

The Topology of Virtual Learning Environment Technologies in Institutions of Higher Learning in Ghana

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ABSTRACT

The emergence of the information and Communication Technology has infested every areas of the world's economy from commerce through to education. Many educational institutions in the developed world have adopted and deployed various forms of technology in the delivery of education. Intuitions of higher learning in both developed and developing countries are making efforts to catch up with. This paper presents the nature and topology of the nature of learning Management Systems and Virtual Learning Environments in currently being used in Institutions of higher learning in Ghana.

General Terms

Learning Management Systems, Virtual Learning Technologies, Virtual Learning Tools.

Keywords

Learning Management Systems Nature; Virtual Learning Environment Topology; Information and Communication Technology.

1. INTRODUCTION

Over the years computer tools have been developed to support teaching, such as assessment or communication tools. In more recent years technology developments have enabled these tools to be combined into single products, called Virtual Learning Environments, or VLEs. Therefore, a VLE can be defined as a self-contained computer based (specifically web) environment enabling interactions between lecturer and student.

In recent years, supporting teaching and learning using technology especially at the tertiary level of education has become a fundamental ingredient in the experience of many if not most students, lecturers and administrators.

One reason for this trend is the widespread introduction and use of Virtual Learning Environment Technologies (VLEs). This combines a variety of tools and resources into a single integrated system.

Despite the existence of VLEs and the numerous advantages it offers, most tertiary institutions in Ghana seems to have done little at implementing them and where implemented, users such as Lecturers, students and school administrators resist it usage.

This research therefore seeks to investigate the status of VLEs in Ghanaian tertiary institutions.

In order to approach the task of investigating the status of VLEs in Ghanaian tertiary institutions, a range of qualitative methodologies is employed by the researchers to undertake the investigation.

2. OBJECTIVES

- Find the environments and platforms Technologies of VLEs in Ghanaian tertiary institutions.
- Examine the kind of VLEs that Ghanaian tertiary institutions deploy to support teaching and learning
- Ascertain the kind of VLEs that students and lecturers access to support teaching and learning.

3. PROBLEM STATEMENT

Upon critical consideration of a student within an institution of a Virtual Learning Environment, there is a lot of information which is connected with them, ranging from personal details (addresses, qualifications etc.) to exam results and module choices. Much of this information is held by different people and in different databases.

It is essential that this information is accurate, not duplicated and accessible by relevant people (including the student) in a quick and reliable manner. Therefore, the platform for management of this information is very important.

It is believed that most of the higher institutions in Ghana which have adopted the Virtual Learning Technologies are not implementing them on a known topology for operation.

4. LITERATURE REVIEW

The widespread use of VLEs is a relatively recent phenomenon; driven by the increasing ubiquity of computer-based activities in education, the ever-growing pressures for increasing the quantity and quality of educational efficiency and student support, and the technical opportunities provided by increasingly mature web technologies.

Contrary to what a class of educationist has always held onto, [1] point out that, "e-learning platforms in Higher Education are no longer expected to continue being data reservoir but instead are becoming central to the learning process itself". In their study to find the differences between face to face and e-mediated learning; [2] found out that, teachers were more committed to the design, content and the activities of the online course, facilitating the learning process of online

students. Comparatively, the learning process of the face to face students was weaker; the interaction processes were more elaborated on the online course, requiring a higher effort of teachers and students.

According to [3], “on-the -task components is a critical characteristic of the traditional teacher managed/controlled learning setting and off-the-task activities are prevalent in learner-mediated independent and exploratory tasks”, thus more related to VLETs. Using the quasi-longitudinal study of user-behaviour and access setting in his study on effectiveness of classroom control systems in a traditional classroom environment, [4] concludes that, “Students will engage more in off-the -task uses than on-the –task - uses by a significant margin”.

Studies by [5] about worth of face-to-face versus distance learning methodologies using questionnaire survey and semi-structured interviews within the grounded theory approach revealed that “the great face-to-face relationship with a teacher leads to increased participation by, and motivation of students, allowing an interaction that is not available with the distance methodology”. From the findings of [5], it’s obvious that, technical solutions alone are not sufficient to restrain off-the-task uses and hence may be necessary support technical solutions with behavioral modification and reform efforts. Thus a blended learning strategy; using VLETs to support lectures will be the ideal thing to do.

A research in 2008 by [6] about e-learning in Africa revealed that there is a wide variety of different e-learning practices in Africa, however, e-learning is still in its infancy across most of the (African) continent”. Ghana is an African country and hence one of the places where e-learning could be in its infant stages.

Results of this study will allow for the status of VLETs in Ghana to be unveiled. It will also allow for a confirmation to be made as to whether VLETs implementation is at its infant stage in Ghana or not.

5. METHODOLOGY

The specific survey research design employed in this research is the one time short design or the cross-sectional survey. The reason for selecting this is because, data for this study will be collected at one point in time from a sample selected to represent the larger population. The researchers are doing the one point in time data collection because, of the study duration: six to seven months duration.

