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What challenges affects the implementation of E-learning in Ghana Tertiary Institutions?

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ABSTRACT: The objective of this study is to examine key challenges hindering the implementation of E-learning systems in Ghanaian tertiary institutions and to recommend practical measures that would ensure the attainment of its fullest potential. Most institutes of higher learning in Ghana have initiated reforms geared towards E-learning adoption. However, the execution of this laudable concept of teaching and learning has not been without its associated implementation challenges. Thus, affecting the realization of all the advantages associated with E-learning. The objective of the study therefore is to ascertain key problems hampering the implementation and utilization of successful E-learning systems in Ghanaian tertiary institutions. Data for the study was gathered through the deployment of questionnaire, interview and secondary data. The survey comprises of 163 respondents made up of School authorities, Faculty members, ICT staff and students of 4 tertiary institutions in Ghana.

The results revealed that the introduction of E-learning comes with inherent challenges that must be dealt with by both Government and implementing tertiary institutions in order to derive all the advantages that comes with it. The study concluded by proposing conceptual recommendations that will enhance the success rate of E-learning implementation by institutes of higher learning in Ghana. In addition, the study suggests that the opportunities with this mode of teaching and learning by far surpass the challenges.

KEYWORDS: electronic learning, Ghana Tertiary Institutions, Implementation Challenges, ICT.

1 INTRODUCTION

Tertiary institutions all over the world are continuously striving for innovation in teaching and learning. An increasing number of them operating in international education markets are using E-learning as a cost effective alternative to conventional face-to-face learning systems (Loh et al, 2016). A large and growing body of research shows that a high technology (high tech) workforce will create substantial economic benefits. Lichtenberg (1995) reported that a single Information Technology (IT) worker can be substituted for six non-IT workers.

Improving tertiary education in Ghana and for that matter other developing countries had until recently been overshadowed by initiatives focusing on national economic and infrastructure development. However, in recent times investments by governments and other developing partners are targeted at expanding the number of student enrollment at all levels of education, higher education inclusive. In conjunction with this, the transformation of tertiary education through the introduction of ICT initiatives to produce capable work force. Numerous policies and projects are being introduced to usher ICT and related teaching, and learning approaches known jointly as electronic-Learning into schools, notably institutes of higher learning.

Various forms of reforms have been initiated by educational policy providers in a bid to provide alternative modes of delivery, such as technology enhanced modes of learning. This has generated a great deal of attention from students, educational designers, researchers, policy makers and education providers. The past 20 years have witnessed a rapid growth of E-learning, "the third generation of distance education" mostly in the economically advanced countries, and most recently, in developing nations (Garrison and Anderson, 2003). One important reason that can explain the increasing demand for E-

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learning by potential students in developing countries is the lack of infrastructural capacity by tertiary institutions to enroll students to pursue programs offered through the conventional face-to face mode of teaching and learning. Garg et al (2015) in their study established that extant literature have identified a number of impediments towards adoption of ICT in supporting teaching and learning in developing countries, few however, have explored the most significant obstacles affecting their implementations.

Tertiary institution in Ghana embarking on any form of E-learning initiatives should explore what it takes to create a successful e-learning experience for diverse learners. Kahn (2001) proposed "A Framework for E-Learning". The framework began with the question "What does it take to provide the best and most meaningful open, flexible, and distributed learning environments for learners worldwide?" and comprise of eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical. Each dimension has several sub dimensions each consisting of issues focused on a specific aspect of an e-learning environment. Wagner et al (2008) stated that the degree or magnitude of E-learning technology varies significantly among delivery institutions.

The focus of this study, therefore, is to undertake an assessment of challenges affecting the success rate of E-learning among tertiary institutions in Ghana. A review of literature of E-learning in Ghana revealed that it is currently bedeviled with lots of challenges acting as barrier to its utilization across economic, geographic and cultural barriers. Dominant among these challenges were issues that had to do with existence of ICT and E-Learning infrastructural gab resulting in equipment and software challenges exacerbated by inappropriate and obsolete equipments, inefficient connectivity and unaffordable internet bandwidth. In addition, there is also lack of trained and motivated ICT and administrative support staff with adequate skills to aid the integration of ICT into courses which are relevant contextually and thereby creating lasting interest to attract students or learners

2 LITERATURE REVIEW

2.1 DEFINITION OF ELECTRONIC LEARNING (E-LEARNING)

For researchers, E-learning is a broad and disconnected area of enquiry that has attracted disciplines as diverse as educational, psychology, computer science, information science, management, communication etc. The comprehensiveness of the subject and the divergent objectives, goals or targets among those studying E-learning has led to a disconnected understanding of what E-leaning means and how it should be defined. The current state of affairs is best illustrated and exemplified by the numerous terms used to refer to instruction delivered through computer technology, such as; online learning, distant learning, distant education, computer-assisted instruction, computer-based instruction, technology-delivered instruction, E-learning, computer-based simulation, and simulation games.

