University of Education, Winneba

Passion for teacher Education

Baseline study on current state of educational technology at University of Education, Winneba

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Acronyms and Abbreviations

CET	Centre for Educational Technology
CHE	Council on Higher Education
ETI	Educational Technology Initiative
HEI	Higher Education Institution
HEIs	Higher Education Institutions
ICT	Information Communication and Technology
IEDE	Institute for Educational Development and Extension
IT	Information Technology
LMS	Learning Management System
MOODLE	Modular Object-Oriented Dynamic Learning Environment
NCTE	National Council for Tertiary Education
OSIS	Online Student Information System
PanAf	Pan Africa
PHEA	Partnership for Higher Education
PNDC	Provisional National Defence Council
SAIDE	South African Institute for Distance Education
SITES	Second Information Technology in Education Study
SMT	Social Media Technology
UEW	University of Education, Winneba
URC	University Rationalization Committee
WebCT	Web Course Tools

Glossary

A Learning Management System (LMS): Also referred to as Course Management System (CMS), is an application software that automates the administrative tasks of education/training, such as registering users, tracking courses in a directory, recording data, charting a user's progress toward certification, and providing reports to managers. LMS is used to organize course experience.

Educational technology: As a field, educational technology emphasizes communication skills and approaches to teaching and learning through the judicious use and integration of diverse media. **Educational technology** is also a term used to refer to the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

ICT Integration Literacy is the ability to use computers and other technologies combined with a variety of teaching and learning strategies

MOODLE is an abbreviation for ***Modular Object-Oriented Dynamic Learning Environment***. It is a popular open source LMS which was developed for the creation of online courses with a focus on interaction and collaborative construction of content.

Off-Campus refers to students who reside outside the University halls of residence and are therefore responsible for their own accommodation.

Open Educational Resource (OER) is the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes.

Open Source Software can be defined as software distributed under a licensing agreement which allows the source code (computer code) to be shared, viewed and modified by other users and organizations.

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Executive Summary

This baseline research on current state of educational technology was a research project funded by PHEA as part of an Educational Technology Initiative (ETI) of the University of Education, Winneba. Knowledge on the current state of educational technology is significant for determining the strategic direction that the University might take in its efforts to expand the use of educational technology. The purpose of this study is to ascertain (i) the available resources for the implementation of educational technology in the University, (ii) how these facilities are being used and (iii) the enablers for the usage of the computing facilities.

The study was conducted in the three main campuses of the University of Education, Winneba. These were the Winneba, Kumasi and Mampong Campuses. The study employed the explanatory mixed cross-sectional design. The total study sample of 1939 consisted of management, faculty and students. Stratified and purposive sampling techniques were used for student and faculty participants respectively. Data were collected using questionnaires and semi-structured interviews. Data were analyzed using univariate and interpretative techniques.

The results of the present study can be categorized on the three themes namely (i) access, (ii) usage, and (iii) enablers of educational technologies.

The study found that the University had the necessary facilities for Internet connectivity on all the campuses of the University. Thirty two (32) out of 33 academic departments were connected to the Internet. Every major building of the University was connected to the Internet via a 1 GB fibre optic backbone. However, access to Internet connectivity did not extend to the distance education centres that were not located on the University campus. The study also found that accessibility to the Internet as well as computing facilities was constrained by the limited number of computers, ICT laboratories, and Internet Cafés.

With regard to the usage of educational technology, the study revealed that first, students found the incorporation of educational technologies in teaching and learning more interesting, but they were not motivated by the existing facilities at the University to embrace the idea of technology for learning. Secondly, most lecturers had received training but this was limited to the use of MSWord. Only a few lecturers had been trained on how to use LMS and the electronic resources at the library. However, most lecturers desired to be trained on the use of LMS and SPSS.

Technical and peer support to enable both lecturers and students to use computing facilities are lacking for the use of the computing facilities is not felt by both lecturers and students. Among the recommendations made were the following:

a. Since it was found that access to computing facilities was limited, management should provide every faculty of the University with an adequately-equipped computer laboratory.
b. In order to provide the needed technical support to students and lecturers, management should recruit competent ICT staff for every campus.

c. Also, training needs analysis of lecturers in terms of educational technology should be performed periodically to determine the areas that require further training and the required training should be provided.
d. Further research on several aspects of ICT usage and enablers, for example, to facilitate effectiveness and data information is recommended.

1. Background to the study

One significant change in the past decade has been the introduction and availability of Information and Communication Technology (ICT) in Higher Education (HE). The turn of the new millennium brought many predictions on the technology revolution within education (Means, 1994; Selwyn, 1998; Van Dusen, 1997). For example, Selwyn suggested that ICT was to become the forefront of the global educational agenda, predicting that students with access and use at home would benefit academically. ICT is affecting Higher Education and therefore virtual teaching and learning will be dominating Higher Education in the future (van Dusen, 1997). Selwyn (1998) reported a pattern of behavioural change that suggested that because computers have become commonplace nowadays, this has encouraged most students to possess and use them. However, concern has been expressed about what students use IT for at home, particularly that there seems to be no leadership or guidance in their use. Higher Educational Institutions (HEIs) can provide leadership in ICT use. HEIs are now forced to implement ICT policies as though their whole existence depends on it.

Notably, ICT literacy is now considered a basic requirement for the lifestyle of the knowledge society for which Universities are preparing their students (Burbules & Callister, 2000; Castells, Flecha, Giroux, & Maccdo, 1999). At an Asian Leadership Roundtable 2010 conference, Tjeldvoll (2011) emphasized the intensity of the knowledge-based, market-driven competition in Higher Education globally, resulting in the need for institutional change towards technology. Citing Castells *et al.,* Tjeldvoll reiterated, “If knowledge is the electricity of the new informational-international economy, then the institutions of higher learning are the power sources on which the new development process [of nations] must rely” (p. 221). HEIs, public or private, are challenged to lead in the information age (Drabier, 2003; Kohrman II & Trinkle, 2003; Lowerison *et al.*, 2006).

In Ghana, the government is committed to implementing a number of policy initiatives and measures to develop the educational sector including Higher Education. Part of the Ghanaian government’s efforts to reform Higher Education led to the appointment of a University Rationalization Committee (URC) under the Provisional National Defence Council (PNDC) (Effah, 2003). (The PNDC was the ruling military government at that time). The Ghana government white paper in 1991 stipulated eleven policy objectives, which included reversing the declining quality of education and restructuring enrolment and output in the provision of skills in science, technology, social sciences and humanities in relation to national needs (Effah, 2003). However, Effah exposed the output challenges in terms of quality (citing a 1999 study by Saint); relevance to national development by referring to the National Council for Tertiary Education (NCTE) statistics; and the development of employable skills for the job market. “If Ghana’s concern is sustainable development, then improving tertiary education is a necessity” (Effah, p. 349).

To improve Higher Education for sustainable development, many researchers advocate access, use, and enablers of ICT in Higher Education (Goktas, Yildirim & Yildirim, 2009; Kisla, Arikan & Sarsar, 2009) and a comprehensive strategy for deployment and exploitation of ICTs within the educational system. A comparative study between South Africa and Chile through the Second Information Technology in Education Study (SITES) reveals the disparities in

developing countries' approaches to ICT policy and initiatives (Blignaut, Hinostroza, Els, & Brun, 2010). Blignaut *et al*. advocate national policy initiatives and measures that promote and encourage pedagogical incorporation of ICT in all forms of capacity building. There is the need for electronic distance education and virtual learning to widen access to Higher Education and training (Van Dusen, 1997). More importantly, there has to be empirical baseline data available for decision making and progress in HEIs throughout developing countries (Blignaut *et al*., 2010). This is the ultimate challenge in Ghana. There is very little evidence of basic and applied research data on Higher Education accessibility and usage and enablement of ICT for both teachers and learners in HEIs.

Even though there is a Pan African (PanAf) research agenda attempting to address this empirical need, the focus has been predominantly on schools in Francophone countries within sub-Sahara Africa (Karsenti, Collin, & Harper-Merrett, 2011). The publication elaborated on infrastructure and pedagogical applications of ICT in schools in those African Francophone countries. But apart from not addressing schools in the Anglophone countries, the authors failed to address the nexus between ICT and pedagogical challenges in schools and also how that affects the efforts of HEIs' to become the engine of national development. However, the PanAf publication has given insight into what is happening in other countries such as Cameroun, Kenya, Senegal, Mozambique and South Africa (Karsenti *et al*., 2011) and what has been happening in ICT in Ghana has been profiled in Mereku, Yidana, Hordzi, Tete-Mensah, Williams, 2009, who have provided baseline information. The need for baseline data from HEIs constituents towards national development based on the framework of ICT accessibility, utilization, and enablement is paramount.

2. Purpose of the study

The realisation of the significance of ICT baseline data for strategic planning encouraged the exploration of ICT use at UEW. The aim of the study was to establish baseline data of the extent of accessibility, usage and enablers of ICT/educational technologies to inform institutional strategies for further development and research in UEW. Furthermore, an understanding of the extent of personal ownership of technologies would also help to inform educational technology strategies and plans (Palak, 2004; Ely 1994). Particularly, personal computers can be used to complement institutional computers in the University's efforts for deployment of educational technology for teaching and learning. However, for this to happen effectively, a good understanding of connectivity, including bandwidth and availability of access points and wireless connectivity on the campuses, and support available to students and lecturers, has to be established.

The University of Education, Winneba (UEW) is strategic in the education of the Ghanaian society (*see* Effah, 2003) and any empirical data or indications of the levels of ICT accessibility, usability and enablement will be valuable information to stakeholders of education in Ghana.

According to UEW PHEA-ETI Proposal (2010), "initiatives have not been comprehensively, systematically and empirically studied to provide informed records on:

- Access and infrastructure issues;

- Existing ICT/educational technologies applications and resources;
- Competencies and skills of academics (enablers); and
- Use of technologies by academics (usage);

As highlighted in the section on educational technology priorities, knowledge on the current state of educational technology is significant for determining the strategic direction that the University might take in its efforts to expand the use of educational technology. A study that provides access to information on infrastructure, facilities, ICT applications and digital educational resources available, how these are being used and attitudes towards educational technologies will be of great significance to the development of educational technology initiatives in the institution.

3. Research problem

There is the need for investigation to establish a baseline data on the extent of accessibility, usage and enablers of ICT/educational technologies (ETs) to inform institutional strategies for further development and research in UEW. The University of Education, Winneba as an institution has not yet established a clear research agenda and monitoring and evaluation strategies for the effective use of ICT and ETs in its teaching and learning. Apart from that there is no research data available on accessibility issues for both faculty and students. There is an equally important research gap on strategies to enable both communities to function effectively in the sub-Saharan African region. Within the context of Ghana, literature available is mostly from the experiences outside the region or outdated, and has very little significance when it comes to the reality in UEW strategic planning. Without substantive investigation of this kind in context future institutional decisions on ICT/ETs are going to be based on speculations, out of context, rather than realities and empirical evidence.

3.1 Research questions

The main question that informed the study is: What is the current state of ICT/educational technology in terms of access, usage and enablers at the University of Education, Winneba? To answer this main question, the following sub-questions were considered:

1. What are the educational technologies accessible to UEW students and faculty?
2. How do students and faculty use available educational technology resources?
3. What are the enablers for the uptake of educational technologies among students and faculty?

4. Contextualising the study

In order to examine what other researchers have established concerning access and usage of educational technology in HEIs as well as the factors that constitute enabling environment for productive use of educational technology in HEIs, a literature scan was conducted.

According to Czerniewicz, Brown and Mlitwa (2006) access to ICT resources is influenced by four key parameters - (i) physical or practical dimensions of technological resources; (ii) resources of personal agency; (iii) resources of contextual environment; and (iv) resources that give access to digital context to technology. Czerniewicz *et al*.'s seminal study on access and use was used to guide the design of the UEW study. Czerniewicz *et al.* (ibid) point out that the practical dimensions of technological resources serve as factors influencing access to ICT. These technological resources cover the 'tangible' components of computer systems and associated infrastructure, which are considered important in access and use of ICT. The availability of physical computers relate to the quantity, type and reliability of that equipment, the access arrangements, and location of the equipment. First, the importance of a physical presence of the

personal computer (PC) access is widely recognized for educational purposes (Dawes, 2001; Preston *et al*., 2000). Hoffman (1996) also recognized PC access for teaching purposes as important. Second, according to different studies (Andrews, 1997; Pelgrum & Plomp, 2001), physical factors go beyond the provision of sufficient computers, display of equipment, and 'tangible supplies.' It also has to do with location of the equipment and access arrangements (e.g., scheduling) (Kiili, 2003; Tearle, 2002). Third, computer reliability is also important (Butler & Sellbom, 2002). Butler and Sellbom considered computer reliability as the most commonly cited significant problem in the adoption of technology in education related activities. This has to do with time, that is, regularity and dependability of the physical infrastructure and equipment (Fabry & Higgs, 1997). Tearle and Dillon (2002) posited that this issue of time is increasing pressure on teachers to deliver meaningful teaching and learning.

Czerniewicz *et al.* (2006) also mentioned personal agency as the way in which the individual conceives access to ICT. Personal agency is a "person's disposition towards using resources as well as their aptitude to resources" (p. 40). This disposition however requires systematic exposure and/or training facilitation in the proper use of ICT. There is a need for systematic instructions with well-planned structures, and a focus on training outcomes for effective personal use of ICT, particularly in education (Passey & Ridgeway, 1992; Rhodes & Cox, 1990; Owen, 1992; Bennett, 1994). According to Czerniewicz *et al.,* the most common indicators of personal agency are interest, attitude, experience and ability.

