USER PERCEPTIONS OF COMPUTER-MEDIATED COMMUNICATION PORTALS IN HIGHER EDUCATIONAL INSTITUTIONS IN DEVELOPING COUNTRIES

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ABSTRACT

Advancement of electronic education in higher education establishments in developing countries is still ongoing. This study examines how users of the CMC Portal at Koforidua Technical University in Ghana perceive its effectiveness. Descriptive survey method with proportionate stratified random sampling was used. Questionnaire responses from 950 respondents were categorised and analysed using the frequency analysis method. It was observed that the CMC portal is a very good platform that can help in facilitating teaching, learning and the day-to-day running of the University. However, the CMC portal is still underutilised by the users. It is recommended that there must be an approach to utilise the CMC portal as a channel for correspondence, learning and instruction. Future research should be done in the area of computer-mediated communication in other organisations, involving a larger learner population.

Keywords: *computer-mediated communication, online education, education portal, higher educational institution, developing countries.*

INTRODUCTION

The progress in information technologies and the increased usage of the Internet have had a significant impact not only on business and government but also on education. This impact of the Web on our day-to-day life is a worldwide affair. However, in certain parts of the world, especially in poor economies, the adoption of emerging technologies remains a challenge as a result of several factors including poor education and infrastructure. Academic institutions increasingly spend large sums of money to provide network connections within and outside their campuses (Moore, Dickson-Deane, & Galyen, 2011). In 2003, Ghana launched the Information Communication and Technology (ICT) Policy for Accelerated Development (Republic of Ghana, 2003). The policy seeks, among other things, to address the developmental challenges and accelerate socio-economic development through the

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development, deployment, and exploitation of ICT. The basic motivation of the policy is that the accelerated development of Ghana, within the emerging information and digital age, will not be possible without an ICT-driven development agenda (modernghana, 2003).

One such innovation was the introduction of computer-mediated communication (CMC) into teaching and learning at higher learning institutions. Koforidua Technical University, situated in Koforidua in the Eastern region of Ghana, is among the eight (8) specialised technical universities in Ghana. A distinguishing feature of the university is its wide application of modern ICT facilities including use of the CMC portal delivered by the ICT department and backed by strong fibre-optic Internet connectivity. However, the service provided by its CMC portal is limited to the uploading of less than 10% of the total number of course outlines and teaching materials, which means that the CMC portal is being underutilised. This research intends to fill the gap by expanding upon the current literature and measuring how the users (students, lecturers, and administrators) perceive the effectiveness of the university's CMC portal. The results of this research can help the university's management to increase the use of its CMC portal.

LITERATURE REVIEW

Electronic Learning

No single definition can precisely portray the concept of e-learning. A few writers unequivocally define e-learning, while others suggest a particular definition or perspective of e-learning in their articles. In particular, Ellis (2004) disagreed with authors like Nichols (2003), who defined e-learning strictly as learning that is accessible using technological tools that are web-based, web-distributed, or web-capable. Ellis (2004) also proposed that e-learning not only covers content and instructional methods delivered via CD-ROM, the Internet or an Intranet (Benson, 2002) but also includes audio and videotape, satellite broadcast and interactive TV. Although technological characteristics are included in the definition of the term, Tavangarian, Leypold, Nölting, Röser, and Voigt (2004), as well as Triacca, Bolchini, Botturi, and Inversini (2004), stated that the use of technology is insufficient as a descriptor of e-learning. Tavangarian et al. (2004) included the constructivist theoretical model as a framework for their definition, stating that e-learning is not only procedural but also shows some transformation of an individual's experience into the individual's knowledge through the knowledge construction process. Both Ellis (2004) and Triacca et al. (2004) argued that some level of interactivity needs to be included to make the definition truly applicable in describing the learning experience. Triacca et al. (2004) added that e-learning was a type of online learning. According to Sak, Skalková and Mareš (as cited in Vaněček & Klement, 2010) e-learning is studying by means of electronic media; be it using CDs or the internet. They were also of the view that e-learning is an education supported by modern electronic means such as computers, media, and the internet in distance learning, combined learning and full-time study (Sak, Skalková & Mareš, as cited in Vaněček & Klement, 2010). In this paper, e-learning is defined as an educational course created in a Learning Management Systems (LMS), which is intended for self-study under the supervision of a teacher who communicates with a student in an electronic manner through the use of electronic media and ICT.

