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-RESEARCH ARTICLE-

CHALLENGES OF ACCEPTANCE AND USAGE OF A LEARNING MANAGEMENT SYSTEM AMONGST ACADEMICS

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─Abstract─

Universities across the globe have invested heavily in a Learning Management System (LMS); however, the adoption and usage is hindered by a number of factors. Recently, a University of Technology (UoT) in KwaZulu-Natal embarked on a major re-circulation drive to embrace student-centred learning. However, this process was stalled by slow maturity use of LMS. Therefore, this paper evaluates the acceptance and usage of an approved LMS amongst academics at a UoT. An e-survey in which 111 academics participated, all having teaching designations, was superseded by semi-structured interviews. A significant finding of the technology acceptance model (TAM) was impugned, in reflecting the gap between low actual usage and high acceptance. Assessments seemed to be given lowest priority, with aspects such as communication and course management receiving highest priority. Little utilized were collaboration tools. Such include blogs, wikis, and a discussion forum. Dedicated training on features of the learning management system, covering its educationally progressive aspects, is of the essence. TAM may require closer scrutiny to account for successful LMS usage at universities.

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1. INTRODUCTION

The broad use of electronic technologies embraces the digital-age society and has the potential to enhance the learning experience in the information age. Horton (2011), defines e-learning as the use of electronic technologies to create a learning experience, also allowing for flexibility of using different tools, depending on the users' preference. An e-learning platform is a system running on a web-server, providing companies or universities with the ability to administer, distribute, and supervise teaching and learning activities (Llamas-Nistal, Caeiro-Rodriguez, & Castro, 2011).

An e-learning platform encourages student engagement, thereby promoting the creation of a student-centred model. Butt (2014) defined student-centred learning as an activity in which the student's learning process is guided by the teacher. A heavy accent has been placed on students, moving away from academics. This paradigm shift is described as a shift to student-centred learning. Academics have now to act as mentors, e-moderators, and facilitators, rather than passively transferring learning as verbal communication (Rienties, Brouwer, & Lygo-Baker, 2013). Importantly, e-learning can support a student-centred learning environment, encouraging this shift of focus away from academics onto students.

Thus academics' buy-in, which entails the acceptance and usage level of the system (Alharbi & Drew, 2014), heavily influences the success of LMSs, which have been largely under-utilized by academics. This has been cited as a crucial factor in overall neglect of the system. This study has as its objectives:

- To evaluate the acceptance of the Blackboard amongst academics at a University of Technology; and
- To evaluate the usage of the Blackboard system amongst academics at a University of Technology.

These objectives can shed more light on the acceptance and usage of the LMS (Blackboard) amongst academics in a South African University of Technology (UoT). This paper will examine in detail how universities, students, and academics can benefit from using a LMS; how the use of such a system can

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augment student-centred learning, together with the significance of academics' enthusiasm for supporting student learning per this means.

2. LITERATURE REVIEW

2.1. Learning Management Systems

LMSs support current pedagogic requirements, in offering both asynchronous and synchronous benefits for students of this age of information. Communication (Llamas-Nistal et al., 2011), accessibility, flexibility, self-paced activity, and interactivity (Abdous, 2013), skill building, and increased availability, improve learning experiences of students, and positively motivate students (Alshammari, Ali, & Rosli, 2016). Advantages like self-paced activity could smooth the transition of leavers from high school to higher education institutions. Consistently accessible and responsive staff is a factor that contributes to a first-year's retention (James, Krause, & Jennings, 2010). Furthermore, LMSs have also been credited with motivating users (students and academics); and increasing participation amongst the students in a class (Alshammari et al., 2016).

2.2. Student-centred learning through LMSs

The shift from an 'industrial age' learning environment to an 'information age' learning environment is inevitable. The information age student's experience and learning can no longer be supported by an outdated model which revolves around academic-centric control rather than shared control (academic/student) of learning (Blewett, 2012). A student-centred environment which engages the student can support the proper use of technology (Revere & Kovach, 2011) by means of guidance provided by both academics and LMSs (Overby, 2011). This may be achieved through information searching, retrieval and generation (Kirkwood & Price, 2014). Such can cultivate a lifelong learning process in which students are capable of solving problems independently. Students can be studying at their convenience, studying being made interesting and entertaining via various methods (Overby, 2011).

