

ONLINE EDUCATIONAL COLLABORATIVE PLATFORM: DESIGN, DEVELOPMENT AND IMPLEMENTATION

Emejuo N. Chibueze – PhD (In View)

Design Laboratory Unit, Department of Petrochemical,
National Research Institute for Chemical Technology, Zaria, Kaduna State

Umma Aboki -MSc

Swiss Management University

Emejuo N. Lauratta – MSc (In View)

National Open University of Nigeria, Kaduna Study State Centre

Abstract

With the advent of innovation in Information and Communication Technology (ICT), every field of endeavour now have a better and cheaper ways of getting things done within faster period of time. This paper is concerned with the design and development of collaborative platform and social networking for online educational system using ICT tools. Further it records various instruments; for example, chat applets, whiteboard, remote desktop applications, file transfer applets, Email programs which can be incorporated into an educational collaboration platform, with a specific end goal to build the learning methods utilized by students. It likewise intends to address the issue of precisely how vital a part the Internet will play within the future of education. The result of this paper was to provide my University an online educational collaboration platform, which incorporated the tools as documented. The reason for the platform was to encourage student interaction in order to gain knowledge from both their fellow students, and their lectures. Further Non-traditional and non-conventions like Non Governmental Organizations (NGOs) can also use it. Individuals can use it to boost their business.

Keywords: *Information and Communication Technology, Collaborative Platform, Nodes, Whiteboard, File-sharing, Chat, Forum.*

INTRODUCTION

The educational environments for many people include a lecturer and a lecture theatre, with notes being made accessible for the student on the branch of knowledge being mulled over. This sort of educational setting has been in existence for a long time, but now with the development of the Internet and the presentation of new innovations, this environment no more must be seen as the standard for students and instructors. The fate of education will be profoundly impacted by the Internet, and the tools it can provide for us within the learning process. Further, social life in most educational environment particularly the University has reduced radically (Totkov, 2009).

These confinements of social life have influenced a percentage of the students not to know how to relate in the outside world. In National Open University of Nigeria (NOUN) socialization is an issue. This is key due to the distant learning structure of the Institution. Therefore, constructing an effective collaborative platform and a social community site for National Open University of Nigeria will make the University to take care of the issues opposition socialization and lecture barrier. Social community is a social structure comprising of individuals or groups known as "Node" which are tied or joined by a particular sorts of interdependency, for example, student/instructor, people of same ideology, research partners and so on, (Shelly, 2010).

Statement of the Problem

The present setting for learning to student today sees them going to lectures, printing notes off the web, and needing to invest energy finding lectures and/or instructors to answer questions. This circumstance is turning out to be progressively deficient for various reasons, which are listed, underneath:

- Unsuitable physical learning environment.
- Time barrier between student and lecturer.
- Wasted time waiting for e-mail responses.
- Student inhibitions within traditional lecture theatre environment.
- Timetable constraints for lecturer.

The few points listed above motivate this paper. Again the push to this research work is to introduce a new and better platform for educational collaboration. This system is geared towards enhancing student management and lecturers communication. Further, to provide online platform for lectures, presentations and discussions board, especially for socialization in National Open University of Nigeria and other Institutions of learning.

Motivation for the Study

The intention in this research work is to implement a system that is outfitted towards upgrading student's administration and lectures correspondence. Further, to give an online platform to lectures, workshops and suggestions and particularly for making of friends in National Open University of Nigeria.

Aims and Objectives of the Study

The primary objective of this research work is to plan, create and actualize a Collaborative Platform and Social Networking site for National Open University of Nigeria, while the aims of the work include:

- To set up a viable and efficient online communication platform for staff and students.
- To enhance the University internet Lecturing/coaching and real-time file sharing
- To create ease access for the students to communicate with the lecturers and head of departments
- To reduce anti socialism
- To make provision for educative gatherings online to improve learning
- To encourage group reading and research partners online
- To enhance making new friends
- To boast the image of the University

Purpose of the Study

The purpose for this paper is the research of tools that can be incorporated into an online education environment with a specific end goal to enhance the learning process, improve collaboration and social existence of the students of distant learning Institution. It additionally intends to give a working implementation of this environment in order to have it evaluated in an actual working setting in National Open University of Nigeria to improve her value within educational domain.

