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Assessment of E-learning Technologies in Universities: Case of University of Dar Es Salaam

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Abstract:

The universities worldwide are struggling to use e-learning technologies to solve the current situation created by pandemics. The universities in Tanzania found themselves with no option but to make use of e-learning like any other public university in the world to support students away from them. There are various e-learning technologies, and according to the various studies reviewed, universities use an amalgamation of e-learning technologies to support the teaching and learning processes. These technologies disorient the users when they want to integrate them during the teaching and learning process. The study adopted a case study design based on the University of Dar es Salaam. The study applied stratified sampling techniques to group the students based on the year of study and simple random sampling was used to get a sample of 392 based on the strata. A questionnaire was used as the tool to get data from the respondents. The findings of this paper will be essential in identifying the most effective e-learning technologies based on the preference to support the learning process.

Keywords: e-learning, e-learning technologies, technology-enabled learning

1. Introduction

Technology has been used to aid learning for a long time. E-learning is a technology that is backed by a variety of other technologies. E-learning comprises technology applications and procedures such as audio or video cassette, satellite TV, CD-ROM, and computer-based learning, and can occur through various media that convey text, audio, graphics, animation, and streaming video. According to (Chikurteva et al., 2020), e-learning technologies are categorized into synchronous and asynchronous technologies.

Synchronous involves the use of real-time tools that allow the teacher and students to communicate simultaneously; also the students can communicate among themselves through synchronous technologies. The study of analysis of synchronous and asynchronous communication tools in e-learning (Lim, 2019) identified that among the benefits of using synchronous communication tools include the ability to collaborate in real-time, just like in a physical classroom, where students and teachers can connect spontaneously, and participants can receive a rapid response from one another, this avoids the feeling of isolation. Chat, Web conferencing, Audio podcasts, and Virtual worlds are among the synchronous technologies.

Asynchronous communication is conducted offline. E-mails, messages, and forums are used to send homework and other forms of communication. Students in asynchronous learning are said to be self-learning. This is the best option for users who prefer to explore a topic on their own or have a more daily commitment (Nedeva et al., 2014). Asynchronous conferencing allows students to access learning materials at any time and allows them to respond to questions or assignments before exposing them to the discussion forum. According to (Moorhouse & Wong, 2022), Social Networking, Virtual libraries, e-mail, forums, and Learning Management Systems are examples of Asynchronous Technologies.

Learning Institutions are using an amalgamation of e-learning Technologies to Support the teaching and learning process (Twaakyondo & Munaku, 2017). These technologies disorient the users when they want to integrate them during the teaching and learning process. Therefore, the aim of this study was to;

- Establish the e-learning technologies that are used in the universities
- Assessing the most preferred technology by the institution

2. Methodology

The study employed a case study research design, particularly a critical instance case study, and the University of Dar es Salaam was used as a case which provides a better and deep understanding of why and how a certain phenomenon is occurring through establishing the relationship between the cause and the effect (Mugenda & Mugenda, 2003). Stratified sampling was used to divide the population into different subgroups (strata), and then the sample was taken from each subgroup. The researcher utilized stratified sampling for dividing the students according to their year of study, from year one to year four. According to Orodho and Kombo (2003), the stratified random sampling method is useful for data collection if the population is heterogeneous. The sample students were selected from each stratum to give information about the e-learning technologies by using simple random sampling.

The researcher employed a simplified formula for proportions by Yamane (1967:886) to calculate the sample size. The formula is given by $n = \frac{N}{1+N(e^2)}$. From this formula, n is the desired sample size of the study population, N is the population sample size, and e is the level of precision.

The researcher employed 95% (0.95) confidence level, which corresponds to 5% (0.05) level of precision and N being the target population of 19,650 (UDSM, 2022). Using the formula, the sample size was 392, as shown below:

$$n = \frac{N}{1+N(e^2)}$$

$$n = \frac{19650}{1 + 19650 \times (0.05)^2} = 392.02 \approx 392$$

The researcher used a questionnaire to collect data for this study. The students completed the questionnaire which had both open and closed questions.

3. Data Analysis and Findings

This section provides the procedures for the analysis of the collected data.

3.1. Response Rate

A sample of 392 respondents was used. The sampled respondents were given questionnaires. 326 completed surveys, or 83%, were gathered in total. Babbie, (2004) states that a response rate of 50% returns is sufficient for analysis and publication, a rate of 60% is good, and a rate of 70% is excellent. The response rate thus suggested the appropriate sample for analysis.