Features of Online Learning

A review of the literature reveals that technology-related factors in online learning are linked to the features of software and hardware used to provide the learning environment. Studies about online learning and e-learning show that the quality of online learning is mostly related to the usability of websites, which seems natural given that students in online learning as

well as in traditional learning are dependent on search engines and websites nowadays (Zhao, 2003).

The criteria identified are presentation, navigability, reliability, external recognition, responsiveness, speed, customer care, access, content relevancy, content richness, content currency, site aesthetics, personalisation, authority, assurance, frequently asked questions and help, special services, tailored communication, and trust. Other scholars have indicated that the use of multiple technologies in different contexts is crucial for the effectiveness of online learning. For example, Benbunan-Fich, Hiltz, and Harasim (2005) considered 'media mix' to be the most important variable since selecting the right technology should be based on pedagogical technique (i.e., peer evaluation and feedback, group case discussion) and thus, it is related to the enhancement of learning. Online courses are generally offered in one of the following three modes:
  (1)   The course is supplemented by tutorial support with a low level of interaction.
  (2)   Online interactions and discussions occupy half the students' time.
  (3)   The course is defined by collaborative activities, discussions, and group
         assignments.
         (Mason, 1998).

Computer-Mediated Communication in Higher Education Institutions

Constructivist approaches to learning involve interactions and dialogues. This communication is not simply a one-way transmission of information from teacher to student. It involves exploring ideas with other people, asking and answering questions, and solving problems with others. When students meet with their teachers and peers, there are many opportunities for learning through communication and interactions, but it is not always easy for students to meet face-to-face, particularly in a distance learning context (Kear, 2007). An alternative is to meet 'virtually', by utilising information and communication technology, which is frequently referred to as computer-mediated communication (CMC). Computer-mediated communication might be synchronous, where all members are online together, or asynchronous where messages are posted and read by others later.

There are many benefits from the use of CMC as part of a course of study. CMC enables collaborative learning activities to be carried out even when students cannot meet face-to-face. Synchronous CMC addresses limitations of distance; students in different locations can communicate via computers and networks. Asynchronous CMC addresses limitations of both distance and time; students can communicate even if they are not in the same place or available at the same time. Students can use both synchronous and asynchronous CMC systems to share ideas and to support each other (Kear, 2007). Lecturers can be in more regular and convenient contact with their students and can distribute learning resources electronically. There are issues when utilising CMC systems in higher education institutions. One issue is that users can feel overwhelmed and confused. This is a specific issue in asynchronous discussion systems, where there might be extensive quantities of messages to read and time slacks between messages. These issues, among others, can bring about low interest among users, and thus reduce the effectiveness of the system.

Electronic Education in Ghana

Most of the current electronic education initiatives on the continent have endeavoured to upgrade the quality of basic education (Association for the Development of Education in Africa, 1999). Although electronic education holds promises, a number of obstacles have to be addressed before it can be fully utilised in Africa. The e-learning Africa report (2012) highlights the most significant constraining factor to e-learning in Africa as being limited bandwidth (17%), followed by the lack of financial resources, inadequate human resource capacity, and limited electricity, each factor at 11%. The report covered selected African

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countries which include Ghana, Nigeria, Zambia, Tanzania, Kenya, South Africa and Uganda (eLearning Africa, 2012). As it is the situation with other African nations, the execution of e-learning systems in Ghanaian higher educational institutions is low in spite of the opportunities provided by the favourable conditions created by the government.