Significance of the Study

Putting under thought the inefficiencies in the social life of student relationship in National Open University of Nigeria and trouble of the students to come together and take lectures in distant learning educational system. The requirement for National Open University of Nigeria to create an online social networking site and collaborative platform that will handle these inefficiencies can't be over emphasized.

The Internet

"The present Internet is as a result of collective innovations, academic freedom and military need", (Gray, 2009). In 1969 the US military made plans to produce a system that would disable the capabilities of a whole nation with the stroke of a computer key. The military imagined a system that could electronically exchange information down one of countless routes to its destination. They realize system conceivable amid the Cold War when one route was shut, others would be accessible to transmit the information. For the academics, the improvement in communication between Institutions of learning, by sending information via cables such as telephone lines, was what grasped their attention in as much as the Internet was concerned.

The result of the converging of these two needs saw the creation of the forerunner of the Internet called the ARPANET (Advanced Research Projects Agency). During which time a specification for the World Wide Web was designed, making it easy to navigate and to organize information on it, by a man called Tim Berbers-Lee who worked for an organization called CERN in Switzerland (Cerf & Kahn, 2010). The code for this improvement of information organization and navigation, now called Hypertext, was released in 1992. The introduction of hypertext implied that we could join together, or link, information stored on servers around the globe, by a just point and click method, you simply clicked on a hypertext link and it call up the information from the connecting server. The first web program using hypertext was released in 1993, and was known as Mosaic, this was closely followed by Netscape Navigator in 1994, and thereafter by software giant Microsoft's Internet Explorer (Abbate, 2008). In 1994 the Internet began increasing business enthusiasm as its popularity expanded. A noteworthy stride in introduction of the Internet within

the educational system was made in 1998 when the UK's National Grid for Learning recounted its plan to have every UK school connected to the Internet by the year 2002.

From that point forward the Internet has developed to much more explosive proportions. As indicated by Global Research in 2001 the web has developed with an estimated 505 million users around the world, with that figure anticipated that would increment to 793 million users worldwide by the year 2003 and more than 1 billion by 2020, (Beckett, 2008). To get connected to the Internet you must have an Internet capable computer. You register with an Internet Service Provider (ISP) who permits you to interface with their server and from there the rest of the Internet through the World Wide Web. You can get to different pages in the Internet in one of three routes; firstly by typing a known address in the address bar on your browser, secondly by typing a keyword of interest into a search engine such as Google, represented in figure 1 below, this will thus list all the site pages containing the specified keyword. Lastly you can use hypertext to jump from one web page to another by clicking on a link that is of interest to you.

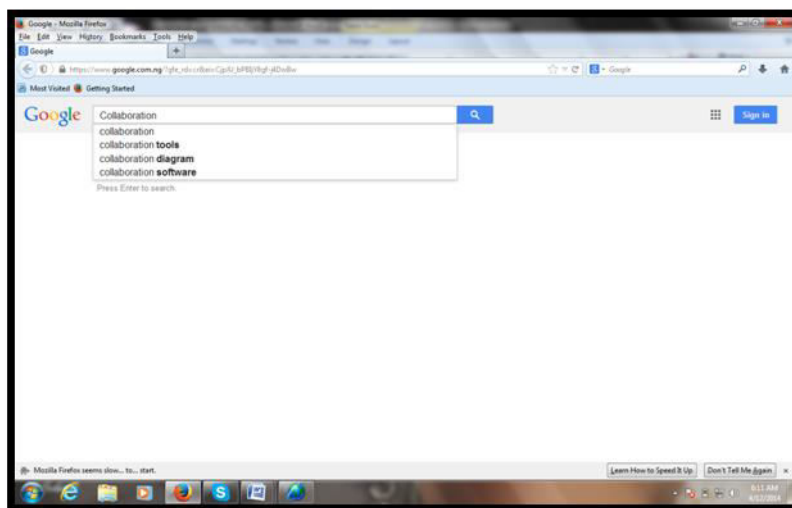


Figure 1 Google hunt page demonstrating a location bar, inquiry field and hypertext join.