However, only the qualitative methods will be employed in this study.

The Qualitative technique aided the researchers capture complexities of phenomena by carrying out an in-depth survey on the target population thereby collecting a lot of data. It also helped describe and evaluate the role of various stakeholders of tertiary Institutions in the implementation of the specific topology of Virtual Learning Environment Technologies in Ghana and finally show a description of the status of Virtual Learning Environment Technologies in Ghanaian tertiary institutions.

The target population for the study is Ghanaian Tertiary Institutions. According to National accreditation board - Ghana, as at December 31, 2013, “there are one hundred and forty (140) accredited Tertiary Institutions in Ghana” [7].

This number include, Public Tertiary Institutions, Chartered Private Universities/Colleges, Private Universities/Colleges, Polytechnics, Public Teacher Training Colleges, Private Teacher Training Colleges, Public Nursing Training Colleges and Private Nursing Training Colleges of which only the accredited institutions were considered.

This study is made up of homogeneous or non-overlapping subgroups such as stated above. In order to make the sample representativeness enough, all these sub groups have to be taken into consideration and the only way to achieve this is to specifically employ the use of stratified probabilistic sampling.

The researchers employed the content validity test to test the validity of the research instrument. With this approach of test, the researchers identified the overall content to be represented. Thereafter items from this content that will accurately represent the trait or property to be measured in all areas of the study were randomly selected to form the instrument.

6. RESULTS AND DISCUSSION

Using appropriate Software, the data collected from the 45 tertiary institutions were analysed. The software that the researcher employed to aid in analysing the collected data is the Statically Package for Social Scientist (SPSS) and Excel.

The Data analysed was collected from three main sources: students, lecturers and IT support staff.

The following unfolds the discussion of the results obtained from the participants upon careful analysis of a total of five hundred (500) participants.

Table 1: Background of Respondents

Participant Profile		Gender		Participants Institutions				
		Male	Female	University	Polytechnics	Nursing Training	College of Education	Others
Lecturer	52 [10.4%]	36	16	27	7	7	11	0
Student	400 [80.0%]	222	178	187	32	56	108	15
IT Support Staff	48 [9.6%]	40	8	22	12	6	6	0
Total	500	298	202	236	51	69	125	19
Percentage		59.6	40.4	47.2	10.2	13.8	25	3.8

From Table 1 above, the outcome of the responses with reference to their profile, gender and the institutions of their affiliation are realised. The distribution is such that all the other items are grouped in relation to the profile of the respondents.

It is realized that a greater portion of the respondents (80%) are made up of student, 10.4% are Lectures and 9.6% are IT support staff.

It can be inferred that greater percentage of the respondents were males (59.6% as against 40.4%) implying that males are more into Computer or IT related issues. This is substantiated from the number of male lectures and IT support staff respondents above.

With respect to institutions of which participants are from, it is realised that greater number of them (47.2%) are from the University, with followed by 25% from the College of Education, 13.8% from Nursing Training, 10.2% from the Polytechnics and the least of the participants with 3.8% from other tertiary institutions.

It is worth noting that the Virtual Learning Environment Technologies are paramount with the universities in Ghana as compared to the other tertiary institutions as shown in the response.

Table 2: Respondents Related Institutions

Profile	Category of Institution		Level of Engagement	
	Public	Private	Undergraduate	Postgraduate
Lecturer	42	10	41	4
Student	243	157	369	38
IT Support Staff	40	8	32	16
Total	325	175	442	58
Percentage	65	35	88.4	11.6

Considering respondents institutions of which they are affiliated with, Table 2 above shows clearly that, 65% are in the 35% are related to Public institutions. Furthermore, with their level of engagement, 88.4% are found to be related to

undergraduate level of education and 11.6% have their relationship with postgraduate level. It suffices to say that majority of the participants are in the public sector and are dominant in the undergraduate level.

Table 3: Respondents Related Academic Discipline

Profile	Participants Academic Discipline							
	Humanities	Business	Education	Social Sciences	Science & Engineering	Biological Sciences	Medicine/ Nursing/ Pharmacy/ Dentistry	Others
Lecturer	8	8	6	7	10	4	5	4
Student	27	80	127	45	44	13	58	6
IT Support Staff	9	7	9	7	8	3	3	2
Total	44	95	142	59	62	20	66	12
Percentage	8.8	19	28.4	11.8	12.4	4	13.2	2.4

From Table 3 above, we can infer that most of the respondents, 28.4% are into Education, followed by Business which is 19% of the total respondents, then 13.2% are into either Medicine, Nursing, Pharmacy or Dentistry. In addition, 12.4% are into Science and Engineering, 11.8% are into Social Sciences, 8.8% are into Humanities, 4.0% are into Biological Sciences and the least of the participants which is 2.4% are into other disciplines.

