INFORMATION AND COMMUNICATION TECHNOLOGY USE IN HIGHER EDUCATION: PERSPECTIVES FROM STUDENTS

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Abstract
    This study presents an analysis of University of Education, Winneba students' use of Information and Communication Technology (ICT). The study describes the ability of students' in using a wide range of ICT devices to support their personal learning. The study used a self-answering questionnaire and focus-group-discussions (FGD) to collect data from students. A total of thousand five hundred (N = 1500) students were selected using stratified sampling. The data from the questionnaires were analysed using SPSS software to identify and compare students' ICT use and ability. The findings revealed that a good number of the students had access to ICT tools and devices, and were competent in using a wide range of ICT tools and devices both for the context of academic and non-academic use. It was evident in the data that most students used this technology on a frequent basis. Furthermore, the results suggested that students used technologies within the objectivist model of teaching and learning. From the findings, academic programs need to provide students with activities that require creative use of ICT devices and tools to enhance their skills in the use of computers as an instructional tool for supporting teaching and learning.

Keywords: ICT use; university students; higher education; activity theory

Introduction

Modern technologies such as Computer and Telecommunications technologies have been the most remarkable and transformative of the technologies emerging over the past 30 years (Afari-Kumah and Tanye, 2009). Afari-Kumah and Tanye further argue that the emergence and convergence of these technologies have been termed Information and Communication Technology (ICT), a term sometimes synonymously used with Information Technology (IT). IT is defined as the combination of computer technology with telecommunications technology. According to Wilson, Ayebi-Arthur and Tenkorang (2011) the term includes computer hardware and digital/analogue devices and software applications.

ICT offers new opportunities and flexibilities but also challenges the confidence of users. The integration of ICTs into educational classroom teaching has attained a new crescendo nowadays. This is marked by the exclusive inclusion of ICTs into educational activities run by the schools across the world. Ghana, a sub-Saharan nation, is one such country which has seen the importance and implications of ICTs in education. In developed countries like the western economy, the Internet and computers are available in the classrooms. Thus, in 2007 the government of Ghana, in a bid to improve education, implemented the information and communication technology for accelerated development (ICT4AD) policy. This policy sought among other things to make ICT a national curriculum at all levels. Thus teachers are to use ICTs as a tool to enhance teaching whiles learners also learn about ICTs. The purpose of this study is to find out the use of ICTs in higher education from the perspective of students.

Literature Review

In recent times ICTs have become an important part of most organisations and businesses of which education is part (Bingimlas, 2009). Bingimlas further argue that ICT play various roles in the learning processes. According to Wang and Woo (2007) the use of ICT in education is not a new concept as it may be as old as radios or televisions technologies. However, the rapid development of technologies, such as web technologies, ICT integration has progressively attracted the attention of instructors. Jung (2005) says that ICTs are innovative technologies that have provided new possibilities to the teaching profession, and at the same time have placed more demands on teachers to learn how to use these new technologies in their teaching. According to Oye, Iahad, & Ab.Rahim (2012) ICTs can also be used to enhance and support distance learning and that it is considered to be the digital application equipment to all aspects of education.

There has been an abundance of positive claims in recent years about the potential of ICT in transforming higher education in the twenty-first

century (Wang, 2009). ICT has the power to radically change classroom practice. A study conducted by Mahmood (2009) on medical students at University of the Punjab showed that students used the computer for the following social media, collaboration, homework, entertainment among others. Mahmood's work also showed that students used computers more for word processing, presentations, data analysis, and emails. According to Mahmood, entry-level students conducted electronic literature searches more frequently than the outgoing classes. Dukić, Dukić and Kozina (2012) indicated that continuous ICT evolution and implementation are forcing universities and colleges to respond to trends that are capable of transforming society into a knowledge economy. Habib, Johannesen, and Øgrim (2014) also argue that trends in higher education point toward an increase in technology-enhanced education. Furthermore, they cite (Yoo & Huang, 2011) as saying that technology acceptance has been identified as a cultural issue that plays a major role in today's learning experience.