Czerniewicz *et al.* further elaborated that resources of contextual environment influence how users conceive access to ICT. Many studies confirm this notion of contextual environment, which can be categorized into contextual resource to community social network (Carvin, 2000; Di Maggie & Hargittai, 2001; Jarboe, 2001; Ganett & Rudd, 2002; Kvasny, 2002; Murdoch, 2002; Warschauer, 2003), and institutional resources environment (Bridges, 2001; Government of Japan, 2000; Jarboe, 2001; van Dijk & Hacker, 2003; Warschauer, 2003). Carvin (2000) defined the community social network as interest and support received from a community of social network; whilst the institutional resource is viewed as the integration of resources into the institution (van Dijk & Hacker, 2003). With contextual environment it is recognised that the educator's use of ICT requires various modes of support, for example:

1. technical support (Leggett & Persichitte, 1998; Ertmer, 1999; D*f*ES, 2002);
2. administrative support (Hoffman, 1996);
3. timetabling or resource allocation supports (Fullan, 1992; Kennewell *et al.,* 2000); and more importantly, peer support for collaboration – i.e., social networks (Czerniewicz *et al.*, 2006; Dawes, 2001).

Additionally, within the framework of resources of contextual environment as an influence on how users conceive access to ICT, leadership and management were noted for effectiveness and efficiency. Here the emphasis was on practical supervision and co-ordination (D*f*ES, 2002; Kennewell *et al*., 2000). Leadership influences the visionary context to assess; management provides the efficiency needed for ICT integration in institutions (Carr, 2003; Downey, 2006; Drabier, 2003). Carr, for example, supported Czerniewicz *et al.*'s proposition on leadership; stating "integration will require faculty transformation and institutional change … for active learning, cooperative learning, multiple intelligences, diverse learning styles, interdisciplinary instruction, authentic learning assessment, critical thinking … [in] our multicultural society" (p. 83).

Czerniewicz *et al.* (ibid) view digital context as a way of conceiving access. Digital contents must of necessity be contextually relevant to make technology resources worthwhile in terms of access. Digital access is defined as the availability of suitable resources online (Czerniewicz *et al.*, 2006), placing emphasis on relevance of resources and the local content availability. Czerniewicz *et al.* presents the Digital Contextualization model as the key resource indicator which is relevant to people using ICT for teaching and learning. According to other studies (Freeman, 2001; Giddens, 1979; Lehman, 2003), there is a great support for a model that addresses digital content and relevance. There is also the need to encourage further studies to explore and establish a relationship between ICT access and context. Further to this is the need to analyse and map out networks, conditions, positions and connections of the current state of educational technology. This measure is to ascertain how best technology supports or enables teaching and learning as well as the resources needed to make it possible for ICTs to improve pedagogy.

In an effort to assess social factors that contribute to ICT access and use, Qureshi (2009) reviewed studies done in developing countries in Latin America and Africa. Qureshi commented that the findings of those studies:

> *Demonstrate that deregulation [of ICT] is not sufficient to effect efficient ICT expansion and argue that existing conditions (economic factors, human capital and geography, and civil infrastructure) must be considered" (p. 235).*

Appropriate context for the use of ICT enhances access and brings relevance and social benefits. According to Oreku *et al*. (as cited in Qureshi, 2009), e-readiness should be a challenge to all because of its impact on e-commerce (as in the case of Tanzania) and development.

4.1 ICT/Educational technology usage

A study conducted at Monash University among Australian students indicated that the present digital-native students are comfortable using online learning and teaching if they are well supported (Weaver, Spratt & Nair, 2008). Students were more concerned with the quality of the online teaching than technicalities. Another study by Lowerison, Sclater, Schmid, and Abrami (2006) also investigated the efficacy of using technology for learning at Concordia University, Montreal, Canada. Lowerison *et al*. reported that technology as a tool is creating effective learning among learners. The researchers advised on pedagogical leadership to stimulate student-centeredness for engaging ICT users for instructional purposes. However the authors posited a challenging question of how to augment learners' usage of ICT for learning.

Lowerison *et al*. (ibid) argue that scholars believe that computer technology allows learners to create, explore and design knowledge. Computer technology can transform the classroom into a learner-centered environment. The primary question is how this can be achieved. The researchers examined several relationships among the various study variables; many of the correlations were statistically non-significant such as between time users spent on tasks. However, the findings were significant in terms of the relationship between computer uses and overall perceived course effectiveness. According to Jonassen and Reeve (as cited in Lowerison *et al*., 2006), technology helps with cognitive learning when the learner is actively engaged in the interaction with technology as a tool. Most

of these researchers believe that access to computer technology has a direct relation with the use of ICT; so is the use also related to enablement of users to maximize the benefit of the technology.

4.2 ICT/Educational technology enablement

What matters most, as enabling factors for computer take-up are not the number of computers provided, rather the condition of use (Czerniewicz *et al*., 2006). The authors revealed that what makes the difference is availability and ease of access, the adequacy of computers (in terms of reliability) and support; but importantly, is an enabling environment for productive use of technology. These enabling factors include practical issues such as opening hours, booking conditions and the conduciveness of the learning environment. The researchers mentioned that students are enabled by the development of ICT skills for professional or vocational purposes. Users develop skills or competencies to enable them to perform tasks efficiently and adopt the computer technology as a tool.

Another enabling factor is the self-efficacy concept in technology use. According to DeTure (2004), cognitive styles of learners and their self-efficacy online are not strong predictors of successful learning when it comes to using technology in an online distance education. However, DeTure assessed the ability of students to be successful in online distance education by measuring their online technology self-efficacy. She used an Online Technologies Self-efficacy Scale to measure the task-ability of learners according to their self-belief as a way to ensure enablement. Once distance educators can evaluate self-efficacy variables, the next step of enabling students is developing their ability or self-belief to use the technology tool. According to the study, enabling factors may not necessary predict success in online learning, however, the opportunity to succeed must be given to all by assessing online technology self-efficacy as a knowledge base for administrators, faculty, and researchers in any form of distance education in terms of design and policy making.

In an age where policy-makers may be expecting students to solve access needs by acquiring personal computers, it is possible that the provision of computer laboratories, information literacy support and an enabling technological environment may not be a priority in most institutions (Kohrman II &Trinkle, 2003). Kohrman II and Trinkle are of the view that strategic planning in colleges with small budgets is the way to go. For many of these institutions the challenges of managing and leading an IT organization makes strategic planning a luxury.

As part of the technology strategy in most HEIs, enabling students and faculty should include contextual characteristics of (i) ensuring electricity power regularity on and off campus, (ii) the equity of access offered via the On-Campus environment and affordable purchases, and (iii) ensuring ways to alleviate the digital divide, which is likely to remain vital in the medium term. Dada (2006) talked about the concept of e-readiness in developing countries when it comes to ICT and e-commerce and e-business. Dada’s concept of electronic readiness should be applicable to HEIs in developing countries where institutional e-readiness will be assessed to include the sustainability strategies of keeping users enabled throughout their use of technology for learning. Dada, for example, considered the relevance of such a concept in the light of easily digestible information that can assist with developing a nation’s ICT

advancement by focusing efforts and identifying areas where external support or aid is required.

Such an enabling environment will be a significant development in ICT and education in developing countries. Within the concept of ICT enabling in HEI, the discussion on moving from strategic paper trials to actionable implementations should be based on a framework that may be more appropriate to address the real situation faced by firms/or institutions (Dada, 2006). The thinking should focus on action-oriented concept to enable consistent, dependable, and uninterrupted ICT technology for teaching and learning. Dada termed it as the availability of the legal, financial, physical, social and technological infrastructure that is required for full functionality and maximization.

Other findings suggest that faculty and students' use of ICTs is enabled by their self-motivation and self-confidence as well as the support system they get. Self-motivation and self-confidence affect frequency of use. Just as DeTure (2004) suggested online technology self-efficacy, students are also enabled to use computer technology by available supportive networks. These may be from their family and friends, who somehow place a high value on the students' use of computers (Czerniewicz *et al*., 2006). Motivation may be intrinsic or extrinsic; self-motivation in self-learning is developed from extrinsic empowerment, and this may be factored by institutional ICT/IT vision (Drabier, 2003). According to Drabier, institutions that automate most of their essential services such as e-admission, e-library, e-shopping, etc. are helping to force (enable) their constituents to adopt and use ICT. Therefore, Drabier suggests that strategies must be in place to force change; planned change in institutional ICT use is progressive.

Another enabling factor in ICT use within HEI is the encouragement of social networking and social media technology for governance at all levels (Kvasny, 2002; Qureshi, 2009). Qureshi opined that the social context of technology must be explored. The social media technology (SMT), such as Facebook™, YouTube™ and so forth, has become a forum for most activism and advocacy in most societies. Developing countries are not immune from SMT influence, therefore the augment that strong social networks and social access as a means of enablers encourages the use of computers in education (Kvasny, 2002). The findings of most technology researchers support social networks as a linkage to frequent computer use and self-motivation and technical support systems. Parents can provide support and guidance for their children to accelerate children's interest and curiosity in using ICT. However, Warschauer (as cited in Czerniewicz & Brown, 2006) observed the lack of social support as a constraint in the use of technology and therefore the social networking component could be an enabler.

Czerniewicz, *et al*. (2006) found ICT use is enabled by giving students ICT - mediated practices. Their study showed that students were more broadly engaged in ICT mediated activities for non-classroom and informal learning purposes. Other researchers talked about ICT enabler through curriculum integration (Stensaker *et al*., 2007). In a study conducted in South Africa, Czerniewicz and Brown (2005) reported that 60% of staff and 81% of students used ICT more than occasionally as part of teaching or learning practices because of the integration of computer technology into instructions. The students used ICT to support their learning, particularly when faculty asked the students to engage in electronic learning. Many faculty and students are aware

of the benefits of using ICT in teaching and learning - the enabling environment is what precipitates frequent and skilful use for innovative learning.

5. Research design

This section covers the research design, population and sampling techniques, data collection, instrumentation and data analysis. As already stated, the purpose of this baseline study was to ascertain the current state of UEW's ICT/educational technology in order to provide empirical data on access, usage and enablers of technology uptake. As such, the focus of data collection was both students and faculty of UEW.

5.1 Methodology

To achieve the purpose of the study, a mixed cross-sectional design was employed. Specifically, an explanatory mixed method design was used. The use of this approach involves the collection of quantitative data followed by qualitative data to help explain or elaborate on the quantitative results (*see* Creswell, 2009). This approach was employed because of the belief that the quantitative data gathered would provide the general picture of ICT access, usage and enablers at the University and the qualitative data would be needed to refine, extend or explain the general picture of the situation.

5.2 Study population and sampling

The study was conducted at the three main campuses of the University. These were the Winneba, Kumasi and Mampong Campuses. The sample size was 1939 including faculty members (n=389) and students (n=1550). The stratified random sampling technique was used for the student population. The stratification was based on department and gender. Departments here refer to the different sub-categories or fields of study that fall under different faculties within separate schools. For example, on the Winneba campus we have the faculty of educational studies which has the department of psychology. Gender refers simply to sex of individuals (i.e., male and female categories) within the departments. Once stratification was done, random sampling was used to select the students. It was intended to obtain a student sample size of 1550 representing a little over five percent of the total UEW student population of approximately 24,000 on the three campuses (UEW Planning Department, 2010). To maximise the response rate, the questionnaires were distributed to all the 389 full-time faculty members on the three campuses of UEW.

In addition, 16 student course representatives (i.e., eight (8) from the Winneba and Kumasi campuses respectively) were purposely selected for two (2) different focus group discussions. It was purposive because the course representatives were readily available, accessible, and representative of the various courses that were to be rolled in the project. These students are likely to give the researchers the information needed as the cohort. Five (5) key members of the University management team (the Vice Chancellor, two Deans, and the Principals of Mampong and Kumasi campuses) were interviewed. Also, the Head of Department of ICT, UEW as well as the Coordinator of ICT Technical Operations,

UEW were interviewed. Table 1 indicates the summary of sampled interviewees from UEW, their roles and responsibilities.

Table 1 Overview of interviewees

No	**Interviewees**	**Role/ Responsibility**
1	Eight (8) Course Representatives from Winneba campus	To represent Winneba campus students from the various courses for a focus group discussion (SFGs)
2	Eight (8) Course Representatives from Kumasi campus	To represent Kumasi students from the various courses for a focus group discussion (SFGs)
3	Vice Chancellor, 2 Deans and the 2 Principals from Mampong and Kumasi Campuses	To represent the top management of UEW (UMgt)
4	Head of ICT Department, Coordinator of ICT Technical Operations	To represent the ICT department and the technical team of UEW (UMgt)
	Total	**23**

5.3 Instrument design

Data for the study were gathered from three (3) questionnaires with close- and open-ended items. The first was for faculty members, the second were for students and the third questionnaire was for Heads of Departments (*see* Appendices A, B, & C). Most of the items for the questionnaires were adapted from '*The Virtual Mobius Strip*' a research report on access to and use of computers conducted in South Africa.

The questionnaires were content validated by institutional experts, peer reviewers, and an external consultant. The close-ended questionnaires were construct validated using factor analysis to assess their three factor structure namely access, usage and enablers. The pilot study showed that the questionnaires had good construct validity in that only a few items cross-loaded and were deleted from the questionnaires. Based on the pilot, the items in the questionnaires were also assessed for their internal consistency and yielded an alpha of 0.72 indicating that the questionnaires had good reliability. For the open-ended items in the questionnaires as well as the items for the interview schedules, lecturers' comments, peer reviewers and experts' advice were considered and the necessary changes effected for their appropriateness.

The basis for the interview guides were the issues that emerged from the questionnaire data. The interviews were meant to clarify and probe further some of the issues that were pointed out within the quantitative data. As qualitative instruments the interview guides were used to start the conversations after which certain probing questions emanated. For the focus group discussion, the interview items were used to regulate and direct discussions.

5.4 Data collection

For ethical consideration, questionnaires were attached with covering letters introducing the purpose of the study. The covering letter also assured participants of confidentiality and informing them of voluntary participation. Students were given the questionnaires through their class representatives who acted as coordinators. The completed questionnaires were collected by the class representatives and passed on to the research assistants. Lecturers were given the questionnaires personally by research assistants who later went and collected the completed questionnaires. In each occasion, participants were briefed on the study, need for honesty and frank responses, and assured of no physical or emotional risks and their confidentiality.

Interviews were conducted with University management (UMgt) and focus group discussions were conducted with student representatives (SFGs). The participants of the focus group discussion were informed verbally about the date, time, venue and duration of the interview. They were also informed of their rights not to participate in the study. The discussion was tape-recorded, and brief notes were also taken.

