International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2015, Vol. 11, Issue 1, pp. 80-100

Students' perception of blended learning environment: A case study of the University of Education, Winneba, Kumasi-Campus, Ghana

Samuel Adu Gyamfi
University of Education, Winneba, Ghana

Patrick Ohemeng Gyaase
Catholic University College of Ghana, Fiapre, Ghana

ABSTRACT

The increasing utilization of Information and Communications Technology (ICT) in addressing various societal needs has catalysed the need to deploy this all important tool in education in developing countries to address the need of the increasing student enrolment in universities. This study was conducted to assess students' perception of blended learning environment. The blended learning environment was designed on a Moodle platform using an adaptation of the practical enquiry model. This intervention was designed to ensure that the benefits of both online and face-to-face learning environment were harnessed for the achievement of set pedagogical goals. The study used formative experiment with 75 first year university students who were studying Communication Skills (CS) and their lecturers as the participants. The experiment was carried out over two semesters at the University of Education, Winneba – Kumasi Campus in Ghana. The findings showed positive perceptions of student on the blended learning environment. However, the problem of slow Internet connectivity and lack of Internet access for some of the students outside the university campus hindered the effectiveness of the blended learning environment for a few students. Improvement in ICT infrastructure and capacity building for lecturers to adopt blended learning approach were recommended.

Keywords: Blended learning environment, formative experiment, intervention, perception

INTRODUCTION

The metaphor of the information age has generated an unprecedented desire for educational reforms to accommodate information and communications technology tools for teaching and learning (Sarfo & Ansong-Gyimah 2010). In addition to making the teaching and learning of Information and Communications Technology (ICT) a compulsory subject across all levels of education in Ghana there exist national programmes that have been created to integrate ICT into teaching and learning especially in the universities to mitigate problems resulting from the large enrolment of students at that level (Sarfo & Ansong-Gyimah 2010).

ICT is credited with facilitating students' collaborative writing processes and interactions (Amir, et al. 2010); fostering creative, analytical and critical thinking skills, creating social interaction and good relationships between writer and reader and supporting learning community (Noytim 2010). However, many educational researchers have highlighted the limitation of using e-learning alone in the teaching and learning of soft-skills based course such as Communication Skills (Sarfo & Ansong-Gyimah, 2010; Garrison & Vaughan 2008). A combination of the traditional classroom setting and the ICT enabled teaching and learning platform referred to in this paper as blended learning environment, has therefore, been suggested for the improvement in the teaching and learning of Communication Skills (Bañados, 2006 & Calabrese & Faiella 2011). The question for this paper therefore is how would students who are used to face to face classroom teaching and

learning respond to the incorporation of ICT tools in the teaching and learning environment? A formative experiment was therefore carried out to evaluate students' perception of a blended learning environment implemented in the University of Education, Winneba – Kumasi campus in Ghana.

BLENDED LEARNING ENVIRONMENT

Blended learning environment refers to the blend of the effectiveness of the face-to-face teaching environment and ICT-mediated teaching and learning environment (Driscoll 2002). Graham & Allen (2009) thus, describe blended learning environment as the combination of instruction, both methods and delivery media from two archetypal learning environments, the traditional face-to-face learning environment and the ICT-mediated or e-learning environment. This is the preferred working definition of blended learning environment for this study since it captures all the relevant issues being considered.

MODELS OF BLENDED LEARNING ENVIRONMENT

Three models of blended learning have been identified in literature (Sharpe, Benfield, Roberts, & Francis 2006). These are:

1. Transmissive pedagogy model which incorporates the provision of supplementary online resources for learning programmes conducted along predominantly traditional lines with institutionally supported virtual learning environments (VLEs). Actual teaching and learning follows the traditional face-to-face modes of lectures and seminars, but provide extra support to the students through placing lecture notes on the web.

2. Transformative model facilitates extensive utilization of ICT tools beyond VLEs to enhance and alter students' mode of interaction, studying and learning and it is underpinned by radical course redesign. It transforms teaching and learning environment from where learners are just recipients of knowledge to where learners are actively involved in the construction of knowledge through dynamic interactions. This type of blend promotes intellectual activity that is practically impossible without the use of technology (Graham 2006). The transformative model is currently on the ascendancy in higher education and is often developed from the application of the principles of constructive alignment where assessment strategies are constructively aligned with the learning objectives of the course (Biggs 2003).

3. A holistic model of technology use to support learning. This is a newer characterization of blended learning where most learners do not distinguish between learning with or without technology. Faculty facilitates learning by using the learners' own technologies such as mobile phones, online communities and instant messaging to support the students' learning at any place and at any time (Sharpe, Benfield, Roberts, & Francis 2006).

This research study therefore, argues that a blended learning environment where the best of face-to-face learning environment and that of e-learning are pedagogical designed would meet the learning needs of these diverse group of learners to improve their skills and knowledge in the course (Ryberg & Dirckinck-Holmfeld 2010).

METHODOLOGY

This study was carried out as a formative experiment. Bradley & Reinking (2011) describe formative experiment as a research strategy for studying promising interventions in real instructional environments. Formative experiment is among closely-related methodological approaches which are often collectively referred to as design-based research (Reinking & Bradley, 2008). Design-based research is defined in this study as a systematic but flexible methodology with the aim to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories (Wang & Hannafin, 2005).

Maintaining methodological rigor in formative experiments requires a careful selection and justification of a research site. Such a site must possess initial conditions that suggest that the success of the intervention will face some hurdles but with conditions not so overwhelmingly challenging as to doom the intervention to failure (Reinking & Bradley, 2008).

DESCRIPTION OF THE SITE OF THE EXPERIMENT

The experiment took place at the Kumasi Campus of the University of Education, Winneba where Communication Skills course was used for first year students over two semesters. The Kumasi campus hosts three faculties, namely Business Education, Vocational and Technical Education and Education and Communication Sciences. The student population of the campus as at the time of the research study was 6,282, made up of 4,311 male and 1,971 female students.

Communication Skills course was used because available research on the course at other universities suggested relative high referral rate of students in this course (Coker & Abude 2012). Again there is stakeholders' suggestion that current graduates from the universities are deficient in Communication Skills (Tagoe, 2009). The site for the study was also influenced by the long association of the principal researcher, which facilitated easy access to the University's ICT infrastructure, lecturers and the students for the conduct of the formative experiment.

THE BLENDED LEARNING ENVIRONMENT USED FOR THE EXPERIMENT

A Blended Learning Environment for Collaborative and Active Learning (ABLECAT) model was designed and implemented for the study. This is a learning process model that combines information and communication technologies and the traditional face to face classroom settings. The blended learning environment was a transformative blended learning model which utilized Moodle learning content management platform with an improved user interface. The enactment process was inspired by the practical inquiry model (Garrison, Anderson, & Archer 2001).

Although ICT is credited with facilitating the expansion of possibilities in teaching and learning by supporting various forms of communication, the design of the experiences and the mode of students' engagement are known to directly affect the quality of the learning experience which a blended learning environment provides (Garrison & Vaughan 2008). Figure 1 presents the enactment model of the intervention for the Communication Skills course.