Oye, Iahad, and Ab.Rahim (2012) also argue that knowledge and ICT usage improves human capacity in all aspects of life in general. This includes fields of human endeavour such as business transactions, industrial operations, and education. Oye, Iahad, and Ab.Rahim argue that failure to use technology by many academics in lesson delivery should be of great concern. Oye, Iahad, and Ab.Rahim believe that the delivery of technology services in a higher educational environment has implications for leadership to meet the reform agenda. In addition to improving administrative efficiencies, leadership must create an environment that appropriately supports technological innovation. The opinion of Bladergroen, et al. (2012) is that though educators have received training in the use of technology to support teaching, most still felt that the training they received was not adequate

ICT has imparted students' lives in Ghanaian educational institutions. The government of Ghana has made huge investment in distributing laptops and desktop computers to schools and individuals. However, the huge investment is not sufficient as it does not guarantee judicious use of the devices and tools. Continuous evaluation in terms of how such technology is used to enhance the quality of teaching and learning is important. Most initiatives which have led to advancements in ICTs (the Internet, for example) had their origins in the academic community. Afari-Kumah and Tanye (2009) argue that the progress in application of ICTs in education has been slow.

Higher education in Ghana requires adequate facilities in ICT to support face-to-face teaching. Again students are to have access to a networking environment with counterpart students across the globe. According to Habib, Johannesen, and Øgrim (2014) excellent and current

learning materials are essential from academic staff to promote quality of education. With ICTs transforming the educational landscape around the world in the information age, higher education institutions in Ghana should rise up and face the challenges brought about by this phenomenal revolution.

Choudhary and Choudhary (2013) also say that for innovative teaching strategies are vital in higher education courses if it is to engage and motivate the newer tech-savvy generation. Choudhary and Choudhary believe that leaders of higher educational institutions are faced with the challenge to position their institutions for the twenty-first century. In order to achieve that, they should recognise the need to do away with practices that are inconsistent with the needs and demands of a knowledge society.

Theoretical Framework

Joy and Ishikaku (2012) believe that the roles of ICT translate into governed rules and learning skills in the use of new technology tools. A person uses these tools to enhance his capacity and become equipped for the future. Students' readiness's to use technologies to their benefits have received some attention from academic departments, faculty members and also through institutional policy framework on ICT. The theoretical underpinning of this study is embedded in the social constructivist's theory. This theory is chosen because it focuses on the relations and actions where participants interact and orient themselves to reach a specific target. Thus this theory believes that knowledge should be constructed and it must be dependent on the cultural and social context through which the knowledge was constructed.

ICT is a powerful tool that helps to address educational problems, support difficult learning activities and enhances thinking skills. Students' construct their knowledge through group activities such as project presentations, term papers, authentic projects and discussion. For example the University policy on ICT enjoins students to study a compulsory ICT course in their first year of admission irrespective of the level of studentship. Students' thus use various collaborative tools and other ICT devices to support their individual assignment and group assignment.

A study conducted by Wilson (2014, p390) discovered that students' experience of technology are varied and many. Figure 1 (Technology use diagram) provides a diagrammatic view of how students interact with technology. This diagram was modelled on the theoretical and empirical evidence derived from the data. The experiences are categorised into academic and non-academic use. It is anticipated that the experiences of students technology use will trigger enthusiasm among students to use technology to support personal learning thereby gaining technology literacy proficiency.
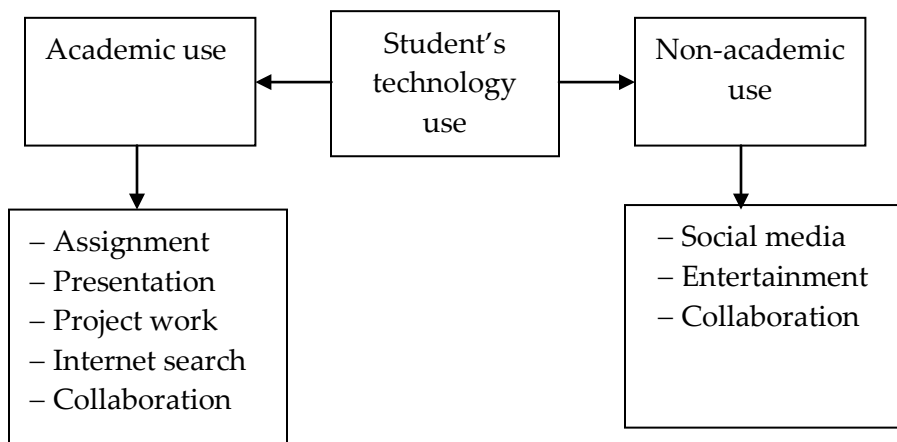
Figure 1: Adapted from Wilson (2014) Students Technology use

Research Problem

Though ICT is being touted in recent years by researchers such as Unwin (2004) as being effective in improving teaching and learning, Afari-Kumah and Tanye (2009) believe that academia does not seem to be abreast with current trends in ICTs. The argument of Afari-Kumah and Tanye is that, in the era of information age, much of ICT usage in academia is associated with "dubbing" simply put copying and pasting. They further state that a good number of the students, who use the internet, fail to recognize that it is an extension of lecture rooms. It provides a deeper understanding to what is taught. This is so because students' use of ICT would enhance their competence and confidence.   However, many students still patronize traditional book materials as a source of information in universities rather than ICT which is more efficient and reliable; hence, the need for this study.

