology in the learning context is perceived by a student (Agudo-Peregrina, Hernández-Garcia, and Pascual-Miguel 2014). Studies carried out on the effect of SN showed that the influence has the potential to affect the behavior of individuals in utilizing technology (Hasbullah et al. 2016). SN has been confirmed as a determinant for PEOU and PU (Abdullah and Ward 2016).

Computer Experience

Computer experience (EXP) explains the confidence levels for one to operate a computer and all related programs (Durodolu 2016). Experience is skills an individual obtains over a period of time (Ching-Ter et al. 2017). Users with experience in using technology-related gadgets have a positive feeling towards the usage of online learning systems and experience less challenges with using the systems (Ching-Ter et al. 2017; Abramson, Dawson, and Stevens 2015; Motaghian, Hassanzadeh, and Moghadam 2013).

Computer self-efficacy

Perceived self-efficacy signifies the ability of a student to utilise available resources to achieve what is needed (Bandura 1997). In education, SE is a one's self-perception of their capability to learn through using an e-learning system (Baki, Birgoren, and Aktepe 2018).

Previous research has shown that SE is linked to goal-oriented behaviors such as willingness and interest (Bandura 1986; Liaw 2008). Computer SE of users affects attitudes and capability to get skills and is positively correlated with PU (Awofala et al. 2019) and PEOU (Hanif et al. 2019; Thakkar and Joshi 2018).

Perceived enjoyment

Perceived enjoyment (ENJOY) is an inherent drive that outlines the degree to which joy can be derived from utilising a system (Chao 2019, 5). It refers to the level whereby making use of a system is seemingly pleasing, regardless of the performance results from using the system (Park, Son, and Kim 2012, 379). ENJOY is positively related to PEOU and PU (Hanif et al. 2019; Sarosa 2019) as well as the intention to use technology (Sarosa 2019). A system is likely to influence users to adopt and utilise it if its regarded as enjoyable.

Computer anxiety (CA)

Computer anxiety (CA) is the uneasiness an individual experience when utilising a computer (Awofala, Akinoso, and Fatade 2017). Venkatesh et al. (2003) referred to CA as "evoking anxious or emotional reactions when it comes to performing a behavior". Anxiety normally

associates with something unfamiliar and normally leads to resistance to change (Awofala et al. 2019).

CA plays a key role towards the adoption of e-learning in higher education (Alenezi, Abdul Karim, and Veloo 2010). CA negatively influences a student's PEOU in an e-learning setting (Awofala et al. 2019). Research has shown CA to have an impact on PU of technology and eventually, its acceptance (Awofala et al. 2017; Ching-Ter et al. 2017; Purnomo and Lee 2013).

METHODOLOGICAL APPROACH

This study considered a quantitative approach and used a survey to gather data from respondents. Questionnaires developed, based on GETAMEL, were distributed to students who were registered at a HDHEI within the Faculty of Management Sciences in the 2nd semester of the 2018 academic year. The questionnaires were shared with learners enrolled for Financial Management (N=84), Management Accounting (N=228) and Business Calculations (N=57) courses. These courses were delivered via a blended learning approach.

The questionnaire had twenty-seven questions representing the seven key constructs of GETAMEL (PU, PEOU, SN, SE, EXP, ENJOY and CA). A five point Likert Scale which had options ranging from strongly agree to strongly disagree, was used to solicit opinions from students (Matarirano et al. 2021). Class representatives were sent the link of the questionnaire via WhatsApp who in-turn, shared with all other students in their WhatsApp groups. Students were afforded three weeks to respond to the questionnaire. Participants were not forced and voluntarily completed the survey, participants also remained anonymous. They could omit questions they did not feel comfortable to answer and could leave the survey before completing the questionnaire if they feel like it. Permission to carry out the survey was approved by the Dean of the Faculty of Management Sciences within the institution. Table 1 presents the number of students who returned the questionnaire as well as their gender and level of study.

Table 1: Composition of respondents

Level	Male	Female	Total
1	3	5	8
2	1	5	6
3	23	36	59
4	13	39	52
Total	**40**	**85**	**125**

A total of 125 students provided responses to the questionnaire. Forty of the respondents (32%) were male students whilst the remaining 85 (68%) were female students. In terms of levels of

study, eight were first years, six were second years, 59 were third years and 52 were fourth year students.