E-Learning is a term that means something different to almost everyone who uses it. Some use the term to refer to packaged content pieces and others to technical infrastructures. Some think only of web-based self-study while others realize E-Learning can encompass real-time learning and collaboration. Rosenberg (2001) defined E-Learning as "*the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance.".* Within two years, this definition has expanded to include wireless as well as internet technologies with the two technologies often working together to deliver focused learning and teaching. Jenkins & Hanson (2003) also referred to E-learning as learning facilitated and supported through the use of information and communications technology (ICT). Garrison (2011) on the other hand, defined E-learning as "electronically mediated asynchronous and synchronous communication for the purpose of constructing and confirming knowledge." E-learning can be classified into two broad categories, synchronous and asynchronous (Cantoni, 2004). Brown et al (2012) in their study discovered 46 distinct terms.

2.2 DIMENSIONS OF E-LEARNING

The variations in the configuration of E- learning offerings can be described through a number of dimensions, as listed in Table 1 below. These attributes are categorized into dimensions, which are; synchronicity, location, independence, and mode. E-learning can be real-time (synchronous) or flex-time (asynchronous). According to Romiszowski (2004), in cases where technology such as video conferencing and electronic white boards are used in the execution of E-learning, it is referred to as Synchronous. In other words, students are required to be present at the time of content delivery. However, Asynchronous applications include programmed instruction and tutorials that allow students to work through the screens at their own pace and at their own time. Most of the courses available on the Internet are based on this asynchronous model (Greenagel, 2002).

Studies across the world have unveiled a growing potential of E-learning in addressing the many socio-economic challenges confronting nations, especially the educational sector. A white paper reports by Olson et al (2011) states among other potentials of E-learning as; addressing the issue of shortage of teachers at all levels of education, addressing the issue of shortage of learning materials such as textbooks for students, improving the quality of education through the provision of improved informational content and learning approaches, and providing students with requisite information communication technology skills.

Table 1: Dimension of E-Learning

Dimension	Attribute	Meaning	Example
Synchronicity	Asynchronous	content delivery occurs at a different time than receipt by the student	lecture module delivered via email
	Synchronous	content delivery occurs at the same time as receipt by the student	lecture delivery via web cast
Location	Same place	students use an application at the same physical location as other students and/or the instructor	using a GSS to solve a problem in a classroom
	Distributed	Students use an application at various physical locations, separate from other students and the instructor	using a GSS to solve a problem from distributed locations
Independence	Individual	students work independently from one another to complete learning tasks	students complete e-learning modules autonomously
	Collaborative	students work collaboratively with one another to complete learning tasks	students participate in discussion forums to share ideas
Mode	Electronically	Only all content is delivered via technology, there is no face-to-face component	an electronically enabled distance learning course
	Blended	e-learning is used to supplement traditional classroom learning	in class lectures are enhanced with hands on computer exercises

Source: Wegner et al (2008)

2.3 ICT IN EDUCATION AND IMPLEMENTATION OF E-LEARNING IN GHANAIAN TERTIARY INSTITUTION

Ghana is among the top twenty countries with the highest E-learning growth rate in the world, where it's expected to grow by 45% in 2020 (Ambient Insight Report, 2015).

Ghana has always exhibited its commitment in transforming the agro-based economy of Ghana into an information rich and knowledge-based economy and society using the tools of Information and Communication Technology (ICT). It acknowledges the need for ICT training and education in schools, colleges and universities and the overall improvement of the education system. The deployment of ICT into Education will result in the creation of new possibilities for learners and teachers to engage in new ways of information acquisition and analysis. ICT will enhance access to education and improve the quality of education delivery on equitable basis.

Consequently, The government in collaboration of its developing partners it came up with the "ICT in Education policy document" in 2008, after an extensive consultative process with various sector stakeholders, thus; public, private, civil society and development partners. The development of this policy represented a critical step in streamlining efforts towards integrating ICTs into Ghana's educational sector.