Academics, once they have accepted the approach of student-centred learning shift from the role of "sage on the stage" to that of "guide on the side" (Overby, 2011). Students must then actively participate in their own learning, having also to be responsible for organising, analysing, and synthesizing their learning content. Such a stance on student-centred learning leads inevitably to the stimulating of critical thinking and problem-solving in students. The most frustrating challenge is the unpreparedness of academics to alter their ingrained role of transferring content verbally, to accepting the role of facilitator.

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2.3. Principal Stakeholders' Readiness for LMS

This research was principally concerned with the acceptance and usage of LMS by academics. However, it is also necessary to consider the roles of the complementary actors (university, academics, and students), when such impinges directly on the academics' ability to conduct their roles as LMS facilitators effectively. Learning management systems demand preparedness of all three main stakeholders, namely, the university, the academic, and the student, in addressing needs of the stakeholders and in implementing LMSs successfully.

2.3.1. Academics' readiness for LMS

Edumadze, Ossei-Anto, Edumadze, Tamakloe, and Boadi (2014)'s definition of readiness is given as the individual being willing to engage in the proffered learning system, benefiting thereby. E-learning readiness covers willingness by, for instance, the student, school, or academic, to use e-learning tools, preferring such as the usual delivery mode of instruction (Edumadze et al., 2014).

Obstacles to acceptance and use by academics of LMSs include lack of prior experience with computers or Information and Communication Technology (ICT), inter alia (Eslaminejad, Masood, & Ngah, 2010). Eslaminejad et al. (2010), found that academics had a positive attitude towards e-learning acceptance, but this did not necessarily translate into usage. Computer experience plays a critical role in LMS acceptance and usage as it affects computer attitude (Teo & Noyes, 2011). Someone highly experienced in computers is more liable to engage readily with LMSs than would users having little experience of such. Should a facilitator accept the integration of technology into the teaching and learning, they are likely to have ICT experience (Mahmud & Ismail, 2010).

2.3.2. Universities' readiness for LMSs

Institutional support is defined as "general support, which includes top management encouragement and allocation of adequate resources" (Igbaria, Parasuraman, & Baroudi, 1996). The university plays a major role in ensuring that all role-players are integrated and working in harmony to create an overall positive acceptance and usage of the system. Davis, Bagozzi, and Warshaw (1989), also concluded that organizational support is one of the critical factors promoting system usage. The management of the university is influential in shaping employees' attitudes towards the system's usage (Al-Busaidi & Al-Shihi, 2012) as also stated by (Kirkwood & Price, 2014; Revere & Kovach, 2011). Therefore, the university's readiness starts with management, who must ensure that the network or Internet connectivity (better bandwidth), along with the

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infrastructure (such as the server), is operating efficiently for LMS to be implemented.

2.3.3. Students' readiness for LMSs

Factors that contribute to students' readiness for LMS usage include, but are not limited to: self-efficacy (Abbad, 2011), computer experience, technical support (Abbad, 2011; and Al-Busaidi & Al-Shihi, 2010), and prior experience (Alharbi & Drew, 2014). Self-efficacy is a personal trait describing an individual's ability to perform certain activities successfully (Bandura, 1978). Low self-esteem can hinder a person's use of LMS, even when compared to an individual with less experience but more self-confidence. This confidence can be developed by providing the student with the necessary training and technical support.