MEASUREMENT OF VARIABLES

The study intended to determine the effect of the factors identified in GETAMEL on use of blackboard learning management system. GETAMEL argues that use of technology is influenced by PU and PEOU which are in turn affected by the external factors that include SN, EXP, SE, ENJOY and CA (Matarirano et al. 2021). The relationship between the different variables (conceptual framework) is summarised in Figure 1.

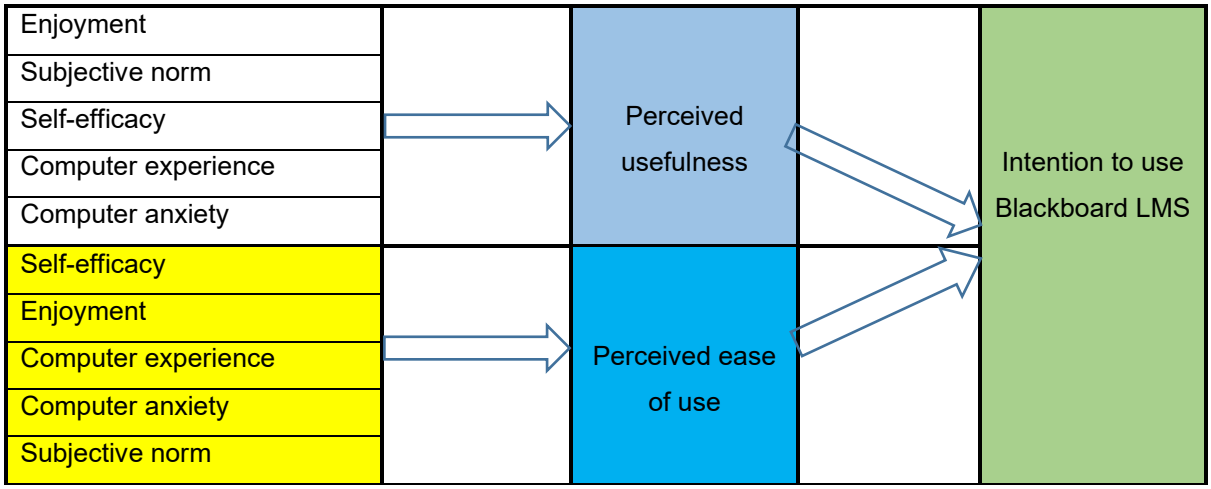

Figure 1: Conceptual framework

Two models were developed to determine the relationships between constructs within GETAMEL on use of BB. The models were built on the premise that using technology is dependent on the PU and PEOU and PEOU affects PU as generally agreed in theory (Matarirano et al. 2021). As a result, the actual use was not the dependent variable, but PU and PEOU. In the first model, PU was the dependent variable whilst PEOU was the dependent variable in the second model. The independent variables for both models included SN, EXP, SE, ENJOY and CA. The models developed are expressed below.

$$Y_{PU} = \alpha + \beta_1 X_{SN} + \beta_2 X_{SE} + \beta_3 X_{EXP} + \beta_4 X_{ENJOY} + \beta_5 X_{CA} + e \quad \text{(Equation 1)}$$

$$Y_{PEOU} = \alpha + \beta_1 X_{SN} + \beta_2 X_{SE} + \beta_3 X_{EXP} + \beta_4 X_{ENJOY} + \beta_5 X_{CA} + e \quad \text{(Equation 2)}$$

$$Y_{SE} = \alpha + \beta_1 X_{EXP} + e \quad \text{(Equation 3)}$$

$$Y_{ENJOY} = \alpha + \beta_1 X_{SE} + e \quad \text{(Equation 4)}$$

$$Y_{CA} = \alpha + \beta_1 X_{SE} + e \quad \text{(Equation 5)}$$

Google forms were to collect data and SmartPLS data analysis software was used to analyse the data (Matarirano et al. 2021; Ringle, Wende, and Becker 2015).

RESULTS

Measurement model

Before testing the hypotheses (structural equation modelling), the computational model was considered for the reliability of the model and its validity.

The results over 0.6 for Cronbach's Alpha (Sarosa 2019), and 0.7 for composite reliability were considered, 0.5 for AVE (Ringle et al. 2015), 0.5 for factor loadings (Hair et al. 2010) show a reliability and validity model (Fornell and Larcker 1981). Table 2 shows the reliability and validity table.

