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INTEGRATING LEARNING MANAGEMENT SYSTEM FOR TEACHING AND LEARNING IN NIGERIA TERTIARY INSTITUTIONS: A NEED FOR 21ST CENTURY EDUCATION

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Abstract

The emergence of sophisticated communication technologies and mobile devices in this era of 21st century is transforming the mode of instructional delivery to learners across the globe without the need to meet in a physical location. Hence, this paper examines the Integration of Learning Management System (LMS) for Teaching and Learning in Nigeria tertiary institutions: A need for 21st century education. Functions of LMS include: management of courses, tracking students' attendance, online continuous assessment, tracking progress, managing users' role, user feedback, grading, communication tools, social connectivity, security and privacy, and ubiquitous access. Integrating LMS for teaching and learning in tertiary institution is possible through course instructional delivery which will foster more interaction among students and instructors than in large lecture courses where they meet physically. However, this can be achieved through the development and implementation of course contents using pedagogical model, using Moodle for various courses and implementation of salient features. It was concluded that; LMS is a great way for teachers to deliver, manage and organize course materials. From a pedagogic standpoint, using Information and Communication Technology tools to develop engaging activities makes learning process more enjoyable for students. However, it was suggested among others that; there should be provision of well-built technology infrastructure for LMS to be fully utilized and there is need for academic staffs to acquaint themselves with the use of LMS as a tool for enhancing teaching and learning in all tertiary institutions in Nigeria.

Keywords: Learning Management System, Teaching, Learning, Tertiary Institution

Introduction

Just as a building is transformed to a new look after undergoing renovation, there is no reservation in saying that the utilization of technology isrenovating the way education is delivered to people worldwide. Living in the twenty-first century entails engaging with the outside world, where the old idea of formal learning, which takes place in a specific physical location, is becoming more irrelevant. In cities or places where most tertiary institutions are located, the internet is readily available and accessible. The stand-and-deliver approach to education, which sets attendance hours, learning places, and modalities of engagement, is dissatisfying modern learners. With the advent of advanced communication technologies and mobile devices, a new generation of information consumers may now fulfil their knowledge needs without having to meet in person. Software manufacturers, open-source developers, and educational institutions are responding to this trend by adopting technologies that make it easier to organise teaching-learning activities (Turnbull, Chugh, & Luck, 2019), allowing students to engage in more efficient and distant learning.

Globalization and internationalisation are important aspects of education in the twenty-first century. Any technological advancement provides theoretical frameworks and actual insights into the growth and improvement of students' and instructors' knowledge, abilities, and attitudes (Abao, Dayagbil, &Boholano, 2015). Self-direction and the capacity to cooperate with people, organisations, and machines are both required skills for 21stcentury learners (McCoog , 2008).

At the turn of the millennium, the term "21st century learner" was coined to describe a certain sort of learner who had a set of "new" 21st century abilities that were firmly linked to digital technology, digital communication, and conceptions of flexible approaches to knowledge (Hirschman & Wood, 2018). These shifts in perceptions of the 21st century student have resulted in a shift in how a student is perceived, with the student now emerging as a self-determined, autonomous 21st century learner and patriotic citizen. In many respects, the term "21st century student" has come to symbolise the reforms that some believe are required in schools to meet the needs of a quickly

changing globalised and digital world. Such changes need new learning methods, skills, knowledge orientations, and pedagogies.

Students, particularly those in higher education, are increasingly using computers and other electronic devices in their everyday lives. It is increasingly unavoidable that E-learning components based on the computer environment be included in teaching and learning approaches (Martin & Madigan, 2006). Teaching in an E-learning environment may help with the capacity to teach, the capacity to learn, and, most importantly, the capacity to bridge the gap between the instructor and the student in the classroom (Cavus&Alhih, 2014). E-learning offers learners with a variety of learning settings, including dynamic, interactive, nonlinear access to a broad range of material (text, images, and animation) as well as self-directed learning via online communication such as e-mail and forums (Kotzer&Elran, 2012).

Learning Management Systems should be used in the teaching and learning of different courses at tertiary institutions as one of the new technologies that may ease the offering of courses across great distances. This is due to the ever-changing culture we live in, where individuals in learning environments are expected to adapt to changing circumstances. However, the advantages of using a Learning Management System in a higher education setting are critical. Students and instructors may utilise the materials again and again (Montrieux, Vanderlinde, Schellens, &Marez, 2015). As a result, this paper discusses the integration of Learning Management Systems (LMS) for teaching and learning in Nigerian tertiary institutions: A need for 21st-century education.