The objective, role, and nature of ICTs in education do not seem to be given the full attention that it deserves. It is important for designers of resource tools for teaching to understand and to be aware of ICT devices that will fit into each educational environment. Instruction and learning activities in the 21st century introduces the roles that digital technologies might play in the changing practices of teaching and learning. This work describes and contextualizes the changes taking place as a result of ICT usage in public universities in Ghana.

Research Questions
1. *What types of technologies are students able to use?*
2. *In what ways do students use technologies to support their learning?*

Methodology
Source of Data
        The data was collected from PHEA (Partnership for Higher Education in Africa) funded research project carried out in 2010-2012. The project used questionnaires and focus-group discussions to collect data from students from all the campuses of the university.

Data Analysis
        This study reports the quantitative aspect of the research with a focus on students' access to and uses of technology in education. Descriptive survey was used in analysing the results of the questionnaires. Simple percentages were generated with a focus on numerical data. This study used descriptive statistics by computing percentages of each valid response for each research item. The percentages are discussed and presented in the data discussion.

Results
        The number of valid responses (N) differs from item to item because of missing responses. Percentages of the responses were thus calculated based on the valid response (N) but not the total number of respondents. The responses (n) represent the number of respondents who indicated they have access to the listed ICT facilities.

Research Question 1:
        What types of technologies are students able to use?
        The data in table 1 below presents students' access to various technologies. The results showed that it was only mobile phones that more than half of the respondents indicated they had access to. Thus access to most of the technologies was very low among the students. For example, only (n=572, 39.9%) of the students indicated that they had access to PC or laptop. It is also noted that there were students who did not have any access to technologies (n=61, 4.3%) in the University. The implication is that with less access to these basic technology needs, students will not be able to use educational CD to do self-tutoring. Scanner, camcorder and digital camera, allow teachers/students to prepare their own teaching and learning materials (TLM) using still and motion images. However, the data in the table showed that 13.9% (n=200,) had access to digital cameras. This is understandable as it requires higher skill level to use in designing TLMs. Interestingly students even though have seen journalist use the voice recorders to conduct interviews only 4.7% (n=67) have actually used the digital voice recorder. This number is worrisome as students have not developed the skill of conducting interviews and recording the interview sessions. Though a good

number of the students have more than one mobile phone it was observed that the students have not explored the voice recorder application in their mobile phone for knowledge acquisition.

Table 1: Students Access to Technology in UEW

Educational Technologies	Number of respondents	%
Mobile phone	922	64.3
Television	705	49.2
Radio	663	46.2
Computer (Laptop or personal Computer)	572	39.9
Printers	213	14.9
Digital camera	200	13.9
PDA (Personal Data Assistant)	136	9.5
Scanners	120	8.4
Camcorder	67	4.7
Digital voice recorders	67	4.7
I have no access to any of the above	61	4.3
Number of participants = 1434		

Source: PHEA (2010-2012)

Research Question 2:

In what ways do students use technologies to support their learning?

The chart in Figure 2 shows the purpose of use of computers by students. The chart shows that students use the computer mostly for research (n=766, 73.4%). This include Internet search. Figure 2 also shows that students use the email (n=619, 58.6%) often for communication and assignment presentation (n=556, 53.6%).
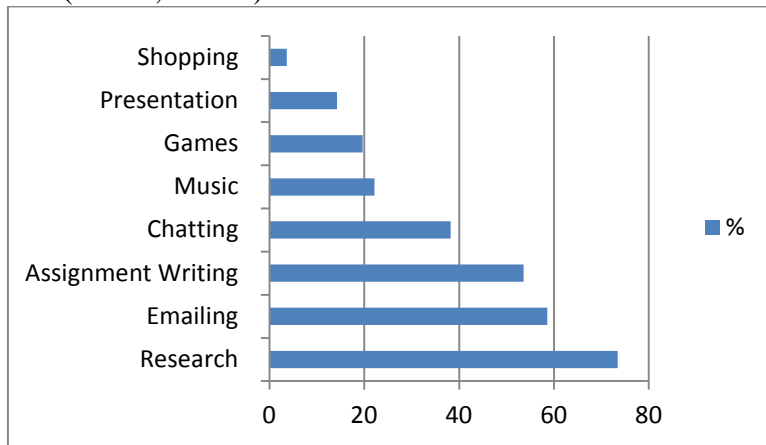