Table 2: Construct reliability and validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
PU	0.719	0.826	0.546
PEOU	0.761	0.843	0.574
SN	0.654	0.812	0.591
EXP	0.299	0.730	0.582
SE	0.567	0.822	0.698
ENJOY	0.719	0.822	0.538
CA	0.506	0.802	0.669

Whilst four constructs were above 0.6, which is the minimum acceptable Cronbach's Alpha value, Computer Experience, Computer Anxiety as well as Self-Efficacy had values below 0.6. The primary reasons for the low values were the number of items for each construct, which was two (Taber 2018). It assumes factor loadings to be the same for all items, an assumption that is not considered in composite reliability. Because the composite reliability of the three constructs was above the 0.7, they were considered for the Confirmatory Factor Analysis (CFA).

Table 3: Factor loadings and cross loadings

	PU	PEOU	SN	EXP	SE	ENJOY	CA
PU1	**0.842**	0.400	0.416	0.414	0.420	0.577	-0.028
PU2	**0.783**	0.193	0.375	0.425	0.411	0.516	0.069
PU3	**0.679**	0.344	0.438	0.439	0.399	0.360	-0.196
PU4	**0.635**	0.210	0.273	0.352	0.372	0.396	0.030
PEOU1	0.366	**0.801**	0.302	0.355	0.472	0.552	-0.232
PEOU2	0.405	**0.790**	0.254	0.444	0.509	0.455	-0.407
PEOU3	0.162	**0.737**	0.161	0.194	0.289	0.396	-0.170
PEOU4	0.158	**0.698**	0.121	0.149	0.237	0.231	-0.247

	PU	PEOU	SN	EXP	SE	ENJOY	CA
SN1	0.459	0.232	**0.827**	0.533	0.489	0.386	0.108
SN2	0.360	0.181	**0.744**	0.373	0.316	0.251	0.073
SN3	0.345	0.266	**0.732**	0.420	0.381	0.251	0.075
EXP1	0.474	0.309	0.420	**0.875**	0.848	0.467	-0.075
EXP2	0.356	0.336	0.511	**0.630**	0.425	0.344	0.033
SE1	0.427	0.583	0.454	0.581	**0.822**	0.509	-0.150
SE2	0.474	0.309	0.420	0.805	**0.848**	0.467	-0.075
ENJOY1	0.645	0.409	0.376	0522	0.535	**0.796**	-0.122
ENJOY2	0.489	0.489	0.241	0.362	0.414	**0.784**	-0.227
ENJOY3	0.365	0.496	0.286	0.412	0.452	**0.745**	-0.175
ENJOY4	0.279	0.207	0.227	0.204	0.242	**0.592**	-0.136
CA1	-0.018	-0.300	0.037	-0.022	-0.147	-0.199	**0.841**
CA2	-0.043	-0.288	0.154	-0.050	-0.067	-0.163	**0.795**

Factor loadings for each item in bold

As portrayed in Table 3, all factor loadings are above the generally agreed 0.5 value and these loadings are the highest for their construct. Six questions which had factor loadings that were below 0.5 were dropped from factor analysis (Fornell and Larcker 1981).

Table 4: Discriminant validity

	CA	ENJOY	EXP	PEOU	PU	SE	SN
CA	**0.818**						
ENJOY	-0.223	**0.734**					
EXP	-0.043	0.537	**0,763**				
PEOU	-0.359	0.566	0.409	**0.758**			
PU	-0.036	0.635	0.549	0.391	**0.739**		
SE	-0.133	0.583	0.878	0.528	0.540	**0.835**	
SN	0.113	0.392	0.582	0.295	0.509	0.522	**0.769**

Square root of AVEs in bold

Table 4 shows discriminant validity data based on the results (Fornell and Larcker 1981).

The measurement model testing results revealed proof of the adequacy of the constructs' measures by having above agreed reliability and validity values. This indicated that the sample data used was in line with the selected model.

Structural model

The two models were run using bootstrapping and the outcomes are presented in Table 5.