The policy outlined various thematic through the guiding principles, objectives and associated strategies that have been identified to achieve goal. Included in these thematic areas was the Educational Management –Ministry/Agencies and Educational Institutions as well as Infrastructural, E-readiness and Equitable access. As part of the strategies, the policy proposed the upgrade of ICT facilities (laboratories, equipments, software, digital libraries, communication access) to acceptable international standards and the promotion of electronic and distance education, virtual leaning systems to complement and supplement the face-to-face campus based educational training systems (ICT for Education Policy, 2008). It

is important to note, however that the government has come up with a revised policy document "National ICT in Education Policy for Ghana" in furthering it reengineering bit to the deploy and the create new possibilities for learners and teachers to engage in new ways of information acquisition and analysis and also enhancing access to education and improve the quality of education delivery on equitable basis.". Most tertiary institutions in Ghana (both public and private) are taking advantage of these policy initiatives by the government to transform their mode of educational delivery bearing in mind the enormous benefits that comes with it.

The University of Ghana has improved facilities in the distance learning centers starting from the 2015/2016 academic year. Students, who are admitted to specific regional centers, will have all tutorials and examinations in their centers, rather than travelling to traveling to the main university campus. This move will go a long way to enhance teaching and learning whiles the programme is being moved away from the use of paper-based teaching materials to Sakai, an E-Learning platform. Additionally, the university's Distance Learning mode has been boosted with a 37.5 million dollar Information and Communication Technology (ICT) project under the Chinese Phase 2 ICT Project. The project, funded with a Chinese Government loan procured by the government of Ghana on behalf of the University, has deployed an integrated Digital Mobile Learning platform for Distance Education. As part of the project, the Accra, Koforidua, Sunyani, Takoradi, Tamale, Tsito, and Wa Learning Centres have been equipped with modern facilities; with each center provided with ultra-modern computer labs, smart classrooms, a video conference facility, backup generators and outdoor Wi-Fi. In addition, as part of the project; 3000 internet enabled android tablets have been acquired; pre-loaded with the relevant teaching and learning materials, and distributed to newly admitted students.

Furthermore, the Kwame Nkrumah University of Science and Technology has a central ICT center with a seating capacity of about 250 personal computers with an execute wing for senior members of staff. Computer access on campus with student/computer ratio is 8:1. The university has taken up the challenge of increasing access to tertiary education and training through the Institute of Distance Learning (IDL), in response to the Ghana Government policy on Tertiary Education and education technology innovations worldwide of providing the policy framework for Ghanaian Universities to increase access to tertiary education. The E-learning center at KNUST offer programmes such as MSc in Information Technology, ICT professional courses and MBA in Finance through ICT usage for the Ghanaian public (KNUST, 2016).

The African Virtual University (AVU), between November 26th and 28th, 2012, launched the AVU multinational Project in Ghana. The project was launched in three institutions including the Ghana Institute of Management and Public Administration, the University of Education – Winneba, and the Kwame Nkrumah University of Science and Technology in Kumasi. The African Virtual University (AVU) has announced the lunching of a multinational project in Ghana. At the Ghana Institute of Management and Public Administration (GIMPA), there is also an implementation of a multinational Project II. Ghana is the only country with three institutions participating in the Multinational Project II (AVU, 2016).

In spite of the laudable initiatives being done currently to boast and embrace E-Learning towards transforming higher education delivery in Ghana, its implementation hasn't been without problems. A review of various literatures on E-Learning has revealed that not much in terms of studies have been devoted to investigate its implementation challenges by tertiary institutions in Ghana specifically. The objective of this study, however, is to undertake a comprehensive assessment of factors impeding the smooth implementation of E-Learning in Ghanaian tertiary institutions and to recommend strategies that could be adopted to ensure the attainment of its fullest potential by users as well as the implementing institutions. The findings and recommendations of this study would benefit researchers interested in other aspects of e-learning adoption and its implementation in the context of developing economies that may not been catered for under this study.

3 RESEARCH METHOD

The objective of this study is to investigate key factors hindering the successful implementation of E-learning systems in Ghana's tertiary institutions. The study adopted a random sampling to collect data from respondents for the purpose of the study. The sample size of the study was 200 respondents, drawn from four tertiary institutions in Ghana. The criteria for selecting these institutions were due to their adoption and utilization of E-learning system for at least three consecutive years. The study assumed that by meeting the above criteria, the selected institutions had comparatively and relatively well-established teaching, learning and research infrastructure, as well as generated more teaching and learning materials in E-learning. Hence they were more likely to assist in unraveling a solution to the research question than institutions that just commenced or plan to implement E-learning.

