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Determinants of Electronic Learning Adoption in Higher Institutions of Learning in Uganda: A Learners' Perspective

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Abstract

The introduction of electronic learning (EL) has been initiated in Higher Institutions of Learning (HIL) as an attempt to improve on education institutions? service delivery. By adopting the Technology-Organization-Environment (TOE) framework, this study was aimed at investigating the determinants of the e-learning adoption in HIL where eight TOE factors were examined. The study adopted a quantitative approach, a descriptive research and cross-sectional survey for the research design. A questionnaire was developed based on the eight identified TOE study constructs and administered to a population of 5438 students in three Faculties of Makerere University Business School (MUBS). In regard to data analysis, factor analysis and assessment of reliability and validity of the measurements items was done. Finally, a multiple regression analysis was carried out to evaluate the relationship between the predictor variables and e-learning adoption. The findings of this study imply that the TOE can be used to analyze ELearning adoption in Universities and other HIL as relative advantage, complexity, compatibility, size, competitive intensity and regulatory environment were identified as significant predictors of EL adoption. Whereas top management support and IT/IS knowledge are insignificant predictors in the adoption of EL.

Index terms— electronic learning adoption, higher institution of learning, TOE factors.

nformation systems (IS) projects, as a result of wide spread usage of the Internet, have been initiated in public Universities and other institutions of learning in developing countries over the past decade as an attempt to improve on public service delivery by investing million of United States (US) dollars in IT infrastructural development. Deng and Tavares (2013) also confirm this assertion that the latest development of Internet technologies has led to a lot of universities investing considerable resources in e-learning systems to support teaching and learning. Among them is the introduction of education information system (EIS) in I higher institutions of learning (HIL), an electronic learning (e-learning) approach that support learning, research and administrative operations through the use of the Internet and computer facilities **??**Raymond, 2000; **??**offe, 2002) in HIL. Henry (2001) defines e-learning as an appropriate application of the Internet that support the delivery of learning in a student-centered learning environment by delivering the required knowledge, skills and in a holistic approach not limited to any particular courses, technologies, or infrastructures. Whereas Koohang and Harman (**??**005) defined e-learning as the delivery of all educational activities relevant to instructing, teaching, and learning through various electronic media such as the Internet, intranets, extranets, satellite TV, video / audio tape, and/or CD ROM. According to Yining et al., **??**2012) the specific learning objectives and applications that e-learning technologies are expected to support include:instruction (lecture, demonstration, webinars, literature, ebooks); collaboration (virtual chat room, discussion board, study group, mentored exercise, instant message); practice (interactive tutorials, online labs, simulation, role playing schemes); and assessment (performance testing, proficiency evaluation, feedback mechanism). Thus e-learning is the attainment of knowledge facilitated and supported through the exploitation of information and communication technologies (ICTs).

Considering educational establishments across the globe, e-learning is becoming more widely adopted with the European Union Report (2014) observing that no less than 96% of the institutions surveyed in Europe use e-learning. Gaebel et al., **??**2014) attribute the drivers to the adoption of e-learning (EL) in European Higher Institutions of Learning due: -to opportunity to gain employment while studying; flexible use of time and space, physical distance/residence in remote areas; professional development and continued education; family and other social obligations and socio-economic situations of students and the need for accessible and flexible access to education lifelong **??**Blin et al., 2008). Globalization, aging society; growing competition between higher educational institutions both national and international, and rapid technological development are also drivers of educational technologies. In addition, other significant drivers to the adoption of EL include:the reduction of overall cost (instructors' salaries, travel costs, and meeting room rentals), as well as access to quality education, the provision of convenience and a Notwithstanding some lately promising initiatives, for the adoption of e-learning (EL), there are some concerns for slow e-learning adoption witnessed in higher institutions of learning in developing countries due to some noteworthy barriers hampering their efforts (Al-Fadhali, 2011) compared to developed countries. According to the Giga Information Group, nearly 75 percent of the 129 top US Universities use e-learning systems **??**Wang & Wang, 2009). Nevertheless, EL has recently become more popular in some developing countries (Alkhalaf et al., 2012) as much as its upscale is low. However, there are limited studies done in the field of e-learning adoption in institutions of higher learning in developing countries, public Universities in particular and yet the Internet usage is on the rise. According to the Uganda Communications Commission (UCC), Inter-net penetration has in the last two decades exhibited tremendous growth by 79.3% by 2014. Therefore, app-lying technology, organization and environmental (TOE) framework, this study was aimed at examining the deter-minants of e-learning adoption in Ugandan University context.