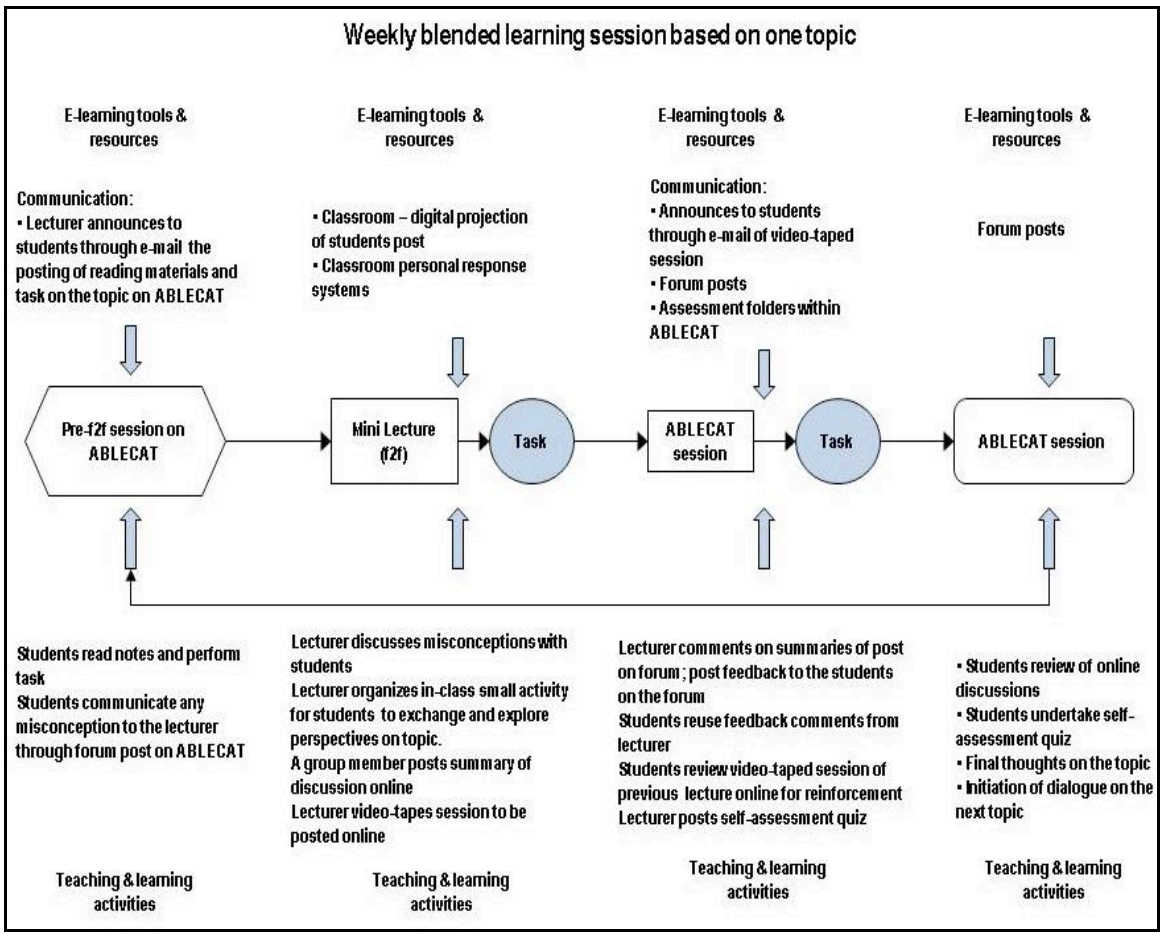

Figure 1: *The Enactment Process Model*

PRE- INTERVENTION DATA COLLECTION AND ANALYSIS

For the blended learning environment intervention of this study, pre-intervention data, both quantitative and qualitative were collected and analysed to identify the benchmarks with which the post-intervention data would be compared to assess the students' perception. For the preparation and determination of the suitability of the study subjects of the formative experiment and to determine their suitability for the study, focused interview and classroom observation were used to determine the state of the current teaching and learning environment. Document analysis was also used in assessing the ICT infrastructure and other supporting policies governing teaching and learning in the University.

Available ICT Infrastructure

The document analysis indicated that there was Wi-Fi on the campus; there were 190 networked computers in the computer laboratories with Internet access of 10mbps broadband connectivity. This facilitated students' access of online materials from the library. A policy document which was aimed at embracing the teaching and learning with ICT was also identified.

Demographics and Entrance Qualifications

Seventy-five (75) students made up of sixty-three (63) male and twelve (12) female students whose ages ranged between eighteen (18) to fifty (50) years took part in the survey (Figure 2). The survey was meant to determine the demographic characteristics of the students and their readiness to use ICT tools in learning so as to aid the design of the instructional environment.

Figure 2 shows that 13.3% were direct applicants with Senior Secondary School Certificate Examination results (SSSCE/WASSCE), 57.3% had diploma certificate. 23% had teacher's diploma certificate, 5% possessed Higher National Diploma programme whilst one student (1.3%) had 4-year post-secondary certificate.

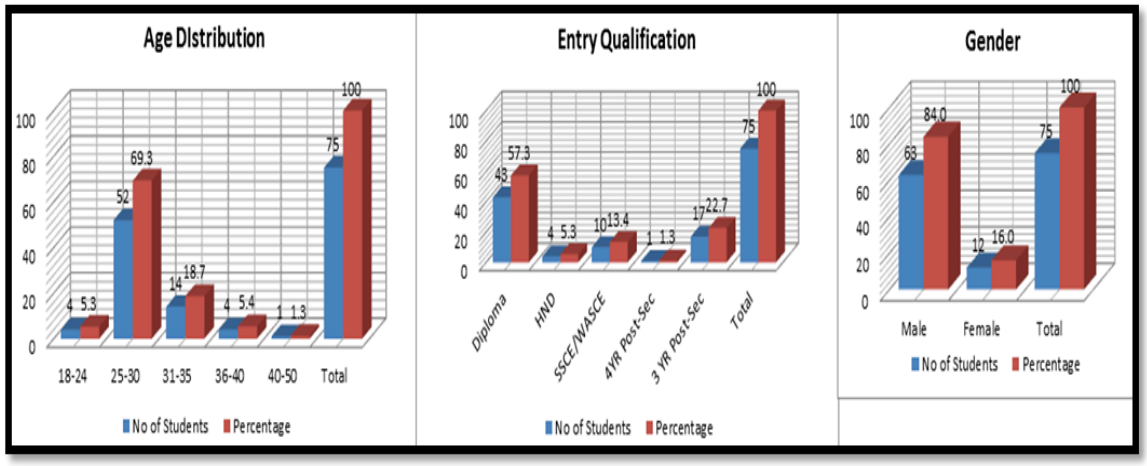

Figure 2: *Demographic Data of Students*

Classroom Observation

To identify the current problems faced by both students and lecturers, focused interviews were conducted for both students and lecturers. Among the problems identified by the students were their inability to access study materials electronically and lack of interaction among students and between students and lecturers after face to face classes. To corroborate the responses from the focused interviews and identify how teaching and learning took place in the Communication Skills classes, classroom observation was undertaken, using passive observation technique during the first lecture of the semester. The responses from the focused interview and the classroom observation identified the need for adopting a new ICT-mediated learning environment giving the number of students per class and the students' desire to access learning materials anytime to facilitate their learning. Table 1 represents the outcome of the classroom observation.