Figure 2: Activities that students use computers for

The findings, presented in Table 2, shows that the most frequently used computer application by students is the "Word processor." The data in the table also shows that 68.4% (n = 981) of the students patronise the word processor software application for writing assignments and generating

reports, thesis and others. The table also showed that the use of the "spreadsheet" application (n=448, 31.2%) among students was very low. It can be attributed to the inadequate uses of the application for learning. Among the least used application by students is the "graphics" (n=178, 13.9%). A crostabulation of the use of graphics versus faculty to which students belonged indicated that 47.1% of the students who use graphic applications were of the faculty of Creative art. This implies apart from the students of the Faculty of Creative arts only few students do use graphic application. Graphic applications are some of the productivity tools that permit students to create multimedia tools for teaching. It is very common to see students struggling to use images to create teaching and learning materials (TLM).

Table 2: Students' Software Ability

Item	Valid No.	*Number of Respondents*	%
Word processor	1430	981	68.4
Spreadsheet	1426	448	31.2
Presentation	1427	402	28
Graphics	1423	178	13.9

Source: PHEA (2010-2012)

Discussion of Findings

Overall, teacher training institutions and governments seem to recognize the significance of integrating ICT in teacher training. The data showed that a variety of ICT-integrated training environments have been created by institutions in Ghana to provide effective ICT training. The training programmes are in line with institutional strategic plan and policy which in turn feeds into the national policy on ICT use in education. The analysis and approaches in ICT use among university students indicates that there are opportunities and challenges in adopting ICTs in teacher professional development and training.

Empirical evidence from the data suggests that UEW students generally have a low technology access. This is not a good enabler for successful implementation of ICT integration in teaching and learning. The study showed that students are aware about the social media and the e-mail. Students use the email, but their usage is limited to personal communication with friends and family members. Despite their common use of email, students do not use it as a conduit for personal learning or knowledge sharing. Marwan (2008) indicates that teachers' lack of knowledge and skills has become a primary factor in failure of integrating technology in teaching and that the benefits of technology integration can only be attained if teachers can use the technology well, both technically and pedagogically. Marwan further argues that technologies do not have predetermined impacts but rather their use influence the outcomes.

The findings showed that UEW students have basic knowledge in the use of a range of technologies, software's and applications such as sending mails, chatting, Internet search and word processing. It is suggested that students' ability in using ICT is also one important factor which can help determine the success of ICT integration (Marwan, 2008). Keengwee (2007) suggest that the success of ICT integration does not only depend on how much money is spent for the procurement of technology facilities, but also depends on how frequently they are used for facilitating teaching and learning. Jung (2005) indicated that, the possibility with the use of ICT in teacher training is that it connects teachers to a larger international teaching community.

Conclusion

The purpose of this study is to analyse how students use technology to support their studies. The conclusion drawn from the data collected and presented is that, students have low technology literacy skills. Though the study showed that students are conversant with the use of the social media, the evidence that student's technology level was low can be deduced from their access and usage data. Even though ICT is a national curriculum, evidence from the study can attest to the fact that not much is done at the senior high school as students' technology level is very low. Furthermore, findings from the study demonstrated that students use technology in two ways; academic and non-academic purposes.

The study revealed some critical factors that affected the facilitation and students use of ICTs in higher education. Teaching and learning with technology is growing fast, therefore it is important to question whether the increased investment in ICTs is translating into actual use and improved educational outcomes. It also noted that students use of ICTs were directed at supporting the main discourse of learning at the macro level, it underlined the fact that proper use of ICTs in education project positive effects. Though a positive approach towards and use of technology may be essential for its adoption, it is worthwhile that policy makers and implementers to be aware of the sources of the discourse amongst intended users.

Recommendation

Based on the study findings, it is recommended that students should be given every opportunity to provide project report and document the technologies used in undertaking the project. Students should be given task that demands the use of technology to accomplish. Technology integration in education has brought about a phenomenal influence in education. There is therefore the need to revisit and regain the values of higher education with the adoption of approaches that value dialogue and debate.

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Furthermore, focus of ICT integration should be directed to achieve the effective attainment of knowledge through technology. Efforts should be made to make technology use as part of all courses across the curricula irrespective of the year and level of the student. Though the focus of this study is on students' use of ICT in higher education, it is equally important that teachers in higher educational institutions should be given attention to improve their technology literacy skills level. The training should be geared towards integrating technology into education. Finally, teachers should be aware that ICTs can provide better learning outcomes than that of the conventional teaching.

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