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# **An Empirical Study on the Use of the Sakai Learning Management System (LMS): Case of NUST, Zimbabwe**

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## **Abstract**

There has been a major increase in the use of information Communication Technology (ICT), particularly Electronic Learning (e-learning) blended with face-to-face (f2f) in teaching to cater for increased student enrolments. E-learning is a technology based method with time and space independence and facilitated by Learning Management Systems (LMSs), computer programs used to create, manage, deliver and retrieve learning content such as Sakai. Much prior studies on LMSs have focused on their adoption and acceptance. This research thus sought to understand the reasons for some lecturers to be dissatisfied with the e-learning platform experience despite their benefits. A questionnaire based survey of 70 lecturers was conducted. The results showed that lack of awareness and the technical knowhow were among the critical factors that influenced the utilization of the Sakai LMS at NUST. This provides useful information to the university management on the need and importance of the LMS users training and refresher courses.

**Keywords:** Learning Management System, e-learning platforms, Higher Education Institutions, information Communication Technology, utilization, academics, Sakai LMS.

## **Introduction**

There has been an increase of Information Technology (IT) usage for teaching and learning, such as the use of mobile devices for an active learning process (Saadé et al., 2012). Mobile devices like smart phones enhance learning due to their being ubiquitous, spontaneous, fun, mobile and low cost (Selim, 2007). The growth in student enrolments and the shortage of lecturers has given rise to the need for ICT based teaching and learning such as e-learning systems. An e-Learning system is a flexible and convenient teaching method based on the internet connectivity (Lee &

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Lee, 2008; Pituch & Lee, 2006; Selim, 2007) that can curb the problems associated with increased student enrolments, high staff turnover and shortages of teaching resources. The literature has many benefits of e-learning system usage like the provision of quality education, time and place independence, course material accessibility, flexibility and convenience (Liaw, 2008). The National University of Science and Tech-

nology (NUST) realizing the benefits of e-learning systems has embraced this technological innovation by adopting Sakai LMS in 2012. Despite the perceived benefits of e-learning systems, many academics still do not use them, an indication that something is not working properly in e-learning platforms. By considering the responses of lecturers who participated in the survey it was possible to better understand the reasons why some lecturers at NUST do not have the e-learning platform experience. The following section discusses the current problem in relation to NUST academics, use of Sakai LMS, objectives of this study, reviewed literature, methodology used and the results of this research.

### **Problem Statement**

NUST acquired a dedicated internet line, dedicated electricity power supply line as well as the generator for power backup to ensure continued use of the Sakai LMS. An initial training workshop was also conducted for the academics on how to use the LMS tools in the teaching activities. The academics have been provided with the relevant hardware and software with each having at least a personal desktop computer, laptop or tablet PCs to facilitate the utilization of the Sakai LMS. Despite this costly initiative, only 20% of the academics are currently integrating the LMS tools in the f2f teaching method. A survey was conducted where seventy paper based questionnaires were administered to the available academics. The questionnaire was based on both closed and open ended questions for a richer understanding of the current situation of the Sakai LMS usage. The survey results revealed that an insignificant number of academics have or are actually integrating Sakai LMS tools into their teaching practices. Based on the questionnaire responses only 20.5% academics have or are still using the LMS, a project that has been running since 2012. The 79.5% non users could be merely resistant to this technological change or are being influenced by other factors not to integrate the Sakai LMS tools in teaching. The LMS tools are not used at all or are underutilized, robbing the students of an enjoyable, flexible, convenient and interesting learning atmosphere. Above all, the institution is deprived of realizing the anticipated return on their technological investment. It is against this background that the study was conducted.

### **Objectives**

This study aimed at understanding the factors influencing the use of the Sakai LMS by academics at NUST. The objectives were to establish the reasons for using the e-learning platform by academics and to establish if LMS utilization is affected by the level of user training and demographic variables such as computer experience, gender, social background and age (Asiri et al., 2012). Prior studies have confirmed attitude, self efficacy, technological relative advantage, compatibility and complexity as major factors influencing the adoption and usability of technology. A rich understanding of LMS utilization is of paramount importance as it informs the LMS developers, researchers, education practitioners and the learning institution management to correct what is wrong in the current LMS use phenomenon.

### **Literature Review**

There are many LMSs such as MOODLE, Sakai, Blackboard, WebCT, Claroline, etc, which are either commercial or open source. MOODLE and Sakai are the most preferred open source LMSs due to their flexibility, ease of use, popularity and compatibility (Caminero et al., 2013; Cigdemoglu et al., 2011). Although, of the two systems, Sakai better handles a large number of users (Caminero et al., 2013) with about three hundred adoptions worldwide. These open source LMS systems, overcome most of the drawbacks of commercial LMS systems where bugs are quickly found and fixed and security patches are released more quickly (Albarrak et al., 2010). LMSs are computer programs that facilitate e-learning through the creation of course content (Lonn & Teasley, 2009; Martín-blas & Serrano-fernández, 2009). They have tools for assessment,

communication, uploading of content, return of students' work, administration of student groups, questionnaires, tracking tools, wikis, blogs, chats, forums, etc over the internet.