Table 1: *Findings from Classroom Observation*

Object for Observation	Description	Observations
Space	The physical setting where the CS course took place	A large Lecture room, Large class size, no public address systems. Not a big enough space for such number of students
Actors	The students and the lecturers in the CS teaching and learning session	75 freshly admitted students. 1 experienced lecturer.
Activities	Sets of related acts taking place during the teaching and learning sessions of the CS course;	The lecturer teaching and the students listening and taking down notes.
Objects	Artefacts and physical things available in the space facilitating the teaching and learning process	White board and markers where the teacher occasionally writes for emphasis
Acts	The specific actions of the actors in the course of the session	Very few questions were asked including request for repetition from the lecturer since the students at the back of the class could not hear the lecturer well. More students came in late.
Events	the sets of activities that took place in the course of the observed session	Students at the back not paying attention, notes taking
Time	When specific sequence of acts, activities and events took place that impacted of the teaching and learning session	Class started at 5pm and ended at 8 pm.
Goals	The efforts of the actors to achieve the learning objective of the session.	The lecturer was constantly asking the students if they understood what was being taught. Students were seen taking notes and asking colleagues what the lecturer said anytime they missed something.
Feelings	The feeling of the actors as they expressed them.	The lecturer was exasperated and complained about trying his best to shout loud enough for the students to hear. The students who came late and had to sit at the back of the class were disappointed because they could not hear most of the lectures that took place.

ICT Skills Data

The relevant characteristics of the ICT skills survey instrument had a statistical significance of 0.95 (where reliability co-efficient of 0.70 or higher is considered acceptable in most social science research situations for reliability of a psychometric test).

The data in table 2 shows that 88% of the participants can perform the basic computer skills very well all by themselves; 8% can perform the basic computer skills with the help from someone; whilst 4% of the participants cannot perform the basic computer skills. When it comes to the basic Internet skills, 76% of the participants can perform the basic Internet skills; 19% can perform the basic Internet skills with the help from someone; whilst 5% cannot perform those skills at all. Specifically and quite significantly, within the age groups of the participants, one person within the 41-50 year olds has no Internet skills, two participants aged between 25 and 35 years do not have Internet skills and four participants aged between 18 to 35 years do not have basic computer skills.

Table 2: *Characteristics of ICT Skills of Students*

Characteristics - How well can you do the following?		I can do this very well by myself					I can do this with the help from someone					I know what this means but I can't do it					I don't know what this means				
	Age group	18-24	25-30	31-35	36-40	41-50	18-24	25-30	31-35	36-40	41-50	18-24	25-30	31-35	36-40	41-50	18-24	25-30	31-35	36-40	41-50
1a. Start a computer	No.	2	46	9	2	0	1	5	3	2	1	1	1	0	0	0	0	0	2	0	0
	%	2.7	61.3	12	2.7	0	1.3	6.7	4.0	2.7	1.3	1.3	1.3	0	0	0	0	0	2.7	0	0
b. Open a file on a computer	No.	2	50	13	2	1	2	1	0	2	0	0	1	0	0	0	0	0	1	0	0
	%	2.7	66.7	17.3	2.7	1.3	2.7	1.3	0	2.7	0	0	1.3	0	0	0	0	0	1.3	0	0
c. Create or edit a file on a computer	No.	2	48	10	3	1	2	3	3	1	0	0	0	0	0	0	0	1	1	0	0
	%	2.7	64	13.3	4	1.3	2.7	4	4	1.3	0	0	0	0	0	0	0	1.3	1.3	0	0
d. Scroll a document up and down on a screen	No.	2	48	12	4	1	2	2	2	0	0	0	0	0	0	0	0	2	0	0	0
	%	2.7	64	16	5.3	1.3	2.7	2.7	2.7	0	0	0	0	0	0	0	0	2.7	0	0	0
e. Copy a file from a computer drive	No.	3	48	9	3	1	1	3	2	1	0	0	0	2	0	0	0	1	1	0	0
	%	4	64	12	4	1.3	1.3	4	2.7	1.3	0	0	0	2.7	0	0	0	1.3	1.3	0	0
f. Save a document or file on a computer	No.	3	52	12	4	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0
	%	4	69.3	16	5.3	1.3	1.3	0	1.3	0	0	0	0	0	0	0	0	0	1.3	0	0
g. Print a document or file from a computer	No.	3	44	7	2	0	1	6	6	2	1	0	2	0	0	0	0	0	1	0	0
	%	4	58.7	9.3	2.7	0	1.3	8	8	2.7	1.3	0	2.7	0	0	0	0	0	1.3	0	0
h. Move files from one place to another on a computer	No.	3	48	12	3	1	1	3	1	1	0	0	1	0	0	0	0	0	1	0	0
	%	4	64	16	4	1.3	1.3	4	1.3	1.3	0	0	1.3	0	0	0	0	0	1.3	0	0
2a. Get on to the Internet	No.	3	48	13	2	1	1	3	0	2	0	0	0	0	0	0	0	1	1	0	0
	%	4	64	17.3	2.7	1.3	1.3	4	0	2.7	0	0	0	0	0	0	0	1.3	1.3	0	0
b. Copy or download files from the Internet	No.	3	43	8	2	0	1	7	5	2	1	0	1	0	0	0	0	1	1	0	0
	%	4	57.3	10.7	2.7	0	1.3	9.3	6.7	2.7	1.3	0	1.3	0	0	0	0	1.3	1.3	0	0
c. Download music, pictures or movie from the Internet	No.	2	42	6	2	0	2	7	5	2	0	0	2	2	0	1	0	1	1	0	0
	%	2.7	56	8	2.7	0	2.7	9.3	6.7	2.7	0	0	2.7	2.7	0	1.3	0	1.3	1.3	0	0
d. Write and send e-mails	No.	2	46	12	2	0	2	5	1	2	1	0	1	0	0	0	0	0	1	0	0
	%	2.7	61.3	16	2.7	0	2.7	6.7	1.3	2.7	1.3	0	1.3	0	0	0	0	0	1.3	0	0
e. Attach a file to an e-mail message	No.	3	35	7	2	0	1	14	4	1	1	0	2	2	1	0	0	1	1	0	0
	%	4	46.7	9.3	2.7	0	1.3	18.7	5.3	1.3	1.3	0	2.7	2.7	1.3	0	0	1.3	1.3	0	0

THE ENACTMENT OF THE BLENDED LEARNING ENVIRONMENT

The first phase of the enactment of the intervention took place at the beginning of the first of the two semesters required to complete the Communication Skills syllabus. The students for the experiment were registered to provide them access to the online learning environment by assigning them usernames and passwords as well as creating email addresses for them.

A two-hour orientation exercise was organised for the participants to explain the rationale behind the formative experiment, to obtain the students' consent and co-operation in the project and explain to the students how to work with the online learning environment. The students were assured of their privacy and confidentiality, noting that the experiment was solely an academic exercise. The students were taken through the process of the website navigation and the use of various tools such as forums and e-mails on the website and the online help facilities. Additionally, a print-out of these instructions was provided to the students.

The Enactment Process

The Pre face-to-face (f2f) component of the enactment process model (Fig.1) provides the initiation of the weekly activity to spur the students' curiosity and define the key tasks and activities for the students on the topic of the week. The sub-components in the pre-f2f include the provision for the students to undertake pre-reading and writing activities which are meant to 'jog' the students into taking the centre stage in the learning process. This was facilitated by the provision of tasks and activities meant to test the students' understanding of the pre-reading and

writing activities. The students are offered the medium to communicate any misconceptions to the lecturer through the forums set up for each topic allowing the students to take centre stage of the learning process and the line of communication between the students and lecturer is then opened.

The second phase of the enactment process model involves the actual face-to-face teaching and learning where ICT tools and resources are provided in preparation for the mini lectures and tutorials and to address issues posted online earlier in the pre-f2f session, promote dialogue between participants and the lecturer and among the participants on the week's topic. This is aimed at increasing collaboration and communication in the CS course which ultimately would improve their skills and knowledge in the course. This session is videoed and posted online to enable the participants who are present and those who inadvertently would miss the mini- lecture to review the sessions. Hence, the f2f sessions are no longer used for lecturing but as an avenue to promote dialogue between the lecturer and the students and among the students which was a novelty.