3.2. Demographic Information

This section explains some background information about the respondents about their gender, age, education level, and e-learning technology experience.

3.2.1. Gender of Respondents

Table 1 indicates the distribution of the respondents by their gender.

	Frequency	Percent (%)
Male	154	47.2
Female	157	48.2
Prefer not to say	15	4.6
Total	326	100.0

Table 1: Gender of Respondents

In this study, 47.2% of the respondents were male, 48.2% were female, and 4.6% preferred not to mention their gender (See table 1 above). From the table, none of the genders has an overwhelming percentage of the response. The gender is well-balanced, which implies that the results of the study will not be biased in terms of gender.

3.2.2. Age of the Respondents

Table 2 below shows the descriptive analysis of the age group of the respondents.

	Frequency	Percent (%)
Below 20	28	8.6
21 – 25	237	72.7
26 – 30	47	14.4
31– 35	12	3.7
36 and above	2	.6
Total	326	100.0

Table 2: Age of the Respondents

The analysis shows that:

- 8.6% of the respondents were aged below 20 years,
 - 72.7% of the respondents were aged between 21-25 years,
 - 14.4% of the respondents were aged between 26-30 years,
 - 3.7% of the respondents were aged between 31-35, and
 - 0.6% of the respondents were 36 years and above
- This implies that most university students' ages range between 21 and 25 years.

3.2.3. Level of the Study

The courses at the University of Dar es salaam are offered at postgraduate and undergraduate levels. Table 3 below shows the picture of the student's qualifications based on the level of the study.

	Frequency	Percent (%)
Postgraduate	52	16.0
Undergraduate	274	84.0
Total	326	100.0

Table 3: Level of the Study

16% of the respondents at the University of Dar es salaam are pursuing postgraduate courses, while 84% are doing undergraduate courses. This implies that the majority of the students at the University of Dar es salaam are doing undergraduate courses.

3.2.4. Experience of E-learning Technology Use

The use of e-learning technology, as experienced by the respondents, is indicated in the table below.

	Frequency	Percent (%)
Less than 1 year	34	10.4
1 - 2 years	163	50.0
3 years and above	129	39.6
Total	326	100.0

Table 4: Experience in the Use of E-learning Technology

The study sought to identify if the respondents have experience with e-learning technology. The majority of the respondents (50%) have used the e-learning technology for 1-2 years, an average of the respondents (39.6%) has relied on e-learning technology for 3 years and above, while a few respondents (10.4%) have used the technology for less than a year. This implies that most of the students at the University of Dar es salaam have enough experience with e-learning technology.

3.3. Available E-learning Technologies at the University of Dar Es Salaam

The table below shows a description of the availability of different e-learning technologies that are used in universities.

	Available	Not Available	Not Sure
	%	%	%
Chat	56.4	13.8	29.8
Web Conferencing	95.7	2.5	1.8
Virtual Libraries	56.4	24.2	19.3
E-mail	86.8	9.5	3.7
E-Forums	52.5	27.0	20.6
E-Portfolio	56.4	27.9	15.6
Multimedia Content	79.4	11.3	9.2
Social Networking	84.7	9.5	5.8
Learning Management System	96.0	2.5	1.5

Table 5: Available E-learning Technologies

Table 5 shows that, for the chat tool, the majority of the respondents (56.4%) of the respondents said this technology is available, 29.8% of the respondents were not sure if the technology is available or not available, and 13.8% of the respondents agreed that this technology is not available. This implies that chat tool/technology has been used in the universities since most of the respondents agreed that it is available by 56.4%.

Web conferencing technology is available in universities, according to 95.7% of the respondents. However, 2.5% of the respondents agreed that it is not used to facilitate learning, and 1.8% of the respondents were unsure whether web conferencing technology is used or not in university learning activities. The employment of web conferencing technologies to support academic activities at the university is implied by this.

The majority of the respondents (56.4%) claimed that virtual libraries are also used to enhance learning. This was followed by 24.2% of the respondents who claimed that virtual libraries are not used in the universities to support learning, while 19.3% of the respondents were not sure if the technology is available or not available. This implies that virtual libraries are used by learners in universities to facilitate their studies.

86.8% of the respondents pointed out that Electronic Mail is available in the institution to facilitate online learning, 9.5% of the respondents claimed that electronic mail technology is not used in the university, and 3.7% of the respondents were not sure if electronic mail technology is used or not used in supporting electronic learning in the institution. This implies that electronic mail technology is also available, and it is used to facilitate e-learning in the university.

