

Integrating a Chatting Tool into a Learning Management System

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Abstract— the objective of this study was to integrate a chatting tool into a Learning Management System (LMS) at Mbarara University with the purpose of aiding interaction, communication and collaboration among users. Many LMS's are developed far from the developing countries context. Where the developers try to put them close to this context, some functionalities that promote the learning process are unavailable. In such situations the developers forget that some tools that are left out could be of great use to teaching and learning, leaving the system to be more of a content repository and not facilitating the learning process. Therefore this study integrated a chatting tool into a LMS. The functional requirements of the system were gathered through the use of interviews and observation methods. Before the roll out of the system, learners' efficacy with the LMS was tested with a pretest questionnaire. After roll out, the learners were allowed to use the system for a 4 months semester before the post test was carried out. Results indicate that the learners' efficacy with the LMS usage improved. The learners said the LMS increased their interest, motivation, and improved on knowledge and performance of other subjects due to increased collaboration with peers and instructors. The increased use of the system is expected to contribute to the learners' ease of use, learning interest and motivation which will improve their throughput.

Keywords— Chatting, Learning Management System, Interaction, E-learning

I. INTRODUCTION

A Learning Management System (LMS) is software designed to simplify management and delivery of course content and resources to learners, and interactions between learners and instructors [4]. The LMS is responsible for learners' administration like registrations, course assignment, monitor participation and assess performance. The learner is therefore able to access course materials, messaging, notifications and scores generally. In today's era of E-learning, the LMS provides access to education both asynchronously and synchronously to on-campus and off-campus learners. Synchronous communication refers to two way simultaneous real time communications between several parties like chatting, video conferencing, teleconferencing and IM-ing applications which operate within the LMS. Despite their wide usage at

institutions, LMS's focus more on content delivery than on the learner needs, and therefore offer few or no prospect for learners to interact and collaborate [4]. Studies have shown that learning is more effective with interactivity, collaboration and communication features in the LMS [3]. It is therefore important to provide these features to realize better performance and improvement in the learning process. In many developing countries, the use of technology in education has been encouraged by government. In Uganda, for example, educational institutions have adopted the use of technologies to enhance the traditional classroom teaching [1]. Most of the higher institutions of learning have implemented e-learning with limited budgets [5]. The challenges with the current methods for e-learning software acquisition may not favor higher institutions of learning with limited budgets [1]. Due to this challenge, many tools that should facilitate learning are left out during the LMS development. This phenomenon prohibits the developing country learner from enjoying all the LMS benefits like online interaction, communication, collaboration and chatting between users. As a result, learners are unable to easily interact and exchange ideas about topics learnt in class within the learning environment. As noted by [4], the interaction features can be integrated in the existing LMS without necessarily rebuilding it to improve interaction between learners and instructors. The study therefore sought to integrate chatting into the LMS which had been developed without one initially.

II. STATE OF ART AND PRACTICE

For learning in a digital learning environment to be effective, integration, communication and collaboration are important [3]. Collaboration with teachers and other learners is often a key feature of effective learning environments. Online discussion activities, which are a communication hub of an online teaching program, can develop a collaborative environment and reduce the alienation of learners studying at a distance [2]. Discussion activities are used to support asynchronous learning and can be text or voice based.

Despite the several benefits of LMS's, there are challenges in their implementation in Developing Countries. [6] Identified

challenges of e-learning implementation in a Pakistani University. He identified technical difficulties like installation, availability of latest technology, fast Internet connection, uninterrupted supply of electricity, maintenance, administration, security and absence of technical support for implementation and maintenance of ICT. Other challenges include access to computers, English competency, need for face to face interaction, and level of awareness, Computer Literacy, Resistance to Change, Student Assistance, Privacy and Security. [8] Identified infrastructure of technology, students' competence, technology satisfaction and instructors' motivation as challenges. The researchers further listed poor strategies, high cost of technology, resistance to change, competition and poor delivery of courses as some of the causes of implementation failure. In Tanzania [7] identified Lack of systemic approach to ICT implementation, development in new technologies, Awareness and attitude towards ICTs, Administrative support Lack of ownership, Technical support, Transforming higher education, Staff development and Inadequate funds as some of the challenges of LMS implementation at a university. Lack of knowledge of ICT and little support, instructors' attitudes and teaching styles, student motivation, student technical competency, student-student interaction, ease of access to the technology, infrastructure reliability, and lack of support are challenges identified by [10]. Therefore with these challenges in developing countries, it is important to improve the existing LMS's to enable more usage and improvement in the learning process.