2.4. Theoretical Framework

Publications on information system (IS) or technology acceptance, have been the subject of academic scrutiny and measurement. According to most models, however, technical aspects of IS outweigh the effectiveness of the social elements. Conversely, the TAM or technology acceptance model (Davis, 1989) and the TRA, or theory of reasoned action (Fishbein & Ajzen, 1977) stress the social side of IS. The social aspects of the TAM are arguably one of the most-used theories in the IS field (Al-Busaidi & Al-Shihi, 2010), with the model's results being validated by some researchers (Al-Busaidi & Al-Shihi, 2010; and Lee, Kozar, & Larsen, 2003). However, some studies (Venter, Jansen van Rensburg, & Davis, 2012) offer conflicting results, particularly for LMSs. TAM was used (Figure 1) in the current study as a baseline following a model for LMSs proposed by Al-Busaidi and Al-Shihi (2010) to assess the extent of academics' challenges affecting the acceptance and usage of the LMS.

Davis (1989) suggests that Perceived Usefulness (PU) is directly influenced by Perceived Ease of Use (PEOU), both these determinants directly influencing attitude towards use (A). Furthermore, Behavioral Intention (BI) is directly influenced by 'A' and 'PU'. Additionally, 'BI' influences the System Use (SU).

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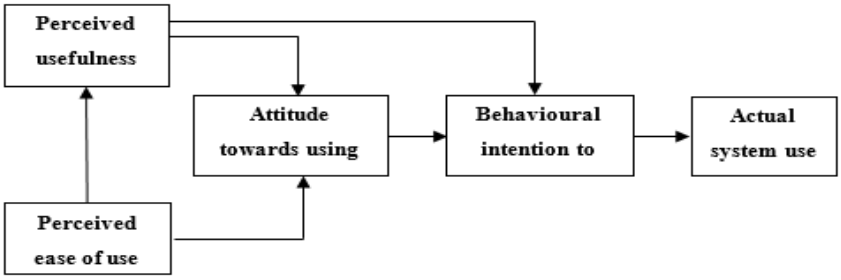
Figure-1: Technology Acceptance Model



Source: Davis, 1989

3. METHODOLOGY

3.1. Participants

The case study took place at a UoT, Durban and Pietermaritzburg campuses, located in KwaZulu-Natal, South Africa. In gathering data from those academics who teach at this UoT, a qualitative, combined with quantitative (mixed-method), approach was employed. Some 550 academics on the permanent staff on all university campuses, were presented with the questionnaire. Only 111 academics responded to the e-survey. In order to access insight and depth sufficient for understanding the topic (acceptance and use of LMSs amongst academics) 10 interview follow-ups were given (Coskuncay, 2013).

The questionnaire contained six sections (1 to 6) with pre-coded and structure questions. Section 1 covered background information; sections 2 to 6 covered constructs (PU, PEOU, A, BI, and SU) used to measure acceptance and usage of the Blackboard system amongst academics at a UoT (Table 1).

Table 1: This Paper's Objectives and TAM Constructs used to Measure them

Objectives	TAM Constructs
1. To evaluate the acceptance level of the Blackboard system amongst academics.	Perceived usefulness, Perceived Ease Of Use, Attitude Towards Using
2. To evaluate the usage level of the Blackboard system amongst academics.	Behavioural Intention to Use, System Use

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The majority of the questions used to measure the constructs were adapted from existing literature and validated by other studies. Questions were reworded to appropriately fit the study; some questions were developed by the researcher.

3.2. Data Analysis

The data collected from the questionnaire was obtained using a 5-point Likert scale for all the sections (except the demographic section). Data were analysed using SPSS version 22. The following data analyses were performed on the data: Chi-Square Goodness-Of-Fit test which tests variables by category. The aforementioned is a univariate test, finding whether any particular responses are chosen markedly more or less often than others. The Wilcoxon Signed Ranks test which is a non-parametric test, was specifically used in this study to test whether the average value is significantly different from a value of 3(the central score). The Regression Analysis test calculates coefficients of any linear equation, establishing which independent variable (one or more) best forecasts the dependent variable's value.