In 2003, Ghana launched the Information Communication and Technology (ICT) Policy for Accelerated Development (Republic of Ghana, 2003). This document presents the vision for Ghana in the information age. It is based on the Policy Framework Document: "An Integrated ICT-led Socio-economic Development Policy and Plan Development Framework for Ghana". The development of this policy framework document was based on a nation-wide consultative process involving all key stakeholders in the public sector, private sector, and civil society. It takes into account the aspirations and the provisions of key socio-economic development framework documents, including the Vision 2020 – The First Steps; the Ghana Poverty Reduction Strategy (GPRS) and the Coordinated Programme for Economic and Social Development of Ghana. The ICT policy sets out the roadmap for the development of Ghana's information society and economy and provides a basis for facilitating the socio-economic development of the country in the emerging information, knowledge and technological age to be dominated by information and knowledge-based economies (modernghana, 2003).

Koforidua Technical University CMC Portal System

Koforidua Technical University was established in 1997. The university, which is one of the eight (8) technical universities in Ghana, was founded with the vision of producing high-level, career-focused and skilled manpower to support the country's industrial growth. It has produced graduates with Higher National Diploma (HND) in Accountancy, Marketing, Purchasing and Supply Statistics and Computer Science.

The university currently has five faculties and one institute namely, the Faculty of Business and Management Studies, Faculty of Applied Science, Faculty of Health and Allied Sciences and Technology, Faculty of Built and Natural Environment, Faculty of Engineering and the Institute of Open and Distance Learning (IODL). The University has increased its academic programmes significantly, from two (2) at its inception in 1997 to a total of twenty (20) Higher National Diploma (HND) programmes and thirteen (13) Bachelor of Technology (B-Tech) programmes (Koforidua Technical University, 2016).

As the world is becoming increasingly connected because of the internet and web, the importance of the internet in teaching and learning at higher education institutions cannot be downplayed. Academic institutions are therefore facing new opportunities as well as challenges. In order to take advantage of these opportunities and overcome the challenges, Koforidua Technical University in Ghana provided a cyberspace environment for teaching and learning in 2011. The university offers a computer-mediated communication (CMC) portal based on Moodle. Moodle is a free web application that educators can use to create effective online learning channels. This collaborative learning environment is used by hundreds of institutions worldwide and provides group management, forums, video conferences, multimedia document repositories, calendar, chat, assignments areas, links to relevant websites, and user profile administration.

Measuring Effectiveness

Measuring the effectiveness of any system is a vital part of the overall internal control programme. Users of any system can audit the system and it is in light of this that necessary provisions are made to measure the system's effectiveness. In this study, Measures of Effectiveness is defined as per the definition provided by the Defense Acquisition University (2001).

According to the Acquisition University (2001), Measures of Effectiveness (MOE) are designed to correspond to the accomplishment of mission objectives and accomplishment of desired results. These measures quantify the results to be obtained by a system and may be expressed as probabilities that the system will perform as required. MOEs may be further decomposed into Measures of Performance (MOP) and Measures of Suitability (MOS), which are described as follows:

The measure of a system's performance or MOP is expressed as speed, payload, range, time-on-station, frequency, or other distinctly quantifiable performance features.

MOS refers to the measure of an item's ability to be supported in its intended operational environment. MOS is typically related to readiness or operational availability, and, hence, reliability, maintainability and the item's support structure. Several MOSs and/or Measures of Performance (MOPs) may be related to the achievement of a particular Measure of Effectiveness (MOE).

The characteristics of MOE are as follows:
(1)   Relates to performance
(2)   Simple to state
(3)   Testable
(4)   Complete
(5)   States any time dependency
(6)   States any environmental conditions
(7)   Can be measured quantitatively
(8)   Easy to measure
       (Defense Acquisition University, 2001)

RESEARCH OBJECTIVES

The purpose of this study is to provide insight into how users of the CMC Portal at Koforidua Technical University in Ghana perceive its effectiveness in the learning, teaching and day-to-day running of the institution.

Specifically, the study sought to:
(1)   Assess or evaluate the effectiveness of the CMC Portal.
(2)   Identify its contribution towards teaching, learning and the day-to-day running of the university.
(3)   Identify the challenges that the users of the CMC Portal face.
(4)   Make recommendations to improve the CMC Portal at the university.