It is quite clear that the major academic disciplines of the population of the Ghanaian Tertiary Institutions are into Education and Business. This is substantiated with the number of accredited tertiary institutions provided by the National Accreditation Board with the programmes they have been approved to run.

Table 4: Frequency of Participants Institutions use of Technology to Support Teaching and Learning

Profile	Participants Institutions use of Technology				
	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
Lecturer	6	34	4	5	3
Student	99	207	61	23	10
IT Support Staff	6	38	0	4	0
Total	111	279	65	32	13
Percentage	22.2	55.8	13	6.4	2.6

The Topology of Virtual Learning Environment Technologies in Institutions of Higher Learning in Ghana is being unfolded with respect to their use in support of teaching and learning. With reference to Table 4, majority of respondents, 55.8% agree to the fact that Ghanaian Tertiary Institutions use Technology to support teaching and learning which is confirmed by 22.2% who even strongly agree. It is also

realized by 13.0% of the respondents who are not aware of it while 6.4% and 2.6% disagree and strongly disagree respectively. Comparatively, a total of 78% of Ghanaian Tertiary Institution are said to have been using technology in support of teaching and learning against 22% who do not know or are not using the technology in this regard.

Table 5: Tools, Facilities or Resources on Participants' Institutions Online Management System

Tools, Facilities or Resources	Profile				
	Lecturer	Student	IT Support Staff	Total	Percentage
Lecture Notes	9	168	9	186	37.2
Assignment	6	29	5	40	8.0
Grades	7	18	6	31	6.2
General Information	5	12	4	21	4.2
E-Library(ies)	3	5	2	10	2.0
Forum	2	7	3	12	2.4
Chart Facility	3	4	3	10	2.0
Email Facility	6	8	4	18	3.6
Message Facility	4	5	5	14	2.8
Link to YouTube	3	2	2	7	1.4
Video Conference facility	1	3	2	6	1.2
MP3 Facility	1	2	1	4	0.8
Link to Social Network	1	2	1	4	0.8
Missing	1	135	1	137	27.4
Total	52	400	48	500	100

Referring to Table 5, reveal that, of the 500 participants who say their institutions have been using technology to support teaching and learning were subjected to provide which tools, facilities and resources that feature in this support on their online management systems. It can be deduced that 186 (representing 37.2%) say lecture notes is provided on it, 40 (representing 8%) say assignments are provided on it and 31 (representing 6.2%) say grades are provided on it. Also, 21 (representing 4.2%) of the participants say Institution general information is provided on it,

We further realised that 10 (representing 2.0%) say e-library or a link to e-library is provided on it, 12 (representing 2.4%) say forum is provided on it, 10 (representing 2.0%) say chat facility is provided on it and 18 (representing 3.6%) say email facility is provided on it. It is also revealed that 14 (representing 2.8%) participants pointed out that message facility is available on their system.

Again, it is noted that, 7 (representing 1.4%) participants reports a link to YouTube is provided on it, 6 (representing 1.2%) say video conferencing facility is provided on it, 4 (representing 0.8%) say MP3 facility is provided on it and another 4 (representing 0.8%) say a link to social network is provided on it. Instead of a total of 500 participants answering this question, 363 did; meaning, 137 (representing 27.4%) of which the greater portion are students could not identify the implementation of the tools, facilities and resources on their online management system or did not understand this question and hence failed to answer.

Institution-bound national research has indicated that the VLE provides a content repository but, in many cases, limited active learner participation as proposed by [8] and [9]. They also noted that there is a qualitative difference between 'teaching online' and merely 'putting a course online'; and online pedagogies are frequently valued by academic staff

only in proportion to how well they seem to reproduce or simulate an equivalent face-to-face experience.

7. CONCLUSION

[9], asserts that “dominance of technology in the delivery of instruction” and the “potential disappearance of schools before the end of the 21st century” are among the top ten educational trends that are unfolding. As a result, technological systems developed nowadays for education are done such that they allow for flexible education and training. This has resulted to virtual campuses and the creation of virtual learning environment technologies for both physical and virtual based schools.

The purpose of this paper is therefore to examine the status of Virtual Learning Environment Technologies in the Ghanaian Tertiary Institutions to ascertain whether they are in line with the trends mentioned above or they are falling behind.

We can in no wise say that the Topology of the Virtual Learning Environment Technologies in the Ghanaian Tertiary Institutions is of wider topology but still in the infant stage considering the outcome of the responses.

With specific reference to Table 5, out of the 363 participants who say their institution have support of the online learning management system in teaching and learning, only 1% to 9% of them agreed that their institutions provide chat e-library or e-library links, forums, chat facility, email facility, message facility, video conferencing facility and links to social media. This means that 90% of Ghanaian institutions that have VLETs do not have the above named facilities on it. This is a confirmation of the findings by [10] that facilities such as interactive video content delivery, audio content delivery, message facility and digital libraries should be provided on VLETs.

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