5.5 Data analysis

The quantitative data collected were captured into SPSS. The data collected were scrutinized for accuracy, coded and analysed for appropriate statistical records using the SPSS software. The various descriptive statistics were generated and recorded for central tendencies where necessary. For qualitative analysis, the interviews were transcribed into text, reviewed and coded, and content analysed thematically. Based on the qualitative and the quantitative analyses, the triangulation method was used to check the accuracy of the results and to improve the validity and reliability of the study. The information gathered through the use of the survey instrument were coded and analysed. Data gathered from the HODs were also collated and summarized.

5.6 Research limitations

- This research employed three (3) survey instruments and structured interviews. It is therefore based on the integrity, authenticity, and trustworthiness of the participants. The data provided should therefore be seen as information on existing facilities as provided by the participants.
- Educational technology usage in the University is dynamic. Even at the time of collecting this information new committees were being set up to see to and to improve on the technology status of the University. In this respect the report should be seen as a picture of the time the research was conducted.
- Lecturers' views were not captured in an interview to provide more indepth information as key stakeholders in the University. It was realised

during the discussion that their views would have enriched some of the issues explored, especially those relating ICT enablers and training.
- The initial manpower and resources allocated for this study was underestimated. UEW as an institution has campuses widely located far from each other, as such needed more resources to reach the participants.

6. Findings

The purpose of this research was to gather data to determine the extent of accessibility, usage and enablers of ICT/educational technologies within UEW to inform institutional strategies for research and development. In all a total of 1939 survey questionnaires were distributed to faculty members and students. Out of this number 389 were distributed to faculty members, while 1550 were distributed to student participants. The following are the findings of the data gathered from the survey questionnaires and the interviews. Also a total of 23 participants which consisted of 16 students and seven university management were interviewed to generate qualitative data for the study.

6.1 Report on Demographics of Respondents

In all, the total number of respondents for the entire study was 1531 of which 1434 were students and 97 faculty members out of the overall total of 1939 who participated in the study. The overall response rate from the survey questionnaires was 79%. The students' response rate was very high (92.5%) and the faculty was 24.9% (n=97).

Table 2 shows the gender distribution of respondents. More males than females participated in the study for both lecturers and students. Twenty-one students (1.5%) did not indicate their gender.

Table 2 Gender distribution of study respondents

Respondents	*Gender*	*n*	*%*
Faculty/Lecturers	Male	77	79.4
	Female	20	20.5
	Sub Total	**97**	**100.0**
Students	Male	867	60.5
	Female	546	38.0
	Unknown	21	1.5
	Sub Total	**1434**	**100.0**

Table 3 indicates the demographics of the faculty respondents. Most of the faculty/lecturers who participated in the study were between the ages of 30 and 50 (76.3%), whilst a majority of the students (56.0%) were between the ages of 20 and 29 years.

Table 3 Age distribution of respondents (Faculty)

Age	**n**	**%**
20 – 29	3	3.1
30 – 39	40	41.2
40 – 49	34	35.1
50 – 59	15	15.5
60 +	5	5.2
Total	**97**	**100.0**

Table 4 shows that there were a few students (2.4%) who were above the age of 50 years of age. The sample suggests that the three UEW campuses studied have a predominantly young workforce and student population. This suggests a favourable "digital native" (Prensky, 2006) population for technology uptake as observed by Weaver *et al*. (2008) in their study conducted among Australian students regarding technology adoption model.

Table 4 Age distribution of respondents (Students)

Age	**n**	**%**
< 20	66	4.6
20 – 29	803	56.0
30 -39	382	26.6
40 – 49	125	8.7
50 +	35	2.4
Missing	23	1.6
Total	**1434**	**100.0**

Table 5 indicates most of the lecturers who responded were Masters' degree holders (79.4%). This implies the university has potential faculty members who may be interested in terminal degree in ICT or educational technology in teaching and learning.

Table 5 Faculty Academic Qualification

Academic Qualifications	**n**	**%**
Diploma	1	1.0
Bachelor Degree	2	2.1
Master's Degree	77	79.4
Doctorate	14	14.4
Others	3	3.1
Total	**97**	**100.0**

Table 6 shows years of experience (service) of faculty members who participated showed that several of the lecturers (55.6%) have worked with the University for between 1 to 4 years. This is quite a large number of staff participants in the study were within the junior ranks and were inexperienced. According to the technology adoption models, the younger staffs are most likely to migrate and adopt ICT as digital natives (Prensky, 2006). Their inexperienced as junior ranks may result in curiosity and readiness to learn and advance in teaching and learning with ICT.

Table 6 Faculty Years of Experience at UEW

Years of Experience	n	%
1– 4	52	55.6
5 – 8	18	18.6
9 – 12	13	13.4
13 – 16	8	8.2
Above 16	3	3.1
No response	3	3.1
Total	97	100

The survey instrument also gathered data on the faculties that the student respondents belonged to. The data gathered is presented in Table 7.

Table 7 Students' faculty of studies

Faculty	**n**	**%**
Science Education	73	5.1
Educational Studies Education	93	6.5
Creative Arts Education	106	7.4
Social Science Education	102	7.1
Languages Education	113	7.9
Agricultural Education	55	3.8
Science and Environment Education	48	3.3
Technical and Vocational Education	67	4.7
Education and Communication Sciences	96	6.7
Business Education	127	8.9
IEDE	554	38.6
Total	**1434**	**100.0**

Table 7 indicates that Faculties of Science and Environment Education, Agricultural Education, and Technical Vocational Education had the lowest percentage (less than 5.0%) of student respondents. This was because these were the smallest faculties at the university. The data in Table 7 reflects the distribution of students according to faculties in UEW. Institute for Educational Development and Extension (IEDE) had the highest percentage (38.6%) of student respondents because distance education students constitute about 50% of the entire UEW student population. Table 8 indicates that most of the students who participated in the survey were undergraduates and post-diploma students (80.5%).

Table 8 Students' Enrolled Programme

Programme Enrolled	**n**	**%**
Certificate	0	0
Diploma	213	14.9
Undergraduate	706	49.3

Programme Enrolled	n	%
Postgraduate Diploma	447	31.2
Masters	64	4.5
Doctorate	2	0.1
Missing	2	0.1
Total	**1 434**	**100.0**

The students of IEDE most often enrol in post-diploma programmes.

Table 9 Students' Year of Study on Enrolled Programme

Year of study	n	%
1st year	388	27.1
2nd year	641	44.7
3rd year	283	19.7
4th year	96	6.7
Missing	26	1.8
Total	**1 434**	**100.0**

The majority of the student respondents were second year students (44.7%) (*See* Table 9). Table 10 shows that most of the respondents were full-time students (51.8%).This were followed by Distance Education students (39.0%). Table 11 indicates that a majority of the students (78.5%) lived off-Campus.

Table 10 Students' Attendance Pattern

Attendance Pattern	n	%
Full-time	743	51.8
Part-time	49	3.4
Distance	559	39.0
Sandwich	78	5.4
Missing	5	0.3
Total	**1434**	**100.0**

Table 11 Students' Residential Status

Residential Status	n	%
On-campus (University facility, e.g., halls, etc.)	293	20.4
Off-campus (Non-University facility e.g., halls, etc.)	1125	78.5
Missing	16	1.1
Total	**1434**	**100**

6.2 Educational technologies accessible to UEW students and faculty

In this section, the data obtained from the Heads of Departments, the coordinator for UEW ICT Technical Operations, lecturers and students using questionnaires and interviewing are presented.

6.2.1 General accessibility to educational technology

The data on educational technology availability collected from 33 Heads of Department is presented in Tables 12 and 13. Whilst Table 14 presents data obtained from the UEW Coordinator ICT Technical Operations. Table 12 provides information on whether a department had or did not have Internet connectivity, ICT Laboratory, ICT policy and an ICT cognate course.

Table 12 State of ICT in different departments

Faculty/Department	**Connected to Internet?**	**Have ICT Laboratory?**	**Have ICT Policy?**	**Have ICT Cognate Course?**
Faculty of Science Education				
ICT	Yes	Yes	No	NA
Biology	Yes	No	Yes	Yes
Chemistry	Yes	No	Yes	No
Home Economics	Yes	No	Yes	Yes
HPERS	Yes	No	No	Yes
Integrated Science	Yes	No	No	Yes
Mathematics	Yes	Yes	No	Yes
School of Creative Arts Education				
Art	Yes	Yes	No	Yes
Graphic Design	Yes	No	No	No
Music	Yes	No	Yes	Yes
Theatre Arts	Yes	No	No	Yes
Faculty of Languages Education				
Applied Linguistics	Yes	Yes	No	No
English	Yes	No	No	Yes
Faculty of Educational Studies				
Basic Education	Yes	No	NR	Yes
CEPS	Yes	No	Yes	Yes
Early Childhood	Yes	No	Yes	Yes
Psychology	Yes	No	Yes	No
SPED	Yes	Yes	NR	NR
Faculty of Social Science Education				
Centre for African Studies	Yes	No	No	No
Social Science	Yes	No	No	No
Faculty of Technical and Vocational Education				
Information Technology	Yes	NR	NR	NR
Design & Technology	NR	No	No	No
Faculty of Business Education				

Faculty/Department	Connected to Internet?	Have ICT Laboratory?	Have ICT Policy?	Have ICT Cognate Course?
Accounting Studies	Yes	No	Yes	Yes
Management	Yes	No	No	No
Faculty of Education and Communication Sciences				
Interdisciplinary Studies	Yes	No	No	Yes
Faculty of Science and Environment Education				
Environmental Health & Sanitation	Yes	No	Yes	Yes
Integrated Science	Yes	No	Yes	Yes
Faculty of Agriculture Education				
Agriculture Economics & Extension	Yes	No	Yes	Yes
Animal Science	Yes	No	Yes	Yes
Crop & Soil Science	Yes	No	Yes	Yes
Engineering & Mechanization	Yes	No	No	Yes
Interdisciplinary Studies	No	Yes	Yes	Yes
IEDE	Yes	Yes	No	No
Summary				
No/NR	2	24	18	12
Yes	31	07	14	20

NR = No response

Table 12 indicates that 31 out of the 33 departments at the University were connected to the Internet. This is significant number should reflect high patronage; but the interview data also points out that students had access to Internet services at most of the departments but the services were unreliable, as suggested by the following comment by some of the students (FGS) and University authorities (UA) interviewed:

> *The major difficulty, I can say, is unreliability of the Internet connectivity --- Sometimes, it works very well and we are happy and sometimes it is down (UA2)*
>
> *We have access to Internet facilities, but the only problem is that sometimes the net is off and on ---. (FGS2)*

Moreover, Table 12 indicates that there were seven (7) departments that had ICT laboratories. The data also reveals that 18 departments had an ICT policy, which encourages staff and students to make use of available educational technologies in teaching and learning. The interview data also suggested that the University had a vision on ICT development, and this had been captured in its strategic plan. However, it appeared that there was no clear policy regarding the use of ICT facilities in teaching and learning. Evidence from the qualitative data further suggested that some of the departments were working within the strategic framework provided by the University:

We have the department strategic plan. What I know is that this department has a document that contains ICT strategic plan, which forms part of the main University's strategic plan ... which says we are going to be doing X,Y and so on ... that is basically what we are working with now (UA)

Again, Table 12 indicates that twenty-one (21) departments had ICT cognate courses – these are the courses that incorporate ICT knowledge and skills. Thus, both the data from the questionnaire and interviews suggests that the departments are well connected to the Internet, have ICT policies and laboratories to support teaching and learning.

Table 13 provides information on the number of some computing facilities available at the departments of the University.

Table 13 Availability of ICT Facilities at the Departments

Faculty/Department	**Desktop Computer**	**Laptops**	**LCD Projectors**	**Photocopiers**	**Digital Cameras**	**Printers**	**Projector Screens**
Faculty of Science Education							
ICT	116	0	2	1	0	1	1
Biology	4	0	1	0	0	1	1
Chemistry	2	0	1	0	0	1	0
Home Economics	6	2	1	1	0	4	0
HPERS	4	0	3	1	0	2	1
Integrated Science	1	0	2	1	0	2	0
Mathematics	30	3	5	2	0	5	1
School of Creative Arts Education							
Theatre Arts	2	1	0	0	0	2	0
Art	25	2	1	1	1	5	1
Graphic Design	2	1	0	0	0	1	0
Music	1	1	1	0	0	2	0
Faculty of Languages Education							
Applied Linguistics	6	3	2	0	0	3	2
English	2	2	1	1	0	3	0
Faculty of Educational Studies							
Basic Education	7	1	1	1	0	4	1
CEPS	7	3	2	2	1	4	0
Early Childhood	4	1	1	1	0	5	0
Psychology	3	1	1	1	0	3	0
SPED	30	3	3	2	1	3	1
Faculty of Social Science Education							
Centre for African Studies	3	2	1	1	0	1	1
Social Science	2	1	1	1	0	4	0
Faculty of Technical and Vocational Education							
Information Technology	2	2	5	1	0	2	0
Design & Technology	3	0	1	1	0	2	0

Faculty of Business Education							
Accounting Studies	6	4	4	1	0	3	1
Management	4	5	4	1	0	4	0
Faculty of Business Education							
Interdisciplinary Studies	3	0	0	2	0	2	0
Faculty of Science and Environment Education							
Environmental Health & Sanitation	1	0	0	0	0	1	0
Integrated Science	1	1	0	0	0	1	0
Faculty of Agriculture Education							
Agriculture Economics & Extension	0	0	0	0	0	0	0
Animal Science	2	0	0	0	0	1	0
Crop & Soil Science	1	0	0	0	0	1	0
Engineering & Mechanization	1	1	0	0	0	1	0
Interdisciplinary Studies	4	1	1	0	0	2	1
IEDE	59	2	2	3	0	5	2
Summary							
Total number of the item	344	43	47	26	3	81	14
Number of departments with item	33	22	24	20	3	33	12

The data shows that there were 344 computers and 43 laptops in the departments. However, more than 75.6% of this equipment is located in only four (4) of the departments i.e. ICT, Mathematics Education, Art Education and Special Education departments. The remaining24.4% of the computers was located in the other 29 departments. A look at Table 13 reveals that the four departments had 75.6% of the computers in the university. Those departments also had ICT laboratories. In essence, the high number of computers at those departments was due to the availability of the computer laboratories. This implies that the computing resources were not evenly distributed among the departments at the University. Comments from the some students during the interview also suggested that the computers were not distributed evenly as the following comments point out:

> *The computers are there – they are even more than the number of the students that are doing the programme (FGS11).*
>
> *I am in the technology department and at our department; we are not even having one computer (FGS10).*

Table 13 indicates that apart for the Department of Agriculture Economics & Extension which had no computers, every department had a desktop computer and a printer. Specifically, the table indicates that out of the 33 academic departments, 22 had laptops while 24 of them had LCD projectors. The interview data suggested however that the number of projectors were inadequate for the lecturers at some departments:

> *Taking my department for instance, last semester, we did a course that involved the use of a projector. However, because the two projectors at the department were not working, the lecturer would come to class and go out. He would not teach because there were no projectors. Projectors are important for teaching and learning, but they are insufficient at some departments (FGS10).*

> *Okay it is a very nice idea for lectures to use the projectors and other things to teach. However, they are insufficient so we are pleading with the authorities that lecturers should be made to have enough of them so that, at least, each lecturer would have one when we have a lecture (FGS5).*

Thus the data suggested that although the University had a number of computing facilities, they were inadequate to support and facilitate effective teaching and learning in the institution. Table 14 shows the facilities that are available to support Internet services at the University-wide.

