IT Best Practices for Implementing E-learning:
The Case of Rift Valley Technical Training Institute

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Abstract

Implementation of technology has proved to be the way to go in most of the disciplines across the world. This is because of the massive benefits that come with it. Education and Training sector has also not been left behind in the quest of embracing technology in learning. Technical and Vocational Education and Training (TVET) institutions play a big role in the provision of well-trained individuals needed by the industry. Most of the learning institutions, including TVET institutions, are currently advocating for e-learning as a mode of teaching and learning. Nevertheless as TVET institutions implement e-learning platforms, there are Information Technology best practices, other than human factors that need to be considered. This paper discusses the best practices for implementing E-learning in TVET institutions as far as information technology is concerned. The paper adopts a case study research design. Data was qualitatively collected from key informants from Rift Valley Technical Training Institute (RVTTI) which is the only TVET institution that has implemented e-learning in North Rift Region, Kenya. An e-learning model was used as the theoretical basis of the study where four themes that guided data collection were drawn. With this guidance, data was collected from key informants who included; the lecturers who had been trained on the use of e-learning and MIS manager and students who had been enrolled in the e-learning application. Data was then analyzed based on the four themes which are availability, usability connectivity and security to identify the best practices of effective implementation of e- learning in TVET. After analysis, the study gave recommendations that ensures successful implementation of e-learning in TVET institutions and also identified further areas of research in this field.
Key words: *dilemma, e-learning, teacher, 21st century, learning, nightmare*

Introduction

Technology plays a very important role in almost all disciplines in our society today. In our day- to-day life we come across the use of computer system as we seek for services in every office that we visit. These services were previously manual, but have been automated due to the massive advantages that come with the use of information technology. Initially the education sector employed computer systems for delivering administrative services only, but currently technology is playing an important role in various aspects including learning. Computer technology has brought about internet based technology which is widely used in learning, hence the term e-learning. According to Moore, Dickson-Deane & Galyen (2011), there has not been a clear definition of e-learning but what is clear is that no matter the terms used to define e-learning, it provides a learning opportunity to individuals. For the purpose of this paper, e-learning is defined as provision of learning materials in digital format that can be stored in a central site and administered to learners at any given time.

TVET institutions play a big role in the provision of well-trained individuals needed by the industry. Some of these institutions are struggling with the use of technology in learning, while others have taken a step in implementing e- learning. A lot of research has been done on the challenges of using ICTs in education but this is mainly looking at human factors (Pittnsky & Chase, 2000; McClelland, 2001; Byrne, 2002; and Savenye, Okina & Niemczyk, 2002).

For e- learning to be implemented effectively, the required technology is to be considered. Therefore there is need to establish information technologies needed for efficient and successful implementation of e-learning due to their dynamism.

Purpose and Objectives of the Study
The purpose of this study was to find out the best IT practices for implementing e-learning in RVTTI and make recommendations that can be used as a guide for other TVET institutions.

The study was therefore guided by the following specific objectives:

a)   To identify the factors responsible for the success of implementation of e-learning.
b)   To determine the success level in the implementation of e-learning in RVTTI
c)   To identify the constraints faced by RVTTI in the implementation of e-learning.

Literature Review
Since the realization of e-learning in 1980s, a lot of research has been done concerning implementation of e-learning. White (2009), discusses the critical success factors of e learning, looking at the organizational perspectives. According to her the major factor is based on the decision makers who come with strategies and policies that identify institutional learning environment. Pittinsky & Chase, (2000) established that success of e- learning is dependent on the following seven key areas: institutional support, course development, teaching/learning, course structure, student support, faculty support, and evaluation/assessment. Govindasamy, (2002), in his paper argued that pedagogical principle is very important in implementation of e-learning.