Table 5: Bootstrap result

	β	T-statistic	P-value
CA -> PEOU	-0.243	2.951	0.003
CA -> PU	0.053	0.661	0.509
ENJOY -> PEOU	0.336	3.278	0.001

	β	T-statistic	P-value
ENJOY -> PU	0.462	4.409	0.000
EXP -> PEOU	-0.245	1.329	0.184
EXP -> PU	0.140	0.952	0.342
EXP -> SE	0.878	40.467	0.000
SE -> CA	-0.133	1.418	0.157
SE -> ENJOY	0.583	7.014	0.000
SE -> PEOU	0.468	2.578	0.010
SE -> PU	0.040	0.272	0.786
SN -> PEOU	0.089	0.938	0.349
SN -> PU	0.220	2.386	0.017

The path coefficients and p-value are used to measure the strength of each causal relationship (Abdullah and Ward 2016). The negative or positive type of relationship among variables is the sign on the path coefficient (Al-Gahtani 2016). The p-values and t-statistic are usually utilised to find statistically significant relationships among latent variables. A t-statistic above 1.69 and a p-value below 0.05 indicates a significant relationship among variables (Ringle et al. 2015).

As presented in Table 5, SN shows a statistically significant positive relationship with PU (β=0,220; t=2.386; p<0.05) whilst no significant relationship is shown with PEOU (β=0.089; t=0.938; p>0.05). EXP did not have any significant relationship with neither PU (β=0.140; t=0.952; p>0.05) nor PEOU (β=-0.245; t=1.329; p>0.05). A statistically insignificant positive relationship between SE and PU (β=0.040; t=0.272; p>0.05) was found. With PEOU, SE seems to have a statistically significant positive relationship (β=0.468; t=2.578; p<0.05). ENJOY was the only factor which had statistically significant positive relationships with both PU (β=0.462; t=4.409; p<0.05) and PEOU (β=-0.245; t=3.278; p<0.05). Finally, CA did not show a significant relationship with PU (β=0.053; t=0.661; p>0.05) whilst a statistically significant negative relationship existed with PEOU (β=-0.243; t=2.951; p<0.05). The results discussed above are summarised in Table 6.

Table 6: Significance of independent variables on PU and PEOU

	Perceived usefulness	Perceived ease of use
Subjective norm	✓	×
Computer experience	×	×
Self-efficacy	×	✓
Enjoyment	✓	✓
Computer anxiety	×	✓

✓ Statistically significant relationship at p<0.05
× statistically insignificant relationship at p>0.05

In addition to testing relationships between PU, PEOU and SN, EXP, SE, ENJOY and CA, the relationships between EXP and SE, SE and ENJOY and SE and CA were also solicited. This

was based on the belief that computer experience would affect SE as users would be more comfortable with using the learning management systems as argued by Tripathi (2018). Users who are computer SE are likely to enjoy working with technology whilst those with low SE can possibly develop anxiety against learning management systems. From the path analysis, EXP had a very strong, statistically significant positive relationship with SE (β=0.878; t=40.467; $p<0.05$). SE also had a statistically significant relationship with ENJOY (β=0.583; t=7.014; $p<0.05$). No statistically significant relationship was however found between SE and CA (β=-0.133; t=1.418; $p<0.05$).

DISCUSSION OF FINDINGS

Subjective norm

The study found SN to influence PU of BB. Findings from many prior studies such as Sarwar et al. (2018); Ching-Ter et al. (2017); Al-Gahtani (2016); Duygu and Sevgi (2013); Motaghian et al. (2013) and Park (2009) concur with this finding. The beliefs and pressure from key people such as friends, peers and lecturers do affect the way students perceive the usefulness of Blackboard. Some studies (Abdullah, Ward, and Ahmed 2016; Abramson et al. 2015) found no significant relationship between SN and PU. No significant relationship was, however, found between SN and PEOU, a finding that concurs with findings by Ching-Ter et al. (2017) and Park (2009). This finding was not surprising as there seems to be a blurred link between the two. How one perceives something to be either easy or not is highly unlikely to be a function of what other people think. Despite this argument, many studies such as Sarwar et al. (2018); Abdullah et al. (2016); Abramson et al. (2015) and Duygu and Sevgi (2013), found SN to have a significant influence on PEOU.