Interview data were assessed using narrative analysis. The interview questions afforded the respondent an opportunity of evaluating in-depth reasons for responses, beyond those obtained from the pre-coded and structured questionnaire. The interview questions were categorized into two groups:

- Group A (those who do use the Blackboard, even if only to a small extent). The aim was to ascertain the motivating factors for using Blackboard.
- Group B (those who do not use the Blackboard at all). The aim was to ascertain the negative factors accounting for their avoidance of Blackboard.

4. FINDINGS

4.1. Questionnaires

The results of Blackboard usage on the Chi-Square Goodness-Of-Fit test reflected that some 31 per cent of academics avoid all use of the Blackboard system. Some 27 per cent of academics use the system perhaps once weekly. The results of Blackboard usage from the Chi-Square Goodness-Of-Fit test also show that a significant number of participants used the system as a repository (χ^2 (5, N=111) = 18.505, p=.001); and used the system for communication (χ^2(5, N=111) = 31.207, p<.0005). A great number of participants neither use the system for assessment (χ^2(5, N=111) = 96.613, p<.0005) nor for reporting (χ^2(5, N=111) = 88.054, p<.0005). This implies that the system is not exploited to its full capacity. Furthermore, the results of computer skills from the Chi-Square Goodness-Of-Fit

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test result highlighted that 53% of the academics rated their computer skills good, 31% rated their computer skills excellent, while only 2% rated their computer skills poor.

The results from all of the constructs (Table 2 and Table 3) reflected a noteworthy difference from the central score of 3. It appeared that the System Usage construct had been little used. Participants appeared markedly in agreement on all other constructs. This would suggest that an event occurs between BI and SU, The TAM framework cannot explain the low system usage, despite its high intention.

Table 2: Mean and Standard Deviation

Constructs	No.	Mean	Std. Deviation
Perceived Usefulness	111	3.3724	.85545
Perceived Ease of Use	111	3.4288	.78617
Attitude	111	3.5261	.72359
Intention to Use	111	4.0631	1.00254
System Usage	111	2.5207	1.12727

Table 3: Wilcoxon Signed Ranks Test

Test Statistics[c]							
	Threes - Perceived Usefulness	Threes - Perceived Ease of Use	Threes - Attitude	Threes - Intention to Use	Threes - Tech Factors	Threes - Support Factors	Threes – System Usage
Z	-4.374[a]	-5.225[a]	-6.486[a]	-7.257[a]	-3.980[a]	-5.854[b]	-3.805[b]
Asymp. Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000
a. Based on positive ranks							
b. Based on negative ranks							
c. Wilcoxon Signed Ranks test							

Table 2 represents a computed mean and standard deviation of the selected items in each construct, which were used to reflect where there is higher agreement. It also depicts the mean and standard deviation for the following constructs: PU, PEOU, A, BI, and SU. Table 3 depicts the results from the Wilcoxon Signed Ranks test. The average score is calculated for each of these constructs, and tested against a neutral 3. In Table 3, the average scores are noticeably distinct from 3 (text highlighted in grey). However, SU in Table 3 shows a significantly low mean, being less than 3, whilst the others are all above 3. Such would indicate that participants, on the four construct statements, agreed with the majority, that is, PU, PEOU, A, and BI, therefore in all constructs except SU.

Furthermore, under Usage, in Table 2, low usage appears noteworthy (lower than 3). Others, however, are all in significant agreement; which means that most academics

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lean towards use of the system, albeit there is scant actual usage. Usage over a single daily usage was 5 per cent, with only 4 per cent using the system daily.

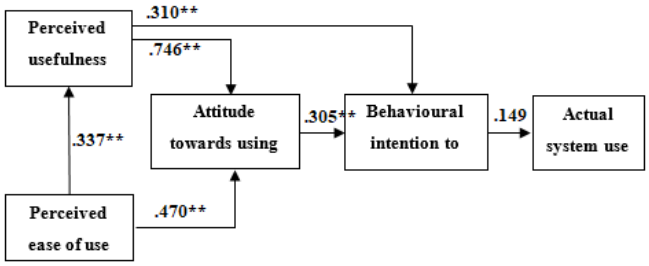
4.2. Interviews

The interview questions were based on Blackboard usage and were categorized into two groups: Group A: participants who do not use Blackboard, and Group B: participants who use Blackboard regardless of the frequency. After recording the interview, it was transcribed. The following themes arose: course management, communication, assessments, support factor, Blackboard update, staff acceptance, support, and incentives.