According to this research, pedagogical principles that apply to the traditional classroom delivery method also apply to e-learning. There is need to extend these principles to accommodate and provide for the rapid changes in the society. DeLone and McLean, (2003) developed the e-learning success model that helps in measuring and assessing success of e-learning. It has three stages (as shown in fig. 1), where success depends on the attainment of the three stages of e-learning system development which are: system design, system delivery and system outcome. Success of System design depends on the three factors, that is, system quality, information quality and service quality. Successes of system delivery depend on the use and lastly success of the system outcome depends on the net benefits (positive and negative aspects) and user satisfaction.
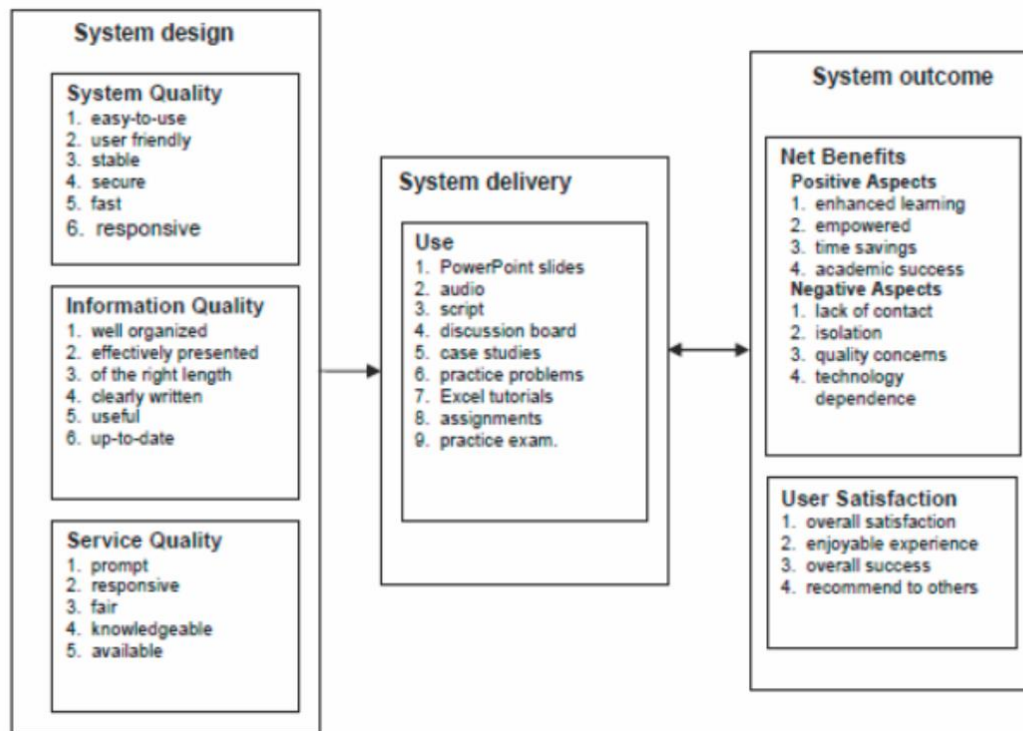
Fig. 1: E- learning Success Model, (DeLone & McLean, 2003)

Theoretical Framework

This paper proposes the use of the extended e-learning success model, (Lee, 2009) which was adapted from (DeLone and McLean, 2003) information systems success model. The model provides a guideline of assessing and measuring the success of e-learning from an information system perspective.

Extended e-learning model extends the critical stages of e-learning success model by incorporating system design, delivery, student outcome and institutional outcome. According to DeLone & McLean (2003), students' outcome and institutional outcome were added to get feedback from the students and the institution. This is because the institution plays a big role in ensuring success of e-learning implementation.

However, the researchers recommended that this model be tested and validated in future to enhance this research area. On that basis the proposed and extended model will be adapted in this research to give an indication of the extended and success of e-learning employment in TVET institutions in North Rift region.
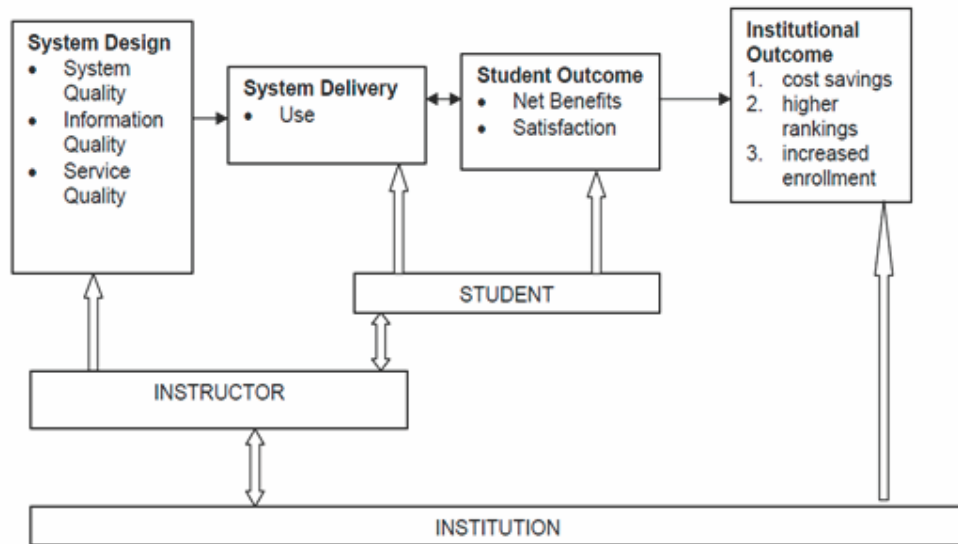
Fig. 2: Extended E-learning Success Model (Lee, 2009)

Methodology

This study adapted a case study research design where RVTTI was selected as one of the TVET institution in North Rift region. The institute leads in the quest of using technology in teaching and learning. Purposive sampling design was used to select the targeted group who are the lecturers who are well conversant with the use of e- learning platforms and the students who have been introduced to these applications. Therefore twenty lecturers who were trained on how to use Moodle, an e- learning application currently employed in RVTTI, and 60 students who had been enrolled to the system and information management system manager, who is the technical expert in the infrastructure which the learning system runs on, were purposively selected.