Computer experience

EXP did not have any statistically significant relationship with both PU and PEOU. This finding contradicts many studies that found EXP to significantly affect PU (Ching-Ter et al. 2017); Purnomo and Lee 2013; Irani 2000) and PEOU (Ching-Ter et al. 2017; Abramson et al. 2015; Motaghian et al. 2013). The finding was supported by studies that found no significant relationship between EXP and PU (Al-Gahtani 2016; Abdullah et al. 2016; Medyawati et al. 2011) and EXP and PEOU (Abdullah et al. 2016; Abramson et al. 2015). This finding was unexpected as EXP was thought to influence PU and PEOU as it provides the skills and ability to use Blackboard. A person with experience in use of computers would find using a system much easier than one without experience as argued by Tripathi (2018). This finding may be a result of most students having the experience in computers since all of them were not first year

students and as such did not see the value of experience anymore. It could also be a result of only the simple functions of Blackboard being used, such as downloading course content, which does not require a great deal of computer experience.

Despite the insignificant influence on PU and PEOU, EXP had a very strong positive influence on SE. In other words, students who had computer experience had high computer self-efficacy. This outcome is in agreement with findings by Fagan, Neill, and Wooldridge (2003) and Cassidy and Eachus (2002).

Computer self-efficacy

The study did not find any statistically significant relationship between SE and PU. This finding, whilst being supported by Thakkar and Joshi (2018); Ibrahim et al. (2017); Ching-Ter et al. (2017); Lee, Hsiao, and Purnomo (2014), Motaghian et al. (2013), it contradicted several studies that include Awofala et al. (2019); Sarwar et al. (2018); Abdullah et al. (2016); Kilic et al. (2015); Al-Ammary et al. (2014); Duygu and Sevgi (2013) and Park (2009). A statistically significant relationship was observed between SE and PEOU. This outcome corroborates the finding by Hanif et al. (2019); Awofala et al. 2019; Thakkar and Joshi (2018); Sarwar et al. (2018); Ching-Ter et al. (2017); Ibrahim et al. (2017); Al-Gahtani (2016); Abdullah et al. (2016); Abramson et al. (2015); Kilic et al. (2015); Lee et al. (2014); Al-Ammary et al. (2014); Duygu and Sevgi (2013); Motaghian et al. (2013) and Park (2009). A few studies (Sánchez, Hueros, and Ordaz 2013; Medyawati et al. 2011) established that there was no significant relationship between SE as well as PEOU. SE affects the perceptions of students on how easy BB is to use. This is logical as SE is unlikely to affect the views on how useful a system is but aids on the ability to use it, thus affecting ease of use.

The study hypothesised SE to influence ENJOY and CA. A statistically significant positive relationship was observed between SE and ENJOY whilst the relationship between SE and CA was statistically insignificant. Although it makes sense for students with higher self-efficacy to enjoy other benefits of computer systems, as they already know how to navigate through basic requirements, prior studies that attempted to establish a relationship between SE and ENJOY were hard to come by.

The relationship found between SE and CA contradicts the findings by Karsten, Mitra, and Schmidt (2012); Saadé and Kira (2009); Fagan et al. (2003) who found a statistically significant negative relationship between SE and CA. Similar to the relationship between EXP and PEOU, students with less computer self-efficacy were expected to have high computer anxiety levels. This could, however, have been moderated by the experience gained by being senior students who have been exposed to computers for some time, thus having low levels of computer anxiety.

Perceived enjoyment

ENJOY was the only factor to have statistically significant relationships with PU and PEOU. Most studies that explored the relationship between ENJOY and PU (Hanif et al. 2019; Ching-Ter et al. 2017; Abdullah et al. 2016; Zare and Yazdanparast 2013) and ENJOY and PEOU (Ching-Ter et al. 2017; Abdullah et al. 2016; Al-Gahtani 2016; Zare and Yazdanparast 2013; Al-Ammary et al. 2014) found statistically significant relationships. ENJOY is the only factor that impacted on PU and PEOU of students and such, should take a centre stage in development of tailor-made learning management systems. What makes this factor critical is that it leads to internal drive within students and as such leading to them liking or not liking a system.

Computer anxiety

There was no relationship between CA and PU whilst a negative statistically significant relationship existed between CA and PEOU. Students with computer anxiety experience difficulties in using Blackboard Learning Management System. The finding supports Al-Gahtani (2016) and Lefievre (2012) who also found CA to influence PEOU. It is however, disputed by Ching-Ter et al. (2017); Purnomo and Lee (2013) who established a significant relationship between CA and PU and Ching-Ter et al. (2017); Abdullah et al. (2016); Purnomo and Lee (2013) who did not find any significant relationship between CA and PEOU.