Table 14 Facilities Supporting Internet Services in UEW

Supporting Facilities for Internet	**Description/ Units**
Routers	8
Servers	44
Wireless Access Points	27
Total Internet bandwidths	310 Mbps
Fibre backbone per campus*	1Gbps
Local Area Network (LAN) for every major buildings on all campuses	1Gbps

*155 Mbps Uplink and 155 Mbps downlink

In addition to facilities supporting Internet services, according to Coordinator, ICT/Technical Operations of UEW, the following are also available:

- Every staff has a user account for accessing the Internet (this is also used as an email address). This indicates that every member of staff of the University has an authentication pass that allows him or her to access the Internet as well as having a University email address.
- The University library has e-Resources containing 33 online databases. Each database has several online journals which cover a wide range of educational fields.

- The University has an Institutional Repositories (IR) called UEW Rep. UEW Rep is an online locus for collecting, preserving and disseminating in digital form, the intellectual output of an institution.
- The Mampong campus of University is linked to AGRIS. AGRIS is a global public domain Database; AGRIS has structured bibliographical records on agricultural science and technology.
- The University has software for the management of students' information and assessment records.
- To promote educational technology the University through in a collaborative programme with Ohio University trained 12 members of staff to become instructional technologist. These are posted to various faculties of the University to support the implementation of educational technology. (UEW document supplied).

Table 14 indicates that there is a huge Network infrastructure at the University to support Internet connectivity at all the departments. However, the University lacks staff with the needed technical expertise in the usage of educational technologies to offer support the infrastructure when needed. This is evident from the following comments made by participants interviewed:

> *… so there is nobody who seems to be responsible for the [ICT] laboratory, and it's been under IT department because they are the most frequent users. So, they take the responsibility but as soon as lectures are over then the [ICT] laboratory is also closed. Either it is closed or unattended*.

> *The main challenge right now is human resource. … [there is not] much support staff and … few [available] are junior staff their level of knowledge in IT is not so high (UA3)*

6.2.2 Students access to educational technology resources

Students were asked to indicate the sort of educational technology facilities they had access to and to indicate if they owned them. Table 15 presents the responses of the students to the relevant survey questions.

Table 15 Students' Response to Available Technologies in UEW

Educational Technologies	**Occurrences**	**%**
Television	705	49.2
Radio	663	46.2
Mobile phone	922	64.3
Computer (Laptop or personal Computer)	572	39.9
PDA (Personal Data Assistant)	136	9.5
Digital camera	200	13.9

Camcorder	67	4.7
Digital voice recorders	67	4.7
Scanners	120	8.4
Printers	213	14.9
I have no access to any of the above	61	4.3
Total	**1431**	**100**

The data in Table 15 indicates that the mobile phone was the most accessible educational technology to students (64.3%) while camcorders (4.7%) and Digital Voice Recorder (4.7%) were the least accessible educational technologies to the students on campus. The responses of the students suggested that most of them owned mobile phones but not the other educational technologies.
There were survey items to find the students' accessibility to other educational technologies including Internet, e-journals and e-books. The data indicated that some students (44.4%) had access to these technologies, while a significant number (55.4%) had no access.

6.2.3Faculty Access to Educational Technology Resources

Faculty members were asked to indicate the kind of educational technologies they had access to. Their responses are presented in Table 16.

Table 16 Lecturers' Response on Educational Technologies Available at Departments

Educational Technology	**n**	**%**
Telephone	52	53.6
Television	17	17.5
Radio	17	17.5
Computer (laptop or PC)	75	77.3
PDA (Personal Digital Assistant)	4	4.1
Cameras	7	7.2
Digital voice recorders	6	6.2
Overhead Projector	32	33.0
LCD Projector	32	33.0
Scanners	30	30.9
Printers	80	82.5
Photocopier	69	71.1

Table 16 shows the key educational technologies that were accessible to faculty members were printers (82.5%), computers (77.3%) and photocopiers (71.1%). The least accessible educational technology to faculty lecturers was Personal Digital Assistant (4.1%) and camera (7.2%). Faculty are more into educational technologies, whilst compared to students who are more into communication and

media/entertainment technologies (i.e., mobile phones, radio, television, etc). This reflects the current digital nativity of new generation of students who are skewed towards ‘edutainment’ (Prensky, 2006)

The questionnaire also provided opportunity for lecturers to indicate if they had access to computers outside of their departments. The responses indicated that most of the lecturers (74.7%) had access to computers apart from those in the departments. The data suggested that 24 (25.3%) did not have access to computers outside of their departments.

On the issue of accessibility to UEW Internet connectivity, a majority of the lecturers (76.3%) noted that they had access to the Internet in their departments. Six respondents did not respond. Also, the survey instrument requested lecturers to indicate if they had access to Internet at home. Forty-nine (49) representing 52.1% of the lecturers indicated they had access to Internet in their homes. This means continuous access to technology for preparation towards teaching and self-development for these faculties is promising. The researchers were interested in knowing how reliable the Internet connectivity at the homes of lecturers was. The lecturers’ responses are presented in Table 17 which indicated mostly satisfactory.

Table 17 Lecturers’ Responses to Reliability of Internet Connectivity at Home

Reliability of Internet	**n**	**%**
Very reliable	8	16.3
Reliable	25	51.0
Not sure	3	6.1
Not reliable	8	16.3
No response	5	10.2
Total	**49**	**100.0**

The data in Table 17 show that 33 out of the 49 respondents indicated a satisfactory reliability of the Internet in their homes. The survey instrument required lecturers to indicate their *Internet* providers. The data suggested that over 85% of the lecturers received Internet services from commercial mobile phone companies.

6.3 Students and faculty use of available educational technology resources

Of the 1434 students who participated in the study, a majority (67.4%) actively used computers for educational purposes. The survey instrument gathered data on the places students’ used the available educational technology resources. The responses of the students are presented in Table 18.

Table 18 Places Students Use Computers in the University

Place of Use of Computers	**n**	**%**
UEW ICT lab	458	31.9

University libraries	438	30.5
At my Departmental lab	181	12.6
IEDE Internet Café	261	18.2
Graduate labs	45	3.1
Campus Hall's ICT lab	154	10.7
Others	**80**	**5.6**

The data in Table 18 show that the computers at the UEW ICT laboratories (31.9%) were most patronised facilities, followed by the University libraries (30.5%). The data indicates the least used facility was the graduate laboratories at the various campuses (3.1%) (this should be read in relation to the graduate sampled population). But this may be probably due to the fact that undergraduates who formed the larger student population were not given access to such laboratories.

Students were further asked to indicate the purpose and the convenient time for which they used the computing facilities. Most of the students indicated that they use the computer facilities mainly for research purposes (77.8%) and for obtaining information (72.4%). It also emerged from the interview data that most students used the Internet and computers (especially their personal ones) for research, browsing on their own, and to do their assignments after lectures:

> *When assignments are given, we go on the Net to browse for information to solve questions. We use our laptops to design our own programmes that lecturers give to us as assignment and home works (FGS7).*

Furthermore, the data suggested that pressure on available computer laboratories made access difficult, compelling students to use their own facilities for academic purposes, as shown in the following comments:

> *After a lecture, if you want to use it (computer) you don't have access because right after your class another class comes in for their lecture (FGS 11).*

Notably, the data also indicated that a few students (4.0%) were using the facilities for online shopping. The most convenient time for using the facilities noted by the students was between 5 pm–10 pm (45.6%) outside of scheduled classes. This suggests that most of the students would like to use the facilities after lectures. However, it appeared that sometimes there were no laboratory technicians to offer support to students and the laboratories are often closed after lectures. One of the University authorities interviewed commented that "... *the computer laboratories have been under IT department because they are the most frequent users.... But as soon as lectures are over, the lab is closed ... or unattended*" (UA3).

In addition, students were asked to indicate how often they used the Internet for educational purposes. Most of the students (27.4%) indicated that they used the Internet only once a week for educational purposes, while others (16.7%) noted that they never used the Internet for such purpose. Then the students were

asked again to indicate how often the use the Internet for any purpose. Table 19 shows that most students (27.4%) will use the Internet at least once a week for any purpose apart from education. But a large number of students (16.7%) indicated they never use the Internet. This implies that some students are either adamant or are not exposed to the benefit of using the Internet for at least information.

Table 19 Students' Response to Frequency of Use of the Internet

Frequency of Use of Internet	**f**	**%**
Never	207	16.7
Once a week	340	27.4
Twice a week	0	0
Thrice a week	199	16.0
Everyday	196	15.8
Total	942	75.9%

n=1434

Students were asked to indicate from a check list of the software (i.e., Word Processor, Spreadsheet, Presentation and Graphics) that they frequently used. Sixty nine percent of the student respondents indicated using the word processor, and., MS Word was cited as the one they often use. This is followed by the use of spreadsheet (e.g., MS Excel) (31.4%), PowerPoint (28.2%) and Graphics (12.5%) respectively. Table 20 shows students' use of the computer facilities for electronic resources such as Open Educational Resources (OER), online database and electronic journals. With a sample of 1434 a significant number of students are aware of electronic resources in diverse ways (e.g., 385 students are aware of ebooks (26.8%), and most have interacted with CD ROMs/DVD (n=446, 31.1%)).

Table 20 Electronic Resources Used by Students

Electronic Resources	*n*	*%*
Online database (e.g., Blackwell, ERIC, EBSCO)	264	18.4
E – Journals	228	15.9
E – Books	385	26.8
CD ROMs/DVD	446	31.1
Open Educational Resources (OERs)	213	14.9

n=1434

With the current trend in social media technology (SMT), students were asked to indicate their use of ICT for social media interactions. Table 21 shows the number of students who had used SMTs and those who had never used SMTs. According to Table 21, most of the students (83.8%) had used or are aware of Facebook™ as a SMT. Some students used other SMT such as Twitter™, Skype™ and Deli.cio.us™ etc. Most of the others that are less used are themselves not very popular in the SMT context. However, a significant number of 894 out of 1434 (75.3 %) students indicated they never used the YouTube ™ for any educational purposes.

Table 21 Student Respondents' Use of Social Media Technologies

Social Media Technologies	**n**	**Used before %**	**Never used before %**
Facebook™	1211	83.8	16.2
Twitter™	1190	20.8	79.2
Skype™	1191	26.3	73.7
YouTube™	1188	24.7	75.3
Deli.cio.us™	1186	4.7	95.3

Students were asked to indicate the number of lecturers/instructors they had observed using Computer Based Technology (CBT) to teach in their classes since they enrolled as students of UEW**.** Data on their responses are presented in Table 22. According to the Table 22, some of the student respondents (37.3%) had observed four (4) or more lecturers use computer based technologies in their lesson delivery.

Table 22 Students Observation of Lecturers Use of Computer-Based Technology in Class

Number of Lecturers	**n**	**%**
No Lecturer	195	13.6
Less than 4 lecturers	550	38.3
4 or more lecturers	535	37.3
No Response	154	10.7
Total	**1434**	**100.0**

The qualitative data gathered through interviews also indicated that most lecturers use CBT for lesson delivery. One of the students interviewed, for example, commented or an observation that "... *most of the lecturers no longer prefer using chalkboard or the marker; they prefer using projector to display what they want the students to learn*" (FGS2).

Table 22 also indicates that 13.6% of the student respondents had never seen lectures use computers in their classroom. The responses of the University authorities interviewed seemed to explain the students' observation that some of the lecturers had never used computer based technologies in teaching and learning. They expressed concerned about the reluctance on the part of some lecturers to incorporate ICT into teaching and learning:

> "…*though computers (ICT) are becoming a commonplace, those who didn't start with them [the computers] are hesitant to move into it [ICT] and this is the nature of modern technology. … and you know most of our staff are also in that bracket*" (UA2).

> "… *You are talking about people getting ICT compliant and you are dealing with people who are reluctant to use ICT facilities in teaching and learnin*g" (UA3).

Thus, it is evident from the data in Table 22 that as much as there were many lecturers who were using computer-based technologies in teaching and learning, there were also quite a significant number of them who were reluctant to incorporate such technologies. Students were also asked to indicate the type of educational software their lecturers used in teaching. Sixty eight percent of the students indicated that their lecturers used PowerPoint for teaching.