The unit of analysis for this study was these four institutions on which individuals such as university authorities, faculty members, ICT staff and students were presumed to be representing. Therefore, all relevant data for the study was collected from these institutions through the use of a structured instrument; that is a questionnaire. To ensure the content validity of

the scales adopted in this study, the items were derived from existing instruments used to measure all the phenomenon of interest in this study. This approach helped ensure content validity (Chang & Tung, 2008). Notwithstanding, in most cases, the wording in the existing items were reviewed to be consistent and relevant to our study. A 5 point Likert scale ranging from1 as strongly disagree to 5 as strongly agree is used for the measurement.

3.1 DATA ANALYSIS

This section of the study presents the manner in which data collected for this study was stored and analyze to arrive at our findings.Through the process of categorizing and coding, the data collected from the questionnaire were quantitatively analyzed using Microsoft excel.

Additionally, qualitative data from interviews was organized into relevant themes and concepts. After analysis of both quantitative and qualitative data, it was interpreted by use of descriptive narrations. The data analysis process also included the comparison between the responses and relevant documents to augment the quality of information.

3.2 DATA COLLECTION

The questionnaire included 4 parts and 40 items. The first part was used to capture the demographic characteristics of the respondents as well as their digital literacy. Respondents were asked to rate their own capabilities to carry out range of tasks using a computer or mobile device. These tasks used for this study were adopted from Kennedy et al (2008).

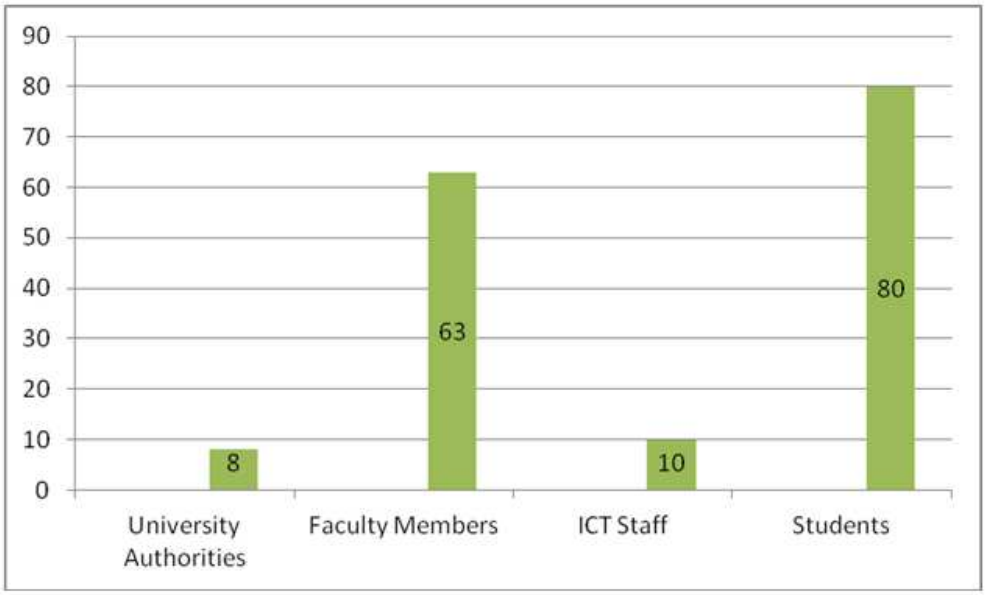
Part 2 which was made of 10 items questionnaire was used to solicit responses on the availability or otherwise of ICT and E-Learning infrastructure for implementation of E-learning. Part 3, on the other hand measured the general perception or attitude towards the implementation of E-learning in Ghanaian tertiary institutions using 10 items. The final part, which is part 4, and made up of 10 items was meant to assess the existence or otherwise of institutional support systems for E-learning and Education Technology

The respondents were university authorities, members of faculties, and staff of ICT department Ghanaian tertiary institutions who are currently running programs in E-Learning at the undergraduate level to help us answer the research question. In all, 200 questionnaires were distributed whiles 163 were retrieved, representing an acceptable 81.5% retrieval rate. The respondents comprised of 8 university authorities, 65 members of faculties, 10 staff members of ICT departments, and 80 students. The objective of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable you to answer your research questions. To this end, purposive sampling which is also known as selective or subjective type of non-probability sampling technique was used to select the 8 university authorities and 10 ICT staff for the study. However, in the case of faculty members and students, a simple random sampling technique was adopted to select the respondents for the study.