The third phase of the enactment model serves as an avenue for the students to reflect on the knowledge and skills stated as the objectives of the topic. This includes the re-use of the lecturer's comments and the review of the video-taped session for reinforcement by the students. This is what has been referred to as the "integration" phase of the 'practical inquiry model' of (Garrison & Vaughan, 2008). There is the provision of self-assessment quiz meant to provide an avenue for the students to apply their knowledge and skills on the topic. The lecturer makes use of e-mail and forum to provide feedback to students whilst the assessment folders are used to record the results of the quiz session.

The final phase involves individual and group assignment that is posted online to enable the students to assess their understanding of the topic and to compare their work and learning with each other. Finally, the participants are offered the opportunity to express their thoughts on the topic. This strategy is meant to improve knowledge construction and initiate a dialogue on the next topic. Garrison & Vaughan (2008) refer to this phase as 'resolution' in their practical enquiry model.

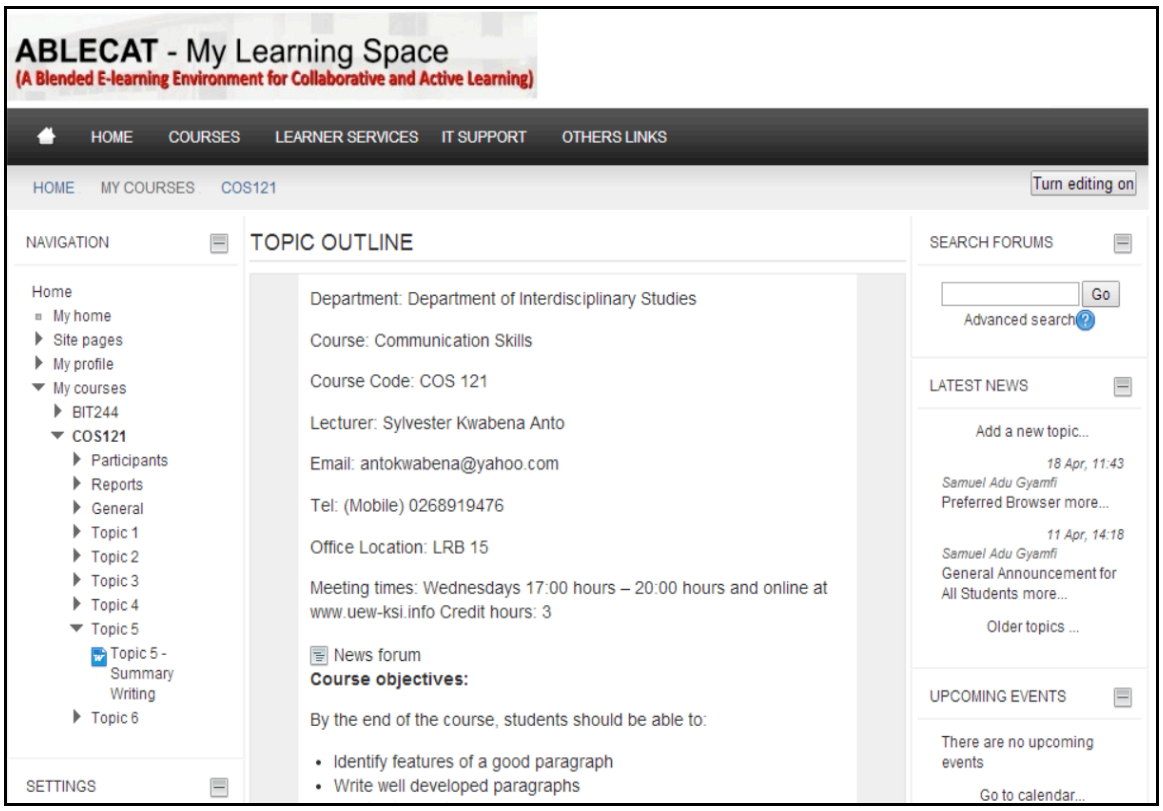

Figure 3: *Online Learning Environment Intervention (ABLECAT) Interface*

The blended learning environment performs the functions of content delivery, as well as promotes communication and construction of knowledge by the students. The unidirectional arrows in the enactment process model (Fig.1) show the students' interaction with the blended learning environment in each of the four components in the model. Furthermore, the model illustrates blended learning teaching and learning situation for a course where both tasks and activities are used to enhance knowledge construction.

Analysis of the Enactment Phase

The classroom observation, informal conversational interviews with students and the lecturer, and online activity logs of students were used to determine the factors that enhanced or inhibited the effectiveness of the intervention towards achieving its pedagogical goal.

Classroom Observation- Enactment Phase

During the enactment phase of the experiment, passive participant observation was used to observe and evaluate the mini-lecture as to how the lecturer dealt with the students' misconceptions about the pre-f2f assigned reading and writing activities; whether this generated dialogue between the lecturer and the students; how the video-recording of the mini-lecture affected the teaching and learning situation and the students' utilisation of the small group activity. The table below provides the summary of the observation during the enactment phase.

Table 3: *Summary of classroom observation at the enactment phase*

Object for Observation	Description	Observations
Space	The physical setting where the CS course took place	A new larger theatre was used with the same number of students as the pre-intervention phase. The room could comfortably accommodate the students
Actors	The students and the lecturers in the CS teaching and learning session	The same lecturer and the same class of students.
Activities	Sets of related acts taking place during the teaching and learning sessions of the CS course;	Students discuss their misconceptions and the lecturer responds to their concerns.
Objects	Artefacts and physical things available in the space facilitating the teaching and learning process	White board and markers where the teacher occasionally writes for emphasis. There was also the use of electronic projector and a video recording.
Acts	The specific actions of the actors in the course of the session	Students attended lectures with prepared questions and comments and references from material sourced from ABLECAT
Events	The sets of activities that took place in the course of the observed session	Students were divided into discussion groups. Used SRC constructed pavilions with access to Wi-Fi. Some students helping group members with difficulty of accessing online materials
Time	When specific sequence of acts, activities and events took place that impacted of the teaching and learning session	Class started at 5 pm and ended at 8 pm with 1 hour pre-lecture group discussions
Goals	The efforts of the actors to achieve the learning objective of the session.	Enhanced engagement between students and lecturer. Lecturer gains attention of students through the provision of pre-lecture reading materials
Feelings	The feeling of the actors as they expressed them	Not enough time for the lecturer to respond to all the technical support requests, the forum was difficult to e-moderate

Informal Conversational Interviews- Enactment Phase

As a follow-up to the classroom observation, the students and the lecturer of the CS course were interviewed. The interview took the form of informal conversational interviews where students were randomly selected and interviewed using open-ended question to evaluate effectiveness of the intervention towards the achievements of the set pedagogical goals. Table 3 below is a summary of the findings from the informal conversational interviews conducted.

The findings indicated that the introduction of the blended learning environment for the first four weeks of lectures had improved interactivity among students and between the students and the lecturer due to the ICT tools such the forum and emailing system that were used. However, due to the low bandwidth of the Internet service on the campus, the students experienced some difficulty in watching videos online and downloading materials from the website. Again the students were unable to access online materials from the website when they were outside the University campus thereby, restricting the online interaction to when they were on the campus.