Overview of LMS

Learning Management System (LMS) is described by Vijayalakshmi (2019) as a software programme or Web-based technology that is used to organise, execute, and evaluate a particular learning process. A Learning Management System, in most cases, allows an instructor to generate and distribute material, track students' involvement, and evaluate students' performance. Students may also utilise interactive features like threaded conversations, video conferencing, and discussion forums using LMSs.

A Learning Management System (LMS) is a software application that is used to manage, record, monitor, report, automate, and deliver educational courses, training programmes, and learning and development programmes

(Ellis, 2009). The LMS idea was born out of e-Learning. Despite the fact that the original LMS was developed for the higher education sector, the bulk of LMSs nowadays are geared toward the business market. The biggest category of the learning system market is Learning Management Systems. The LMS was initially introduced in the late 1990s (Davis, Carmean, & Wagner, 2009). These systems have been dubbed Course Management Systems, Virtual Learning Environments, Collaborative Learning Environments, and a variety of other titles during their development. Despite its name, the software has a comparable set of features, such as ways for managing users' roles and course information, online communication, grading, and web-based or blended material delivery. There are prominent commercial tools like Blackboard and WebCT, as well as open source solutions like Moodle and Sakai, in this category (Lonn, 2009).

According to Watson (2007), a Learning Management System (LMS) controls, monitors, and reports on interactions between the student and the material, as well as between the student and the instructor. Although each LMS package has its own set of features, some features are shared by all LMS, such as the ability to create class rosters (student records), control over registration processes, and the ability to create waiting lists, uploading and managing curricular content documents, delivery of course content via web-based interfaces, and most often allowing remote participation by the instructor (Brown & Johnson, 2007). Automatic enrollment and reminders for mandatory courses, options for manager access, such as approval of materials or participation, integration with human resource systems for tracking employment eligibility, performance goals, and other corporate priorities, and control over access and class groupings based on a number of metrics (Ellis, 2009). As a result, at an academic institution, a well-managed information flow may lead to higher academic standards and better equity.

The majority of today's LMSs are web-based. AICC, xAPI (commonly known as "Tin Can"), SCORM (Sharable Material Object Reference Model), and LTI are some of the integration options for embedding content into LMSs (Learning Tools Interoperability). LMSs were meant to be locally hosted on-premise, which means that an organisation will need to buy a licence for a version of the program and installs it on their own servers and network. Many LMSs are now available as SaaS (software as a service) solutions, with hosting handled by the vendors (Lin, 2015).

Lecturers and instructors may use the LMS to design and integrate course materials, describe learning objectives, align content and assessments, monitor students' progress, and build customised tests. Learning goals may be communicated and learning timeframes may be organised using a Learning Management System. The advantage of a Learning Management System is that it distributes learning materials and resources directly to students, and it may also reach out to underserved populations via custom settings. Customizable elements, such as evaluation and tracking, are implemented into such systems. As a result, learners can observe their progress in real time, and instructors can track and convey the success of their teaching (Long, 2004; Wang, Woo, Quek, Yang, & Liu, 2011). One of the most essential components of a learning management system is the attempt to simplify communication between students and teachers. Apart from supporting online learning, measuring progress, offering digital learning tools, managing communication, and maybe selling material, such systems might be utilised to offer a variety of communication functions (Chaiprasurt, Chantorn; Esichaikul, Vatcharaporn ,2013). The following part, however, goes into the specific operations of LMS.

Functions of LMS

A reliable, high-quality LMS is an essential component of any online course's success, and it has the power to make or destroy an institution's reputation in the increasingly competitive education industry. LMSs must support timely and accurate communication between learners, course facilitators, and other institutional stakeholders in addition to providing material to learners. The following are the qualities of LMS that make it so unique for teaching and learning activities so much that it should be incorporated into a higher learning environment for successful teaching and learning:

Managing courses, users and roles

The LMS may be used to produce organised, professional course materials. Text, photos, tables, links, text formatting, interactive exams, slideshows, and other elements may be added by the instructor. Furthermore, multiple sorts of users, such as lecturers, students, parents or guardians, visitors, and editors, may be established (hierarchical order). It can allow you to select which materials a student has access to, monitor their progress in class, and communicate with them using contact tools. Lecturers may create and

administer courses, as well as enroll students or set up self-enrollment, see student reports, and import students into their online classrooms (Schoonenboom, 2014).

Online continuous assessment and tracking students' attendance

Teachers may use a learning management system to generate personalised assessments for their students, which can then be accessed and submitted online. Multiple question formats, such as one/multi-line answers, multiple choice answers, drag-and-drop order, essay, true or false/yes or no, fill in the gaps, agreement scale, and offline assignments, are supported by the platforms. LMSs may also provide learners with real-time information about their progress in a course, as well as appropriate comments from the teacher/instructor. Administrators may examine attendance and records of whether a student attended, came late, or missed sessions and activities in certain LMSs that allow for attendance management and integration with classroom instruction (Long, 2004).