Student was also asked to report on how often their lecturers used computer based technology to communicate. Most of the students (62%) indicated that their lecturers never used technology to communicate. Also, many students (79.5%) noted that their lecturers did not get students to communicate with each other via a discussion board. Thus, as much as the University wants to encourage ICT and educational technologies for teaching and learning, what students see and learn from faculties is equally important. There is a significant correlation between classroom technology usage and learners' motivation to use technologies after the classroom (Lowerison *et al*., 2006)

6.3.1 Lecturers' Use of Educational Technology Resources

An item in the survey instrument gave lecturers the opportunity to indicate how often they used the Internet services. Their responses are presented in Table 23.

Table 23 Lecturers' Response to Frequency of Use of Interne

Frequency of Internet Use	**n**	**%**
Never	4	4.3
Once a week	7	7.4
Twice a week	5	5.3
Almost everyday	41	43.6
Everyday	37	39.4
Total	**94**	**100.0**

As indicated in Table 23, most lecturers used the Internet service *"Almost Every day"* (43.6%) and *"Everyday"* (39.4%). Only a few of the lecturers (4.3%) surveyed indicated they never used the Internet. The fact that four lecturers answered 'Never' is significant. This indicates that the University has to convince some lecturers of the Internet for teaching and learning. This may call for institutional advocacy and exposure to the significance of educational technology in contemporary lifestyle of the society.

The survey items requested lecturers to indicate what they used the computer for. The responses are presented in Table 24. According to Table 24, a large number of lecturers (84.5%) used the computer for Word processing. The table also indicates that very few lectures (8.2%) used the computer for shopping. Lecturers were also asked to indicate the subject based application that they used. Majority of the lecturers (67.1%) indicated SPSS as the application software that they used.

Table 24 Lecturers' Use of ICT Resources

ICT Resources	**n**	**%**

Word processing	82	84.5
Research	80	82.5
Communication (e.g., e-mailing)	79	81.4
Obtaining information	77	79.4
Creating presentations	75	77.3
Lesson preparation	74	76.3
Specialised data management software (e.g., OSIS)	61	62.9
Calculations	55	56.7
Lecture delivery	53	54.6
Managing information in spreadsheets	52	53.6
Music	45	46.4
Chatting	42	43.3
Movie	36	37.1
Supervision	34	35.1
Graphics (e.g., Corel draw)	28	28.9
Posting assignments	25	25.8
Games	19	19.6
Online teaching	19	19.6
E-banking	10	10.3
Shopping	8	8.2

n=97

Lecturers were also asked to indicate the electronic resources that they used. It is of interest to note that lecturers did use electronic resources (i.e., e-Journal, e-Books, e-Portfolio and SMT). For example, as many as 54 of the lecturers (55.7%) patronise e-Journal while the least patronised e-resources by lecturers was the e-Books (32.0%). For social media technologies, Facebook™ was found to be most popular among lectures (56.7%), whiles the Del.cio.us™ was the least used by them (2.1%). Some of the collaborative tools that lecturers indicated they use are Wikipedia™ (36.1%) and e-Portfolio although not as widely used as Wikipedia (3.1%).

The lecturers were requested to indicate if they were able to use the computers at their departments whenever they want. Forty-three (43) of the lecturers (44.3%) responded in the affirmative. Lecturers were also requested to specify the time they frequently used the departmental computer outside their lecture periods (see Table 25).

Table 25 Lecturers' Time of Use of Departmental Computer Outside Lectures

Time	**n**	**%**
Before 8 am	4	4.1
Between 8 am-12 pm	13	13.4
Between 12 pm-5 pm	18	18.6
Between 5 pm-10	5	5.2

pm		
After 10 pm	2	2.1
I don`t use it	37	38.1
No Response	18	18.6
Total	**97**	**100.0**

The Table 25 indicates that a sizeable number of lecturers (38.1%) did not use the computer in the department when they are not in the department to teach. But a significant number of lecturers (32%) indicated using the computers in the department outside the normal lecture times.

6.4 Enablers of educational technologies for students and lecturers

In this research, the researchers considered factors that enable and constrain educational technology use for teaching and learning.

6.4.1 Enablers of and constraints to students' use of educational technology

An item on the Students' survey instrument requested the students to indicate the factors that support their use of ICT in learning. The responses to these factors were either "Yes", "No" or "Don't know" and are presented in Table 26.

Table 26 Factors that Support Students' Use of ICT in Learning

I use ICT in learning because:	***n***	***Yes***	***Don`t Know***	***No***
a. the available resources at the University are sufficient	1111	27	12	61
b. I receive support from colleagues	1110	26	24	50
c. the available ICT resources at the University are of high quality	924	31	13	56
d. it makes my work easier	970	22	10	68
e. I know its benefits	938	29	–	71
f. I have received sufficient technical support	942	9	30	61
g. the available technical support is adequate	923	37	14	49
h. I am personally interested in it	966	21	8	71
i. it suits my learning style	942	20	11	69

Table 26 shows that the condition that students claimed most encouraged them to use ICT for learning were available technical support (37%). This was followed by the quality of available ICT resources (31%); realisation of benefits of using ICT (29%); and available ICT resources (27%). Generally, the responses of the students in Table 26 show that the available resources and conditions at the University were not very supportive of their use of ICT for learning as their

responses to all the items were higher on the 'No' options than the 'Yes' options. The responses of the students suggest that most of them have not embraced the idea of technology for learning. This situation could affect the quality of teaching and learning at the University.

The survey also requested the students to indicate if they had challenges in accessing computers in the University. To this question, majority of the students (66.6%) responded in the affirmative – i.e., they indicated that they found it difficult to access computers in the institution. The students were then offered the opportunity to identify the challenges they faced. Table 27 presents the challenges identified by the students.

Table 27 Students' Challenges in Accessing Computers on Campus

Challenges	**n**	**%**
Limited number of computers	706	49.2
Limited number of computer labs	551	38.4
Opening and closing times of labs	383	26.7
Internet access on campus	912	63.6
The cost of using computers at the Café	367	25.6

Table 27 shows that the major challenge faced by students was inadequate access to the Internet (63.6%) as well as limited number of computers on campus (49.2%). According to the table, student challenges included infrastructure availability, connectivity, and management of labs and the cost of outside access.

To examine the opinion of students on what motivates them to use ICT in learning; two statements were presented for them to indicate their levels of agreement (see Table 28).

Table 28 Students' opinions on What Motivates Them to Use ICT in Learning

Motivators	***n***	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**
a. Exciting learning	1121	56	30	6	4	4
b. Enhancing understanding of key concepts	1060	34	41	15	6	4

Table 28 indicates that most of the students (86%) agreed that they are motivated by ICT because it makes their learning exciting as well as enhancing their understanding of key concepts (75%). The interview data gathered from students also suggested that the use of educational technologies, especially PowerPoint facilitated their understanding of key concepts. The students believe

that such technology enabled them to follow lessons consistently, and encourage them to use ICT themselves, as the following comments by one of them:

> *... Now most of our lecturers use projectors to present lessons and this makes us follow whatever they teach. We understand most of the things they teach us because the PowerPoint makes them simple (FGS7).*

However, the qualitative data also suggest that lack of space in the lecture theatres constrained the use of projectors. It also shows how frustrated the students are about what enabled them to use ICT by the following comments:

> *... And to add to what he [my colleague] just said our classrooms or lecture rooms here are not built in a way to accommodate projectors. Because of that, during the day, when the sunshine is on and you project, the visualization [sip] of the material on the projector becomes a problem. This is because the rays of the sun are in the room and it becomes very difficult for students even to see it (FGS6).*

> *... We are not okay with the facilities, where we are sitting for instance [in the ICT laboratory], is it the facility we can boast of? If you see ten computers, you will only get to know that only two out of them are working! Because of this, it is becoming a big problem for students. .....You come here [for lectures] and if you are not having a laptop, then it becomes a problem for you. So, with regard to ICT facilities, I am sorry this university is lacking a lot (FGS7).*

> *... There was an instance last semester; there was an examination where they [students] had to use computers..... Half-way the examination, the power went off! Although, we have UPS around this place, all of them were not working. They [the students] had to stop the exam and continue the following day. So they [the University authorities] have to improve power supply (FGS2).*

The contributions made by the student interviewees indicated that there are several issues regarding enablers of ICT use. For instance, students' comments indicated that though they pay for ICT use they are unable to fully utilize the facilities. Another student pointed out the electricity power problems that affected their enablement of ICT use during examinations in the University.

6.4.2 Enablers for Lecturers' Use of Educational Technology

Lecturers were asked if they had received formal training in the use of educational technology resources since they joined the University. Majority of lecturers (62.8%) who responded to this question indicated they had received formal training in the use of educational technology since they joined the University. Lecturers who indicated receiving training in educational technology were also asked of the type of training they had received. Table 29 shows the areas of educational technology lecturers indicated they had received training since they became staff of the University.

Table 29 Training Received by Lecturers in the Use of Educational Technology

Educational Technology	**n**	**%**

Microsoft Office applications	61	62.9
LMS (e.g., Moodle, Blackboard)	30	30.9
Use of digital library resources	24	24.7

n=97

All lecturers who indicated they had received training in Educational Technology Resources also indicated they had received training in Microsoft application. Fewer numbers of lecturers (24.7%) indicated they had received training in the use of digital library resources (which includes the use of online resources).

The survey instrument also provided opportunity for lecturers to indicate the Educational Technologies they wished to receive training in. Eighty-three (93.3%) of the lecturers who participated in the survey indicated they would want to be trained in the use Educational Technology for teaching and learning. Those who wished to be trained were given the opportunity to further respond to specific technologies they wished to be trained in. The results are presented in Table 30.

Table 30 Educational Technologies Lecturers Wished to be Trained to Use

Educational Technologies	**n**	**%**
Microsoft Office Word	19	19.6
Microsoft Office Excel	33	34.0
Microsoft Office PowerPoint	36	37.1
Microsoft Office Access	28	28.9
Statistical application tools e.g., SPSS	61	62.9
Graphic Software e.g., Corel Draw	42	43.3
Learning management Software e.g., MOODLE	61	62.9
Electronic library resources	41	42.3

n=97

Table 30 shows that majority of lecturers (63.9%) wished to be trained in the use of Statistical application tools e.g., SPSS as well as Learning Management Software e.g., MOODLE. The open-ended questionnaire also gave the lecturers the opportunity to express their views on factors that would enable them to use ICT resources and facilities. It emerged from their responses that the enablers of ICT use were as follows: (i) physical computers and access to *Internet* facilities, (ii) improved networking, (iii) *Internet* 24/7, (iv) computers for students to use and (v) availability of experts to provide the needed technical support.

The opinion of the lecturers was sought on two issues of training (i.e., whether they would want to be trained in the use of technology in the classroom and whether they would want to be trained in the use of technology for teaching online). The responses are presented in Table 31.

Table 31 Opinion of lecturers on training

Opinion	***n***	**Agree**	**Not Sure**	**Disagree**

I would like to be trained in the use of technology for teaching online.	87%	54%	16%	30%
I would like to be trained in the use of technology for teaching in the classroom.	88%	57%	9%	34%

The Table 31 indicates that most of the lecturers (54%) wished to be trained in the use of technology for teaching online whilst 57% of them indicated that they wished to be trained in the use of technology of teaching in the classroom. However, some of them (30% and 34% respectively) indicated that they did not need training in the use of technology for teaching online and/nor for teaching in the classroom. This may be because of their indication (see Table 29) that they (the lecturers) had received some form of formal training in the use of educational technology since they joined the University, indicating their proficiency.

The opinion of lecturers was investigated to find out what enables them to use technology. The responses are presented in Table 30.

Table 32 Opinion of lecturers on use of educational technology

Opinion	***n***	**Agree**	**Not Sure**	**Disagree**
I think it is important to use technology for teaching in the University.	89%	89%	1%	10%
The availability of ICT resources at my department encourages me to use technology.	89%	28%	35%	37%
The support and enthusiasm of colleagues encourages me to use technology.	89%	42%	36%	22%
ICT does reduce my workload.	86%	49%	24%	27%
I am encouraged to use technology.	87%	58%	16%	26%
The realisation of benefits of using ICT encourages me to use technology.	87%	85%	8%	7%
The ICT training I have received encourages me to use technology	81%	68%	26%	6%

Table 32 indicates that most of the lecturers (89%) think it is important to use technology to teach in the University. Another 85% of the lecturers noted that the realisation of benefits of using ICT encourages them to use technology.

7. Summary of key findings

7.1 Access to Educational Technology in UEW

A number of issues relating to general access to educational technologies were investigated in the study. It emerged from the study that the University had a large Network infrastructure to support Internet connectivity. It was also found that most departments of the University were connected to the Internet. It however seemed the departments had no clear policies regarding the incorporation of ICT into teaching and learning. This raises an important question on the Internet connectivity issue: in other words, whether the unreliable nature of the Internet connectivity is contributing to the lack of interest to incorporate fully ICT into teaching and learning.

In total, there were 344 desktop computers in the 33 academic departments. There were also 43 laptops in 22 academic departments. However, these items were not equitably distributed (i.e., 75% of the desktop computers were located at four (4) of the 33 academic departments). The study found that these computing facilities were inadequate in terms of quantities to support effective teaching and learning. There were a lot of computing facilities that were not in working condition.
The University lacked the staff with the needed expertise in maintaining the ICT facilities at the departments. It also lacked the human capacity to keep some of the ICT laboratories opened for longer hours so that students could have longer access to the laboratories.

In relation to the students' access to educational technology resources it came out that the most accessible resources for students were mobile phones while very few had camcorders and digital voice recorders. The educational technology resources accessible for the faculty members were printers, computers and photocopiers. The data also suggested that about 61% of the lecturers had acquired reliable internet connectivity in their houses and this was used mostly for academic purposes.

7.2 Use of educational technologies at UEW

The study found that most of the students used computers especially the ones in the libraries for educational purposes such as research and processing of assignments, while the lecturers were found using computer-based technologies, especially PowerPoint™ to deliver lessons. However, pressure on the limited number of computers at the University made access difficult. The study discovered that most of the computers at the laboratories often broke down without being repaired, limiting their effective use for academic purposes.

It was also revealed that the most convenient time for students to use the computers at the University was after they had closed from lectures (i.e., 5-10 pm) and they often used the facilities once a week. It emerged, however, that most of the computing facilities available for students were, in most cases, either unattended or closed, preventing access. It emerged that the most often used software by students was MS Word. This was used by the students basically for processing of assignments.