4.3. Research Model's Path Analysis

The summary of the results from the correlation coefficients of the TAM is depicted in Figure 2. The result reflects noteworthy correlation of all constructs of the model, save SU and BI. A single asterisk (*) in the research model's correlation coefficient path (Figure 2) reflects a level of significance of 0.05; while a double asterisk (**) reflects a significance level of 0.01.

Figure-2:Research model coefficients' path



This section of the paper will highlight only the most significant route of the model, as indicted by the value of the higher coefficients. It appears from the results that both PEOU (r=.470, p<.0005) and PU (r=.746, p<.0005) are predictors of A. Strong and medium correlation, strong predictors, respectively, had positive correlations with A. The SU is, however, not notably correlated with BI (r=.149, p=.118), the strength being low. This result indicates a gap between SU and BI. However, this discrepancy may be attributed to factors unique to the studied university. Furthermore, this result is not in accordance with the TAM. The TAM maintains that BI is the principal determinant of any IS.

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5. DISCUSSION

Use of LMSs by academics was reflected in interview and e-survey results. Results were consolidated and interpreted in evaluating LMS usage and acceptance by the above-mentioned users at a university of technology.

5.1. LMS Usage

Benefits such as flexibility, interactivity, accessibility, and self-paced learning are being attained by correct application of an LMS (Abdous, 2013), increasing availability and skills development (Alshammari et al., 2016). In assessing usage of LMSs, Pearson's analysis tests of correlation and regression were conducted. The Pearson's correlation test and the regression analysis test revealed that the correlation between SU and BI is not significant; and the BI does not predict SU at all. The findings from the current study concur with all of TAM's determinant relationships, except for behavioural intention and actual usage. A study by Venter et al. (2012) investigated the factors that either promote or hinder students' LMS acceptance and usage. Venter et al. (2012)'s research unearthed a positive, albeit weak relationship between behavioural intention and usage of an LMS. These findings would indicate a need for TAM to be revised, thereby allowing for other factors to be taken into account.

It was discovered per the interviews that the principal use of the system was communication and course management; the LMS was least used for evaluation purposes, despite the fact that it could be beneficial to students for self-assessment after each concept covered. Academics are also encouraged to incorporate LMS assessments into their final course mark. In addition, the assessment marks can be automatically featured, thereby reducing academics' workload, providing speedy response and assessment of progress. In general, interview results were aligned with those of the questionnaire. This highlighted the course management and communication as aspects most used. The aspect of assessment was largely neglected. The Kruskal Wallis test (Table 4) offered LMS experience as a crucial element in system usage. Such a result would be expected at a higher learning institution.

Computer skills' correlation with Actual Usage reflected that the greater the skills of the academic, the more the system would be used. Such is supported by the contention in literature that proficient use of technology exerts a positive influence on LMS usage. In other words, those academics most adept on the computer are likely to be less fazed by an LMS than academics not technologically experienced (Fishbein & Ajzen, 1977). Thus, LMS acceptance is

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greatly influenced by technological skills, for instance, with computers (Fathema & Sutton, 2013). Experience of ICT will be aligned with decisions on integrating technology with teaching and learning (Mahmud & Ismail, 2010). The Behavioural Intention to Use factor agreed notably with all statements on the element Behavioural Intention to Use. BI, as reflected in the results, correlated positively with PU (r =.310, p =.001) and A (r =.305, p =.001): medium strength was shown for both. It was also confirmed in the findings on TAM, that Perceived Usefulness and Attitude towards Using correlated positively with Intention to Use (Davis et al., 1989), which was also noted by (Alharbi & Drew, 2014).