1 II. Literature Review

E-Learning is becoming more popular as the most effective method of teaching and learning, while disseminating information and knowledge in institutions of higher learning and organizations in general (Noh et al., 2012). In view of that, E-learning has relentlessly played an essential role to the advancement of the performance of teaching staff and learners, and the enhancement in the quality of teaching methods. Elearning engages the use of a computer or electronic device in some way to offer educational or learning materials, and e-manage data, information, and knowledge to improve student' performance **??**Agarwal et al., 2004). E-learning has resulted in increased popularity of education in different educational institutions (Basheer and Ibrahim, 2011) and generally its pervasiveness in higher institu-tions of learning due to the accessibility of the Internet. Liu and Wang (2009) observe that the characteristic of e-learning process was mainly based on the Internet; information dissemination and knowledge flows in form of network courses among others. E-learning has provi-ded several benefits to both the academic and adminis-trative staff and students alike. E-learning enable students at a higher educational level to obtain their education in parallel with pursing their personal goals and maintaining their own careers, without a need to attend classes and be subjected to a rigid schedule **??**Borstorff and Lowe, 2007). This has resulted to an increase in the number of online courses due to attained benefits for both University and learners as also reported by **??**Kartha, 2006). This has also improved in the quality of education as it triggers competition amongst educational institutions.

E-learning systems can be categorized into two types; the Course Management Systems (CMS) and the Learning Management Systems (EMS). Course Management System is a set of tools that allow the instructor to create online course materials and post it on the Web without having to handle HTML or other programming languages (Janssen, 2015). It's also referred to as Content management systems available since the late 1990s and considered as an integral part of higher education in recent times. Its administrative components involve class rosters and student grade records. Whereas the teaching component of CMS include all aspects of teaching, student-teacher interaction; learning objects, quizzes, class exercises, tools for real-time chat, or asynchronous bulletin board type communications and tests (Technopedia, 2015).

On the other hand, Learning Management Systems (LMS) are software programs for the administration, documentation, tracking, reporting and delivery of electronic educational technology (also called e-learning) courses or training programs (Ellis, 2009) that handles all aspects of the learning process. Mindflash (2015) suggest that they are the infrastructure that distributes and manages instructional content, identifies and assesses individual and organizational learning and training goals as well as to automating, record keeping and supporting employee registration. The TOE framework has been used by other researchers to analyse the adoption of a variety of information systems (IS) and technical innovations, including e-commerce, online retailing, e-business, and ERP (Chong et al., 2009;Lin and Lin, 2008;Oliveira and Martins, 2010;Zhu et al., 2006). The TOE framework's technology context refers to internal and external technologies which are relevant for the firm. Frequently used constructs are relative advantage, complexity, and compatibility **??**Ramdani et al., 2009), (Thong, 1999), **??**Grover, 1993) which have also been proposed in this study. Whereas, the TOE framework's organizational context comprises" the characteristics and resources of a firm including linking structures between employees, intra-firm communication processes, firm size, and the amount of slack resources" **??**Baker, 2012). Firm size, IT/IS knowledge and top management support have been proposed for the study. Lastly, the TOE framework's environmental context relates to the area "in which a firm conducts its business -its industry, competitors, access

to resources supplied by others, and dealing with the government" (Tornatzky and Fleischer, 1990). Competition pressure or intensity and regulatory environment / policy have been proposed for the study.

