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Electronic Simulation Collaboration (E-Collaboration) Using Mobile Platform for Higher Education

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Abstract- ***Electronic collaboration has revolutionized academic activities; some have described electronic collaboration as a tool for revolutionized academic performance. In a simple definition, electronic collaboration is the use of electronic devices such as computers and phones for knowledge sharing among people. It cut across different locations and time zones. In electronic collaboration, knowledge sharing is done remotely and is not time-bound. Some institutions in developed countries have been using this tool for academic activities and for improving the academic standard of their students. The purpose of this work is to take electronic learning a step further by making it possible through a mobile phone, which is very common among students. This paper presents a concept that will enable students to share their knowledge and make contributions to one problem or the other. The proposed mobile collaboration software made use of Java technology since it is suitable for mobile applications.***

KEYWORDS: ***Electronic Collaboration, Mobile Collaboration Software, Mobile Phone and Electronic Learning***

I. INTRODUCTION

Definitions of collaborative learning vary. Collaborative learning is defined by the United Nations Educational, Scientific and Cultural Organization as learning that takes place 'when learners work in groups on the same task simultaneously, thinking together over demands and tackling complexities.' Collaborative learning is viewed as an 'act of shared creation and/or discovery and within the context of electronic communication as taking place without members being physically in the same location' (Recabarren, 2009). Simply put, collaboration is a process by which people work together on an intellectual, academic, or practical endeavor. Historically, collaboration took place in person, by letter, or on the telephone.

Since the inception of the Internet and the World Wide Web, collaboration is viewed as an electronic phenomenon that connects individuals electronically via the Internet using tools such as email, online communities, discussion groups, wikis, blogs, podcasting, or through access to sites on the World Wide Web. Electronic collaboration allows collaborators to communicate anytime, from anywhere, to any place. People from different parts of the world, different universities, and/or in different courses can exchange information, collaborate on shared documents and ideas, study together, or reflect on their practices (Watson, 2005).

This Internet-based work allows collaborators to communicate anytime, from anywhere, to any place. People from different parts of a building, state, country, or continent can exchange information, collaborate on shared documents and ideas, study together, or reflect on their practices.

The advancement in information technology has revolutionized the way collaboration is. The entrance of mobile phones to the technology market has given communication a facelift. One of the contributions of the mobile phone, which is mobile internet, has enhanced internet connectivity and made collaboration easier. With mobile phones, students can easily share ideas and knowledge without using personal computers. The revolution in different mobile technologies such as GPRS (General Packet Radio Service), EDGE, 3G and even 3.5 G has added to the speed of accessing information via mobile phones. This paper focused on how mobile phones can be used as a tool for collaboration. This is to enable those who cannot afford personal computers to still have access to electronic collaborative systems for academic activities

II. STATEMENT OF PROBLEM

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The learning in higher institutions is enormous, so it requires extra effort outside the classroom, where students can share problem that borders on academic interest. Before now, the only medium where something like that is done may be through the internet, which is possible or accessible when one has a computer and a modem or service provided through a cybercafé; outside of these, students come together to discuss issues of academic concerns. These options have one or more problems. Like the cost of buying a modem, proximity to a cybercafé, congestion and threats in a cybercafé, lack of awareness on the path of students, etc

III. METHODOLOGY

The design of the proposed mobile collaboration will be based on prototyping software development methodology using an Object-Oriented Programming (OOP) approach. The programming tools will be Java Micro Edition (JME) and Java Server Pages (JSP) with MYSQL for the database. The development will conform to client/server architecture, while the client will run on mobile phones and the server on the Mobile collaboration web server.

IV. COLLABORATION AND RELATIVE CONCEPT

Collaboration is a recursive process where two or more people or organizations work together in an intersection of common goals — for example, an intellectual endeavor (Watson,2005) that is creative by sharing knowledge, learning and building consensus. Most collaboration requires leadership, although the form of leadership can be social within a decentralized and egalitarian group (Spence, 2006). In particular, teams that work collaboratively can obtain greater resources, recognition and reward when facing competition for finite resources.

Lave et al (1991) in their findings claimed that collaboration is also present in opposing goals, exhibiting the notion of adversarial collaboration, though this is not a common case for using the term. Structured methods of collaboration encourage introspection of behavior and communication. These methods specifically aim to increase the success of teams as they engage in collaborative problem solving. Forms, rubrics, charts and graphs are useful in these situations to objectively document personal traits to improve performance in current and future projects (Recabarren, 2009). Electronic collaboration (e-collaboration) is operationally defined here as collaboration using electronic technologies among different individuals to accomplish a common task (Kock et al, 2002). This is a broad definition that encompasses not only computer-mediated collaborative work, but also collaborative work supported by other types of technologies that do not fit most people's definition of a "computer," such as the telephone, which is not, strictly speaking, a computer – even though some of today's telephone devices probably have more processing power than some of the first computers back in the 1940s. Another example is the teleconferencing suite, whose main components are cameras, televisions and telecommunications devices.