It also came out of the study that the University authorities had a vision for ICT development and this had been captured in the institution's strategic plan. However, this had not been well communicated to the various departments, as only those that had offered ICT-related courses had policies on ICT usage. It emerged from the study that some of the lecturers were reluctant to use resources in teaching and learning because it appeared there was no clear policy on their usage. Eighty-three percent of lecturers surveyed indicated using the Internet services provided the University to access e-Journals, e-Books, e-Portfolios and Social Media Technologies, especially the Facebook™. Generally, the lecturers used ICT resources primarily for word processing; whilst few lecturers used the resources for shopping online.

7.3 Enablers of use of educational technologies in UEW

It was found out that educational technology facilities and conditions were in existence in the University. These included (i) ICT laboratories at the departments, libraries and Cafes, (ii) Internet connectivity at the various campuses, (iii) lecturers requiring students to use ICT in teaching and learning activities, and (iv) some students had their personal laptops. These were to enable students and lecturers' of the University incorporate educational technology in teaching and learning. Yet it emerged from the study that these facilities were not in quantities that encouraged students and lecturers to access them.

The constraints to access and usage as identified by the participants included unreliable internet services; inadequate number of computers, especially in the computer laboratories for students, to promote teaching and learning; unfavourable operating (opening and closing) hours of the computer centres; lack of space for acquired computers; and inadequate number of staff with technical knowledge in ICT to offer relevant support and services to students; and erratic power supply at various campuses of the University.

On the part of the lecturers, majority of them indicated they had received formal training in the use of educational technology since they joined the University. Other lecturers also requested for further specialized training such as e-resources and SPSS. Thus, the enablers of their ICT use at UEW were identified as follows: (i) physical computers and access to *Internet* facilities, (ii) huge Network infrastructure, (iii) *Internet* 24/7, (iv) computers for students to use and (v) availability of experts to provide the needed technical support.

8. Study summation

The baseline research on current state of educational technology is a research project funded by PHEA as part of an Educational Technology Initiative (ETI) of the University of Education, Winneba. The research proposal focused on finding out (i) the available resources for the implementation of educational technology in the University, (ii) how these facilities are being and (iii) the enablers for the usage of the computing facilities. To achieve these objectives, an exploratory mixed method designed around the following research questions:

- What are the educational technologies accessible to UEW students and faculty?
- How do students and faculty use available educational technology resources?
- What are the enablers for the uptake of educational technologies among students and faculty?

To answer these questions questionnaires and interview schedules were employed to gather data from the participants who were lecturers, students and authorities of the University. Major observations drawn from the study are presented below.

- The University had the necessary facilities for Internet connectivity on all campuses of the University. These facilities do not extend to the distance education centres that are not located on the University campus.
- Thirty two (32) out of 33 academic departments were connected to the Internet. Every major building of the University was connected to the Internet via a 1Gb fibre optic backbone.
- Every member of staff had an authentication pass that allows for free access to the University Internet and a personal email address.
- The University had Internet-native institution-wide software for managing students' information. It was used for keeping records such as bio-data, fee payment, registration of students and assessment records. This was being used freely by every member of staff who had an authentication pass. Patronage by students was however limited by inadequate number of computers.
- There were less than 400 Personal Computers and laptops at the academic departments of the University. There were six (6) ICT laboratories in the University. These were used basically for teaching ICT cognate courses. The University also had one Internet Café. This was located at Winneba, North Campus of the University. Besides the computers the University could boast of a limited number of computing facilities such as computers, photocopiers, projectors and projector screens.
- The training lecturers had received was confined basically to the use of Microsoft word. Only a few lecturers had been trained on how to use LMS and the electronic resources at the library. Most lecturers desired to be trained on the use of LMS and SPSS.
- Accessibility to the Internet as well as computing facilities is constrained by the limited number of computers.
- Technical and peer support for the use of the computing facilities is not felt by both lecturers and students.

9. Conclusions

The conclusions that could be drawn from the study are presented below.

- The University has huge infrastructure to support internet services. However, it lacks the other educational technologies such as computers and projectors at the departments to facilitate teaching and learning.
- The educational technologies available at various campuses of the University are not equitably distributed, making access to them difficult.
- The existing ICT facilities do not promote effective teaching and learning because they are inadequate and lack adequate number of technical staff to ensure their effective usage.
- Although the students found the incorporation of educational technologies in teaching and learning more interesting, they were not motivated by the existing facilities at the University to embrace the idea of technology for learning.
- The lecturers wished to be trained in the use of technologies so that they would be able to incorporate them in teaching and learning activities. However, this was constrained by limited number of such resources, staff with technical knowledge in ICT, unreliable internet services as well as unfavourable opening hours of the available computer laboratories.
- Students and lecturers would be encouraged to use the existing facilities in teaching and learning if adequate computing facilities and reliable internet services were provided and staff with the relevant technical knowledge in educational technologies available to offer support to them, when necessary.

10. Recommendations

The following are recommended for consideration at the managerial level and decision making leadership:

1. To improve on students' and lecturers' access of computing facilities, every faculty of the University should have an ICT computer laboratory. Such laboratories should have adequate number of photocopiers, projectors and projector screens. The opening and closing hours of such facilities should take into accounts the time students and lecturers desire to use the facilities.
2. To facilitate students' and lecturers' use of educational technology, every campus of the University should have competent ICT trained person who will liaise with the management team of the campus and the coordinator of UEW ICT technical operations to provide the needed technical support. Resources such as lecturer theatres should be redesigned to suite the current educational technology requirements.
3. To motivate students to embrace the incorporation of educational technologies in teaching and learning, stakeholders of the University will have to introduce programmes and activities that will compel students to acquire the ICT interests and competencies.
4. Also periodic assessment of lecturer's training needs in terms of educational technology should be performed to determine the areas that require further training. Such training needs should be provided.

5. Further research on several aspects of ICT usage and enablers, for example, to facilitate effectiveness and data information is recommended. Thus, areas such as ICT/online technology self-efficacy among university constituents may be appropriate for empirical data and practical purposes.

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Appendix 1: Covering Letters to Research Participants

UNIVERSITY OF EDUCATION, WINNEBA

Office of the Vice-Chancellor

P. O. Box 25, Winneba, Ghana. Tel: (233-432) 22361/22140 Ext. 112/114 Fax: (233 -432) 20954 Email: vc@uew.edu.gh

Our Ref: VC/PHEA/VOL.1/24

Your Ref:

Date: 08 March 2011

Dear Lecturer,

BASELINE STUDY USING TECHNOLOGY FOR STUDYING

The Vice-Chancellor kindly invites you to participate in this study which aims to look at your access to computers and how you are using them for learning.

This questionnaire is intended for students of University of Education, Winneba. It is part of a larger project which aims to integrate modern technology in teaching and learning in our university. To achieve this we need to improve on our understanding of quality and equity issues in educational technology. This project is made possible through the support of the Partnership for Higher Education in Africa (PHEA).

The questionnaire consists of 8 pages with a total of 50 items. We estimate that it will take you approximately 15 minutes to complete it. The questions are in a multiple choice format for which you are to select the most appropriate answer. However there is opportunity for you to write further comments on some of the sections should you wish to do so.

We are not trying to find out your identity nor examine your responses on an individual basis. This is intended to be an anonymous questionnaire. Participation is voluntary. By completing this questionnaire you are consenting to take part in this research. If at any stage you do not wish to continue just stop and do not return the questionnaire. If you do not wish to answer a question at any stage please skip it.

If at any stage you have any queries or concerns, please contact any of the following persons: Casmir Mazure (0201210649), Kofi Bentum Wilson (0242689961) (Researchers) and Mr. Isaac Tete-Mensah (0208115508) (Project Leader).

Thank you for your interest in participating in this questionnaire.

Emmanuel Agyin-Birikorang
For: Vice Chancellor

INFORMATION AND COMMUNICATION TECHNOLOGY DEPARTMENT
LIBRARY EXTENSION - SOUTH CAMPUS
UNIVERSITY OF EDUCATION
WEBSITE: www.uew.edu.gh

P. O. BOX 25,
WINNEBA.
TEL: 03323–20945

18 January 2012

The Principal
College of Technology
UEW
Kumasi

Through: Ag. Director, EFPO

Dear Sir,

PERMISSION TO CONDUCT INTERVIEW

The University of Education, Winneba, in collaboration with the Partnership for Higher Education in Africa, South Africa (PHEA), is implementing an Educational Technology Initiative (ETI) programme in the University. As part of this programme, a baseline research on the current state of educational technology in UEW is being conducted.
The research requires that an interview be conducted on the Educational Technology Initiatives that is being undertaken at the Kumasi Campus.

I therefore write to seek your permission and consent to have you interviewed by the research team. I will be grateful if the date and time for the conduct of the interview could be 25th January 2012 at 1.30 pm. You may suggest any other suitable date and time within the 25th January week, if the suggested time is not suitable to you, Sir.
The interview will cover the following areas:

i. The ICT related items on your campus

ii. Research being conducted in the area of ICT or educational technology on your campus or by academicians on your campus. There may be a research work conducted by a member of your department or the whole department

iii. Internally or externally funded projects that are targeted at introducing or improving educational technology in the departments.

iv. Other significant ICT or educational technology related issues that you will want to draw our attention to.

The research team will also be grateful if documents related to ICT and educational technology emanating from your campus are made available to them for study and codification. Such documents could be memos, research or project proposals, policy documents as well as published journals or articles on educational technology in UEW.

I am counting on your cooperation.

Yours faithfully,
Alhaji Issifu Yidana (Ph.D)
Programme Team Leader

4.

UNIVERSITY OF EDUCATION, WINNEBA
Department of Information & Communication Technology

P. O. Box 25, Winneba

www.uew.edu.gh

Tel: 0233-23-20945

18 January 2012

The ICT Coordinator
Technical Operations and Services
UEW
Winneba

Through: Ag. Director, EFPO

Dear Sir,

LETTER OF CONSENT

The University of Education, Winneba, in collaboration with the Partnership for Higher Education in Africa, South Africa (PHEA), is implementing an Educational Technology Initiative (ETI) programme in the University. As part of this programme, a baseline research on the current state of educational technology in UEW is being conducted.

The project requires that we interview you. As a result, we write to seek your consent for the research team to interview you. The team will contact you for the date and time of the interview.

The interview will cover issues relating to:

i. Your office's role in ICT integration in the university.

ii. Clarifications about issues that are emanating from our survey data.

iii. Any successes and challenges in the integration of ICT in the university that you want to share with us.

iv. Other significant ICT or educational technology related issues that you will want to draw our attention to.

The team will be very grateful if any documentation (memos, research or project proposals, policy documents, workshops etc) that support any of the issues in the interview can be made available for further study. We count on your kindest assistance in this exercise.

Yours faithfully,

Alhaji Issifu Yidana (Ph.D)
Programme Team Leader

Appendix 2: Questionnaire for Students at UEW

This questionnaire is intended to gather information on educational technology and ICT initiatives and usage in the teaching and learning process at UEW. Some personal information will be required from respondents to assist in the analysis of the data. Personal information collected will be used solely for this study and as such will remain confidential.

---

a. BACKGROUND INFORMATION

1. Please tick your department

Faculty/Department		
Faculty of Science Education		
a.	Department of ICT Education	[1]
b.	Department of Mathematics Education	[2]
c.	Department of HPERS Education	[3]
d.	Department of Home Economics Education	[4]
e.	Department of Biology Education	[5]
f.	Department of Chemistry Education	[6]
g.	Department of Physics Education	[7]
h.	Integrated Science Education	[8]
Faculty of Educational studies Education		
i.	Department of Psychology Education	[9]
j.	Department of Early Childhood Education	[10]
k.	Department of SPED Education	[11]
l.	Department of Basic Education	[12]
Faculty of Creative Arts Education		
m.	Department of Theatre Arts Education	[14]
n.	Department of Music Education	[15]
o.	Department of Graphic Design Education	[16]
p.	Department of Art Education	[17]
Faculty of Social Sciences Education		
q.	Department of Business Education	[18]
r.	Department of Social Studies Education	[19]
s.	Department of Social Science Education	[20]
Faculty of Languages Education		
t.	Department of English Education	[37]
u.	Department of French Education	[38]
v.	Department of Akan-Nzema Education	[39]
w.	Department of Gur-Gonja Education	[40]
x.	Department of Ewe Education	[41]
y.	Department of Ga-Dangme Education	[42]
z.	Department of Applied Linguistics	[43]

	Education	
aa.	Department of Media & Communication Studies Education	[44]

2. Which programme have you enrolled in?
   a. Certificate [1]
   b. Diploma [2]
   c. Undergraduate [3]
   d. Postgraduate diploma [4]
   e. Masters [5]
   f. Doctorate [6]

3. Your current year of study on the enrolled programme
   a. 1st year [1]
   b. 2nd year [2]
   c. 3rd year [3]
   d. 4th year [4]

4. Your attendance pattern
   a. Full time [1]
   b. Part time [2]
   c. Distance [3]
   d. Sandwich [4]

5. Your sex: (a) **Male** [1] (b) **Female** [2]

6. Age:
   a. Under20 [1]
   b. 20 – 29 [2]
   c. 30 -39 [3]
   d. 40 – 49 [4]
   e. 50 and above [5]

7. Which of the following best describes your residential status whiles at UEW?
   a. On-campus (University facility, e.g. halls etc) [1]
   b. Off-campus (Non-University facility e.g. halls etc) [2]

B. ACCESS TO EDUCATIONAL TECHNOLOGY RESOURCES

8. As a student of UEW which of the following do you have access to on campus? (*Please, select as many as applicable*)

	Yes	No
a. Television	[2]	[1]
b. Radio	[2]	[1]
c. Mobile phone	[2]	[1]
d. Computer (Laptop or personal Computer)	[2]	[1]
e. PDA (Personal Data Assistant)	[2]	[1]
f. Digital camera	[2]	[1]
g. Camcorder	[2]	[1]
h. Digital voice recorders	[2]	[1]
i. Scanners	[2]	[1]

j. Printers [2] [1]

k. I have no access to any of the above [2] [1]

l. Other(s) please specify: ..... [3]