Table 3: Summary of the responses from the Students

Parameters	Responses
	Students
Mode of Teaching	Lecture , Discussions and group activities
Setting	Lecture Theatre with Internet Connected Computers
Course Texts and Material	Online materials, videos, and digitized course materials
Teaching materials	Board and Markers, Electronic projector, Computers
Mode of Assessment	Online feedback, posts on forums and small group assignments
Interaction	Occasional classroom discussions, small group activities, forum
Use of ICT tools	Yes
Evidence of impact of intervention	Came to class prepared, with questions and comments on notes
Feedback	Yes, Lecturer answered questions posed in forums and assessed online activity
Problems identified on the new learning environment	Activities not part of continuous assessment. Slow Internet connectivity affected access to video lectures; High cost of Internet access outside the school , Challenges with email accounts,
Benefits Identified in the new learning environments	Access to course materials and teaching activities anytime anywhere. Reminding colleagues on new postings, acquisition of new ICT skills
Suggestions for improvement	Emails should be improved, expansion and increased speed of the Internet connectivity. Make online activities part of continuous assessment towards course grade.

Students' Activity Logs

At the end of the second week of the intervention, the students' activity logs on ABLECAT were checked to assess the level of participants' usage of ABLECAT (Figure 4). Records of students' logs on ABLECAT indicated that most students were able to access the course readings and notes and the activities at the pre-f2f stage. It was noted that when there was no task or activity assigned to the week's topic, students' logs on course reading materials on the online learning environment were very low. Additionally, only a few of the students made postings on the forum as well as accessed the video-taped lectures. This corroborated the informal conversational interview with the students when they suggested that they could not access the video files because of network problems.

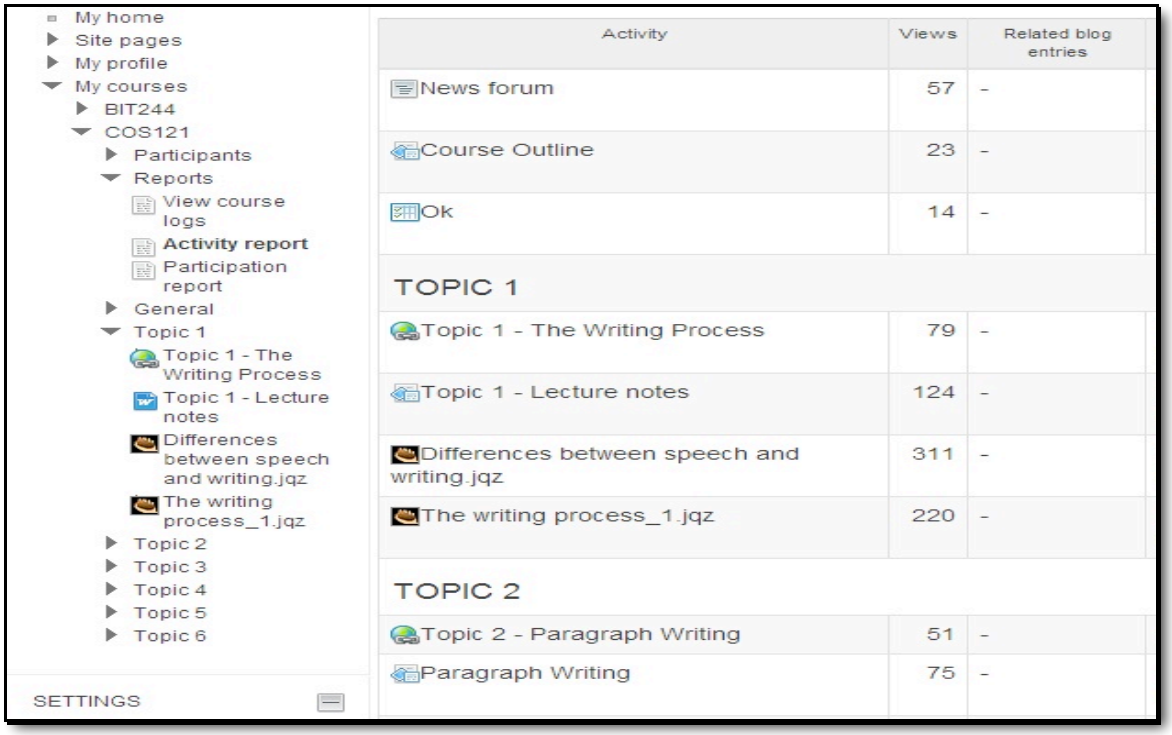

Figure 4: Students' Online Learning Environment Activity Logs

In sum, the descriptive analysis and reflection on the data that were gathered at this stage were to determine which practices on the instructional environment needed to be discontinued, adapted or transformed to achieve the pedagogical goal.

Modification and Implementation of Modified Intervention

In formative experiment, factors influencing the effectiveness, efficiency and appeal of an intervention must be identified and explained to enable modifications that could neutralize the inhibiting factors whilst capitalizing on the enhancing ones (Reinking & Bradley, 2008). To neutralise the inhibiting factors identified from the enactment phase, the intervention was adjourned after the fifth week lectures. The course however, continued with the usual face-to-face lecture method. However, teaching and learning materials were still posted online for students' reference purposes. Consequently, ABLECAT offered the participants to engage in self-directed learning (Davidsen & Georgsen, 2010) whilst modifications were made for the achievement of the set pedagogical goals.

First, the problem with the e-mail was fixed to enable effective communication between the lecturer and students and among students. The initial e-mail system used was hosted on the Universities Intranet hence, the students could only access their mails when they were on campus. The students were asked to create additional e-mail accounts by using ***Gmail, ymail*** or ***yahoo mail***.

Secondly, the new lecturer for the second semester of the Communication Skills course was asked to score students' activities on ABLECAT such as quizzes, group activities and coursework assignments and included them in the final assessment grade of the students.

Implementation of the Second Cycle of ABLECAT

The changes above resulted in a modified enactment model to enable an effective implementation of ABLECAT in the second semester (Figure 5). The only change in the new enactment model was the schedule of the video-recorded lectures which is now found in the third phase of the model as presented in Figure 5.

The intervention was re-enacted with the same students in the second semester of the academic year for the second component of the Communication Skills course.