2 a) Relative Advantage of Technology

In a technological context, Low and Chen (2011) define relative advantage as a degree to which a technological factor is perceived as providing great

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benefit to an organization and that the adopted technology must assist the organizations to accomplish its goals. Rogers (2003) on the other hand defines relative advantage as "the degree to which an innovation is perceived as being better than the idea it supersedes" and has been positively associated with the adoption of innovative technology in previous research [(Iacovou et al., 1995); (Kuan and Chow, 2000); **??**Ramdani et al., 2009), (Tornatzky and Klein, 1982)]. Relative advantage of the technology has been consistently identified as one of the most critical adoption factors (Iacovou et al., 1995; **??**uan and Chow, 2000). It's considered to be similar to what the Technology Acceptance Model (TAM) calls perceived usefulness. Comline (2008) refers to perceived usefulness as the benefits or the efficiencies that will be enabled through the use of the system. According to Heck and Ribbers (1999), organizations with management that recognizes the benefits of the new system proposed will be more likely to adopt the system and enjoy higher impacts compared with firms with management that do not recognize the benefits of the system (Heck and Ribbers, 1999); (Iacovou et al., 1995). When perceived benefit or relative advantage of e-learning is high, there are higher chances that the organization will allocate more managerial, financial and technological resources to implement the innovation. Agarwal and Prasad (1998) demonstrate that the advantage an innovation has relative to another method is positively related to its rate of adoption. It is therefore possible to suggest that the advantages that e-learning offers would influence its rate of adoption. Therefore, the following hypothesis (H) was formulated on this basis:

4 b) Complexity of Technology

Complexity refers to the degree of difficulty users' encounter in understanding or using an innovation **??**Rogers, 2003) and (Jianyuan and Zhaofang, 2009). The level of difficulty of using an innovation is inversely related to its adoption **??**Meuter et al., 2005); (Jianyuan and Zhaofang, 2009); and (Taylor & Todd, 1995). Higher (perceived) complexity will create higher uncertainty related to a successful implementation **??**Grover, 1993), (Tornatzky and Klein, 1982). Jianyuan and Zhaofang (2009) in their study on adoption of B2B E-Marketplace in China, indicate that the complexity of an IT system has a negative correlation with the final adoption of the system. They further pointed out that, the more difficulty it is to use or train users on an IT system, the less likely it is for an organization to adopt the new system. Thus, the complexity of an IT system can be seen as having a negative impact in adopting innovation **??**Low and Cheng, 2011). Consequently, the greater the perceived complexity of using e-learning, the less likely its adoption will be. Thus, the study sought to verify:

5 c) Compatibility of Technology

Rogers (1995) defines compatibility as the degree to which innovation is consistent with the adopter's current culture, lifestyle, values, needs, processes and technological requirements. Previous research most frequently singles out compatibility's influence on the adoption of innovative technology; it correlates positively with the diffusion of innovations (Tornatzky and Klein, 1982). The lack of compatibility had led many organizations to doubt the potential of the innovation in relation to their current environment (Jianyuan and Zhaofang, 2009). Organizations are more likely to adopt a technology when it is compatible with their existing practices and values **??**Rogers, 2003). Prior studies such as Teo et al., **??**2007) and Tan et al., (2009) provide evidence suggesting organizations are more likely to adopt and use technology that is compatible with the organizations existing technology infrastructure, business processes and value systems. The study also intended to verify that:

6 d) Organization Size/Firm Size

Firm size refers to the number of employees, size of the target market and capital invested in an organization (Anand and Kulshreshtha, 2007) and has been recognized as an important facilitator for the adoption of technology innovations [(Tornatzky and Fleischer, 1990), (Thong, 1999)]. Anand and Kulshre-shtha (2007) further point out that, large organizations have more resources that can be used to finance innovation and plays a key role in determining IT innovation (Pan and Jang, 2008). Consequently, large organizations stand to benefit greatly out of technology adoption due to greater flexibility and risk-taking ability **??**Liu, 2008; **??**liveira and Martins, 2011; **??**ang et al., 2010) and also often are more well-equipped with resources and infrastructure to facilitate innovation adoption (Thong, 1999; **??**evenburg et al., 2006). Organizational and firm size is constantly found to be positive with regard to the organizational inclination to adopt an innovation (Rogers, 1995). Jeyaraj et al., (2006) also revealed that organizational size is one of the best predictors of IT adoption by organizations. This is consistent with the study done by (Gibbs and **??**raemer, 2004; **??**rover, 1993;Zhu et al., 2003) who also suggested that organizational size positively influenced the organizational adoption of IT innovations.