User feedback

The LMS can allow students to share their opinions with professors or other lecturers as well as their coursemates. Lecturers may form discussion groups to enable students to provide input and boost class participation. Students' feedback is a tool that instructors may use to enhance their work, determine what to add or delete from their courses, where students feel more at ease, and how they may feel more involved (Davis, Carmean, & Wagner, 2009).

There are other features that are likely to be present in most high-grade LMSs (Darren, Ritesh& Jo, 2019). They are outlined as follows:

Tracking progress

Learners' attrition is a problem that many institutions face. Because of the absence of face-to-face interaction in an online setting, learners have been shown to be more likely to drop out of programmes. As a result, the ability to measure user involvement in a course is seen as a crucial element of an LMS. Log-on frequency, time spent in various portions of a course, communication exchanges, and the quantity of materials downloaded are all examples of user tracking statistics. Course facilitator or lecturer may notice any student's performance weaknesses and intervene before the course is withdrawn or terminated using suitable reporting tools (Darren, Ritesh& Jo, 2019).

Grading

Grading in LMS simplifies the distribution of assessment information to students. Individual assessment scores, teacher comments, and student attendance are examples of such functions. This category includes the ability to construct a cumulative grade point average and a grade point average, as well as reporting information such as class grades, item score analysis, and at-risk student information tools (Darren, Ritesh&Jo, 2019).

Communication tools

Within LMSs, communication tools may be categorised as synchronous or asynchronous. E-mail, discussion forums, and Wikis are examples of asynchronous technologies that offer one-way communication. They are often chosen by course facilitators since they may be started on the go. Synchronous tools, on the other hand, are two-way communication devices that allow for real-time data exchange. Instructor-led videoconferences and interactive message boards are two examples. This last category of communication tools is often seen as critical for duplicating conventional classroom-based conversations and building a feeling of community among online students 'tools (Darren, Ritesh&Jo, 2019).

Social connectivity

The absence of natural community in online learning is one of the most common critiques of LMSs. Discussion boards, live chats, and videoconferencing facilities, as covered in the preceding section, are examples of features that attempt to imitate a social environment online. Some LMSs also contain capabilities that track learners' interactions with communication tools, which are particularly useful in courses that need class participation as an assessable component tools (Darren, Ritesh& Jo, 2019).

Security and privacy

The efficiency of an online course relies heavily on security and privacy. User authentication, access verification, password integrity controls, and intruder detection are all important security elements in LMSs. Privacy measures are also necessary to guarantee that sensitive information is only shared with those who need it (Darren, Ritesh, and Jo, 2019).

Ubiquitous access

LMS encourages ubiquitous access to learning. As people are becoming more reliant on their cell-phones to access the Internet, it stands to reason that online course participants will need to use their mobile devices to engage with LMS course settings. With ubiquitous access, learning can occur both in the

classroom and other places where people interacts with each other such as in libraries, homes, workplace, playgrounds, museums and nature (Suartama,Setyosari, Sulthoni&Ulfa, 2020).Most LMS providers provide responsive Hypertext Markup Language (HTML) pages that are viewable on most smartphones and other mobile computing devices, resulting in ubiquity (Darren, Ritesh&Jo, 2019). Ubiquitous access to learning can be developed using Moodle LMS. Learning activities that are more engaging and adaptive can be created through ubiquitous learning environment (Suartama,Setyosari, Sulthoni&Ulfa, 2020).

Using LMS for course content delivery in tertiary institution
Students may study their numerous courses from wherever they have an internet connection and a computer. Students may work at their own speed, join debates on the bulletin board threaded discussion sections at any time, and interact with classmates, instructors, and lecturers from afar in self-paced learning modules. Using a Learning Management System to teach and learn at a tertiary institution will encourage greater interaction between students and instructors than huge lecture halls. E-learning can accommodate a variety of learning styles and facilitate learning through a variety of activities, develop internet and computer skills that will benefit learners throughout their lives and careers, successfully complete online or computer-based courses, build self-knowledge and self-confidence, and encourage students to take responsibility for their learning (Pandey & Pandey, 2009). Learners may skip through or test out of subjects they have previously mastered, focusing their attention on areas with fresh knowledge and/or abilities (Kalogiannakis, 2010). Based on these, the utilization of LMS for teaching and learning courses offered in Nigeria tertiary institutions can be achieved. Mahalakshmi and Suresh (2014) opined that the achievement of teaching and learning of a course can be achieved through the development of course content for LMS and implementation. The approaches to achieve this development are discussed as follows in full details.