4 FINDINGS AND DISCUSSIONS

4.1 DEMOGRAPHY OF RESPONDENTS

The figure 1 presents the demography of the respondents of this study.



(n=163)

Fig. 1. Demographic Characteristics of Respondents

4.2 NON-AVAILABILITY OF ICT AND E-LEARNING INFRASTRUCTURE

The lag in the development of computer and ICT infrastructure was identified as one of the key factors hindering the smooth and implementation of E-learning systems in Ghana's tertiary institutions. To ascertain the adequacy and availability of ICT and E-Learning infrastructure in these institutions, a question was asked on the existence of well-equipped computer laboratories, expansion of ICT services, improved network backbone and increased bandwidth. Internet bandwidth is rather limited. The University of Ghana, for instance has increased its internet bandwidth from 10 megabyte per second (mbps) in early 2010 to 310 mbps in late 2013 (UG, 2015) in terms of both uplink and downlink, internet connectivity in virtually all the institutions are unreliable. E-learning system users have to rely on their private USB mobile internet connectivity to be able to complete their tasks.

The study revealed that, significantly, 85% (that is 139) of the respondents consented to the fact that there were various challenges involving the inadequacy of ICT infrastructure to aid the implementation of E-learning in Ghana's tertiary education delivery system. Equally prominent also, was the lack of awareness of existing ICT services, lack of coordination across campuses and departments, lack of instructor incentives to integrate technology with teaching and research, frequent power outages and fluctuations. This is consistent with the results obtained by (Marfo & Okine, 2011) on their study of the disadvantages of implementing E-Learning systems in Kwame Nkrumah University of Science and technology Kumasi, Ghana.

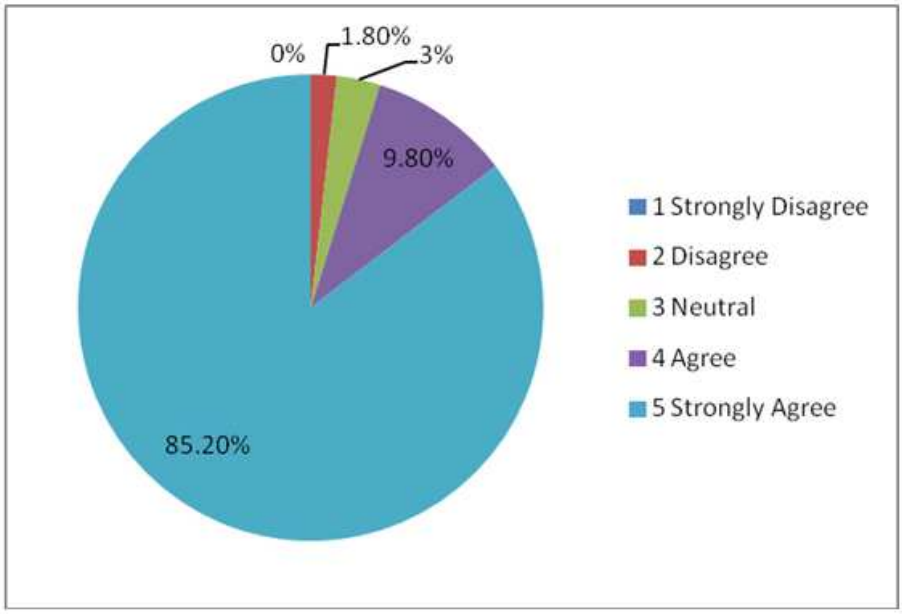


Fig. 2. Lack of availability of ICT and E-Learning infrastructure

4.3 Attitude And Perception Towards E-Learning Systems

Furthermore, analysis of data collected (both primary and secondary) confirmed the general perception that even though, the concept of E-learning is consociated with instructional experience that is difficult or impossible to create in the classroom or through alternative media, they still harbor a negative perception with regards to its adoption and utilization. Another factor that was also identified as being responsible for the difficulties confronting the successful implementation and integration of E-learning systems was the issue unwillingness and hesitation to change. Andersson and Grönlund (2009), in their study, reported that beliefs and attitudes of decision-makers in a system will affect the growth of both technology and e-learning in a country. In this study, a sizeable majority 61.3% (that is100) of the respondents agreed that E-learning is still embroiled with certain deficiencies, particularly as alternative to the conventional face-to-face mode of education where a classroom made up of students with a teacher leading the process.