The Internet within Educational system

As the biggest resource for accessing electronically transmitted information, the Internet holds numerous benefits for education today. These benefits can range from gaining knowledge from electronically published papers to group conferencing. The Internet globally links together individual stores of information into the largest library of information in the world. The British government has recognized this and has formed the National Grid for Learning, which aims to promote learning through Information and Communications Technology (ICT), in order to enhance and enrich the teaching and learning of the curriculum, (Conn, 2012). What was planned to be accomplished by this was that the advantages provided for education by the Internet would be accessible to both students and teachers globally. Some of the benefits that the Internet can provide education have been described as below:

Access to Data Resources: An apparently unlimited amount of information can be accessed on the Internet both directly through web page access, and indirectly through virtual libraries and search engines.

Exploratory Learning Situations: This is learning through different means than are traditionally used, such as through adventure games, simulators, or virtual learning situations such as operating theatres for medical students.

Collaboration Platforms: The subject of this paper is that the Internet can provide education with tools such as chat rooms, whiteboards, discussion board, socialization and remote desktop incorporated.

Personal Tutoring: The Internet permits individuals from everywhere throughout the world to communicate with each other so personal tutoring online is foreseeable because of the Internet

The Collaborative Platform Components

The system, NOUN collaborative platform, is a web-based application which is broken down into a number of links containing the following key features:

Feature 1: Course Materials

This feature allows the students to access course materials for the module that they are currently studying, within the NOUN integrated platform environment.

Feature 2: Chat Applet

This component permits the student to log on to a chat room to join in on a discussion of the module currently being studied. It is basic tool which gets and sends content to and from different users at the same time.

Feature 3: Whiteboard

The whiteboard permits the student to diagrammatically delineate the points being made in a discussion with the tutor. The whiteboard resembles an average Paint project screen where items can be drawn and pictures put upon it that is shared over a lecture session. It is a method for having a diagrammatical representation that any of the students can add to and control for an examination of thoughts.

Feature 4: E-mail System

This is a structure in which the student can email the lecturer over an issue, and indicate a reply email address so that the lecturer can email them back a solution and lecture schedule.

Feature 5: Document/File Sharing

This procedure handles the genuine transfer of documents, from the sender to the beneficiary. Amid the transfer process, to avoid surging the transfer control protocol (TCP) layer, it is important activate monitoring status, and to permit resumes of file sending if congestion occurs.

Feature 6: Socialize (Forum)

This feature allows students to register to site and then login to the site. Then the students have to send request to their friends. After the request is accepted then they can chat with each other, they can view each other profile, this software has almost all the features which are there in an ideal social site.

Use Case Diagrams

The essence of introducing the use case diagrams to the users was so that the users could see the various interactions that can be made with the collaboration environment in order to accomplish the tasks that were deemed important from the user task analysis. Use case diagrams give the users a diagrammatical representation of the connections that can happen inside of the system from the user's viewpoint. They are made in a notation that is well known to a wide range of users. The use case diagram takes two structures; a high level use case diagram and a series of low level use case diagrams. Use case diagrams expect to permit the prerequisites caught inside of the research phase of the undertaking to be confirmed as right by the proposed users of the system.

High level Use Case

A high level use case diagram demonstrates all the connections which can be achieved by the users. The diagram in figure 1 is the high level use case diagram that was displayed to the users who finished the survey. It demonstrates all the high level interactions users (being a student or a lecturer) can make with the collaboration environment.

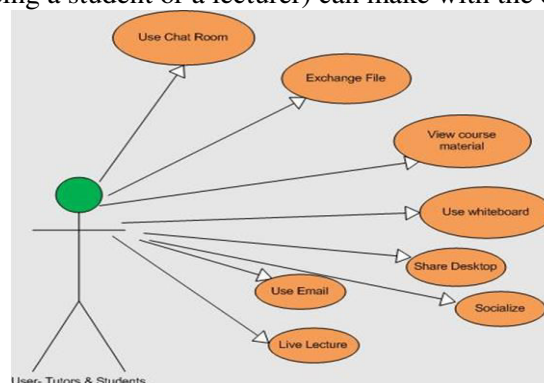


Figure1: Demonstrating the high level use case outline for the collaboration platform

The users who saw the high level use case outline expressed that it was right and this is the thing that they would hope to have the capacity to do inside of the collaboration environment. As the diagram was revised no further corrections were expected to it.