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Volume XVII Issue I Version I H Montazemi (1988) also affirms that the probable reason for the significant positive relationship between organizational size and IT adoption is the greater size of the organizations as they generally have more slack in their resources and therefore assign more organizational resources (e.g., financial, technical, and human resources) for the adoption of any new IT innovation. Derived from the above theoretical arguments and empirical support, it can be argued that larger Universities with more students number is linked to a large sized University thus more likely to adopt e-learning. Thus, the following hypothesis was formulated on the basis of the above evidence:

8 e) Information System (IS) / IT Knowledge

Information system (IS) expertise or knowledge also referred to as technological readiness and the IT/IS human resources and infrastructures of a particular firm. Knowledge about IS enables organisations to manage effectively the risks associated with investing in an innovation **??**Teo et al., 2007). Those organizations that do not have much IT/IS expertise and experience may not be aware of new technologies and may not desire to take a risk by adopting them **??**Ramdani et al., 2009). Relevant IS/IT experience variables have been investigated in many studies (Lee et al., 2004; Lertwongsatien and Wongpinunwatana, 2003). Dholakia and Kshetri (2002) suggest that the experience of already available technologies in the organization will influence the adoption of similar technology in the future. Moreover, Kuan and Chou (2001) also found that prior IS experience influences the adoption of new technologies. Previous researchers identified their technology knowledge as a crucial factor influencing adoption decisions [**??**Grover, 1993), (Chau and Jim, 2002); (Fichman, 1992); (Zhu et al., 2002). Considering that increasingly non-IT employyees -or at least their management -are involved in strategic IT decisions, their perception and under-? H1: Relative advantage is positively associated with e-learning adoption.

? H2: Technical complexity is negatively associated with e-learning adoption.

? H3: Technical compatibility is positively associated with e-learning adoption.

? H4: University size is positively associated with elearning adoption.

standing of the targeted technologies is important. Van Grembergen and De Haes (2008) also state that IT knowledge within business divisions contributes to a creative and innovative environment. There are also some empirical evidence that shows the positive relationship between employees' IS knowledge and the decision to adopt IS (Thong, 1999). Therefore, the following hypothesis can be formulated on this basis on technology readiness of the non-IT human resources:

with environmental factors affecting technological adoption (Iacovou et al., 1995) (Thong, 1999) as organisations also allocate more resources to innovations **??**Grover, 1993). Hence, derived from the above theoretical arguments, the following hypothesis was devised:

h) Regulatory Environment / Policy Baker (2012) points out that government regulation can have a favorable or negative impact on organizations, depending on whether its policy encourages or discourages innovation. Organizational regulation tendencies are aimed at accommodating audit trails and legislative compliance. Firms operating in a well-regulated environment have to balance legal requirements with the adoption of technology innovations. Governments can support technology innovation by providing tax advantages by introducing regulation that force firms to adopt certain technology standards (Zhu, Xu, and Dedrick, 2003). In order to be well accepted the elearning solutions need to meet some legal rules and security issues (Betts et al., 2006). Adversely, governments can also pass constraining regulation and restrictions; for example restrictions for trading with specific countries, local legislations or disaster regula-tions (Quayle, 2005). Hence, derived from the above theoretical arguments, the following hypothesis was formulated:

9 IV. Research Methodology a) Research Design, Sampling and Research Instrument

The study examined the determinants of e-learning adoption in a higher institution of learning, specifically Makerere University Business School (MUBS). The study used a quantitative, descriptive and crosssectional research designs. Cross-sectional research design collects and uses data for only a specific point in time. The study population included MUBS students from three (3) Faculties of Computing and Management Science (FCMS); Faculty of Graduate Studies and Research (FGSR) and in Faculty of Vocational and Distance Education (FVDE) with the number of respondents indicated in Table 1 below.

? H5: IS/IT knowledge is positively associated with elearning adoption.

? H7: Competition pressure is positively associated with e-learning adoption.

? H8: Regulatory environment/policy is positively associated with e-learning adoption.