Development of course contents for LMS and implementation
**A.	Development of course content for LMS using a pedagogical model**
    a.	Learning though LMS is a new paradigm of learning. So, a pedagogical model considered as a basis may give a lot of clarity to begin with.

b. Pedagogical basis may help in filling the gaps between the steps in the procedure. In essence, a smooth implementation can be rendered by the 'vision' gained from the proven pedagogical basis.

c. Any future modifications or upgrading of a course is facilitated by the sound pedagogical basis

d. Any research outcome in pedagogy can be utilized in the enhancement or in the future evolution of the system.

B.   Course content through Moodle for various courses

LMS Moodle can be integrated in a developed website to administer various courses in different faculties through LMS Moodle with a vision to empower students with improvement in 'Learning Outcome'. For instance, if the first course to be taken is on a particular topic, it will have 3 modules depending on the content size. Each module can be implemented using Gagne's Model (Selvam, 2012). The implementation for each of the steps of Gagne's Model, for the 3 module is briefly described below:

Moodle Modelling

Moodle modelling can be applied to the following steps (Kristina Hollis Teaching and Technology, 2012):

1. **Gaining attention:** This may be accomplished by using appropriate titles for topic/weekly parts and creating an effective layout

2. **Describe goal:** In the subject summary field, provide the aims and objectives for the topic/week**.**

3. **Stimulate prior knowledge:** To remember past and background information about the topic, a review quiz or examination should be employed

4. **Present material:** Video content should be presented to create interest in the subject area and text content should be given to the students to aid them in preparing for examination and to enable them gain terminologiesin the subject area. Thus aiding the administration of lecture content to present information in a way that is accessible for all learners

5. **Provide guidance:** The leading faculty should be well-informed so that they can be accessible via forums and other forms of communication inside the course, and offer enough scaffolding for activities.

6. **Elicit performance; practice**

a. Encourage students to put new knowledge and information to use, reflect on it in a practise activity, and then offer a summary of how they used it.

b. Choose the type of practice exercise based on the nature of the module. For practical exercises, give assignment and let students discuss on the problem through blog.

c. For knowledge based and creative work, let students participate in the forum and discuss. The forum steered should be steered by experts.

7. **Provide feedback:** This may be done using Moodle forums or by leaving comments on blog entries, summaries, and other materials that are offered. Peer input is also quite beneficial and may be obtained via forums or blog comments

8. **Assess performance:** Moodle quiz or test, assignment, practical and workshops can be used for assessment purposes

9. **Enhance retention and transfer**

a. In the course, the third module is designed for this purpose.

b. A case study or a small project can be given for them to work in upcoming topics/weeks.

c. Giving a preview of the following stages and how a certain subject matter will play a role in what is to come will help students recognise the relevance and importance of the material, which will help them transition to the next topic and maintain interest**.**

C. **Implementation of salient features**

a. The course administered through Moodle can be rendered as a supplementary content to the main stream. So students can participate without fear of examination / results, as it is purely on an outcome basis.

b. Lectures can be rendered both as a video and a text-based study material

c. Questions in the tests have to be designed to test the different levels of learning in reflection of Bloom's taxonomy.

d. Forum topics should be carefully formulated according to the nature of the module; descriptive and creative. Learning Outcome of the participants will be assessed after the 3 modules are administered.

Conclusion

Just as changes occur in humans and other living organisms, the educational process is always changing. The role of teacher and student has shifted as a result of educational paradigm alterations that have influenced learning theories and conceptions. Learners' independence has developed more important as older systems have been phased out. Because knowledge is always changing, altering, and expanding, adopting a Learning Management System (LMS) will be an excellent approach for instructors or course lecturers to organise, manage, and present course content and resources. From a pedagogic standpoint, using Information and Communication Technology tools to develop engaging activities makes the learning process more enjoyable for students.

With the use of LMS, academic staffs will have access to a wealth of material that they are unable to display in the classroom owing to lack of time. Lecturers can ensure that the areas of the course students arehaving trouble understanding its topics in the physical classroom are discussed in LMS environment. Hence, integrating LMS as a tools for teaching and learning in Nigeria tertiary institutionswill go a long way to be fruitful in achieving educational objectives in this era of 21st century.

Suggestions

As a follow up in identifying how LMS can be integrated in teaching and learning in tertiary institutions in Nigeria, the following suggestions are offered:

1. Academic staffs should acquaint themselves with the use of LMS as a tool for enhancing teaching and learning.
2. There should be provision of well-built technology infrastructure for LMS to be fully utilized at all levels of courses in each department.
3. Lecturers who utilize LMS in teaching and learning should also vary their presentation of learning module to different styles so that it will be easier to accommodate other different learning styles.

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