The integration of ICT into the higher education delivery in Ghana calls for a new orientation in methods and changing roles of teachers and quite obviously pushing some faculty members out of their comfort zones. The resistance to change by these institutions and strong feelings of academic staff towards traditional teaching practice and methods is a major concern requiring urgent attention. The apparent deficiency of teacher incentives to integrate technology with teaching and research was clearly manifested. The study found that, a segment of stakeholders still holds the view that E-learning offers less educational value than traditional classroom courses. A section of faculty members who were interviewed were skeptical of the value of E-learning because it differs in terms of characteristics and traits from the way they were taught, and hold the fear that the system will distant them from their students, thereby subverting the educational and mentoring process. This is coherent with the study by Kwofie & Anders (2011) that Ghana educational system portrays the teacher as the principal source of knowledge.

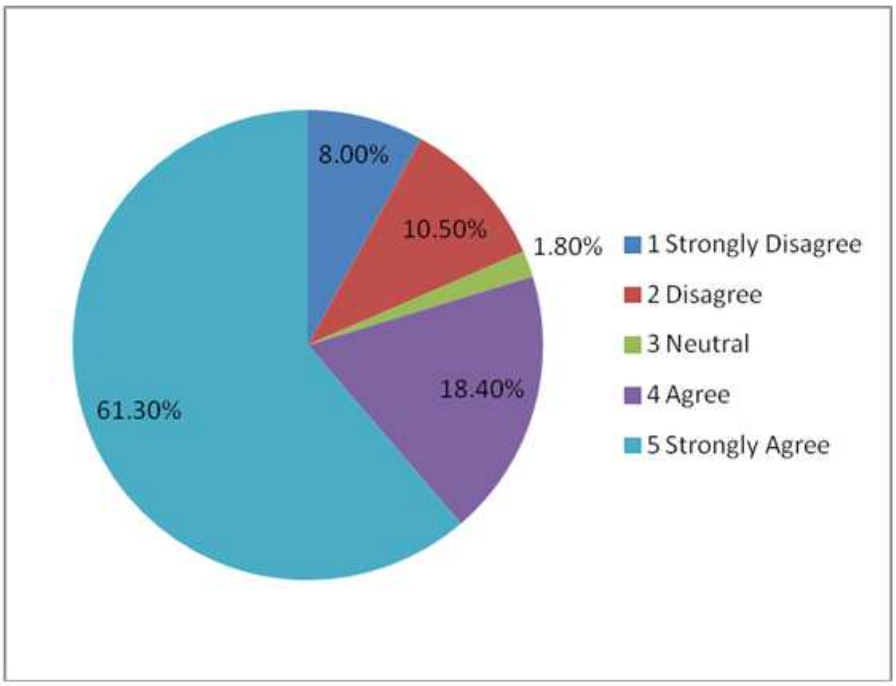


Fig. 3. Attitude and perception towards E-Learning Systems

4.4 INSTITUTIONAL SUPPORT SYSTEMS FOR E-LEARNING AND EDUCATION TECHNOLOGY

To conclude, the questionnaire was administered to obtain responses that will enable the study analyze another important factor, which is the availability of institutional support systems that are targeted towards E-learning implementation and improvement in education technology in these institutions. Data gathered demonstrated that, although these tertiary institutions have been implementing E-learning for at least three years or more, there was no policy documents designed to guide the implementation process. Institutional support, policies and strategies that will ensure the creation of a solid basis for a wider integration of learning technologies in teaching and learning were not well grounded and constituted.

Critical institutional and management responsibilities such as the provision of monitoring and evaluation support systems which will provide support to assess that the outcomes of E-learning match the anticipated goals were in most cases nonexistence. In situations where policy documents on ICT and E-learning implementation have been put in place, lack of firm and concrete budgetary commitment prevents its adherence to the latter.

Additionally, management of these institutions has failed to institutionalize policies that will serve as motivators to administrators, teachers and students to adopt and implement E-learning systems for teaching and learning purposes. Although, virtually all these institutions make yearly projections and financial budgetary allocations for E-learning implementation and related activities collected to technological mediated teaching and learning, it's evident that these allocations are not sufficient to accomplish important E-learning activities like the provision of infrastructure, training, creating of awareness on the need to change and empowering teachers to the learning process by transforming themselves into team leaders and role models.