LMSs are widely used in higher education for the creation, distribution, management, and retrieval of course materials, support interaction, enable institutional innovations in teaching and learning, provide tools for active online engagement such as discussion, summative assessment, chat rooms, wikis, and blogs (Cigdemoglu et al., 2011; Lonn & Teasley, 2009). LMSs are also beneficial for developing reciprocity and cooperation among learners, using active learning techniques, giving prompt feedback, emphasizing time on task, communicating high expectations, and respecting diverse talents and ways of learning (Wang et al., 2013). Other benefits of LMSs are increased degree of student-led learning, improved student morale, enhanced information skills acquisition and student achievement and may even reduce student withdrawals and absenteeism (Woods et al., 2004). In addition, some LMSs can automate notifications of due dates on a readily visible calendar, and some can automate direct email communication if students are not participating as required (Rubin et al., 2010). Much of the prior research describes LMS implementations, comparison with f2f, the adoption and continuance of use by learners where perceived usefulness, system characteristics, clarity of design, interaction with instructors, and active discussion significantly influenced their perceptions and had major influences on their use (Mcgill & Klobas, 2009). Despite the many advantages of LMSs, the major challenge of using LMS is their lack of capability to achieve pedagogical practices,

LMSs are currently not implemented and configured to help faculty engage in the seven principles of effective teaching, which are useful for enhancing learners' satisfaction, improved teaching quality, productivity, and a high level of learning. Another disadvantage of LMSs is the lack learners' contact (Woods et al., 2004) making it difficult to monitor and evaluate individual learner progress. Some LMSs require manual and time-consuming processes to track participation and notify learners (Rubin et al., 2010) of expectations and also lack the tools for formative assessment. The LMSs research Sakai included is characterized by a diversity of studies conducted in a wide range of contexts aimed at various outcome variables based on different explanatory variables and models. This makes it difficult to generalize when trying to understand its utilization in the context of lecturers; an understudied group, hence this research.

## Research Methodology

This research was based on a case study method an empirical inquiry that investigates a contemporary phenomenon within its real-life context and has the capability to utilize both qualitative and quantitative data collection and analysis. The quantitative technique is a quick data collection method used to identify and profile e-learning system users. The population of the study consisted of seventy lecturers who were administered with standard questionnaires in the six faculties of the NUST institution. The questionnaires provided quick responses on the factors influencing the use of the Sakai LMS. The questionnaires were not difficult to answer as they were structured in such a way that the respondents could choose the answers from a list. Questionnaires are convenient methods of data collection as their anonymity nature made the respondents provide valid information freely. They also could be completed at the respondent's convenient spare time dedicated to the questionnaire. It was also easy to administer and collect them since they were administered and collected via the departmental secretaries to maintain the privacy and anonymity of the respondents.

The data were analyzed using the statistical package for social sciences (SPSS) version 20, a computer program for statistical analysis. Its advantages being that it enabled the scoring and analysis of quantitative data very quickly and in many different ways such as frequencies, affording the ability to derive answers quickly and with little effort as well as its ease of use in analyzing numerical data (Bryman & Cramer, 1999). A qualitative technique was used as a follow up to

elaborate more on the challenges to using the Sakai e-learning platform. The method collected qualitative data appropriate for this research because in (Miles, 1979) they are rich, full, earthy, holistic, real; valid; they preserve chronological flow, minimal distortion collection requires minimal front-end instrumentation and undeniable quality results. This method facilitated the collection of data in naturalistic settings based on the participants' own categories of meaning, providing an understanding and description of the users' personal experiences with e-learning platforms. The qualitative method also offered a rich understanding of how the e-learning platform tools were currently used as well as the motives of using the e-learning strategy. Collected individual case information resulted in a detailed research explaining factors influencing the pedagogical use of e-learning systems.