From the analysis, 52.5% of the respondents pointed out that E-Forums technology is available in the institution to facilitate online learning, 27.0% of the respondents claimed that electronic forums technology is not used in the university, and 20.6% of the respondents were not sure if electronic forums technology is used or not used in supporting electronic learning in the institution. This implies that electronic forums technology is also available, and it is used to facilitate eLearning in the university.

The majority of the respondents (56.4%) claimed that electronic portfolio technology is used to enhance electronic learning. This is followed by 27.9% of the respondents who claimed that virtual libraries are not used in the universities to support online learning, while 15.9% of the respondents were not sure if the technology is available or not available. This implies that electronic portfolio technology is used by learners in universities to facilitate their studies.

Table 5 shows that, for the Multimedia Content technology, the majority of the respondents (79.4%) of the respondents said this technology is available, 11.3% of the respondents were not sure if the technology is available or not available, and 9.2% of the respondents agreed that this technology is not available. This implies that the university uses the CDs and the DVDs to abandon some courses so that the learners can review them repeatedly.

Social networking is available in universities to facilitate electronic learning, according to 84.7% of the respondents. However, 9.5% of the respondents claimed that it is not used to facilitate learning, and 5.8% of the respondents were unsure whether social networking technology is used or not in university learning activities. This implies that universities use different social media platforms to facilitate electronic learning.

The majority of the respondents (96.0%) claimed that Learning Management System is used to enhance electronic learning in universities. This is followed by 2.5% of the respondents who claimed that Learning Management Systems are not used in the universities to support online learning while 1.5% of the respondents were not sure if the technology is available or not available. This implies that the universities are using learning Management systems to facilitate electronic learning.

Generally, the analysis indicates that these technologies have been used at the University of Dar es Salaam to facilitate electronic learning, as most of the respondents pointed out that it is available.

3.4. Preference for E-learning Technologies at the University of Dar es Salaam

The study found out to assess the preference for e-learning technologies that are used in universities. The learners were required to give their experience in line with the electronic Learning technologies that are used at the University of Dar es Salaam. Table 6 illustrates a summary of the responses.

	Excellent (5)	Good (4)	Neutral (3)	Poor (2)	Very Poor (1)	Weighted Mean
Chat	37	47	123	64	55	2.84
Web Conferencing	120	145	50	6	5	4.13
Virtual Libraries	73	89	76	44	44	3.32
E-mail	12	78	113	101	22	2.87
E-Forums	14	56	111	84	61	2.63
E-Portfolio	23	67	74	97	65	2.65
Multimedia Content	75	13	98	120	20	3.01
Social Networking	90	137	71	12	16	3.84
Learning Management System	210	79	35	2	0	4.52
University services web access	86	152	81	3	4	3.96
Mobile web access to university services	69	164	79	10	4	3.87
Average weighted mean						3.42

Table 6: E-learning Technologies Preference

Data analysis in table 6 illustrates that the mean weighted score is 3.42. This implies that the mean preference of the technologies used to support electronic learning is neutral/average. The weighted mean for chat is 2.84, for E-mail is 2.87, for E-Forums is 2.63 and for E-Portfolio is 2.65. This implies that these technologies are poor and hence they are not much preferred.

The weighted mean for virtual libraries is 3.32, for the multimedia content is 3.01, for university services web access is 3.96 and the weighted mean for mobile web access to university services is 3.87. This implies that these technologies have an average preference (neutral).

Moreover, the weighted mean for web conferencing technology is 4.13, and the weighted mean for Learning Management systems is 4.52. This implies that these technologies are good at facilitating e-learning in universities.

Generally, the most preferred technologies that enhance Electronic Learning are web conferencing technology and the Learning Management System. Moreover, Chat, virtual libraries, E-mail, E-Forums, E-Portfolio, and Multimedia Content lag behind the general means weighted score (3.42). This implies that the universities have to orient the learners on how to use the technologies, and their weighted mean is below the general mean weighted score for e-learning to be used comfortably by the learners.

4. Conclusion

The analysis shows that the University of Dar es Salaam uses different e-learning technologies to support the learning process. Despite using different technologies, the Learning Management system and Web conferencing technologies were the most preferred since they had weighted means above 4.52 and 4.13, respectively, above the average weighted mean of 3.42.

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