A key characteristic of Computer-Supported Collaborative Learning (CSCL) research is its diversity in methodology: Computer-Supported Collaborative Learning (CSCL) researchers apply laboratory experimental methods, quasi-experimental approaches, discourse analyses, or case studies. Qualitative data shows high regard for the use of Computer-Supported Collaborative Learning (CSCL) tools as aides to learning in the classroom (Jakes, 2008). If Collaborative learning is the idea of bringing together learners to work and learn collaboratively (Gokhale, 1995), then Computer Supported Collaborative Learning (CSCL) tools accomplish this task either synchronously or asynchronously. {See Asynchronous Learning} Online collaborative tools provide a central environment for these types of interactions (Hsiao, 1996).

V. RESEARCH FRAMEWORK

In recent times, Nigerian society has experienced tremendous improvement in Information Technology. The boost in Information Technology in Nigeria can be attributed to the introduction of mobile networks into Nigeria in 2002 (Ernest, 2003). Today, mobile phones are virtually everywhere, and the penetration of mobile phones is greater than computer systems. Nearly all students in Nigeria have mobile phones

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compared to the students' population with computer systems. With an increase in the number of mobile phone users in Nigeria, there is a need to tailor the applications to suit the millions of mobile phones.

Fixed internet, which is internet on computers, does not integrate the concept of mobility, while mobile internet does. In today's cyberspace, mobile phones with computer capabilities are now available and affordable; this has made the internet accessible to all and sundry. The main purpose of this study is to take advantage of mobile phones to offer mobile collaboration to students to enhance academic activities

VI. SYSTEM ARCHITECTURE

The mobile collaboration system was based on client/server architecture. In this architecture, the client is the mobile phone, while the server is the web server. The communication method is described below: The client (mobile phone) initiated the communication by sending a request to the web server. The web server, in turn, processes the request and sends an appropriate response back to the client. The client used WAP (Wireless Access Protocol) to send a request to the mobile operator Gateway, while the Mobile operator Gateway uses Hypertext Transfer Protocol (HTTP) to forward the request to the web server (internet). On the other hand, the web server sends a response back to the Mobile Operator Gateway using HTTP, and the gateway forwards the response to the client using WAP. The billing for data usage for the mobile collaboration system is done on the mobile operator gateway

VII. SYSTEM SIMULATION

The NetBeans 6.8 IDE, with the help of Java Micro Edition version 2, is used for the simulation. Starting the application depends on the choice of the user and the system depends on the model of the mobile phone. On most Nokia Phones, follow the steps below:

1. Open the application menu
2. Locate mobile collaboration in the menu
3. Select the application, the login interface appears, and enter the login parameters such as the user's name (i.e., matric number) and the password. The login parameters will be validated; if successful, the mobile collaboration menu appears, else an error message appears. The following diagrams show the screenshots of the e-collaboration interface input and output.

Fig. 1: Mobile collaboration Login interface

After a successful login, the interface that shows all the available mobile collaboration features appears. The interface is shown below:

Fig. 2: Application Main menu

Joining Group

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The developed mobile collaboration application permits students to join a group before they can collaborate. The most important function here is that you must join a group. To join a group, select join a group and press the select button. The interface below appears.

Figure 3: Group joining interface

Select any group and press the join group button, then the interface below appears.

Fig 4: Group joining data form

After filling in all the necessary data into the form, select the join now button. The data will be validated; if any error is found, an error message will be displayed, else the data will go to the database.

Submitting Topic for collaboration

To submit a topic for collaboration, select Submit a topic from the application's main menu. Use the interface to submit the topic, which must be related to your group, or else there may not be any contribution.

Fig 5: Topic submission form

Contributing To Collaborative Topic

To contribute to the current collaborative topic, select Contribute to topic from the application's main menu. The interface below allows you to contribute to the topic.

Fig 6: Contribution interface

The same interface enables you to view the entire available topic in your group.

End User Training

The end user can to successfully use the application without the appropriate training. There are several training methods that can be used; the method that will enhance adequate dissemination of the training information will be utilized. Orientation, user manual and help feature will go a long way in ensuring that the users receive adequate training on how to use the software.

CONCLUSION

In the era where there is advancement in mobile phone technology, with mobile phones that have the power of computers, there is a need to embrace the concept of mobile technology for academic use. In third-world countries, like Nigeria, mobile technology can go a long way in increasing access to academic information and therefore increasing participation in academic activities through the use of Mobile e-collaboration. For instance, 21% of students in academic institutions own computer systems, while 80% own mobile phones; this is an indication that mobile applications will have wide coverage in Nigeria. Internet access is very expensive; cyber cafes, in most cases, are congested and not conducive to academic activities. These have affected students negatively in the area of not being able to take part in electronic academic activities.

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