

E-Learning: A Tool for Enhancing Teaching and Learning in Educational Institutes

Abubakar Mohammed¹, Sanjeev Kumar², Bashir Maina Saleh³, Aishatu Shuaibu⁴

¹Department of Information Technology, Modibbo Adama University of Technology Yola, Nigeria.

²Department of Information Technology, NIMS University Jaipur, Rajasthan, India.

³Department of Computer Science, NIMS University Jaipur, Rajasthan, India.

⁴Centre for Distance Learning, Modibbo Adama University of Technology Yola, Nigeria.

Abstract – Educational institutions have adopted the use of information and communication technology (ICT) at various levels ranges from communication, examination and even human resource management. This paper explores the use of e-learning in enhancing teaching and learning in educational institutes. The paper is a descriptive research and uses unified modeling language (UML) techniques to provide descriptions and models of e-learning practice in educational institutes. The models were presented using Use Case and Activity diagrams as the results of the study. The models show the interactions based on email interactions, social media (network), computer-based test (CBT), and learning management system (LMS). Finally, the paper recommends that e-learning platforms should be used at various levels of educational institutions, government and education regulatory bodies should enforce the adoption of e-learning in addition to conventional teaching modes, and teachers should be encouraged to share learning materials and tasks to students using electronic means.

Keywords – E-learning, Tool, Enhancing, Teaching and Learning, Educational Institutes.

I. INTRODUCTION

Information and Communication Technology has brought a lot of changes and innovations into various fields. Innovative changes were made in various educational institutes as a result of ICT. Many institutions were using information systems for managing their records both academic and non-academic matters. Some institutions were using ICTs infrastructures in terms of communications within and outside the schools, conduct of examinations, human resource management, etc.

However, one important aspect that is affected by ICTs innovation in educational institutions is the teaching and learning section. The introduction of e-learning platforms has reduced a lot of hardship associated to teaching in various institutions. Teachers find it very easy to share and distribute learning materials to students.

E-learning involves acquisition of knowledge and skills using electronic technologies such as computer and internet ^[1]. It gives an opportunity to access and share learning materials in various formats such as word document, PDF, PPT slideshows, audio and videos for demonstration, chat and messaging forums for interactions with instructors or other learners.

Therefore, this paper will explore the use of e-learning in enhancing teaching and learning in educational institutes. This can be achieved with the following objectives:

- 1) To identify the current practice of e-learning in educational institutes.
- 2) To identify the level of enhancement e-learning made to educational institutes.

II. LITERATURE REVIEW

A. Concept of e-learning

1) What is e-learning?

E-Learning can be viewed as learning through electronic means. It involves acquisition of knowledge and skills using electronic technologies such as computer and internet ^[1]. eLearning enables you to learn anywhere and anytime irrespective of geographical locations.

Before the evolution of internet, distance courses were offered to students on particular skills or subjects. In 1840s, Isaac Pitman usually teaches his students shorthand by correspondence. In 1954, a Harvard university professor invented a teaching machine that allowed schools to manage instructions to students. In 1960s, the first computer based training (CBT) program known as PLATO (Programmed Logic for Automated Teaching Operations) was introduced to the world. PLATO was originally developed for students of Illinois university but later ended up being used by other schools within that area. In 1970s, e-learning became more interesting and interactive as Britain Open University was interested to take the advantage of e-learning. Their educational system was purely on learning at distance. Course materials are usually delivered to students through post and correspondence with tutors or instructors are done through mail ^[2].

However, with the introduction of internet, the university delivered courses materials, educational experiences as well as correspondences to students through emails. More technological advancements were made in 20th and 21st centuries to improve e-learning. These makes schools to deliver courses online and education is widely available and accessible to people regardless of their geographical and time constraints. Business organizations also adopted e-learning platforms to educate and train their employees. This has given workers the opportunities to

improve their industrial knowledge and skills towards achieving organizational objectives.

2) *Benefits of e-learning:*

- i) Flexibility of timing and location
- ii) Improve student-to-student communication
- iii) Improve faculty-to-student communication
- iv) It gives room for different learning styles and methods
- v) Availability and accessibility of course materials
- vi) It reduces the faculty workload
- vii) It gives learners confidence and composure

3) *Categories of e-learning*

E-learning has two (2) categories that enable students to learn from the platform. The methods of obtaining information from e-learning platform depends on the learner's choice on the category to be used. Each of these categories has its own benefits and drawbacks. The two categories are Synchronous and Asynchronous e-learning.