III. METHODOLOGY

We specifically reviewed literature on development and implementation of LMS's within the developing country's context and observed the current system at the university to identify the functional requirements. After developing the tool using the requirements, it was integrated into the LMS using PHP and MYSQL as front end and back end respectively.

The functional requirements were determined by collecting data through interviews from a cross section of 36 participants that include 20 learners and 16 academic staff at Mbarara University. Purposive sampling was used to select the study population as it bases on the knowledge of a population and the purpose of the study. The identified system requirements include the ability for both learners and instructors to chat; invite new chats from offline users, and ability to upload content for learners. The requirements were the basis of developing and integrating the chatting tool into LMS.

Three phases of design including Conceptual, Logical and the Physical design stages were used. In the architectural design, the System was divided into Sub – systems, which were developed separately and later integrated in a format of Front End, Middle Tier and Back End. The User view Sub – system- is the part of the System that allows different categories of users to interact with the System according to the type of privilege assigned to each of them. It consists of Graphical User Interfaces which were designed according to user needs and the data to be tracked. It consists of buttons and menus through which users can interact with the internal part

of the System. User information was captured and viewed through the interfaces. These interfaces have a provision for handling user exceptions, by way of error messages. The security subsystem enhances security of the system. In order to log on, a user requires a password, provided by the administrator who authorizes access.

System implementation was achieved using Microsoft windows platform, using Apache server, Standard Query Language (MYSQL) and PHP scripting language. MySQL was used for the backend database design and PHP scripting language to develop the codes that link up the system interfaces and the database. The database "must_chat" contains twelve tables which make up the database schema that keep records or data as entered by the user. The database stores user details, images and other specifications and user attributes. PHP was used to implement the middle tier because it is platform independent, fast, Stable, Secure, Simple and works better with MYSQL. Once the application is installed, any authenticated user can access it from any work station by using the hypertext transfer protocol, server name, and port number.

Before the roll out of the enhanced system, a pretest was conducted to check the learners' prior knowledge using the LMS, performance and efficacy with technology. The system was then rolled out for use for a period of a 4 months academic semester. In the validation process, e-learning experts interacted with the system and provided feedback on its performance. The system was validated using review meetings to ensure that specified requirements were met. The researchers asked experts from both Mbarara University and Makerere University Business School if the new system met the intended functionalities like chatting and other discussion modes, report generation, notes upload among others.

IV. RESULTS

The chatting tool was developed and integrated in the LMS. The developed tool has a two tier architecture with the database server and graphic user interface. After learners used the system for a period of 4 months, a post test was carried out to test for efficacy, performance and change in prior knowledge. In terms of efficacy, the system increased the learners' interest and motivation to use the LMS for other functions like content management, assignment submission, online tests and instructor communications. In terms of performance, the instructors reported that learners were more involved in the learning process, increased participation and overall performance in online assessments. The instructors and learners also reported that they were more comfortable with the functionalities of the LMS like uploading notes and assignments, discussion, collaboration, communication among others. Therefore there was an increase in learners' knowledge of using the LMS.

Communicating effectively and timely was addressed by communications tools which include the following;

- Write: One-way communication with another user currently logged into the system.
- Wall: One-way communication with all other users currently logged into the system.