Table 4: Kruskal Wallis Test - LMS Experience vs System Usage

	N	Mean	Std. Deviation
None	28	1.4929	.75715
<1 yr	18	2.3111	.98988
1 - 2 yrs	31	2.9161	.88057
3 - 4 yrs	12	2.7500	1.11559
>4 yrs	22	3.3182	.99649
Total	111	2.5207	1.12727

Test Statistics[a,b]

	System Usage
Chi-Square	35.873
df	4
Asymp. Sig.	.000

a. Kruskal Wallis Test

b. Grouping Variable: 1.6. (recoded) How long have you used, or have been using a Learning Management System (LMS)? (In general, not only the Blackboard)

5.2. LMS Acceptance

On the Wilcoxon Signed Ranks test, results indicated that most academics agreed that the system was both useful and simple to use, therefore they had a positive attitude towards use of the LMS. This finding concurs with the results of Davis (1989) and Venkatesh and Bala (2008) that attitude towards use is greatly influenced by perceived ease of use, and perceived usefulness. A similar study on academic behaviour towards acceptance of an LMS, yielded congruous findings. Academics accepted that the LMS was useful as a tool in learning and teaching, and easy to use (Fathema & Sutton, 2013), which concurs with the results of this

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study. The participants, on usefulness of the Blackboard system, indicated that this system saved time and simplified their teaching activities. It was noted that those who used the system did so selectively, ignoring certain features possibly for their unfamiliarity, or out of indifference. Neglected features included student tracking, and the forum for discussion and collaboration. Such features add greatly to support for student-centred learning.

A noteworthy correlation was indicated on Perceived Usefulness, the medium strength being (r =.470) with the high-strength Perceived Ease of Use (r =.746). The findings concurred with those of (Alharbi & Drew, 2014). In answering this question, regression analysis was conducted. Results reflected that Perceived Usefulness (β = .663, p<.0005) and Perceived Ease of Use (β = .247, p<.0005) significantly predicted Attitude Towards Using. It was noted that, not only did participants believe that use of the Blackboard system was enjoyable and far from boring; but, importantly, they believed that the system was worth the expending of time and effort in assessing of students, course management, and preparing of content.

6. LIMITATIONS AND FUTURE RESEARCH

The study acknowledges some limitations and also provides a recommendation for future studies. Academics' challenges are a focal concern of South African literature. LMS acceptance and use is limited; however, the international literature is relevant. Studies assess which of the factors raised is applicable to this case: challenges reviewed in the literature could also apply to a UoT. This study can be used to further investigate other challenges found within academia context.

7. CONCLUSION

The results of the objective that evaluated Blackboard's use by academics reflected the gap between acceptance and usage of the system. These results show that academics do intend to use the approved LMS. However, only a few actually use it. Even fewer use it for student-centred learning activities. Factors that contributed to academics using LMS infrequently, or not at all, included their level of computer skills, and LMS experience. This would seem to indicate that more intensive training should be offered, upskilling all academics with teaching responsibility on deploying LMS systems.

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Meanwhile, the results of the objective that evaluated the acceptance of the Blackboard system amongst academics revealed that acceptance was reasonably high. Most academics considered the LMS positively, finding it both easy to use and useful. The university should exploit this positive attitude towards acceptance and use of the system. An educational drive should be initiated, highlighting the benefits of such a system. This would be seen as giving support to the learning experience of students now in the digital age. While LMSs are complex systems, if implemented properly, and if the needs of the all the key stakeholders are satisfied, the rewards can be enormous. Therefore, continuous training is critical to ensure that LMSs are utilized to their full capacity. Incentivizing academics to use LMSs will act as a catalyst in integrating LMSs into the teaching and learning culture(s) of the higher education institutions.

TAM has been proven in numerous studies to successfully account for acceptance and usage in the business environment. However, it was inadequate to successfully account for usage in a university environment; and these results are similar to another, comparable study (Venter et al., 2012). Therefore, the current use of the TAM model within a higher education context appears to need further scrutiny.

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