Synchronous e-learning is an instructor-led platform that provide real-time teaching or learning process instantly (online) to students. Both the learners and instructors or tutors must be present during the lesson period. The category uses real-time tool or media such as video conferencing and instant messaging or chat. This makes it possible for teachers and students to communicate and share knowledge or ideas with immediate response. The major benefit of synchronous e-learning is the absence of isolation from learners which makes them more social. But this platform lack flexibility of time^[3].

Asynchronous e-learning is a self-placed learning process that can be done even offline with or without the presence of the teacher or students. Coursework and other learning communications are delivered through the web and email. Students can go through the web and download course materials as well as uploads any pending task. This platform has benefits of flexibility of time and schedules and also improve level of cognitive thinking of the students. The only shortcoming of this platform is that students feel like they are isolated working on their own^[3].

Several studies have been conducted on the area of e-learning system across the globe. In research conducted by scholars on a model for assessing the impact of e-learning systems on the employees' satisfaction, the study explores the means of enhancing employees' satisfaction through e-learning. It also identified various kind of training or teaching activities that are effective to increase employee's learning satisfaction^[4]. Joi *et al*^[5] conducted research that explores the differences between e-learning, online learning and distance learning environments among people. The results of the study revealed the existence of differences and perceptions of users or people on e-learning, online learning and distance learning environments. Dauda *et al*^[6] conducted research towards a model of e-learning in Nigerian higher institutions. The paper was trying to explain the software engineering

methodologies. It does not provide any model for e-learning system.

B. *Learning Management System*

Learning management system (LMS) is an application program (system) developed to manage online courses, share learning materials, and permits collaboration between students and students or between students and teachers^[2]. LMSs are more of web portals developed using different platforms or programs such as PHP, java or .Net. They are usually embedded with a database engine such as MySQL, PostgreSQL, or SQL server.

LMSs are used for both corporate and academic organizations. Corporate organizations use LMS for staff training and appraisal assessment, while academic organizations or institutions uses LMS for teaching delivery and performance assessments of students or learners.

Sharma and Vatta^[7] have identify the following advantages of LMS as follows:

- i. LMS can increase motivation of learners which in-turn will promote learning and encourage interactions among them.
- ii. LMS can provide feedback and support during learning process.
- iii. Access to learning materials is easier and can be done at any time.
- iv. It provides reusability of the learning activities or materials.

Therefore, LMSs are specific programs designed to facilitate and manage administrative task as well as student participation in e-learning courses. This means that, LMS is a system that provides and supports access to online education services for students, teachers, and administrators^[7].

III. **METHODOLOGY**

The paper is a descriptive research that gives insight on how e-learning enhances teaching and learning in educational institutes. The paper uses Unified Modelling Language (UML) techniques to provide descriptions and models of e-learning practice in educational institutes.

IV. **RESULTS AND FINDINGS**

This section provides the findings of the research as well as discusses the results. The section is presented based on the models designed to describe the practices of e-learning in educational institutes. This is presented as follows:

A. *Email Interactions*

In some institutions, e-learning practice is done via email interactions. Teachers or instructors usually send learning and other teaching related materials to students by email. Policies and other regulations concerning school activities are equally sent to both students and teachers by email from management of the school.

These interactions are presented in the Use Case diagrams below:

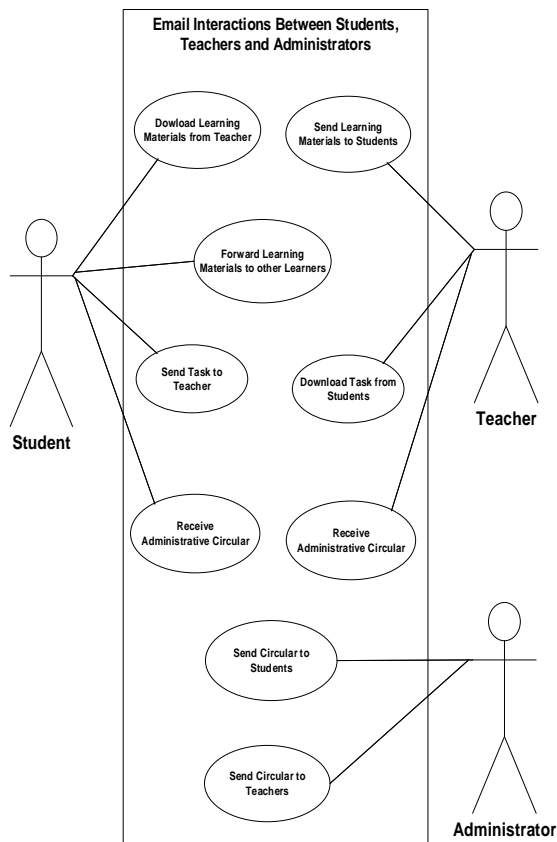


Fig. 1: Use Case Diagram showing Email interactions between student, teacher and administrator.

The Use Case diagram in Fig. 1 describe email interactions in educational institutes. It consists of three (3) actors namely teacher, student, and administrator. The teacher performs activities such as sending learning materials to students, downloading task or assignments from students, and also to receive administrative circular from school management. The student performs activities such as downloading learning materials from teachers, forwarding learning materials to other learners, sending tasks or assignments to teachers, and finally receive administrative circular from school management. Administrator on the other hand performs activities such as sending circulars about school policies and decisions to both students and teachers.

Fig. 2 gives elaborate interactions between student and teacher. The major activities between them are concern with learning materials and task or assignment. The diagram contains extended arrows that depict the extension of activities by the actors.

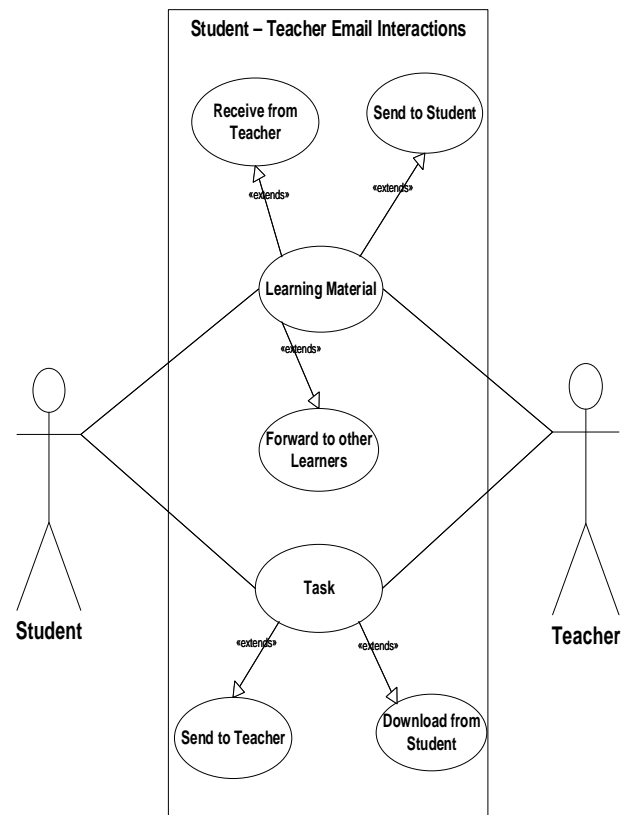


Fig. 2: Use Case Diagram showing Email interactions between student and teacher.

B. Social Media (Networks)

Today, social networks have provided means of communication and learning between teachers and students as well as between students and students. Social networks like Facebook, twitter, WhatsApp, etc are used in educational institutes. Students usually create groups for interactions among them concerning issues related to academic and other administrative issues for the class. Teachers also create group about their courses or subjects and let the students follow it for questions or updates from the teachers. Faculty or department also create group for interactions and inquiries among students and other faculty members.

C. Computer-Based Test

Nowadays, many applications are used in conducting assessments for students. This process is known as computer-based test. Mostly, students will log into the application and start the session. Once the session end, the application will automatically end the session and logout the student. Questions used are mostly multiple choice and fill in the blanks. Some schools adopt the use of these applications especially to large class or common courses. The Fig. 3 below describes the activities involves in CBT application:

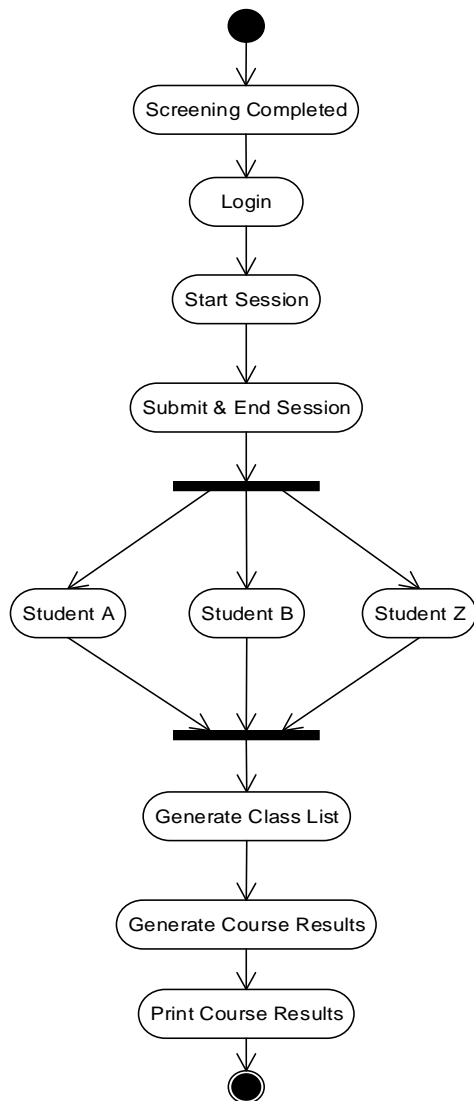


Fig. 3: Activity Diagram showing interactions of stakeholders in CBT assessment or exams

The above figure contains initial state, final state, action state, both transition fork and transition join, and finally control flows. The initial state is used in order to indicate the beginning of activity while the final state indicates the end of the entire activities. The action state used are ten (10) in number.

D. Learning Management System

Some schools or institutions uses learning management system. This is an application that allow sharing of resources between instructors and learners as well as provide platform to assess the performance of learners. The interactions between instructors and learners is presented in Fig. 4 below:

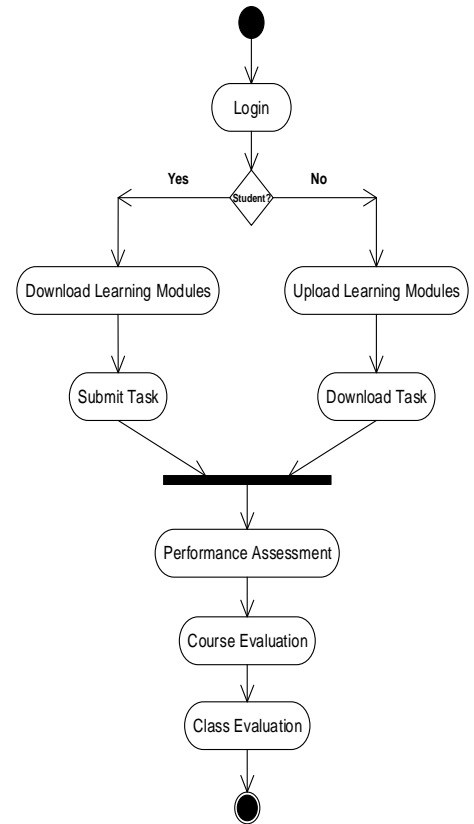


Fig. 4: Activity Diagram showing LMS interactions between students and teachers.

The above figure describes the interactions between students and teachers in learning management system (LMS). Both the students and teachers have to log into the LMS in order to use the application. The students' successful login will lead them to download learning modules or materials as well as submit whatever assignments or tasks that given to them. On the teachers' side, they upload learning modules or any relevant materials for students to download. They can equally download or view any submitted assignment or task by the students.

LMS also gives room for assessment and evaluation as can be seen from the above figure. The teachers can assess the performance of students once they submit the assignment or task given to them. Course and class evaluation can also be done on the LMS. Both teachers and students can have access to these facilities. The students can only view and print the outcome of the assessment or evaluation, while the teachers can assess and grade the performance of the students at individual courses level and the class coordinator or head of department can assess and evaluate the entire class.

V. CONCLUSION AND RECOMMENDATIONS

E-learning is a platform that provide institutions with means of improving teaching and learning activities. It enhances students-teacher relationship and provide students with means of interactions among themselves.