Low level Use Case Diagrams

A low level use case diagram then demonstrates a solitary association, from the high level use case diagram, that the user can make with the collaboration platform in point of interest. The following are the low level use case diagrams interaction identified within the high level use case outline.

1. Chat in Chat Room Use Case

The figure 2 below shows level use case diagram of the Chat Room

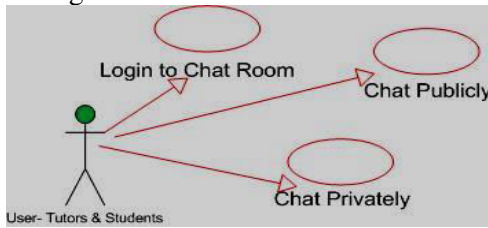


Figure 2: Showing the low level use case outline for the Chat Room

2. Exchange a File Use Case

The low level use case outline for Files transfer is shown in the figure 3 beneath.

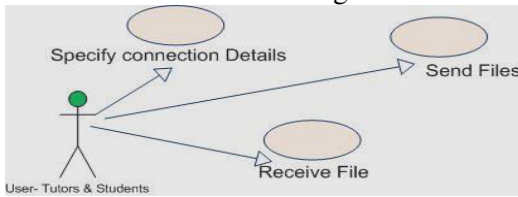


Figure 3: Showing the low level use case outline for the Exchange a File use case

3. View Course Material Use Case

The low level use case outline for the View Course Material is as shown in figure 4 below.

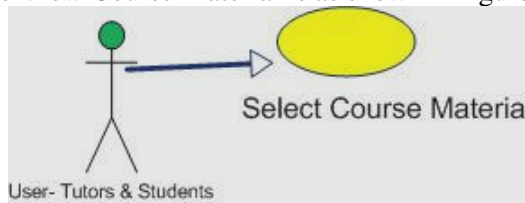


Figure 4: Showing the low level use case for the View Course Material

Although quite a straightforward feature, the researcher felt that it would be more reasonable to expect to have to choose a course material category before actually selecting the course material. The use case presented in figure 5 was created to reflect this request and the users verified it to be correct.

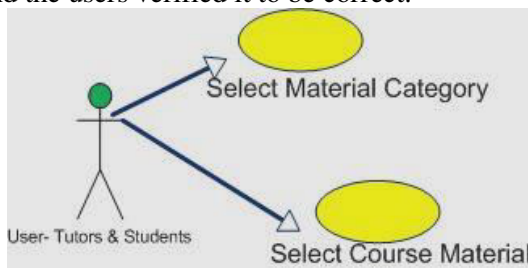


Figure 5: Showing revised low level use case for the View Course Material

4. Draw with Whiteboard Use Case Diagram

The low level use case outline for the draw with whiteboard high level use case can be found in figure 6 underneath.