TABLE 1 Validation Results

Test Description	Test Data	Expected Result	Actual Result	Passed /Failed
Chatting	User (Asaph) initiating chat	Asaph (from computing and Infomatics) says: Hello	Asaph (from computing and Infomatics) says: Hello	Passed
Offline users	Click on user to invite him/her for a chat	Invited to must chat room, login with credentials	Invited to must chat room, login with credentials	Passed
Posting on blog	Posting comment	Posted by: Name, (email), date and time.	Posted by: Name, (email), date and time.	Passed
Content upload	Uploading notes	Successfully uploaded , learners have been informed	Successfully uploaded , learners have been informed	Passed

- Talk: Interactive two-way communication with another user currently logged into the system.
- msg: Message reception (talk and write) from other non-root users currently logged into the system.
- motd: Message of the day received by users when they log into the system.
- Pre-login message /etc/issue: Displaying the message on a terminal at time of login. Users do not have to log in to see this message.

The screen shots indicate that there is interactivity, communication and collaboration between the users of the system. The new system is therefore able to do the following:

1. Capturing of information being exchanged in learners' chat room and on blog as opposed to the previous system.
2. Retrieve Information from the database because learners download course materials uploaded by teachers.
3. Authenticate the users with the access control facility to prevent unauthorized users from accessing the data.
4. Allow users to post comments on blog thereby increasing user interaction with the system and student-teacher-system interaction.

5. Validate the entries by prompting the user whenever a wrong command is entered to avoid unnecessary errors that can distort information.
6. Update the database whenever new information is entered. The system provides for changes that the user makes in different areas.

The learning process needs techniques and tools to present the knowledge from different resources, interact with it and share it with others. The benefits of integrating chatting in the LMS include interactive technologies, communication systems, and the potential to transform the teaching and learning processes. Other benefits include learners learning effectively through discussions, question asking, explanation and justification of opinions, articulation of reasoning, and elaboration and reflection upon their knowledge. Basing on the findings and analysis, integration of chatting into LMS is venture worth investing in. In this context, this is an important tool to achieve the learning goals. The results show that there was an improvement in the learning process. It agrees with studies carried out with previous research. Positive students' attitudes toward inclusion of e-service in LMS were realized by [9].

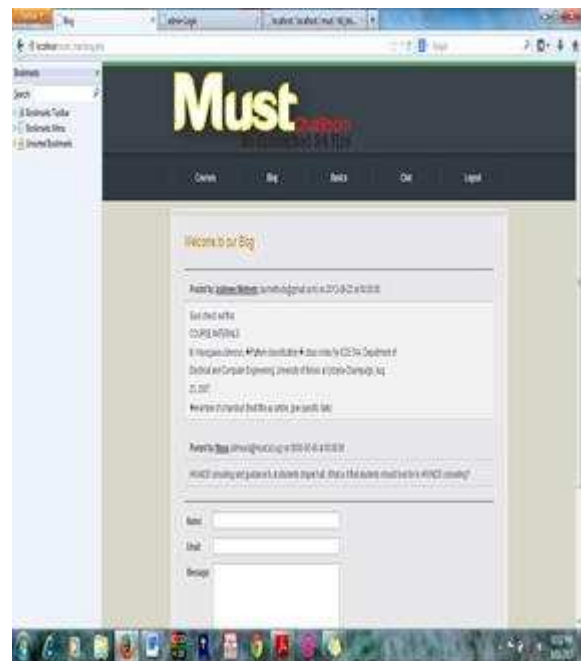


Figure 1: Users Blogging

As a result, this study integrated a chatting tool that could enable discussion between learners and learners, learners and instructors and instructors with instructors. The philosophy behind this study is that today's learners need to follow their own trails of interest, scaffolded by instructors, peers and tools for thinking and learning. The implications of this study are that, learners are capable of learning and could develop themselves anytime, anywhere with the facilitation of technology.

A. Contribution of the Study

This study was carried out in Uganda which is a developing country. It is important to note that developing countries are commonly referred to as the disadvantaged economies due to low economic growth. Such developing countries are struggling to acquire a flexible economy. However, a flexible and innovative economy requires permanent adaptations of knowledge, skills and attitudes that may not be obtained from traditional classroom teaching alone. The developed tool in this study, aimed at producing self-directed flexible and innovative learners that are capable of learning throughout their life time. Since producing self-regulated learners is a complicated and a long-term task, this study is a step in contributing to effort of producing learners for life.