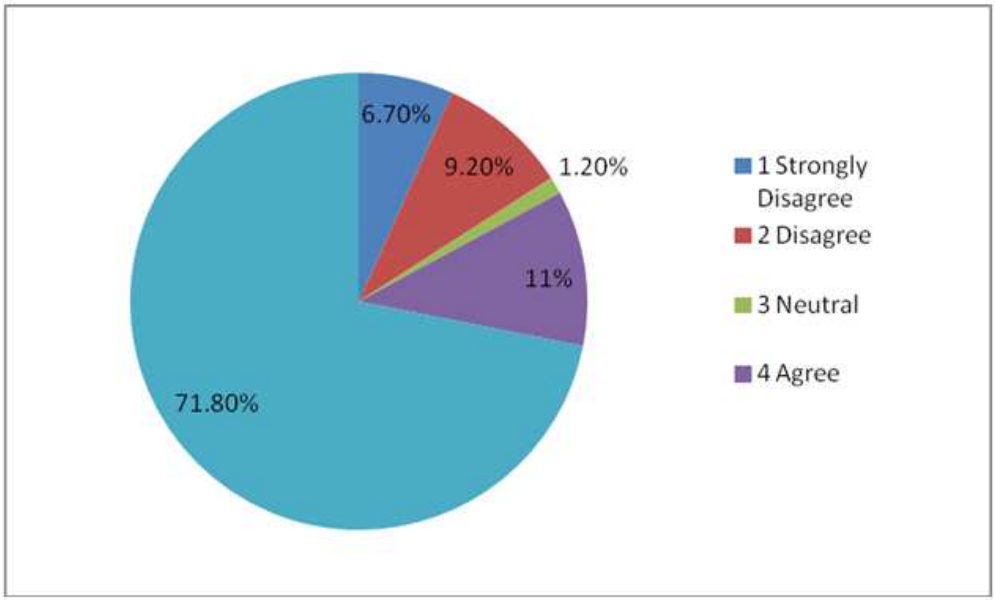


Fig. 4. Institutional support systems for E-learning and Education Technology

5 RECOMMENDATIONS

Having gathered and analyzed both qualitative and quantitative data obtain for this study; the results and discussions above indicate that the implementation of E-learning in Ghanaian tertiary institutions, notwithstanding all the benefits that is associated with, is still faced with myriad of constraints. Bhuasiri, Wannasiri, et al (2012) in their study to investigate critical success factors for E-learning in developing countries, identified six (6) dimensions and twenty (20) critical success factors for E-learning systems in developing countries. Technology awareness, motivation and changing users' behavior and attitude towards E-learning featured predominantly for the successful implementation of E-learning in the context of developing countries. The critical constraints confronting the adoption and smooth implementation E-learning by Ghanaian tertiary institutions can be attributed to the problems enumerated in the results and discussion section of this study. The following key E-learning implementation challenges were identified by the study;

- ICT and E-Learning Infrastructural gab resulting in equipment and software challenges exacerbated by inappropriate and obsolete equipments, inefficient connectivity and unaffordable internet bandwidth.
- Inadequate financial and budgetary support, resulting in overly dependence on external support thereby E-learning implementation facing problems after funding has elapsed.
- Lack of consultations and coordination among tertiary institutions and appropriate government agencies resulting in many piloted E-learning programmes enable to expand to other courses.
- Lack of trained and motivated ICT support staff, and school administrators to support, with adequate skills the introduction of E-learning into courses which are relevant contextually and thereby creating lasting interest to attract students or learners.
- Insufficient technological (ICT) orientation on E-learning and general absents of E-learning implementation policies, guidelines and strategies.
- Lack of interest and negative perception towards E-learning by key stakeholder groups.

The development of matured E-learning systems in higher education delivery in Ghana is still restricted by lack of complete and absolute ICT infrastructures and connectivity solutions. According to 2012 estimates by the international telecommunication authority (ITU, 2012), internet penetration in Africa has reached only 15.6%. Despite the fact that the impact is undoubtedly significant, the statistics showcases a major infrastructural inequality between Africa and the rest of the world. It is however gratifying to note that the progressive increase in the demand for mobile devices seems to be a major motivating factor and trend that will encourage the growth and development of E-learning in Africa and Ghana in particular.

Thus, in the light of the constraints identified above by the study, as the main factors affecting the smooth implementation and adoption of E-learning systems by tertiary institutions in Ghana, the study proposes the adoption of the following recommendations for addressing implementation challenges confronting E-learning adoption in Ghana's tertiary education delivery system.