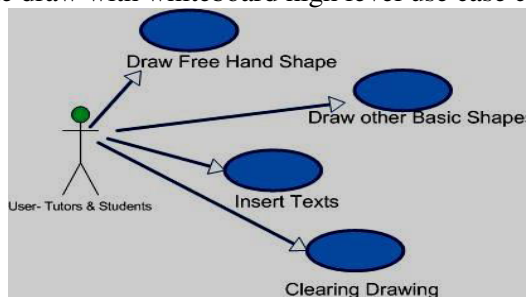


Figure 6: Showing low level use case for the Draw with Whiteboard use case

5. Email Use Case Diagram

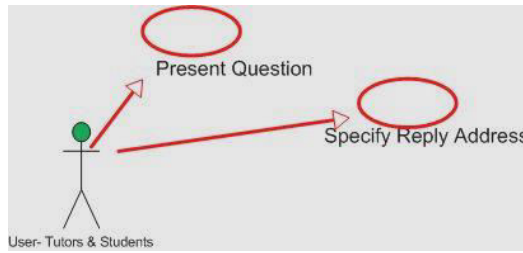


Figure 7: Showing low level use case for the Email use case

6. Socialize (discussion) Use Case Diagram

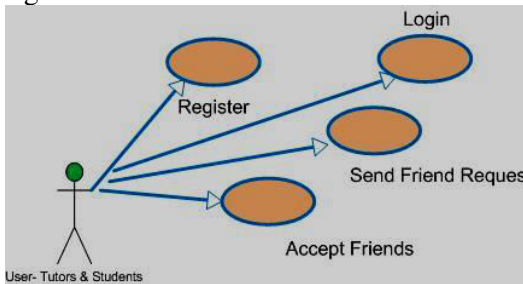


Figure 8: Showing the low level use case for social network use case

SYSTEM DESIGN AND IMPLEMENTATION

The collaborative system has navigational map to enable users navigate around the platform. In table 1 below an overview of the platform is provided, while figure 8 illustrates the flow of processes through the platform.

Table 1 Overview of the Platform

PAGE NAME	DESCRIPTION
Login	Allows the user to log on to the system
Failed Login	Informs user that login failed and to try again
On Line Collaboration Tools	Provides a list of On Line Collaboration Tools, and allows user to select the link of their choice
Home	Brings the user to the National Open University ‘ iClass Home’ page, and thus a reference to the url.
School Tabs	Brings the user to the School environment and allows them to participate in lectures
White Board	Brings the student to the White Board applet and allows view lectures in real-time.
Forum	Brings the student to the Notice Board applet and allows them to post, retrieve and share comments from it as appropriate
Email	Allows the users to select a participant of choice and email them with any comments

The navigation is important at the design phase as it provides valuable communication between the developer and the user (Liegle & Janicki, 2010). Users can better visualize how the platform can be navigated, while the developer can gain a better understanding of the necessary steps in the navigational scheme