The instruments for data collection were interviews and questionnaires. Interviews are advantageous since they provide in-depth data which is not possible to get with questionnaires, while questionnaires are appropriate where you are collecting data from a large group because it will take a lot of time to interview the respondents (Kombo & Tromp, 2006).

For the purpose of this study, the following themes were drawn from the e-learning success model: usability, availability, connectivity and security.

Therefore, interview guides and questionnaires were developed having in mind the four themes that were drawn from the adapted e- learning success model to determine the success of e-learning implementation in RVTTI.

The study focused data collection tools to draw findings based on four themes identified above. These were: availability, usability, connectivity and security. The following findings were drawn from 20 lecturers, 1 Management Information System (MIS) Manager and 58 Students.

Findings

Availability

It was evident that the Moodle application used in RVTTI could be accessed only within the institution. This is because all the lecturers interviewed also indicated that they were not able to generate their courses or even add content to existing ones anywhere else apart from being physically within the institution premises.

Furthermore, 46 students said that they could not access Moodle outside the institution's premises and therefore learning anywhere anytime policy was not applicable. The other 12 students had not tried accessing Moodle outside the compound.

Usability

All the lecturers interviewed acknowledged the fact that they have been using e-learning applications. The widely used application is Moodle which was purposely designed to be used for learning. The features presented by Moodle that were mentioned by all the participants were ability to: create and manage courses, create course categories, enroll students to various courses, change roles, use forums for discussions, present quizzes in various formats and do the assessment; use of multimedia including videos to transfer information and use of chats that facilitates synchronous communication. Therefore the application was considered to be user friendly, well organized, clearly written and useful.

However none of the 20 lecturers were able to use simulations to present real life situations to students. Eleven (11) out of 20 lecturers stated that it is necessary to blend Moodle (e-learning) with the traditional way of teaching because some aspects of teaching require hands on experience, for example practical sessions.

It was evident that all the 58 student respondents were positive to the introduction of the new method of learning. Fifty three (53) students said Moodle was user friendly, easy to learn and could help them read ahead since the content is readily available. The other 4 students said it was difficult and they needed more practice to get used to the platform.

Connectivity

Based on connectivity, 15 out of 20 lecturers said that it was very slow to download videos on YouTube and sometimes they could not download completely. Five of the remainder said that they had not tried downloading from YouTube. Moreover, 46 out of 58 students indicated that it was slow viewing video content, and 12 students said they had not tried viewing videos.

Security

When asked whether their content was secure, 2 out of 20 lecturers said their content was secure because the servers were well equipped with an antivirus and a firewall. But 18 of them said they did not know and that it was the duty of the institution to ensure that their content was safe. This finding is acceptable because these students were not ICT specialist/experts so it was not within their jurisdiction.

The researcher also interviewed the Information System Manager who was the technical expert. He indicated that there was a firewall installed and an up-to-date antivirus to curb any threats. The operating system used in the server was windows server and backup was done inside the same server.

Conclusions and Recommendations

Basing on the findings it is evident that RVTTI has taken a step in implementing e-learning. However, the following recommendations are made to ensure successful and efficient implementation.

Ability to access e-learning application anywhere anytime is paramount. Therefore it is recommended that the institution ensures that the application currently in use can be made online. This will enable the lecturers to create their courses from anywhere without having to visit the school compound. The students on the other hand will be able to study using their phones as long as they have internet connectivity.

Since simulation is very important, it is therefore recommended that Moodle can provide this feature. Moodle compatible plug-ins that support simulations could also be developed. This could be possible since Moodle is published under an open source license, which allows customization.

Downloading documents may sometimes take a long time, pointing to the need of a very fast and reliable internet. The institution should ensure that the bandwidth is increased to a minimum of 10Mbps over high speed internet connectivity. This will help improve the service quality especially video streaming.

It also commendable that RVTTI puts measures to ensure that content in e-learning is secured. It is therefore recommended that Linux operating system be used since it is proven to be more secure and flexible than windows. This is because Linux is based on UNIX and was designed from the start to be a multiuser operating system. Only the administrator, authenticated users and applications can access the kernel. Users of windows systems can hide files from the system administrator but in Linux the system administrator is always in control (Noyes, 2010).

Having back up within the same server is risky because if that server malfunctions for some reason, then all the data including the backups will disappear. Therefore the institution should

put in place an isolated server that can be used for backup to be on the safe side. This will increase the security of the e-learning and other information systems in the institution.

It is anticipated that in future when more lecturers and students will be enrolled to the e-learning platform, the computers currently in use for e-learning will be on high demand. There is need for the institution to consider increasing more computers in the near future because some students will not afford laptops or smart phones due to their expensive nature.

It is hoped that the findings and recommendation of this research may be applied to all other TVET institutions and to the education sector at large to ensure successful implementation of e-learning. Future testing and validation of e-learning by TVET institutions is recommended to enrich this research, given the dynamic nature of the technology.

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