METHODOLOGY

This paper is based on a case study, where quantitative data collection instruments (questionnaire) were designed and used to collect data to assess the effectiveness of the CMC portal at Koforidua Technical University. This method was chosen to enable the researcher to use a methodical empirical inquiry to investigate, make sense of, or interpret the meaning of a social phenomenon as experienced by individuals themselves (Malterud, 2001).

Sampling Method

The participants of this study included students, lecturers, and administrators of the institution. The justification for this selection of participants is because of their direct usage of

the CMC portal compared to other groups of people in the university who do not in any way use the portal.

The targeted population of this research comprised 7,155 users, including students, lecturers, and administrators at various schools and offices of the university so that responses represent the unbiased views of all users of the CMC portal. Since it will be costly, impractical or impossible to study the entire population, most researchers use a sampling population (Pittenger, 2003). The sampling population is a subset of the target population (Frederick & Lori-Ann, 2006). Stratified random sampling method was used to obtain the sample. Fraenkel and Wallen (2003), as well as Frederick and Lori-Ann (2006), suggested researchers use stratified random sampling to ensure that the different sub-groups in the target population are equally represented in the sample. Stratified random sampling ensures that each subgroup of a given population is adequately represented within the whole sample population of a research study. Stratification can be proportionate or disproportionate. In a proportionate stratified method, the sample size of each stratum is proportionate to the population size of the stratum. The proportionate stratified random sample is obtained using this formula:

$$\frac{sample\ size}{population} \times stratum\ size$$

For this research, the proportionate stratified method was used. The total population of 7,155 was made up of 6,895 students 190 lecturers and 70 administrators, while the sample size of 950 respondents, was made up of 916 students (13.1%), 25 lecturers (13.2%) and 9 administrators (12.9%) (See Figure 1).
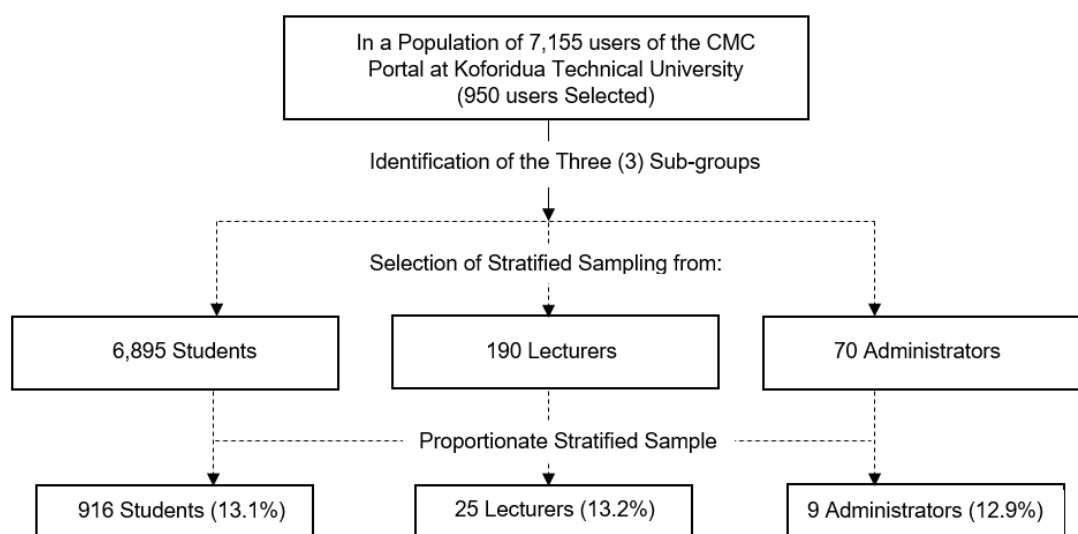

Figure 1: A Proportionate Stratified random sampling of the respondent
Adopted from Fraenkel and Wallem (2003)

The responses received were examined closely to ensure accuracy and consistency. The responses to the open-ended questions in the questionnaire were categorised and analysed with the Statistical Package for Social Science (SPSS) using the frequency analysis method.