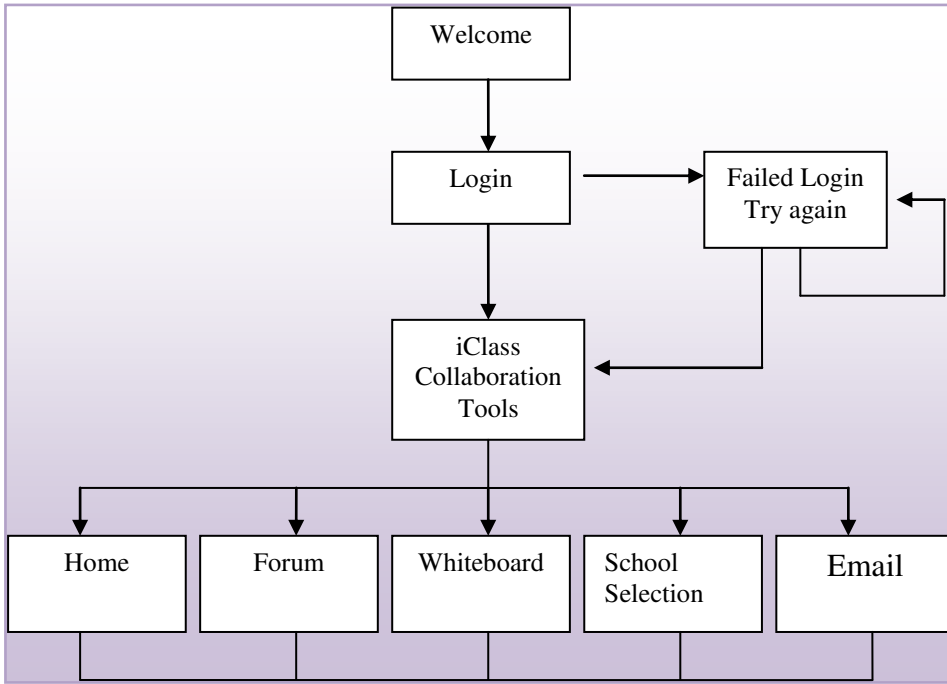


Figure 8: Illustration of the Flow of Processes on the Platform

RESULTING OUTPUT SCREEN SHOTS

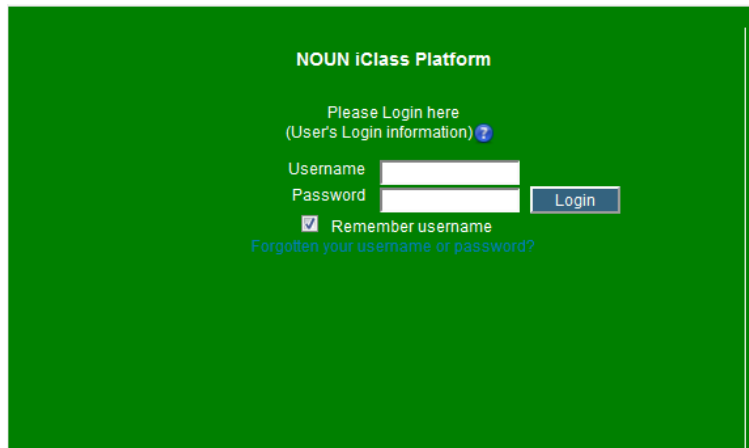


Figure 9: Showing the login form to the collaborative platform



Figure 10: Showing the user interface for the collaboration platform

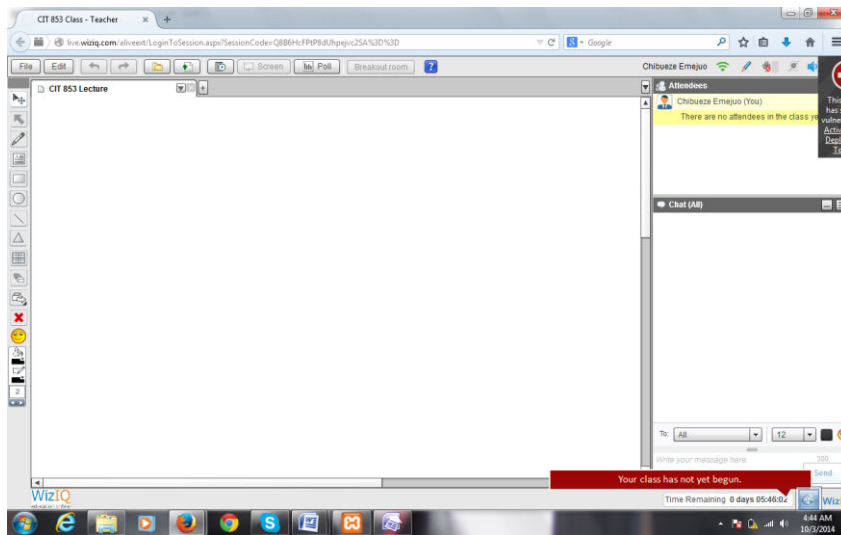


Figure 11: Showing sample whiteboard

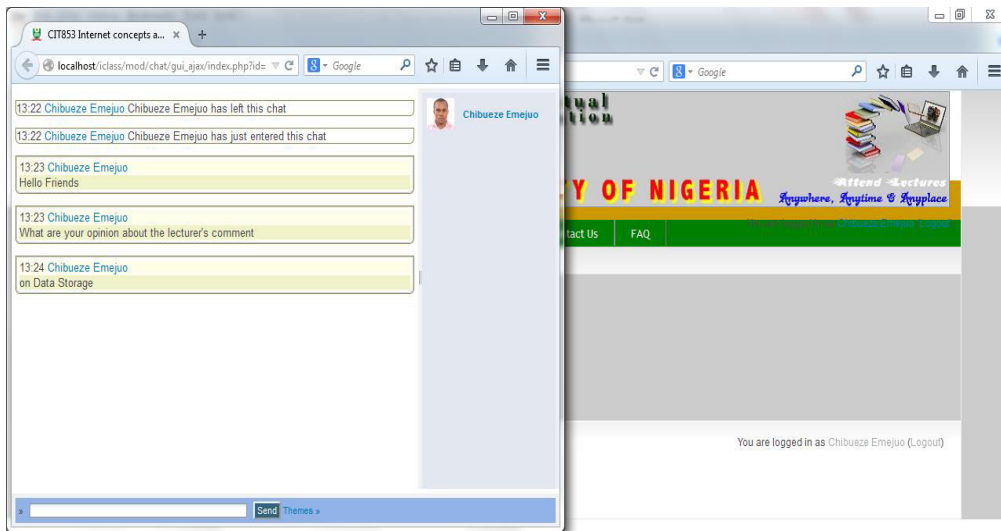


Figure 11: Showing Sample chat applet

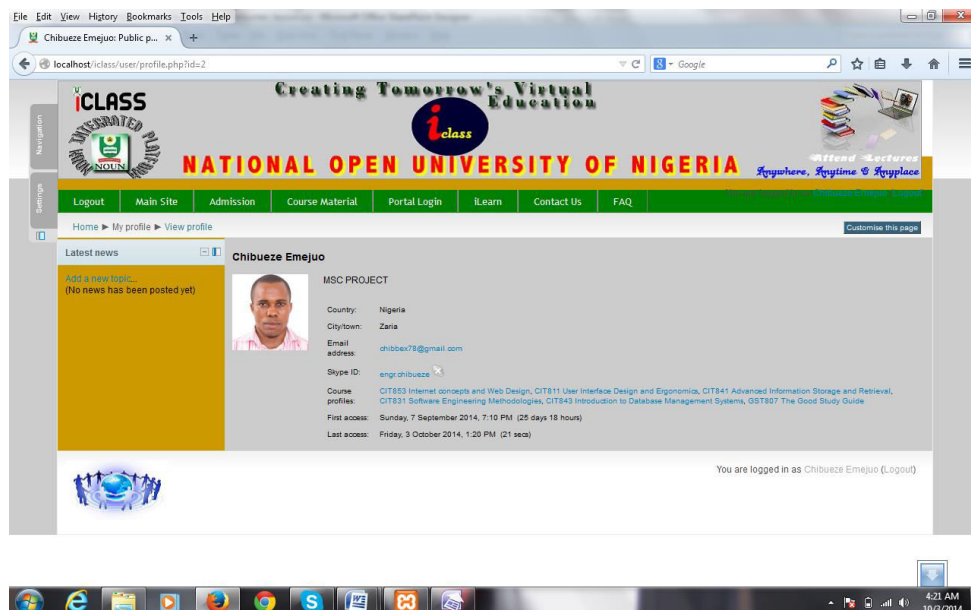


Figure 12: Showing Admin Profile Page

CONCLUSION

A collaboration platform for online educational system is created for National Open University of Nigeria in this research. The platform is capable of delivering the whiteboard for presentation, file sharing, drawing and real-time communication between tutors and student using chat applet, forum for discussion and socialization among students. Further, this research found out that there exist quite a number of collaboration platforms already on the web in various forms. However, the majority of these are for business rather than educational purposes and they do not contain all of the features which would be desirable within an educational collaboration environment (Secker, 2011). Some of the platform researched were called Web-4M, Binary Meetings and STS WebClassroom. Overall the implementation of the platform as indicated in this research, utilizes the most recent innovations in technology. This platform makes education easier for tutors as well as students' and it has made learning and socialization become accessible to millions of people across the world.

Suggestions /Recommendations