9. If you have access to any of the items below as a student studying in UEW, who owns it?(*Please, select as many as applicable*)

University = 4, Personal = 3, Both = 2, Others = 1

a. Television				
b. Radio				
c. Mobile phone				
d. Computer (Laptop or personal Computer)				
e. PDA (Personal Data Assistant)				
f. Digital camera				
g. Camcorder				
h. Digital voice recorders				
i. Scanners				
j. Printers				
k. I have no access to any of the above				

10. As a student of UEW, do you use a computer?

(a)Yes [2] (b) No [1]

11. If yes, which of these campus facilities do you use?

	Yes	No
UEW ICT lab	[2]	[1]
University libraries	[2]	[1]
At my Departmental lab	[2]	[1]
IEDE internet café	[2]	[1]
Graduate lab	[2]	[1]
Campus Hall's ICT lab	[2]	[1]

Other (please specify) ..... [3]

12. If you use a campus computer, what do you use it for? (*Please, select as many as applicable*)

	Yes	No
a. Emailing	[2]	[1]
b. Chatting	[2]	[1]
c. Lectures	[2]	[1]
d. Research	[2]	[1]
e. Obtaining information	[2]	[1]
f. Assignments writing	[2]	[1]
g. Presentations	[2]	[1]
h. Games	[2]	[1]
i. Music movie	[2]	[1]
j. Shopping & e-banking	[2]	[1]

13. As a student of UEW, if you do not use a computer, which of the following is your reason/s?(*Please, select as many as applicable*)

	Yes	No
a. I am not interested in the use of computers	[2]	[1]
b. I do not have access to the computers	[2]	[1]
c. I do not know how to use the computer	[2]	[1]
d. I do not need to use the computer	[2]	[1]

14. Do you have any difficulty with access to computers on campus?

(a)Yes [2] (b) No [1]

15. If Yes which of the following is the difficulty/difficulties?

	Yes	No
a. Limited number of computers	[2]	[1]
b. Limited number of computer labs	[2]	[1]
c. Opening and closing times of labs are not convenient	[2]	[1]
d. The cost of using computers at the café	[2]	[1]

16. Outside your lectures periods, when do you most often use a computer?

a. Before 8am [1]
b. Between 8am – 12pm [2]
c. Between 12pm – 5pm [3]

d. Between 5pm – 10pm [4]
e. After 10pm [5]

17. Are you able to use the internet provided by UEW?
(a) Yes [2] (b) No [1]

18. Are you able to use the internet off-campus?

(a)Yes [2] (b) No [1]

19. If Yes, what is the source?

	Yes	**No**
a. University	[2]	[1]
b. Mobile phone company	[2]	[1]
c. Private internet provider e.g. iBurst	[2]	[1]

20. Do you have any difficulty with using the internet on campus?
(a)Yes [2] (b) No [1]

21. If Yes, which of the following are the difficulty/difficulties?

(*Please, select as many as applicable*)

	Yes	No
A. Limited number of computers	[2]	[1]
B. Limited number of computer labs	[2]	[1]
C. Opening and closing times of labs are not convenient	[2]	[1]
D. The cost of using computers at the café	[2]	[1]
E. Few wireless access points	[2]	[1]
F. Limited skills and knowledge in using the internet	[2]	[1]

22. How often do you use the Internet? (*Please tick only one option*)

a. Never [1]
b. Once a week [2]
c. Twice a week [3]
d. Thrice a week [4]
e. Everyday [5]

C. ACCESS AND USE OF ICT APPLICATIONS AND RESOURCES

23. Which of the following general application software do you frequently use?

	Yes	No	
a. Word processor (e.g. ms word)	[2]	[1]	
b. Spreadsheet (e.g. excel)	[2]	[1]	
c. Presentation (e.g. PowerPoint)	[2]	[1]	
d. Graphics (e.g. coral draw)	[2]	[1]	

Other(s) (Please specify): .....[3]

24. Which of the following subject based applications do you use?

	Yes	No
a. CAD	[2]	[1]
b. CorelDraw	[2]	[1]
c. SPSS	[2]	[1]
d. Atlas.ti	[2]	[1]
e. Derive	[2]	[1]
f. Mathlab	[2]	[1]
g. Maple	[2]	[1]
h. Adobe InDesign	[2]	[1]
i. Finale	[2]	[1]

j. Others (Please specify) ..... [3]

25. Which of the following social networking tools do you use

	Yes	No
a. Facebook	[2]	[1]
b. Twitter	[2]	[1]
c. Skype	[2]	[1]
d. YouTube	[2]	[1]
e. Deli.cio.us	[2]	[1]

f. Others (Please specify) .....[3]

26. Which of the following electronic resources do you use?

	Yes	No
a. Online database (e.g. Blackwell, ERIC, EBSCO)	[2]	[1]
b. E – Journals	[2]	[1]
c. E - Books	[2]	[1]
d. CD ROMs/DVD	[2]	[1]
e. Open Educational Resources [OERS]	[2]	[1]

f. Others (Please specify) .....
[3]

27. How many of your lecturer(s) have ever used computer-based technology to teach in your class since you enrolled on this programme?

a. None [1]
b. 1 lecturer [2]

c. 2 lecturers [3]
d. 3 lecturers [4]
e. 4 lecturers [5]
f. More than 4 [6]

28. Which of the following computer based technologies does your lecturer(s) use in teaching? (*Please, select as many as applicable*)

		Yes	No
a	PowerPoint presentations	[2]	[1]
b	Mobile phone	[2]	[1]
c	Computer	[2]	[1]
d	PDA (Personal Digital Assistant)	[2]	[1]
e	Digital camera	[2]	[1]
f	Camcorder	[2]	[1]
g	Digital voice recorders	[2]	[1]
h	Scanners	[2]	[1]
i	Printers	[2]	[1]
j	Microsoft Word (word processing software	[2]	[1]
k	Spreadsheet software (Excel)	[2]	[1]
m	Internet	[2]	[1]
n	Other (Please specify)	[3]	

29. My lecturer uses computer based-technology …
Very often = 4, **Often** = 3, **Not often** = 2,**Never** = 1

	4	3	2	1
a. in the preparation of his lesson				
b. in students task				
c. in reporting students results				
d. in his lesson presentation in class				
e. to communicate with students by e mail				
f. to get students to communicate with each other via a discussion board				

g. Other: (Please specify) ..... [5]

30. Which of these factors at the University encourage or support your use of ICT in learning? (In each case tick one box only)

I use ICT in learning because:	**Yes** 3	**No** 2	**Don't know** 1
a. the available resources at the University are sufficient			
b. I receive support from colleagues			
c. the available ICT resources at the University			

are of high quality			
d. it makes my work easier			
e. I know its benefits			
f. I have received sufficient technical support			
g. the available technical support is adequate			
h. I am personally interested in it			
i. it suits my learning style			

a. Others (Please specify) ..... [4]

D. ATTITUDE TOWARDS THE USE OF TECHNOLOGY

31. Considering your attitude to ICT use, how do you agree with these statements? (*In each case, tick one box only*)

Strongly Agree = 5, Agree = 4, Not sure = 3,Disagree = 2, Strongly Disagree = 1

Using computer based-technology can ...	5	4	3	2	1
a. make my lectures more interesting					
b. help to address learning outcome requirements					
c. improve the quality of my teaching in my subject area					

Comments

32. What areas of technology would you requires or wants further training in should the opportunity provide itself?

		Yes	No
	Microsoft Office Word	[2]	[1]
	Microsoft Office Excel	[2]	[1]
	Microsoft Office PowerPoint	[2]	[1]
	Microsoft Office Access	[2]	[1]
	Statistical application tools e.g. SPSS	[2]	[1]
	Graphic Software e.g. Corel Draw	[2]	[1]
	Learning Management Software e.g. MOODLE	[2]	[1]
	Electronic library resources	[2]	[1]

33. What ICT tools do you want to be made available for students use

	Yes	**No**
a. E-learning resources	[2]	[1]
b. Television	[2]	[1]
c. Teleconferencing	[2]	[1]
d. Radio	[2]	[1]
e. Computer (laptop or PC)	[2]	[1]
f. PDA/iPad	[2]	[1]
g. Cameras	[2]	[1]

h. Digital voice recorders	[2]	[1]
i. Overhead Projector (OHP)	[2]	[1]
j. LCD Projector	[2]	[1]
k. Scanners	[2]	[1]
l. Printers	[2]	[1]
m. Photocopier	[2]	[1]

34. In your opinion, what are the constraints to integration of educational technology for teaching and learning in UEW?

……

……

35. What are the enablers for integration of ICT into teaching and learning in UEW?

……

……..……

Thank you for your time and input

Appendix 3: Questionnaire for Lecturers at UEW

This questionnaire is intended to gather information on educational technology initiatives and ICT usage in the teaching and learning process at UEW. Some biographical information will be required from respondents to assist in the analysis of the data. Personal information collected will be used solely for this study and as such will remain confidential.

---

a. BACKGROUND INFORMATION

1. You department (*Please Tick Only One*)

Faculty of Agriculture Education		
a.	Department of Crop & Soil Science Education	[22]
b.	Department of Animal Science Education	[23]
c.	Department of Agric Mechanization& Engineering Education	[24]
d.	Department of Interdisciplinary Studies	[25]
e.	Department of Agric Economics & Extension Education	[26]
Faculty of Science &Environment Education		
f.	Department of Science Education	[27]
g.	Department of Environmental Health & Sanitation Education	[28]

2. Which of these levels do you lecture? (*You can tick more than one*)

	Yes	**No**
a. Certificate	[2]	[1]
b. Diploma	[2]	[1]
c. Undergraduate	[2]	[1]
d. Postgraduate Diploma	[2]	[1]
e. Masters	[2]	[1]
f. Doctorate	[2]	[1]

3. Your sex: Male [1] Female [2]

4. Age:

20 – 29[1] 30 -39 [2] 40 – 49 [3] 50 – 59 [4] 60 and above [5]

5. Which of the following is your highest educational qualifications

A. Diploma [1]
B. Bachelor Degree [2]
C. Masters Degree [3]
D. Doctorate [4]

E. Others (Please specify):..... [5]

6. Number of years you have been working as a lecturer in UEW?
   a. Less than 1– 4 [1]
   b. 5 – 8 [2]
   c. 9 – 12 [3]
   d. 13 – 16 [4]
   e. Above 16 [5]

b. ACCESS TO EDUCATIONAL TECHNOLOGY RESOURCES IN YOUR DEPARTMENT

7. For each of the following educational technology devices, indicate if it is available in your department. (*Please, select as many as applicable*)

	Yes	**No**
a. Telephone	[2]	[1]
b. Television	[2]	[1]
c. Radio	[2]	[1]
d. Computer (laptop or PC)	[2]	[1]
e. PDA (Personal Digital Assistant)	[2]	[1]
f. Cameras	[2]	[1]
g. Digital voice recorders	[2]	[1]
h. Overhead Projector (OHP)	[2]	[1]
i. LCD Projector	[2]	[1]
j. Scanners	[2]	[1]
k. Printers	[2]	[1]
l. Photocopier	[2]	[1]

8. For each of the following devices that may be available in your department, please indicate which of these you use to lecture/assist you to lecture.

	Yes	**No**
a. Telephone	[2]	[1]
b. Television	[2]	[1]
c. Radio	[2]	[1]
d. Computer (laptop or PC)	[2]	[1]
e. PDA (Personal Digital Assistant)	[2]	[1]
f. Cameras	[2]	[1]
g. Digital voice recorders	[2]	[1]
h. Overhead Projector (OHP)	[2]	[1]
i. LCD Projector	[2]	[1]
j. Scanners	[2]	[1]
k. Printers	[2]	[1]

l. Photocopier	[2]	[1]

9. Do you have access to a computer in your office?

(a) **Yes** [2] (b) **No** [1]

10. Do you have access to computers outside your office in your department?

(a) **Yes** [2] (b) **No** [1]

11. If you have access to computers in your department can you use them whenever you want?

(a) **Yes** [2] (b) **No** [1]

12. Do you have any difficulty with access to computers in your department?

(a) **Yes** [2] If YES go to 13
(b) **No** [1] If NO go to 14

13. If Yes, which of the following is/are the difficulty/difficulties?

Strongly Disagree = 1, Disagree = 2, Not Sure = 3, Agree = 4, Strongly Agree = 5

a. Limited number of computers					
b. Limited number of computer labs					5
c. Opening and closing times of labs are not convenient to me					5
d. The cost of using computers at the café					5
e. I don't know how to use them effectively					5
f. Lack of technical support					5
g. Not reliable					5
h. Others (Please specify) ……..……[5]					

14. Outside lectures, when do you most often use your departmental computer? *(Tick only one)*

a. Before 8am [1]
b. Between 8am – 12pm [2]
c. Between 12pm-5pm [3]
d. Between 5pm-10pm [4]
e. After 10pm [5]
f. I don't use it [6]

15. Do you have access to the UEW internet connectivity in your Department?

(a) **Yes** [2] (b) **No** [1]

16. If you have access to the UEW internet connectivity at your department can you use it whenever you want to use it?

(a) **Yes** [2] (b) **No** [1]

c. PERSONAL EDUCATIONAL TECHNOLOGY RESOURCES

17. Indicate if you own any of the following educational technology devices

(*Please select as many as applicable*)

	Yes	No	
a. Mobile Telephone	[2]		[1]
b. PDA (Personal Digital Assistant)	[2]		[1]
c. Cameras	[2]		[1]
d. Digital voice recorders	[2]		[1]

e. Others (Please specify) ……..……[3]

18. For each of the following devices that you own please indicate if you use it to lecture/supervise or to assist you to lecture/supervise.