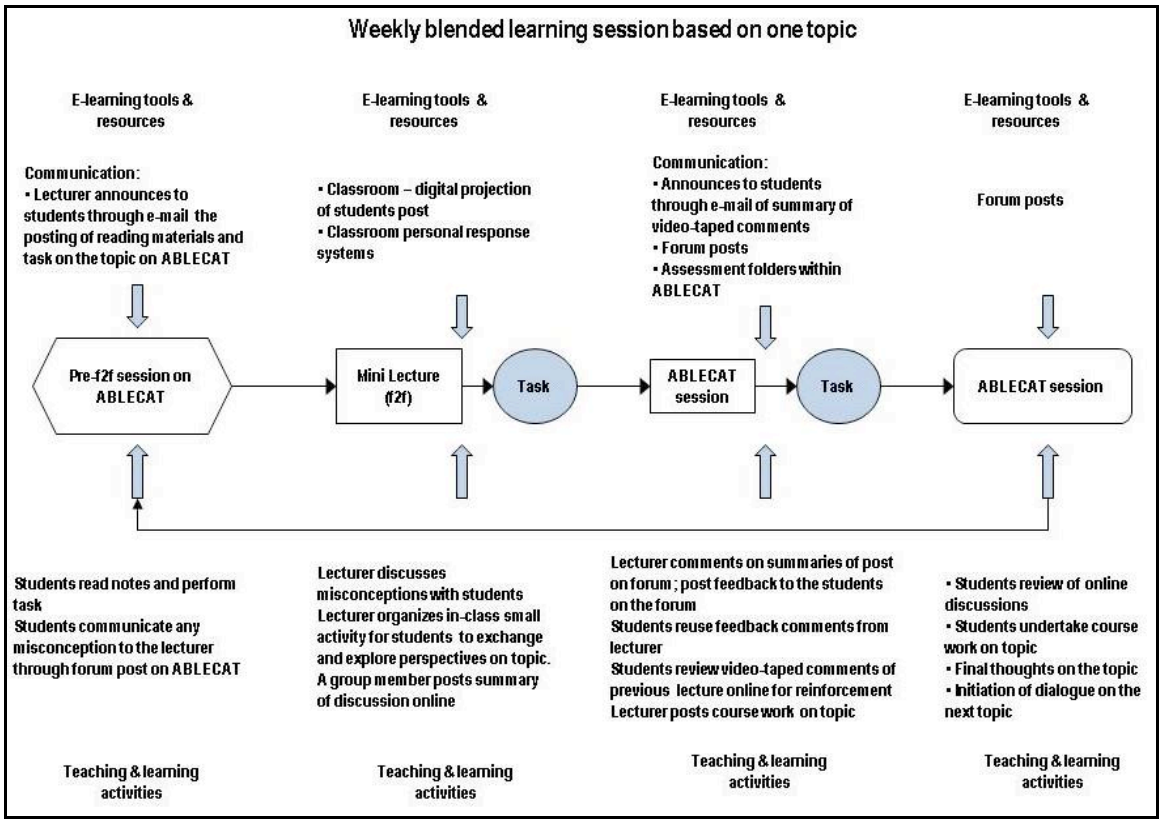

Figure 5: *Modified Enactment Process Model*

During the second cycle of the intervention, data was gathered to help identify and seek explanations for unanticipated effects and outcomes through informal conversational interviews and the students' online activity logs.

The students' online activity logs were used to examine the frequency of the students' use of ABLECAT prior to the face-to-face sessions, the use of the video-recorded lectures, performance of assigned activities, and postings on the forums.

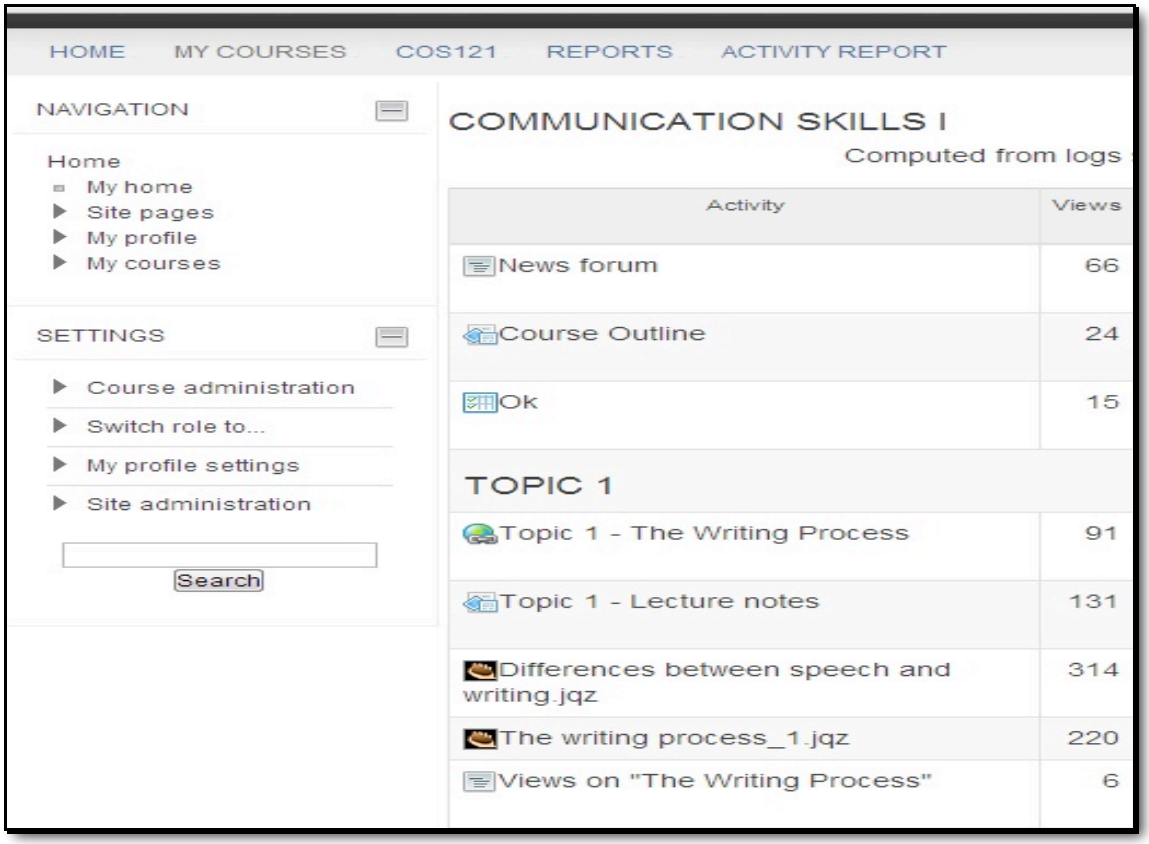

Figure 6: *Students' Online Activity Logs in the Second Cycle of Implementation*

The data from the activity logs of the students (n=75) on ABLECAT showed that, 66 students viewed and or made postings on the first task to the forum that was created for the topic; there were 131 views or readings of the lecture notes posted by the participants on the first topic and 314 attempts or views by the participants on the task and quiz that were set for the topic (Figure 6). The trends in the data showed that the marginal increase in activity on ABLECAT could be attributed to the e-mail communication with the students that announced the course topic and the tasks assigned. This satisfied the design objective of the intervention of establishing the initial interaction between the lecturer and the students which could also make the lecturer become more accessible to the students (Ogata & Yano, 2004).

Focused group interview in the form of informal conversational interview was used to assess the reaction of the participants to the modification made to the learning design and the lecturer's impressions on the incorporation of the assignment and activities as part of the students' end of course grades, and how that had translated into the students' learning. The responses are summarised in Table 4.

Table 4: *Summary of Informal Conversational Interviews: Second Cycle Implementation of Intervention*

Indicators	Students	Lecturer
Impact of the modified email system	Use email to initiate interaction with course lecturer	Use email to provide students feedback and response to questions and concerns
Modified video format and size	Improved download , videos are short and to the point	Video recording environment has improved and the time needed for recording has been shortened
Knowledge of the incorporation of scores of online activities	This is motivating and driving the use of online activities and group activities	Student participate better in online activities and face to face group activities

Post-Intervention (ABLECAT) Analysis

Formative experiments require the collection of quantitative data identifying conditions under which an intervention works or otherwise in order to develop theory and or improve practice (Reinking & Bradley, 2008). At the end of the intervention, a researcher-designed questionnaire was used to gauge the students' perceptions of the use of the blended learning environment (ABLECAT) that was used in the experiment. The questionnaire sought to find out from the participants their perceptions in terms of the quality of the content, learning, communication and the level of engagement they experienced with ABLECAT.

Sixty-four students answered the Likert-type questionnaire consisting of 11 statements with the options to state their agreement on a scale of 5 to 1 (strongly agree, agree, neutral, disagree and strongly disagree). Statistical Package for Social Sciences (SPSS v.16) software was used to perform a descriptive analysis of the data obtained.