FINDINGS

Before we analysed the effectiveness of using the CMC portal, we posed some questions to find out whether the students use the CMC portal at all and whether any orientation was given to them on using the portal. In addition, we wanted to find out whether using the CMC portal meets their academic needs.

The effectiveness of the CMC portal

Students' responses are summarised in Table 1. The findings show that 744 students (81.23%) indicated that they had used the CMC portal, while 172 students (18.7 %) said they had not used the CMC portal. Those who had not used it said that although the CMC portal was designed to assist them in getting their reading materials, lecture slides and assignments, they still obtained these items from their colleagues and the lecturers since not all lecturers use the platform. This issue can be addressed if all lecturers use the CMC portal as the only platform to communicate to students and are required to make all their assignments and lecture notes available through the CMC portal.

A majority of students (858 or 93.7%) indicated that they had been given orientation during the second week of admission. The rest 58 students (6.3%) did not receive any orientation. This could be due to the fact that they reported late to the university or were admitted late, that is after the orientation had been conducted. A mini orientation could be organised for students who were admitted late so that they can be shown how to use the portal.

On the topic of whether the CMC portal meets students' academic needs, 687 students (75%) said that it does not meet their academic needs. This is confirmed by their usage. Since many students did not use the CMC portal for the intended purpose, they were not able to see the relevance of the CMC portal to their academic needs. The remaining 229 students (a quarter of the sample) said the CMC met their academic needs.

Table 1: Effectiveness of CMC portal

Questions	Number of Respondents				Total
	Yes	No	% Yes	%No	
Have you used the CMC portal before?	744	172	81.3	18.7	916
Were you given orientation on the use of the CMC portal?	858	58	93.7	6.3	916
Is the CMC portal helping meet your academic needs?	229	687	25	75	916

The responses of lecturers are summarised in Table 2. When the lecturers were asked whether the CMC portal had changed the way they teach, 10 lecturers said yes and 15 of them said no. The lecturers were also asked whether the CMC portal is a perfect platform for teaching. A total of 18 lecturers agreed while remaining 7 disagreed. On the issue of improving their teaching methodology, 17 lecturers stated that the CMC portal had not improved their teaching methodology while 8 lecturers affirmed that it had. When asked if they would recommend the use of the CMC portal to other colleagues in other universities in the country, 16 lecturers said "yes" while the remainder 9 said "no".

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Table 2: Contribution of the CMC portal towards Teaching

Questions	Number of Respondents				Total
	Yes	No	% Yes	%No	
Has the introduction of the CMC Portal changed the way you teach?	10	15	40	60	25
Do you see it as a good platform for teaching and learning?	18	7	72	28	25
Has the use of the CMC portal improved your teaching methodology?	8	17	32	68	25
Will you recommend the use of the CMC portal to your other colleagues in other universities in the country?	16	9	64	36	25

Table 3 summarises the responses of administrators. When asked whether the CMC portal had changed the way they work, 3 administrators said yes and 6 of them said no. Responding to the question about whether the CMC portal is a good platform for the general administration of the university, 7 of the administrators agreed while 2 others disagreed. A total of 7 administrators stated that the CMC portal had not improved their work while only 2 administrators said that it had. Nevertheless, 8 of them said that they would recommend the use of the CMC portal to colleagues in other universities in the country, while only one administrator would not recommend the use of the portal.

Table 3: Contribution of the Portal towards Working

Questions	Number of Respondents				Total
	Yes	No	% Yes	%No	
Has the introduction of the CMC Portal changed the way you work?	3	6	33	67	9
Do you see it as a good platform for the general administration of the university?	7	2	78	22	9
Has the use of the CMC portal improved your work?	2	7	22	78	9
Will you recommend the use of the CMC portal to your other colleagues in other universities in the country?	8	1	89	11	9

DISCUSSION

This study set out to examine how users perceived the effectiveness of the Koforidua Technical University's CMC portal. This discussion is also supported by various other sources such as articles, books, websites and information from Koforidua Technical University. In order to identify its contribution towards teaching, learning and general administration at the university. In this study, primary data was collected using questionnaires that were administered to the lecturers, administrators, and students of the university who directly use the CMC portal.