10 f) Top Management Support

Top management support refers to the level of support extended by the higher management to adopting the technological innovations for use **??**Grover, 1993) **??**2006). Quinn **??**1985) argued that there happen to be two different grounds for justifying the positive relationship between top management support and technological innovation adoption. In the first instance, powerful top management support can make sure of the

ample distribution of organizational resources (e.g., financial, technical, and human) for flawless adoption and implementation of an IT innovation **??**Oliveira and Martin, 2011) and also have the ability to send innovation importance and acceptance messages across the organization (Wang, Wang and Yang, 2010). Secondly, such support lessens organizational disagreement on adopting an IT innovation as top management can provide long-term vision, proposals, support, and the obligation to generate an affirmative environment for the IT innovation **??**Quinn, 1985). Innovations that receive management support are therefore easily adopted in organizations. Therefore, it would be highly likely that the organizations with stronger top management support for e-learning adoption would also be more likely to adopt such applications. Therefore, based on the previous theoretical arguments, the following hypothesis was formulated:

11 g) Competitive Pressures

Competitive pressure refers to the degree of pressure experienced by organisations within the industry (Oliveira and Martin, 2011) and usually associated ? H6: Top management support is positively associated with e-learning adoption. Out of the 5438 sample size in Table 1 above that was conveniently selected, 4743 questionnaires were returned, implying 87.2% response rate. However, some 95 questionnaires were found to be incomplete and others inconsistent in the way questions were answered. These were therefore removed from the analysis.

Consequently, 4648 questionnaires representing 85.5% of the sample were analyzed. Even after the removal of 95 questionnaires, 85.5% representation of the study results was very adequate. The response rate was very good because the survey was conducted during exams period when most students are available at the Campus. The number of female and male respondents is almost even with the female representing a slightly higher percentage of 52.3% against 47.7% for male respondents. The gender composition reflects the student population trend in across all Universities in Uganda whereby female students constitute the majority of the student enrollments as indicated in

12 b) Reliability and Validity of Measurement Instruments

A questionnaire was developed based on the study constructs of several information systems adoption studies in Table 3 below.

13 ?

The skills needed to use EL are too complex for our institution.

14 ?

Integrating EL in our current practices will be a challenge.

15 ?

There is adequate legal protection for EL usage in institutions.

16 ?

There is knowledge about the availability of information regarding information system laws and regulations from government. The instrument for this survey comprised of items that provided indicators as a yardstick for EL adoption. The instrument was anchored on a multi-item five-point Likert scale with statements to which respondents gave the degree to which they were in agreement/disagreement with five options offered as:-Strongly Agree ”5”, Generally Agree ”4”, Neutral ”3”, Generally Disagree ”2”or Strongly Disagree ”1”. The questionnaire was pre-tested through solicited views from MUBS staff to ensure validity of the items within the instrument.

In order to have robust findings, the scales used to measure the variable constructs has to be reliable. Thus, an assessment of the items used for every variable was conducted using Cronbach alpha to determine the internal consistency of the measurement model. Consequently, the Cronbach alpha coefficient and factor loadings for the variables were extracted to ensure the internal validity and consistency of the items. The construct validity of the measurement items was determined by conducting a principal component analysis (PCA) with varimax rotation where a minimum loading value of 0.5 was used for all primary factor loadings. Other items were eliminated because of crossloadings or their factor loadings were below the 0.5 threshold value.

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(BTOS) was measured to ascertain whether the adequacy of sampling was appropriate to proceed with factor analysis. A small KMO value indicates the factor analysis may not be an excellent alternative. **??**aiser (1974) suggests that a KMO measure in the 0.90's is considered as 'marvellous', in the 0.80's as 'meritorious', in the 0.70's as 'middling', in the 0.60's as 'mediocre', in the 0.50's as 'miserable', and below 0.50's as 'unacceptable' for sample adequacy for factor analysis purposes. Further Blaikie (2003) suggest that KMO should be at least 0.60 and BTOS should indicate test for the overall significant correlation among all items at ($p < .05$). The result for the KMO and BTOS are shown in the Table 4 below. Hair et al., (1998) recommended Cronbach alpha of more than

0.7 as appropriate for a reliable mea-surement instrument. However, the generally accepted Cronbach value of 0.60 and above and factor loadings for each of the variable items of over 0.5 are also considered reliable. Therefore, since the Cronbach alpha for all the combined construct was 0.815 coupled with an acceptable Cronbach alpha of the individual constructs and factor loadings as indicated in Table 3 above, the results demonstrates that the internal consistency in the survey items demonstrate a reliable measurement instrument in terms of reliability and validity.