Perception of students on the use of ABLECAT

The tables below shows the results of the students' perceptions of the blended learning environment (ABLECAT) towards achieving the pedagogical goals in the teaching and learning of Communication Skills in the university.

Pedagogical Goal 1: Provision of multiple learning resources on ABLECAT would sustain leaners interest and promote cognitive engagement in Communication Skills.

Table 5: *Responses on Design Proposition One*

Multiple learning resources on ABLECAT would sustain learners interest and promote cognitive engagement in CS	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Std. D	Mean
Item							
1. The learning materials on ABLECAT explain the concepts in CS very well.	40.6	40.6	10.9	3.1	4.7	1.03	1.91
2. The learning materials on ABLECAT were relevant to the needs of the CS course.	46.9	39.1	9.4	0.0	4.7	0.97	1.77
3. ABLECAT was a very useful extra source of information and resources for the CS course.	39.1	43.8	10.9	4.7	1.6	0.91	1.86
4. The learning resources on ABLECAT enabled me to gain good understanding of each lecture before attending them.	26.6	46.9	17.2	3.1	6.2	1.06	2.16
5. The learning resources on ABLECAT enabled me to revise more effectively.	35.9	48.4	7.8	3.1	4.7	1.00	1.92
6. The learning resources on ABLECAT helped me to perform better in assignments/course work	32.8	39.1	18.8	6.2	3.1	1.03	2.08

From table 5, more than 80% perceived that the learning materials on ABLECAT explained the concepts in CS very well and were therefore relevant to their needs; more than 70% perceived that ABLECAT helped them to perform better in assignments and coursework. It can therefore, be concluded that the provision of multiple learning resources in the design and implementation of ABLECAT contributed to sustain the leaners' interest and promoted their cognitive engagement in the course as expressed in the survey.

Pedagogical Goal 2: Provision and use of communication tools on ABLECAT would encourage learners' collaboration and promote the cognitive engagement in Communication Skills.

From table 6, more than 70% of the students perceived ABLECAT as having improved their communication with their lecturer whilst more than 68% perceived that ABLECAT has helped them to understand the course content on CS due to the discussions they had in the forums on ABLECAT.

Computer-mediated communication (CMC) – both synchronous and asynchronous, is considered the most revolutionary development in computer-assisted language learning since it involves direct human-to-human communication rather than human-to-machine (Warschauer & Kern 2000). It could therefore, be concluded that the provision and use of the communication tools in the design and implementation of ABLECAT contributed to the perceived collaboration that the students enjoyed in the CS course, and hence the enhancement of their cognitive development and improvement in the course.

Table 6: *Responses from design proposition 2*

Provision and use of communication tools on ABLECAT would encourage learners' collaboration and promote their cognitive engagement in CS	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Std. D	Mean
Item							
1. ABLECAT has improved the communication I had with the lecturer	20.3	59.4	15.6	4.7	0.0	0.744	2.05
2. I felt discussions with my colleagues in the forums on ABLECAT helped me understand the course content on CS.	23.4	45.3	23.4	4.7	3.1	0.957	2.19

Pedagogical goal 3: provision of learning tasks and coursework assignments on ABLECAT would engage and build learners' understanding and use of the concepts in Communication Skills

From table 7, more than 60% agreed that discussions on the forum on ABLECAT helped them to understand the course content better. More than 80% of the students agreed that the quizzes and coursework on ABLECAT were very helpful for their understanding of the concepts in the CS course. Furthermore, more than 70% of the students agreed that the feedback/answers they received on the tasks and quizzes were very helpful in the course.

Table 7: *Responses from design proposition 3*

Learning tasks and coursework assignments on ABLECAT would engage and build learners' understanding and use of concepts in CS	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %	Std. D	Mean
Item							
1. Discussions on the forums helped me understand the course content better.	17.2	46.9	18.8	15.6	1.6	1.00	2.38
2. The quizzes and coursework on ABLECAT were very helpful for my understanding of the concepts in CS	40.6	37.5	10.9	9.4	1.6	1.022	1.94
3. The feedback/answers I received on the tasks/quizzes were very helpful in the CS course	37.5	37.5	15.6	6.2	3.1	1.039	2.00

Feedback has been found to be central to learning and improving performance, and therefore, students need appropriate feedback on performance to benefit from courses. It has also been observed that if coursework is taken away from a course due to resource constraints, students do not perform the associated studying. It could therefore, be deduced from the participants' responses that the learning tasks and coursework assignment provided on ABLECAT engaged and built their understanding and use of the concepts in the course.

Unsurprisingly quiet substantial number of students either were indifferent or disagreed that the learning task and the online learning tool contributed to the improvement of their performance. This was attributed to the slow Internet connectivity on campus and lack of access for those students who lived outside the campus.

Therefore, the data suggested that the value of *effectiveness* was achieved with the intervention, because the students who have a stake in the intervention have expressed positive perception about its suitability for the development of their skills and knowledge in the CS course (Reigeluth & Frick 1999).

In sum, even though the perceived threat to internal validity does not make the intervention highly generalizable to other similar situations, the design theory that underpins the intervention suggested that ABLECAT was effective, efficient and appealing to the improvement of the students' knowledge and skills in CS.

FINDINGS AND IMPLICATIONS

Against the backdrop of the controversy that surrounds the traditional classroom vs. Computer-assisted language learning comparisons (Chapelle 2003) the findings in this study are drawn from the students' perceptions in terms of the quality of the content, learning, communication and the level of engagement experienced by their using the blended learning environment in a University setting that is characterised by large class sizes and face to face teaching and learning environment. In a developing country such as Ghana, the students' acceptance of blended learning environment would go a long way to improve teaching and learning outcomes in the higher academic institutions.

The findings from the classroom observation, informal conversational interviews with the students and the survey of the students corroborate the findings of previous research (Chapelle 1998); Kupetz & Ziegenmeyer 2005 & Harker & Koutsantoni 2005) that when learners are provided with multiple formats of learning materials in blended learning environment it could sustain the students' interest and thereby promote their cognitive engagement. From the activity logs on ABLECAT, it was discovered that most of the students logged in to view the course materials (lecture notes, lecturer's video explanations and comments, links to websites on CS) every week. The activity logs on course materials were higher when the students were asked to undertake course work or assignment on the topic for the week. This indicated that the students utilised the course materials for their coursework and assignments. This could be attributed to the fact that the course materials were accessible all the time (24/7) and at any place (at home as well as on campus) provided the students had access to the Internet (Boyle, et al. 2003).

This finding notwithstanding, the use of web-based materials for blended learning programmes was problematic giving that some students encountered problems with Internet access and the slow speed of the connectivity on the university campus. This implies that any adoption of the blended learning environment in a university-wide situation would require investment in Internet infrastructure to make it successful. The status quo could not support such innovations in teaching and learning.

Again, the results from the classroom observation, informal conversational interviews of the students and the survey of the students indicated that when learners were provided with adequate and appropriate communication tools in blended learning environments it could enhance interaction and collaboration with their peers and instructors and thereby enhance their development of knowledge and skills in the course, further corroborating (Aycock, Garnham, & Kaleta 2002; Chen, Belkada, & Okamoto 2004 & González-Lloret 2003). Findings from both the

qualitative and quantitative data suggested that these tools enhanced communication among the students as well as between the students and the lecturer. However, an analysis of the activity logs of the students on ABLECAT showed that a few 'ardent' students regularly posted their misconceptions on the forums that were created for the topics. Much of the interaction that took place was by the use of the e-mail and the forums, which created an avenue for the students to regularly exhibit their knowledge and writing skills in the course.