It can be firmly prescribed that this platform is received and be used in its original format in the Institution it meant: National Open University of Nigeria, Kaduna state study centre. The utilization is important ensure users adaptability and assess the students' learning results and the accomplishment of the educational plan over the full academic year.

This platform is recommended on the grounds of high demand for education through the entire universe. It has got to be essential that everybody becomes educated regardless of the time, distance and location.

The use of Information and Communication Technology (ICT) tools ought to be exceptionally encouraged in lecture delivery particularly in the Institutions of higher learning in the nation.

Adequate ICT infrastructure facility such as, Internet, High speed computers, and efficient power supply should be put in place for good utilization of the platform.

An on-the-spot assistance should be provided to render technical support for both students and lecturers who use the platform.

REFERENCES

- [1] Liegle, O. & Janicki,T. (2010). The effect of learning styles on the navigation needs of Web-based learners, *Computers in Human Behavior*, Vol. 22, No. 5, pp. 885-898.
- [2] Secker, J. (2011). *Electronic Resources in the Virtual Learning Environment: A Practical Guide for Librarians*, Chandos.
- [3] Shelly, C. (2010). *Discovering Computers Concepts for a Connected World*, London: Book Power Publishing Company.
- [4] Totkov, G. (2009). Virtual Learning Environments: Towards New Generation, *Proceedings of International Conference on Computer Systems and Technologies*, Paris.