Prior to proceeding with factor analysis, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity .000

As indicated in Table 4 above, the KMO measure for the determinants of e-learning adoption show a value of 0795, which is almost meritorious. The observed value of the Bartlett test of sphericity was also large (15499.325) and its associated significance level was very low (0.000). Combining the results of KMO measure and Bartlett test of sphericity, the items used to indicate the determinants of e-learning adoption evidently met the conditions for subsequent tests of factor analysis. The result of this factor analysis also will affect the hypotheses that were suggested earlier.

18 V. Analysis of Results

In this study, the technological, organisation and environmental (TOE) factors were used to predict elearning adoption in a University context. A multiple regression analysis was run to determine the predictors. Prior to interpretation of the regression results, issues of multicollinearity and multivariate outliers were checked. Consequently, possible problems of multicollinearity were found not to be of concern as each predictor had a tolerance value of more than 0.5 (Tabachnick & Fidell, 2001) and a variance inflation factor (VIF) less than three (Stevens, 2012) as seen in Table 7 below. On the other hand, as a rule of thumb, if VIF>5.0, one suffers from the problem of multicollinearity (Pallant, 2001). The maximum Mahalanobis distance (19.8) did not go beyond the critical ?2 **??**22.5), showing that the multivariate outliers were purged. Consequently, specific focus in the analysis was on the model summary, ANOVA and coefficients in Tables 5, 6 and 7 respectively as indicated below. In the model, R Square is 0.756 (75.6%), taken as a set indicates that the predictors: -RA, CX, CT, S, IT, TM, CI and RI account for 75.6% of the variance in elearning adoption. It's the measure of the amount of variance in the dependent variance (DV) that the independent variable (IV) account for when taken as a group. Therefore, the overall model predicts 75.6% of the variance, which is pretty good indicating that 76 percent of the changes in behavioral intention to adopt e-learning can be explained by the changes in the eight (8) independent variables. The analysis of variance (ANOVA) Table 6 below is the test of whether R Square is significantly greater than zero (o) such that when the P value is less than 0.05 (<0.05) then the regression output is deemed significant.

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Volume XVII Issue I Version I As a result, at P<0.05, the overall regression model was significant where F (8, 4577) = 1773.8, p<0.001, R Square = 76% thus showing the fitness of the model. Thus, the predictor taken as a group predicts e-learning adoption and also indicates that the combination of the e-learning (EL) predictors can significantly predict the EL adoption. a) Dependent Variable: E-Learning Adoption Considering the coefficient Table 7 above, the P value for Relative Advantage (RA) as one of the elearning (EL) adoption predictors is 0.000. This is less than 0.05 hence RA is a significant predictor of elearning adoption. Similarly, complexity with a P value of 0.000 is also a significant predictor of e-learning adoption since the P value is less than 0.05. Furthermore, Compatibility (0.024), Size (0.002), Competitive Intensity (0.000) and Regulatory Environment (0.010) all with P values less than 0.05 are also all significant predictors of e-learning adoption. However, IT knowledge (P=0.636) and Top Management Support (P=0.735) are not significant predictors of e-learning adoption since their P values are all greater than 0.05.

20 VI. Discussion on the Findings

Set of hypotheses H1 to H8 was derived from a review of the literature on e-learning adoption numbered to correspond to the labels shown in Figure 1 in Section 3 (on page 5) indicating the anticipated effect each predictor variable would have on the criterion variable is shown as a plus sign (positive effect) or minus sign (negative effect). The hypotheses were used to test the research model involving both the independent and dependent variables. The independent variables of this study are relative advantage (RA); technical complexity (CX); technical compatibility (CT); size (S); IT/IS knowledge (IT); top management support (TM), competition intensity (CI) and regulatory environment (RI). These independent variables may be the determinants that influence the dependent variable (represented by REL), that is, the intention to adopt elearning among students respondents of MUBS in Uganda.