The literature review acknowledged both positive and negative aspects of the CMC portal. One of the negative issues concerns how people adapt to internet learning. Internet World Stats (2017) revealed that "The internet is now ubiquitous and with internet penetration rates ranging between as low as 10.9% in Africa and up to 48.7% in Asia". Even those with access to the internet may not have robust connectivity. Reluctance to change is another important factor influencing the acceptance of new technology or innovations such as the CMC portal.

Perhaps the existing mode of teaching and learning in physical classrooms adequately serves the needs of students and lecturers.

This study analysed the responses received to identify whether the CMC portal has been useful to the university community. The students, lecturers and administrators generally perceived that the university's CMC portal was effective. However, there were also perceptions that the CMC portal could be improved to fully utilise its capabilities. An important point raised is that online education enables students to work and learn at the same time. With the introduction of the Bachelor of Technology (BTEC) degree, which is a continuation programme for the higher national diploma (HND) graduates, the CMC portal has become an important platform since most of the HND graduates are working and are therefore face to difficulties to attend.

The findings also indicated that the CMC portal contributes towards teaching, learning and the general administration at the university although a majority of the students indicated that it does not contribute to their academic needs. The students' perceptions likely result from their lack of receiving a good orientation to the portal when they reported to school in their first year and from their use of the CMC portal for tasks other than its main purpose. This finding is in agreement with previous studies (Reeves, 1998; Ringstaff & Kelly, 2002). According to Ringstaff and Kelly (2002), students can learn from computers where technology used essentially as tutors and serves to increase students basic skills and knowledge; and can learn with computers where technology is used as a tool that can be applied to a variety of goals in the learning process and can serve as a resource to help developing higher order thinking, creativity and research skills. In carrying out their day-to-day work, administrators of the university have been recording and retrieving data manually. In other words, despite a centralised database being provided by the CMC portal to simplify the management of student records, it has not changed the way and manner at which the administrators work. This corroborates the statement of Cox and Dale (2001) that "human aspects such as courtesy, friendliness, helpfulness, care, commitment, flexibility, and cleanliness cannot be replaced by technology".

The study also found that some lecturers print and sell their lecture notes, and therefore do not upload their lecture notes for free to the students. This practice makes them reluctant to use the CMC portal. Furthermore, results related to delivery modes showed that although the university has made provisions for e-learning delivery modes, students and lecturers are not familiar with them. Benson (2002) pointed out that "e-learning not only covers content and instructional methods delivered via CD-ROM, the internet, or an intranet, but also includes audio and videotape, satellite broadcast and interactive TV". Most of these delivery modes are not used. It also appeared that university management has not established broader electronic learning facilities that would trigger users to adopt the CMC portal.

CONCLUSION

This study revealed that some of the students who are working adults enrolled in the evening and the weekend school programme are most likely to use the CMC portal. Some students consider the CMC portal as a good platform to download lecture notes and submit assignments. The CMC portal enhances learning for these students, while others face challenges because there are lecturers who do not use the portal. The students indicated that some lecturers prefer to give them printed lecture notes in class. This study also found that while most of the lecturers were aware of the platform to aid their teaching, most of them admitted that they were not using it. The reason for this is that they are not ICT inclined and were not present during the orientation on how to use the CMC portal. Nevertheless, the lecturers who were using the CMC portal strongly recommended its use to aid teaching. These lecturers also mentioned the challenge of poor internet connectivity. The third group,

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the administrators, were aware of the existence of the platform and admitted that it was a useful platform for their day-to-day work at the university. This study observed that students, lecturers, and administrators generally found the CMC portal to be a good platform for teaching, learning and daily administration at the university. However, the CMC portal is underutilised by its users. Hence, more work needs to be done. Policies should be drafted and enforced by university management to enable students, lecturers and administrators to use and experience the full benefits of the CMC portal as an aid to teaching, learning, and administration. Future research can develop on the results of this investigation by including a wider user population from a more diverse background.

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