	Yes	No	
a. Mobile Telephone	[2]		[1]
b. PDA (Personal Digital Assistant)	[2]		[1]
c. Cameras	[2]		[1]
d. Digital voice recorders	[2]		[1]

19. Do you have access to internet connectivity at your home?

a. **Yes** [2] If YES go to 20

b. **No** [1] If NO go to 21

20. If Yes, what is the source of the internet connectivity at your home?

	Yes	No
a. The University	[2]	[1]
b. Mobile phone company	[2]	[1]
c. Private internet provider e.g. iBurst	[2]	[1]

d. Others (Please specify) ……..……[3]

21. If you answered yes to question 20, how reliable is that Internet service?

1. Very reliable [1]
2. Reliable [2]
3. Not sure [3]
4. Not reliable [4]

d. USE OF ICT APPLICATIONS AND RESOURCES

22. Do you use the computer that you have access to?

(a) **Yes** [2] (b) **No** [1]

23. If you use a computer, what do you use it for?

Item	Yes	No
a. Word processing	[2]	[1]
b. Calculations	[2]	[1]
c. Managing information in spreadsheets	[2]	[1]
d. Creating presentations	[2]	[1]
e. Communication (e.g. e-mailing)	[2]	[1]

f. Using specialized data management and analysis software (e.g. OSIS)	[2]	[1]
g. Online teaching	[2]	[1]
h. Lesson preparation	[2]	[1]
i. Chatting	[2]	[1]
j. Graphics (e.g. Corel draw)	[2]	[1]
k. Lecture delivery	[2]	[1]
l. Research	[2]	[1]
m. Supervision	[2]	[1]
n. Obtaining information	[2]	[1]
o. Posting assignments?	[2]	[1]
p. Games	[2]	[1]
q. Music	[2]	[1]
r. Movie	[2]	[1]
s. Shopping	[2]	[1]
t. E-banking	[2]	[1]

u. Others (Please specify) ……..…… [3]

24. If you do not use a computer which of the following is the reason?

Item	**Yes**	**No**
a. I am not confident in using computers	[2]	[1]
b. I am not interested in using computers	[2]	[1]
c. I do not know how to use computers	[2]	[1]
d. I do not need to use computers	[2]	[1]
e. I do not have access to the faculty computers	[2]	[1]
f. I do not own a computer	[2]	[1]

g. Others (Please specify) ……..……[3]

25. Do you have any difficulty with using the internet on campus?

(a) **Yes** [2] (b) **No** [1]

26. If Yes, which of the following is/are the difficulty/difficulties?

Item	**Yes**	**No**
A. Limited number of computers	[2]	[1]
B. Limited number of computer labs	[2]	[1]
C. Opening and closing times of labs are not convenient	[2]	[1]
D. The cost of using computers at the café	[2]	[1]
E. Few wireless access points	[2]	[1]
F. Limited skills and knowledge in using the internet	[2]	[1]
G. Not reliable	[2]	[1]

h. Others (Please specify) ……..……[3]

27. How often, do you use the Internet? (*Please tick only one option*)

D. Never [1]
E. Once a week [2]
F. Twice a week [3]

G. Almost everyday [4]
H. Everyday [5]
I. Others (Please specify) ……..……[6]

28. Which of the following subject based applications do you use?

	Yes	No
a. CAD	[2]	[1]
b. CorelDraw	[2]	[1]
c. SPSS	[2]	[1]
d. Atlas.ti	[2]	[1]
e. Derive	[2]	[1]
f. Mathlab	[2]	[1]
g. Maple	[2]	[1]
h. Adobe inDesign	[2]	[1]
i. Finale	[2]	[1]

j. Others (Please specify) ……..……[3]

29. Which of the following social networking tools, if any, do you use?

	Yes	No
a. Facebook	[2]	[1]
b. Twitter	[2]	[1]
c. Skype	[2]	[1]
d. YouTube	[2]	[1]
e. Deli.cio.us	[2]	[1]

f. Others (Please specify) ……..……[3]

30. Which of the following electronic resources, if any, do you use?

	Yes	No
a. Online database (e.g. Blackwell, EBSCO)	[2]	[1]
b. E – Journals	[2]	[1]
c. E – Books	[2]	[1]
d. CD ROMs/DVD	[2]	[1]

e. Others (Please specify) ……..…….…… [3]

31. Which of the following collaborative tools, if any, do you use?

	Yes	No
a. Wiki	[2]	[1]
b. Blackboard	[2]	[1]
c. Podcast	[2]	[1]
d. E-portfolio	[2]	[1]
e. Second life	[2]	[1]

f. Others (Please specify) ……..……..……[3]

32. Apart from the computer(s) in your department, which of the following UEW facilities do you use?

	Yes	No
a. ICT lab South Campus Winneba	[2]	[1]
b. University libraries	[2]	[1]

c. At my Departmental lab [2] [1]
d. IEDE internet café [2] [1]
e. Graduate lab [2] [1]
f. Campus Hall's ICT lab [2] [1]
g. Lab 1, 2, 3 and 4 at Kumasi [2] [1]
h. ICT lab at Mampong [2] [1]

e. CAPACITY BUILDING

33. Since joining UEW, have you formally received any form of training on the use of Educational Technology Resources?

(a) **Yes** [2] (b) **No** [1]

34. If Yes, which of the following have you been trained to use?

	Yes	**No**
a. Microsoft Office applications	[2]	[1]
b. Online resources (Moodle, Blackboard)	[2]	[1]
c. Use of digital library resources	[2]	[1]

35. Would you require any training in the use of ICTs for teaching and learning?

(a) **Yes** [2] (b) **No** [1]

36. If Yes, please tick the type of training that you would like to receive.

	Yes	No	
a.	Microsoft Office Word	[2]	[1]
b.	Microsoft Office Excel	[2]	[1]
c.	Microsoft Office PowerPoint	[2]	[1]
d.	Microsoft Office Access	[2]	[1]
e.	Statistical application tools e.g. SPSS	[2]	[1]
f.	Graphic Software e.g. Corel Draw	[2]	[1]
g.	Learning management Software e.g. MOODLE	[2]	[1]
h.	Electronic library resources	[2]	[1]

i. Other ……..

f. ATTITUDE TOWARDS THE USE OF TECHNOLOGY

Indicate if you agree or disagree to each of the following:

Agree = 3, Not Sure = 2, Disagree = 1

37.	I think it is important to use technology for teaching in the University.	[1]	[2]	[3]
38.	I would not like to be trained in the use of technology for teaching in the classroom. R	[1]	[2]	[3]
39.	The availability of ICT resources at my department encourages me to use technology.	[1]	[2]	[3]
40.	I would not like to be trained in the use of technology for teaching online. R	[1]	[2]	[3]
41.	The support and enthusiasm of colleagues encourages me to use technology.	[1]	[2]	[3]
42.	ICT does not reduce my workload. R	[1]	[2]	[3]
43.	I am not encouraged to use technology.	[1]	[2]	[3]
44.	The realisation of benefits of using ICT encourages me to use technology.	[1]	[2]	[3]
45.	The ICT training I have received encourages me to use technology	[1]	[2]	[3]

g. RECOMMENDATIONS

46. What ICT resources would you like to use for teaching at UEW?

	Yes	**No**	
n.	E-learning resources	[2]	[1]
o.	Television	[2]	[1]
p.	Teleconferencing	[2]	[1]
q.	Radio	[2]	[1]
r.	Computer (laptop or PC)	[2]	[1]
s.	PDA/iPad	[2]	[1]
t.	Cameras	[2]	[1]
u.	Digital voice recorders	[2]	[1]
v.	Overhead Projector (OHP)	[2]	[1]
w.	LCD Projector	[2]	[1]
x.	Scanners	[2]	[1]
y.	Printers	[2]	[1]
z.	Photocopier	[2]	[1]

aa. Others (Please specify) .....[3]

47. What are the enablers for integration of ICT into teaching and learning in UEW?

.....

.....

48. In your opinion, what are the constraints to integration of educational technology for teaching and learning in UEW?

.....

.....

49. What will make you adopt technology for teaching in UEW?

.....

.....

50. Are there any recommendations that you would like to make to UEW for successful integration of ICTs for teaching and learning?

.....

.....

***NOTE**: If you are engaged in any innovative use of technology for teaching that you would like to share with the research team please provide your name and contact details below:*
itmensah@uew.edu.gh,

nifaatigr2000@yahoo.co.uk

kbwilson@uew.edu.gh

Thank you for your time and input

Appendix 4: Questionnaire for Heads of Departments at UEW

University of Education, Winneba
PHEA-ETI PROGRAMME
CURRENT STATE OF EDUCATIONAL TECHNOLOGY IN UEW

Name (Optional): _____ Date: _____

(i) (a) Faculty: _____

(b) Department: _____

(c) Number of lecturers: _____ Number of students: _____

10. **ICT related items owned by the department**

SRN	Item	Number available in the Department	Number in working Condition	Number being used by lecturers for teaching and learning purpose
(ii)	Desktop Computers			
(iii)	Laptops			
(iv)	LCD Projectors			

(v)	Photocopiers			
(vi)	Digital Cameras			
(vii)	Printers			
(viii)	Projector Screens			
9 others (Specify)				

i. Is your department connected to the Internet? (a)Yes [2] (b) No [1]

ii. Does your department have an ICT laboratory (a)Yes [2] (b) No [1].

iii. If **YES** to question 11, what is it used for?

	No	Yes
i. Teaching courses that incorporated ICT		
ii. Students to have access to computers		
iii. Lecturers to have access to computers		

iv. Does your department have an ICT policy on pedagogical integration of ICT tools in your curriculum? a)Yes [2] (b) No [1].

v. Does your department have ICT cognate courses for addressing students' learning needs?
a)Yes [2] (b) No [1].

vi. Indicate your opinion about on how faculty members use available educational technology resources in your department:

	Strongly agree	**Agree**	**Not sure**	**Disagree**	**Strongly disagree**
1. For research purposes					
2. For instruction (lesson delivery)					
3. For communication (e.g. sending mail and writing memos)					
4. For their personal/private work					
5. for processing students' results					

B. Research work in the area of educational technology or ICT:

vii. Within the last 5 years has any member of your department conducted research in the area of ICT or educational technology?
(a)Yes [2] (b) No [1]

viii. Does your department have research work being conducted in the area of ICT or educational technology? (a)Yes [2] (b) No [1]

ix. If you have answered Yes to questions 16 and/or 17, please fill in the information below.

Title of Research	**Name of Researcher**
1.	
2.	

3.	
4.	
5.	
6.	

C. ICT/Educational Technology Projects in your department

*Projects-*Should have the objective of introducing educational technology or improving the quality of teaching and learning through technology. Externally funded projects are projects funded by external organizations. (E.g. Carnegie, GET Fund, TALIF) Internally funded projects are projects funded directly by the Department or UEW*

x. Is there a project at your department that is focusing/using educational technology?
Yes [2] **No** [1]

xi. If **Yes** how many are such projects in your department?
1. Only one (1) of such projects [1]
2. Only two (2) of such projects [2]
3. Only three (3) of such projects [3]
4. more than three (3) of such projects [4]

xii. If you answered **Yes** to question 19, then kindly fill in the sheet at the back of this page

Project title	**Main Project Objective**

D ICT/EDUCATIONAL TECHNOLOGY COMMITTEE IN YOUR DEPARTMENT

xiii. Has any committee been set up by the department to plan, oversee, or source for funds to introduce ICT/Educational technology into teaching and learning?
Yes[2] **No** [1]

xiv. If you have answered Yes to question 22, which of the following is/was the focus of the committee?

(i) Availability of ICT resource at the department	**Yes** [2]	**No** [1]
(ii) How ICT is being used at the department by lecturers	**Yes** [2]	**No** [1]
(iii) The ability of lecturers to use ICT resources	**Yes** [2]	**No** [1]
(iv) Integration of ICT in the Department's academic curriculum	**Yes** [2]	**No** [1]
(v) The attitudes of lecturers towards the use of ICT resources		

xv. If you have answered Yes to question 23, what would you say are the achievements of the committee thus far? Not more than three

i.
ii.
iii.

Appendix 5: A Guide for Students' Focus Group Discussion

Baseline Research on current state of educational technology

i. You are welcome to this Focus Group discussion.
   Please introduce yourselves
   i. Yours name: …
   ii. Sex …
   iii. Your level …
   iv. Programme being offered (course)
   i. Department and faculty

As a student, what are your experiences on using ICT:
- during lectures?
- after lecture?
- at home(off campus)?

ii. What ICT facilities do you have access to on campus?
   a. What do you think about these facilities?
   b. Specifically what do you like and dislike about using the available ICT facilities at the University?
   c. In your own view, how does the state of ICT facilities at your department affects teaching and learning?

iii. How do you think the state of ICT facilities at the University could be improved?
With regard to:
   a. internet connectivity
   b. computer laboratories etc

iv. Any other issues you would like to add to what you have already raised?

Appendix 6: Interview Guide for University Authorities

Vice Chancellor

What has been your vision for ICT integration at UEW?
What is the level of your involvement in ICT integration at UEW?
What are the major difficulties that you face in promoting ICT at UEW?
What are the major enabling factors that aid the promotion of ICT at UEW?

Principals and Deans

Do you have an ICT strategic plan for the faculty?
If yes, can you briefly give us the highlights of this plan?
If no what accounts for the lack of a plan?
What are the challenges do your establishment/unit face with regard to the usage of ICT?
How do you think these challenges affect teaching and learning?
What are you doing to address these challenges?
What are the major enabling factors that aid the promotion/integration of ICT in your faculty?

Head of ICT Department

What is your department's role in this University?
How does your department integrate ICT in the activities of UEW?
Do you have a marketing strategy to ensure that issues of integration, implementation etc are embraced by the university community? If yes tell us the impact of this strategy.
What challenges do you encounter in promoting ICT?
What enabling factors exist in your dept/unit/campus that promote your agenda of developing ICT in UEW.
In your budgetary plan what are some of the ICT infrastructure or resources have you accounted for?

ICT Technical Coordinator and Head of Dept of ICT

What is your role as an ICT coordinator/Head of Dept of ICT?
What challenges do you encounter in promoting/providing/sustaining of ICT initiative?
What enabling factors exist in your dept/unit/campus that promotes your agenda of developing ICT in UEW.