Hypothesis H1, Relative Advantage was found to have the most significant positive influence (t = 103.3, p-value <0.01) on the students' intention to adopt e-learning services in the University. The finding was consistent with past studies conducted related to adoption of e-learning services **??**Ansong et **??**2012) affirm that Universities that adopt elearning provide better services in their functions consequently, opening up new opportunities in the fields of teaching and transferring knowledge to the learners. This result implied that e-learning services will be embraced provided it leads to improved student performance thus increases user satisfaction; being very convenient; improves operational efficiencies and effectively through the provision of new opportunities.

Hypothesis H2, complexity was found to have significant negative impact (t = -6.336, pvalue <0.01) on the students' intention to adopt e-learning services in the University. It shows an inverse relationship with elearning adoption. Complexity in EL implies that as technology becomes more complex in a University it will lead to EL being less adopted. Other studies suggest that integrating EL in University practices is a challenge and the skills needed to use EL are also complex as demonstrated in previous studies **??** Hypothesis H4, size was found to have significant negative impact (t = -3.031, p-value <0.01) on the students' intention to adopt e-learning services in the University which supported the hypothesis. The result was consistent with several past studies by **??**Ramdani et al., 2009; **??**l-Somali, et al., 2010; **??**ung et al., 2010). Thus, the study also implies that large institutions are well-equipped with resources to make possible EL acquisition and usage. Furthermore, adoption of EL services is possible by large Universities, because they have more students and programmes, due to their greater risk-taking ability and greater flexibility in usage.

Hypothesis H5, IT knowledge was found to have insignificant negative impact (t = -0. Low et al., 2011; **??**ang, 2010). Both H5 and H6 are not very strange findings in regard to this research because the students had some prior training in the use of IT integrated in their year one curricular; therefore there was no need of top management support as far as the use of EL platform was concerned. They also see no need of having any IT expert to take them through the usage of the platform.

Hypothesis H7, competition intensity was found to have significant negative impact (t = -4.207, p-value <0.01) on the students' intention to adopt e-learning services in the University which supported the hypothesis. The result was consistent with several past studies by **??**Ansong et **??**2014). Thus, the study also implies that Universities that adopt EL do so due to improve on the existing EL services and implement new technologies as a result of competition in the education sector. Universities are in effect in a competition for supremacy, esteem, popularity, recognition and for the best products in the market. Furthermore, the Universities embrace the usage of EL due to global changes and standard practice pressure.

Hypothesis H8, regulatory environment was also found to have significant negative impact (t = -Year 2017 Quayle, 2005). Thus, the study also implies that Universities that adopt EL do so due to existence of adequate legal protection for EL usage and knowledge about the availability of information regarding information system laws and regulatory requirement from government.

21 VII. Conclusion and Recommendations

The aim of the study was to examine the determinants of EL adoption in Universities in a developing country context. The eight technology, organization and environmental (TOE) factors and predictor variables examined in this study are relative advantage, complexity, compatibility, top management support, size, IT/IS knowledge, competitive pressure or intensity and regulatory environment. The results point to six (6) factors, that is; relative advantage, complexity, compatibility, size, competitive pressure or intensity and regulatory environment identified as significant predictors of EL adoption. Whereas top management support and IT/IS knowledge are insignificant predictors in the adoption of EL in HIL. The factor having the strongest relationship on the adoption and usage of EL is relative advantage because students are more interested in their academic performance.

The implication of the top management support and IT/IS knowledge results being insignificant shows that there is need to have the same study in a University that does not have IT based course units in year one of their curriculum for sake of comparison. Perhaps, the scope of the study was also limited, so a comprehensive study should be done at MUBS to include all the six (6) Faculties instead of only three (3) before generalizing results.