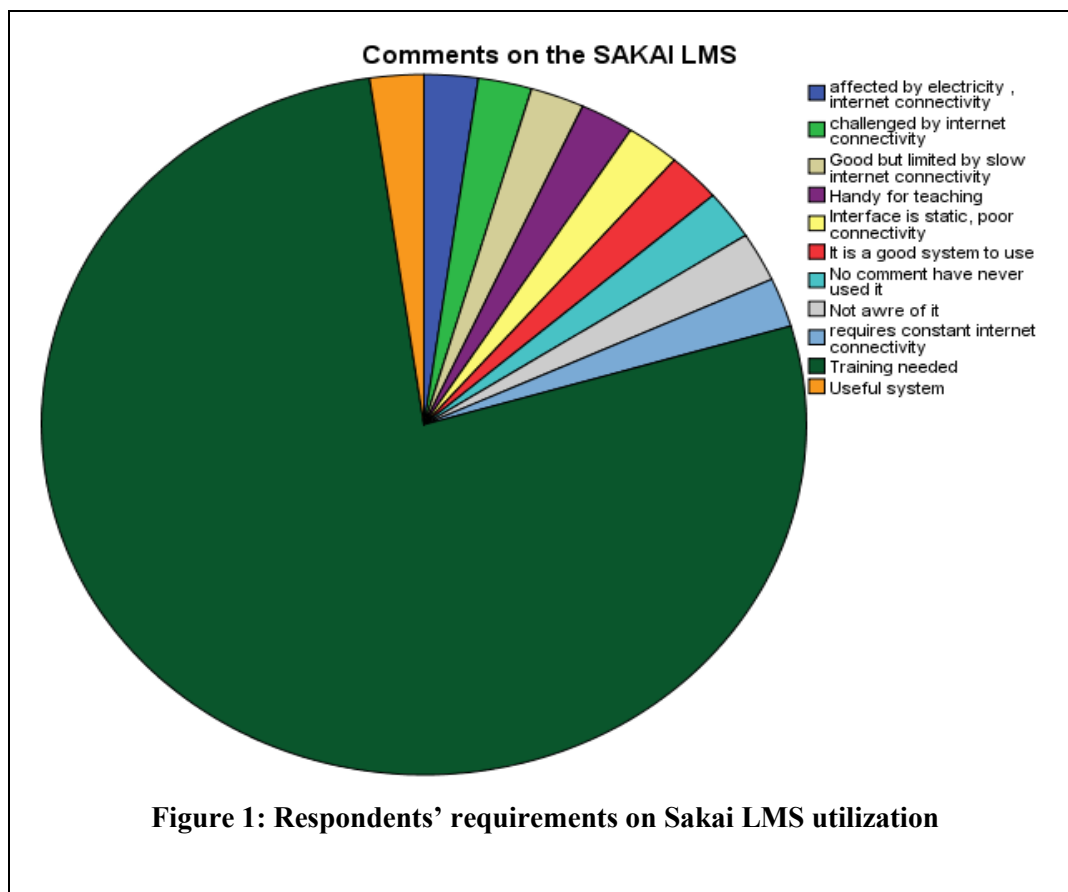
## Results

The results from this research revealed that academics do not use the LMS for teaching mainly due to lack of knowhow of the system, thus confirming (Smet, et al., 2012, p. 690)'s assertion that "users need to acquire a basic factual knowledge level about technology before they are able to move on". Only 65.9% respondents lacked technical knowhow of the Sakai LMS as they did not attend the once off training, which was never communicated to them. Lack of awareness about the system was another critical factor that influenced the use of the system since only 50% of respondents indicated awareness of Sakai LMS's existence as indicated in Table 1.

**Table 1: Statistics of Sakai LMS Awareness**

	FREQUENCY	PERCENT	VALID PERCENT	CUMULATIVE PERCENT
Yes	22	50.0	50.0	50.0
Valid No	22	50.0	50.0	100.0
Total	44	100.0	100.0	

More regular training on how to use the Sakai system is required as indicated in Figure 1. where 77.3% of respondents indicated a need for training on the Sakai LMS. This is an indication that with adequate and appropriate training there is a high potential of utilization of the system. The training will also benefit the 9.1% of academics who joined the institution after the implementation and the initial training on how to use the Sakai system. Of the 20.5% academics using the Sakai LMS, the results indicate that they primarily use it as a course information transmission tool. This is an underutilization of the system as it converts learners into passive consumers of the transmitted information rather than active participants in the learning process. Thus proving true (Woods et al. (2004)'s sentiments that few academics use an LMS for instructional purposes, and even fewer utilize it to foster a more positive sense of community within their face-to-face classes. In addition some of the Sakai users indicated challenges with the system such as its failure to integrate audio and video conferencing features for real time interactions, the constant power cuts, poor internet connectivity and lack of fully equipped computer laboratories for use by students.



Inspired by the discussed challenges, the study established that the Sakai LMS is an essential learning platform due to its availability, access to technical support, facilitation of communication and interaction between the lecturer and students, enabling of quick assessment and immediate feedback. Therefore it is a wise move to integrate it into the teaching and learning environment. The study found that demographic issues such as gender, income and age had no influence on the use of the LMS. Also technophobia was not a factor since 88.6% had a working computer that they used for developing either presentation slides and lecture notes hand outs. An in-house developed LMS is currently being used in the departments of Applied Mathematics and Statistics and Operations Research an indication that e-learning systems are a valuable educational strategy not only at NUST but in higher education institutions.

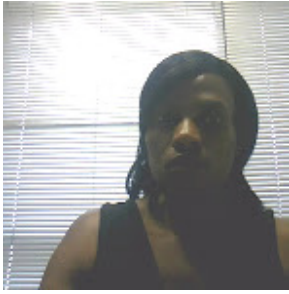
## Conclusion

The purpose of this paper was to develop a better understanding of lecturers' acceptance of the Sakai LMS and establishing if they actually use it in their teaching. Though the results, discussed above have clearly helped to attain the research goals, a number of limitations are to be considered such as the learners' experience with the system and the use of log files rather than questionnaires to get more accurate LMS related data. The study was limited by the unavailability of lecturers who were on leave since it was conducted during the long vacation. Nevertheless the study informed the education practitioners on the importance of training and the need for refresher training workshops for value-added use of LMSs. There is a positive correlation between technology use and user training for realization of return on the technological investment, a thought to be considered by higher learning institutions management.

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## Biographies



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