This paper highlighted the importance of e-learning to educational institutions and also describes different levels of e-learning interactions adopted by various schools. The study make the following recommendations:

- 1) E-learning platform should be employed at various levels of educational institutions.
- 2) Government and education regulatory bodies should enforce the adoption of e-learning platforms in addition to conventional teaching mode.
- 3) Teachers should be encouraged to share learning materials and tasks to students using electronic means.

ACKNOWLEDGMENT

Abubakar Mohammed: I appreciate my parents and my beloved wife for supporting me with prayers. I also acknowledge Dr. Sanjeev Kumar for taking part of this research paper as well as guiding me in other research work. Finally, I appreciate Prof. S.K. Das, Prof. A.M. Saddiq, Prof. Arthur Ume, Prof. Abraham Okolo, Dr. A.S. Bashir and Dr. H.G. Muazu for their support and words of encouragements towards research work, thank you all.

Sanjeev Kumar: I appreciate the management of Nims University for admitting research scholars into information technology and computer science. Their contributions to the department is enormous. I also appreciate the contribution of the principal and other faculty members in guiding the research scholars.

Bashir Maina Saleh: I sincerely acknowledge and appreciate the habitual support, prayers, motivations and encouragements I get from my uncle Prof. Bashir Maina and my entire family members. I also wish to extend my appreciation to Mr Ruchir Saxena and my course mates for their assistance in this paper and research in general. To you all, I say thank you and I remain indebted.

Aishatu Shuaibu: I wish to acknowledge the contribution of my husband Prof. Abdullahi Muhammad Saddiq, my late father Alh. Shuaibu Jagab and my mother Hajjiya Aishatu Shuaibu for their prayers, patience, understanding, support and encouragement. I also wish to appreciate my academic mentors; Prof. Arthur Ume, Dr. A. S. Bashir, Dr. H.G. Muazu for counseling, careful scrutiny, constructive critique and shaping my academic talent to its current status. I acknowledge and appreciate the contributions of my colleague Abubakar Mohammed for his assistance in research. Thank you all.

REFERENCES

- [1] Kahiigi, E.K., Ekenberg, L., Hansson, H., Tusubira, F.F. and Danielson, M. (2008) Exploring the e-Learning State of Art. Retrieved from www.ejel.org/issue/download.html?idArticle=67 on 26th September, 2016.
- [2] LLC, Epignosis (2014). E-learning Concepts, Trends, Applications. San Francisco, California, USA. Retrieved from <https://www.talentlms.com/elearning/elearning-101-jan2014-v1.1.1.pdf> on 25th January, 2017.
- [3] S. Hrastinski. Asynchronous & Synchronous E-learning. Education Quarterly 31(4) 2008. Pp51-55. Retrieved from <http://er.educase.edu/~/media/files/article-downloads/eqm0848.pdf> on 25th January, 2017.
- [4] Nima, J.N. and Batool, Z. (2015) A Model for Assessing the Impact of E-learning Systems on Employees' Satisfaction. Computer in Human Behaviour, 53, pp475 – 485. Retrieved from [https:// pdfs.semanticscholar.org/93ed/cce65bcd843bb1b7e2e37efa0a75447a6eb8.pdf](https://pdfs.semanticscholar.org/93ed/cce65bcd843bb1b7e2e37efa0a75447a6eb8.pdf) on 26th September, 2016.
- [5] Joi, L.M., Camille, D. and Krista, G. (2011) E-learning, Online Learning, and Distance Learning Environments: Are they the same? Internet and Higher Education, 14, pp129 – 135. Retrieved from <https://scholar.vt.edu/access/content/group/5deb92b5-10f3-49db-adeb-7294847f1ebc/e-Learning%20Scott%20Midkiff.pdf> on 26th September, 2016.
- [6] Dauda, A. Safiriyu, E. Ditimi, A. and Mohammed, A. (2011) Towards a Model of E-learning in Nigerian Higher Institutions: An Evolutionary Software Modelling Approach. Information and Knowledge Management, Vol.1 no. 1. Retrieved from <http://www.iiste.org/Journals/index.php/IKM/article/view/688> on 26th September, 2016.
- [7] A. Sharma and S. Vatta. Role of Learning Management Systems in Education. International Journal of Advance Research in Computer Science and Software Engineering. Vol.3 issue 6, 2013. Retrieved from http://www.ijarcse.com/docs/papers/Volume_3/6_June2013/V3I6-0456.pdf on 23rd January, 2017.