As a recommendation, since E-Learning is still at its infant stage in Universities in developing countries, in order to promote its usage, Universities have to encourage both staff and students to positively embrace the EL system. Furthermore, based on the result of IT knowledge and top management support as insignificant to the adoption of EL, Universities should incorporate IT related course units in all their study programmmes during First year of study. The findings are envisioned to present government, education stakeholders and educational institutions better understanding of the e-learning adoption determinants before rolling the E-Learning system to other institutions of higher learning, perhaps including supporting private Universities. Therefore, the study will ignite the process of the formulation of national policies and strategies to enhance and support e-learning initiatives to counter and address the existing and future e-learning challenges given the foreseen potential of e-learning in higher education. The study will also contribute to the gaps in educational information systems adoption literature. [1] [2] [3] [4] [5] [6] [7]

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2009); (Jianyuan and Zhaofang, 2009); (Oliveira and Martins, 2011); (Kuan & Chou, 2001); (Low and Cheng, 2011) and (Chong and Ooi, 2008)]. Thus, competition increases the likelihood of innovation adoption
( ) H

Figure 1:

1

Faculty	Sample Size
Faculty of Computing and Management Science (FCMS)	1671
Faculty of Graduate Studies and Research (FGSR)	663
Faculty of Vocational and Distance Education (FVDE)	3104
Total	5438

Figure 2: Table 1 :

2

Frequency	Percentage

Figure 3: Table 2 :

2

and lastly, above 35 years constitute 4.8%. Considering the education background of respondents, Certificate constitute 9%; Diploma constitute 61.3%; Bachelors constitute 24.1% and finally Masters respondents constitute 5.2% as shown in Table 2 above.
above. The numbers of respondents 19 years and below constitute 1.2%; 20 -25 years constitute 63%; 26 -30 years constitute 18.4%; 31 -35 years constitute 12.6%

Figure 4: Table 2

3

Constructs & Sources		Construct Measurement Items	Cronbach's Alpha	Factor Loadings
Relative Advantage	?	EL usage increases user satisfaction and leads to improved academic performance.	0.675	1. 0.568
				2. 0.636
(Ali & Green, 2007); (De Haes & Van Grembergen, 2008); (Lee et al., 2008a); (Nfuka & Rusu, 2010); (Nfuka & Rusu, 2011). (Wang et al., 2010); Yen et al., 2013; Alshamaila et al. 2012; Low et al., 2011; Jang, 2010); Dublin, L. (2004)	?	EL offer convenience in service provision.		3. 0.566
	?	EL usage is better than the use of previous manual systems in an institutions setting.		4. 0.673
	?	Using EL improves on operational efficiencies as a result of cost reduction in service delivery.		5. 0.692
	?	Using EL improves on effectiveness in performance through the provision of new opportunities.		

Figure 5: Table 3 :

4

Kaiser-Meyer -Olkin (KMO) and Bartlett Test of Sphericity		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.795
Approx. Chi-Square		15499.325
Bartlett's Test of Sphericity	Df	36
	Sig.	

Figure 6: Table 4 :

5

Model Summary b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.870 a	0.756	0.756	0.27207

a. Predictors: (Constant), Regulatory Environment, Relative Advantage, Competitive Intensity, Complexity, Top Management Support, Compatibility, IT Knowledge
b. Dependent Variable: E-Learning Adoption

Figure 7: Table 5 :

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Figure 8: Table 6 :

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Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.487	.041		11.784	0.000		
Relative Advantage	.974	.009	.889	103.286	0.000	0.719	1.390
Complexity	-.044	.007	-.053	-6.336	0.000	0.767	1.304
Compatibility	.017	.008	.020	2.257	0.024	0.649	1.541
Size	-.020	.007	-.026	-3.031	0.002	0.714	1.401
IT Knowledge	-.003	.007	-.004	-.473	0.636	0.617	1.620
Top Management Support	.002	.007	.003	.339	0.735	0.628	1.593
Competitive Intensity	-.032	.008	-.035	-4.207	0.000	0.775	1.290
Regulatory Environment	-.015	.006	-.024	-2.592	0.010	0.637	1.570

Figure 9: Table 7 :

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et al., 2013; Alshamaila et al., 2012; Low et al., 2011; Jang, 2010) due to benefits derived from EL adoption. It also matches the results of Islam (2013) and Motaghian et al., (2013) who found a significant relationship between expected benefits and e-learning adoption. Raouf et al.,

Figure 10:

Figure 11:

Figure 12:

Figure 13:

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