Further still, the current global exponential growth of information is making it imperative for learners to grasp learning contents more quickly. The integration of chatting into a LMS and the devising of methods of its effective usage is paramount for the acquiring of knowledge and skills and could be regarded as a resource needed for the knowledge economy. This study results hence serves as a practical guide for educators and decision makers while planning resources needed for the implementation of E-learning systems. More so, this study also serves as an effort to raise awareness among online instructors, management and researchers of need to give attention to the tools that are essential for creating effective learning.

B. Limitations and Recommendations

The researcher believes that, in order to maximize learning performance in a fully online learning environment, learners' demographical factors and situational variables need to be put into consideration. In the same perspective, learners' psychological and social factors that may include; learning efficacy, enjoyment, skills, habits and experiences could also impact on their behavior. This study didn't examine these characteristics hence future studies should examine the effects of these factors.

The advent of ICT and the Internet has greatly influenced the way knowledge is transmitted. This has resulted in the system in which chatting is integrated to make the systems more interactive and collaborative. Research has shown that many higher institutions of learning are still lacking a number

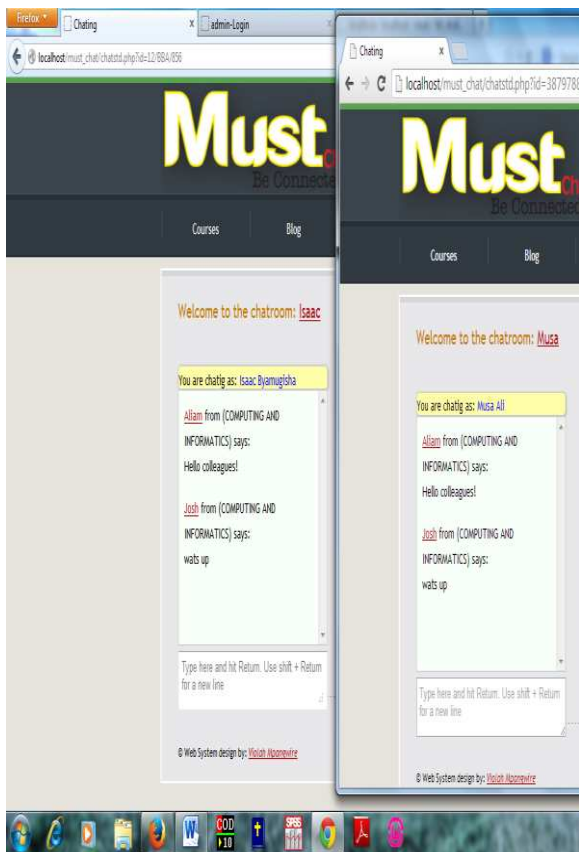


Fig. 1. Chat room for users

In figure 1, Asiimwe Methods and Musa Ali posted on the blog. The system displays user posts on the blog and allows other users to participate in conversations on the blog by putting their name, email and message or information to be posted. In figure 2, users Isaac and Musa are able to view what Allan and Josh have posted on chat. The system allows Isaac and Musa to participate in the chat. This communication shows the two users chatting effectively.

V. DISCUSSION AND CONCLUSION

The effective use of LMS is essential for the utilization of a variety of pedagogical and technological approaches that are paramount for the dissemination of knowledge, skills and competencies across learners from diverse social and cultural backgrounds. Much as E-learning use has created reasonable progress for teaching and learning for learners of developed nations, those of developing ones are still struggling to make use of; open E-learning resources, open access journals, learning objects, and open source software. Studies have shown that much as economic factors are highly contributing to this effect, other issues like contextualization, customization and parameterization are equally essential. This study, showed that poor customization of LMS for the developed countries learners is a critical failure factor for the utilization of LMS.

of vital functionalities in their e-learning portals. Therefore more research is still required for both learners and instructors to appreciate the use of interactive features in LMS in the learning process. A more comprehensive study to exploit the full benefits of integrating chatting into LMS is highly recommended. This may be able to unveil more gaps and therefore improve on the designed system.

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