PROVISION OF ADEQUATE ICT AND E-LEARNING INFRASTRUCTURE:

Various Surveys indicate that the Ghanaian learning population is willing to engage and embrace new technology-based tools to improve their education and knowledge. However, the Ghana's current ICT infrastructure proves to be a main hindrance, undermining the long-term benefits of Internet and computer mediated learning.

The smooth and successful implementation of E-learning in Ghanaian tertiary institutions, the process of transforming the country's economic development and spurring a transition from an agrarian to a knowledge- based economy, to a large extent, depends on the provision of appropriate internet bandwidth and required hardware and software packages. This is also dependent on the availability of appropriate ICT infrastructural facilities, whiles institutions implementing E-learning systems ensure continuous availability and affordable high-speed internet connectivity.

The government of Ghana, developing partners and all stakeholders in education must recognize the expansion of ICT and E-learning infrastructure as a topmost priority. There should be conscious efforts and commitments towards expanding and maintaining ICT and E-learning infrastructure, empowering ICT staff with requisite technical capacity and the acquisition and deployment of appropriate computer aided design and software to support and foster E-learning implementation process in tertiary institutions. The government, through the Ministry of Education should as a matter of policy ensure the efficient monitoring and evaluation of all E-learning programmes across the country and tertiary institutions in particular

IMPROVING INSTRUCTIONAL CHARACTERISTICS:

Ross et al (2010) argued that "educational technology is not homogeneous 'intervention', but a broad variety of modalities, tools and strategies for learning. It depends on how well it helps teachers and students achieve the desired instrumental goals". Effectively, to ensure successful implementation of E-learning in Ghanaian tertiary institutions, conscious efforts must be done to improve the instructional characteristics and underpins engrafted in them such as; content, immersion, interactivity and communication. Through these characteristics, E-learning systems can produce a particular instructional feature, characteristic or experience.

By "content", this study refers to the degree of consistency of value and substance with which knowledge is transferred to students through E-learning. Communication quality such as bandwidth should be increased in order to positively influence students' ability to communicate verbally or non-verbally.

The richness of communication channels must be improved to enable students interact synchronously in real time. Interactivity, that is the level of interaction between student-student, student-teacher, teacher-teacher as well as institutional collaboration should also be enhanced.

TACKLING THE CULTURE AND BARRIER TO CHANGE:

A new mindset is required to adopt ICT in education with authorities, teachers and students of tertiary educational system in Ghana spearheading the effort favorably towards new learning and instructional methodologies that would allow them to catch up with their colleagues in other developed countries. Key issue hampering and obstructing the integration of E-learning implementation in tertiary institutions in Ghana is the existing culture of systematic resistance to change. The need for a comprehensive re-orientation targeted towards eliminating conservativeness and inherent reluctance by tertiary institutions in Ghana to change and modification.

Training, information and education should be used as a tool to deal and in enhancing a positive attitude and perception towards the modification and alteration towards teaching and learning as far as higher education delivery in Ghana is concerned. With the integration of new technology and methods, systematic training is the effective way to transform instruction. However, it must be emphasized that not only teachers need training and re-orientation, senior and middle-level staff of tertiary institutions also play a critical role in the decision making process of E-learning implementation. This category of professionals should be empowered to have a solid appreciation of the important elements of successful E-learning implementation and especially how to establish cohesiveness between policy objectives and practical actualization.

6 CONCLUSION

With an appropriate strategic plan and policies in place, careful consideration of the stakeholder's needs and concerns, and adequate funding, the public universities in Ghana will have set the stage for successful adaptation of e-learning instructional methods and implementation of appropriate supporting technologies. This groundwork can facilitate the national goal of offering higher education for everyone in Ghana who wants it.

The study concludes by suggesting that the implementation of E-learning by Ghanaian tertiary institutions should be preceded by instituting an E-learning implementation plan. This plan should encompass the creation of awareness of the need for modifications in knowledge delivery and acquisition. The study proposes that the commencement of E-learning adoption and implementation process must be done on pilot basis since this will be the ideal approach of starting up an institutional change and appropriately convince and create awareness on the need for change. The institution of an E-learning implementation plan will afford the implementing institution the opportunity of having insights of the existing challenges and possible barriers before coming up with a long term strategy or action plan. A critical evaluation of the outcome of E-learning implementation on a pilot basis will serve as a credible manifestation or prove of potential academic, infrastructural, cultural and financial implications of E-learning implementation success.

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