Relationship with GETAMEL

The results are in congruent with Abdullah and Ward's GETAMEL that found ENJOY was the ideal predictor of PU of e-learning, followed closely by SN. The positive relationships found between PU and SE and EXP were statistically insignificant. The ranking for the factors affecting PEOU was exactly the same bar for the EXP and SN which were statistically insignificant for this study. The comparison of the findings of the study and GETAMEL are presented in Table 7.

Table 7: Factors affecting PU and PEOU – comparison with GETAMEL

Rank	PU				PEOU			
	GETAMEL		Current study		GETAMEL		Current study	
	Factor	β	Factor	B	Factor	B	Factor	β
1	ENJOY	0.452	ENJOY	0.462	SE	0.352	SE	0.468
2	SN	0.301	SN	0.220	ENJOY	0.341	ENJOY	0.336
3	SE	0.174	EXP	0.140	EXP	0.221	EXP	-0.245
4	EXP	0.169	CA	0.053	CA	-0.199	CA	-0.243
5	CA	0.070	SE	0.040	SN	0.195	SN	0.089

Whilst the ranking for most of the factors identified in GETAMEL is the same as the findings of the study, most factors do not carry the same importance as with the current findings. Unlike GETAMEL, SE and EXP did not have any significant effect on the PU of BB whilst SN and EXP were found to have insignificant effect on PEOU of BB by the surveyed students.

SUMMARY OF FINDINGS

The key findings of external elements that influence the use of BB at the HEI under study are summarised as follows:

- Subjective norm and perceived enjoyment had a significant positive influence on PU;
- Perceived enjoyment and computer self-efficacy showed a significant positive relationship with perceived usefulness whilst computer anxiety had a significant negative relationship with PEOU;
- Computer experience had a significant relationship with computer self-efficacy;
- Computer self-efficacy had a significant relationship with enjoyment.

The findings of the study suggest that perceived enjoyment had the strongest effect on perceived usefulness. Enjoyment was in turn, strongly affected by computer self-efficacy. Contrary, computer self-efficacy had the strongest effect on perceived ease of use which in turn was, affected by computer experience.

CONCLUSION

To fully enjoy the benefits of learning management systems such as Blackboard, it is critical for HEI, especially coming from disadvantaged backgrounds to find ways to make the use of technology enjoyable. This may be done by training students on adoption of technology and provide ICT equipment to them in order to use for learning as soon as they are enrolled at the institutions. Additionally, full utilisation of the LMS by considering most of the features on the BB platform could bring the variety and motivate students to use technologies. This may improve their experience with technology which would in turn improve their self-efficacy, leading to positive perceptions on ease and use of technology. As shown by the result, it is also necessary to encourage lecturers to recommend use of learning management systems as their recommendation would positively affect usefulness of the system.

Understanding the factors behind behaviour of students towards use of technology assists universities with developing systems that are considered useful and easy to use by students

primarily from the previously disadvantaged backgrounds (Ching-Ter et al. 2017).

IMPLICATIONS AND LIMITATIONS

It is critical for universities to plan and strategise accordingly to prepare for successful roll-out of LMS (Matarirano et al. 2021). There is a need to tailor-make the generic LMS such as BB so that they are aligned to the learning needs of the students. Such adjustments would improve the perceptions of students towards LMS, improve their enjoyment and reduce computer anxiety.

The e-learning strategy should be part of a strategic plan for a university that promotes the use of LMS. A percentage of teaching in academic programs structured with a blended approach should be using the LMS. Introducing the LMS concept in the first year would help the students familiarize themselves with it and quickly adapt to it.

The study adds value to the field by establishing the relationship between enjoyment and positive perceived usefulness and ease of use of LMS by students. Lecturers can help students get exposure to LMS by recommending use of many facets of Blackboard, thus enhancing on their computer experience. Computer experience influences enjoyment which in turn, has a positive influence on perceived usefulness and perceived ease of use.

Although the study findings are critical to effective implementation and use of LMS, it was limited to constructs and factors identified in GETAMEL. In future, the study would have to be improved to consider factors that are likely to affect use of learning technology. These factors might consist of institutional support, availability of access gadgets, accessibility of internet and living (accommodation) arrangements.

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