In conclusion, although the findings from this study show the transformative potential of the intervention, there could be an issue with the generalization of the findings to all courses in the University setting. It is therefore, pertinent for future research endeavours to study the effects of making use of the intervention across various courses in different situations.

REFERENCES

Afful, J. B. A., 2007. Academic literacy and communicative skills in the Ghanaian university: A proposal. Nebula, 4(3), pp. 141-159.

Amir, Z., Ismail, K. & Hussin, S., 2010. Blogs in Language Learning: Maximizing Students' Collaborative Writing. Procedia Social and Behavioural Sciences, 18(2011), pp. 537-543.

Aycock, A., Garnham, C. & Kaleta, R., 2002. Lessons learned from the hybrid course project. Teaching with technology today, 8(6).

Bañados, E., 2006. A Blended-learning Pedagogical Model for Teaching and Learning EFL successfully through an Online Interactive Multimedia Environment. CALICO Journal, 23(3), pp. 533-550.

Biggs, J., 2003. Teaching for quality learning at university: What the student does. 2nd ed. Buckingham: SRHE and Open University Press.

Boyle, T. et al., 2003. Using blended learning to improve student success rates in learning to program. Journal of Educational Media, 2(3), pp. 165-178.

Bradley, B. A. & Reinking, D., 2011. A formative experiment to enhance teacher-child language interactions in a preschool classroom. Journal of Early Childhood Literacy, 11(3), pp. 362-401.

Calabrese, R. & Faiella, F., 2011. Theoretical and practical issues in designing a blended e-learning course of English as a foreign language. In: G. Dettori & D. Persico, eds. Fostering Self-regulated Learning through ICT. Hershey, PA: IGI Global, pp. 162-178.

Chapelle, C. A., 1998. Multimedia CALL: Lessons to be learned from research on instructed SLA. Language Learning & Technology, 2(1), pp. 22-34.

Chapelle, C. A., 2003. English Language Learning and Technology : Lectures on Applied Linguistics in the Age of Information and Communication Technology. Amsterdam: John Benjamins Publishing.

Chen, J., Belkada, S. & Okamoto, T., 2004. How a web-based course facilitates acquisition of English for Academic Purposes. Language Learning & Technology, 8(2), pp. 33-49.

Cohen, L., Manion, L. & Morrison, K., 2007. Research Methods in Education. 6th ed. Abingdon: Routledge.

Coker, W. & Abude, F. M., 2012. Referral trends among students of the Communicative Skills course in a Ghanaian university. English for Specific Purposes World, 36(12), pp. 1-20.

Cooper, D. R. & Schindler, P. S., 2006. Business Research Methods. New York: McGraw Hill.

Davidsen, J. & Georgsen, M., 2010. ICT as a tool for collaboration in the classroom - challenges and lessons learned. Designs for Learning, 3(1-2), pp. 54-69.

Driscoll, M., 2002. Blended learning: Let's get beyond the hype. E-Learning, 3(3), p. 54.

Garrison, D. R., Anderson, T. & Archer, W., 2001. Critical Thinking, Cognitive Presence, and Computer Conferencing in Distance Education.. American Journal of Distance Education, 15(1), pp. 7-23.

Garrison, D. R. & Vaughan, N. D., 2008. Blended Learning in Higher Education: Framework, Principles and Guidelines. San Francisco: Jossey-Bass.

Gibbs, G. & Simpson, C., 2004. Conditions under which assessment supports students' learning. Learning and Teaching in Higher Education, Issue 1, pp. 3-31.

González-Lloret, M., 2003. Designing task-based CALL to promote interaction: En Busca de Esmeraldas. Language Learning & Technology, 7(1), pp. 86-104.

Graham, C. R., 2006. Blended learning systems: Definition, current trends, and future directions. In: C. J. Bonk & C. R. Graham, eds. The Handbook of Blended Learning:Global Perspectives, Local Designs. San Francisco: Pfeiffer, pp. 3-21.

Graham, C. R. & Allen, S., 2009. Designing blended learning environments. IGI Global, pp. 562-570.

Harker, M. & Koutsantoni, D., 2005. Can it be effective? Distance versus blended learning in a web-based EAP programme. ReCALL, 17(2), pp. 197-216.

Kuh, G. D., 2003. What we're learning about student engagement from NSSE: benchmarks for effective educational practices. Change: The Magazine of Higher Learning, 35(2), pp. 24-32.

Kupetz, R. & Ziegenmeyer, B., 2005. Blended learning in a teacher training course: Integrated interactive e-learning and contact learning. ReCALL, 17(2), pp. 179-196.

Laurillard, D., 2012. Teaching as a Design Science. New York: Routledge.

Macdonald, J., 2008. Blended Learning and Onlline Tutoring: Planning Learner Support and Activity Design. 2nd ed. Aldershot: Gower Publishing Limited.

Noytim, U., 2010. Weblogs Enhancing EFL Students' English Language Learning.. Procedia Social Behavioral Sciences, 2(2010), pp. 1127-1132.

Nunan, D., 2004. Task-Based Language Learning. Cambridge: Cambridge University Press.

Pelgrum, W. J., 2001. Obstacle to the Integration of ICT in Education: Results from a Worldwide Educational Assessment.. Computers & Education, Volume 37, pp. 163-178.

Reigeluth, C. M. & Frick, T. W., 1999. Formative research: A methodology for creating and improving design theories. In: C. M. Reigeluth, ed. Instructional design Theories and Models: A New Paradigm of Instructional Theory. Hillsdale, NJ: Lawrence Erlbaum Associates, pp. 633-651.

Reinking, D. H. & Bradley, B. A., 2008. On Formative and Design Experiments: Approaches to Language and Literacy Research. New York: Teachers College Press.

Ryberg, T. & Dirckinck-Holmfeld, L., 2010. Analysing digital literacy in action: A case study of a problem-oriented learning process. In: R. Sharpe, H. Beetham & S. De Frietas, eds. Rethinking Learning for a Digital Age: How Learners are Shaping their own Experiences. Abingdon: Routledge, pp. 170 - 183.

Sarfo, F. K. & Ansong-Gyimah, K., 2010. The Perceptions of Students, Teachers and Educational Officers in Ghana on the Role of Computer and the Teacher in Promoting the First Five Principles of Instruction. The Turkish Online Journal of Educational Technology, 9(3), pp. 85-95.

Sharpe, R., Benfield, G., Roberts, G. & Francis, R., 2006. The Undergraduate Experience of Blended E-learning: A Review of UK Literature and Practice, York: The Higher Education Academy.

Smidt, E. & Hegelheimer, V., 2004. Effects of online academic lectures on ESL listening comprehension, incidental vocabulary acquisition, and strategy use. Computer Assisted Language Learning, 17(5), pp. 517-556.

Swan, K., 2003. Learning effectiveness: What the research tells us. In: J. Bourne & J. C. Moore, eds. Elements of Quality Online Education, Practice and Direction. Needham, MA: Sloan Center for Online Education, pp. 13-45.

Tagoe, M., 2009. The Relevance of University Education and Fears of Unemployment: Perceptions of University Students Making Transitions to the World of Work in Ghana. In: R. Brooks, ed. Transitions from Education to Work: New Perspectives from Europe and Beyond.. Hampshire: Palgrave Macmillan, pp. 113-135.

Wang, F. & Hannafin, M. J., 2005. Design-based research and technology-enhanced learning environments. Educational Technology Research & Development, 53(4), pp. 5-23.

Warschauer, M. & Kern, R., 2000. Network-based language teaching: concepts and practice. Cambridge: Cambridge University Press.