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Moodle: A proficient integrated learning management system for digitalizing higher education

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Article Info

Abstract

The educational landscape has undergone a significant shift. Online instruction and evaluation have become popular from the primary to the higher education levels. This has turned out to be a blessing in disguise because the educational process has to be reimagined in order to meet the demands of the fourth industrial revolution, also known as Education4.0. The future of education is centered on digitization and the usage of technology. The key to the success of digitalization in higher education institutions is simply not upgrading to the newest tools or embracing new technologies. The process of developing a sustainable educational paradigm, where success is measured in several competence areas, involves reflection more frequently. It is not enough to just adopt new technologies or upgrade to the newest tools for digitalization in higher education institutions; rather, there needs to be an overarching curriculum designed to convey the necessary skills and knowledge. The entire educational system made the switch to digitalization in order to create a comprehensive solution and meet the educational demands of all students who came from different locations, schools, and universities. Utilizing cutting-edge technology, the new phases of online learning have started like Artificial Intelligence (AI), Robotics, the internet of things, social media, Animation etc and MOODLE is one of them. MOODLE is a personalized learning platform designed to manage and generate learning experiences for learners. The exercises on this learning platform are designed to keep the learner actively involved and motivated throughout the course. Administrators and teachers can customize all phases of the learning process, from information delivery to assessment, using the tools offered by LMS MOODLE. The objective of paper is to support the digital transformation of education by implementing and utilizing Moodle platforms to create robust and adaptable educational ecosystems. MOODLE can be implemented in institutions of higher education to adapt the educational process according to the demands of the students.

1. Introduction

The 21st century is arrived, and technology has no boundaries. Technology is consuming every nook and cranny in this stage of extreme progress. Tablets, computers, and smart phones are no longer foreign words. The educational system is currently changing for the better because learners of this age were not created to be constrained by the confines of simple learning; their curiosity is wide and cannot be satiated by older educational systems. We would rob our children of tomorrow if we continued to educate them the same manner we did yesterday. Our outdated educational system is unable to compete in the twenty-first century. We must therefore embrace digitization in our education (Walters, 2022). The National Education Policy (NEP) 2020's establishment has also encouraged online and digital learning environments. The initiative has cleared the way for the new addition of modern technologies with the advent of "digital India." and curriculum development starting at the basic level of school so that our educational system becomes capable of meeting the demands and challenges of the modern world (Agrwal, 2022).

New objectives and the beginning of ed-tech platforms in influencing education

Which seek to connect as many educational institutions in India as possible, have been established? This is a significant milestone. Through the National Programme on Technology Enhanced Learning (NPTEL), the Indian Institutes of Technology (IITS) have already made substantial progress in making education in a range of technical courses publicly accessible. Additionally, the NKN is utilized in real time to share lectures among institutions with comparable organizational structures, such as Indian Institutes of Science Education and Research, which provide shared courses (Ramaswamy, 2014) [15]. Many Ed-tech platforms have arisen to encourage students to engage in online learning as the internet usage in India is predicted to reach 55% by the end of 2025. Many of these platforms have also worked with educational institutions to provide learning management tools including blended learning, 3D and DIY kits, and experiential and interactive learning powered by AI. These startups' main goal is to give their customers an unmatched experience. Through these initiatives, small towns and villages are receiving high-quality education and have access to qualified teachers. Since it would make it easier for learners to unite with their classmates from corner to corner of the university as well as with former students and the outer community, such a system has a larger potential to promote the related Curriculum. By practicing digital identity in a supportive setting, learners could more successfully decide to present the work they have produced for outside audiences and build their digital skills necessary for job and spare time as well as lifelong study. Such digital skills are necessary for social network participation, which has grown to be a significant ingredient of "people's everyday life worlds." (Cook and Pachler 2012) [5]. the improvement of business performance of the enterprise.

Potential of digitalization for higher education

- By providing learning opportunities to those who are unable to physically attend classes due to a variety of factors, such as impairments or distance from a learning institution, you can increase student enrollment.
- To solve shortages, increase the capacity for education and training and optimize the roles and workloads of educators (based on the activities associated with teaching).
- By making it possible to acquire all subjects and skills completely through digital methods, geographic restrictions will be eliminated.
- Reduce the upfront cost of creating the course content against delivery costs, which are paid by the content providers, to increase resource use/efficiency. In environments where education is obtained through a self-paced digital content course rather than a conventional classroom setting, digital education also has the potential to lower other general costs as well as the opportunity costs to students.
- Support lifelong learning by making relevant learning courses easily accessible for students who, for good reasons, may find it difficult to take time out of work to attend classes.
- Improve learning outcomes by providing higher quality, standardized education. This will also enhance "on demand" learning by the person, i.e. studying at a time and location of their choosing, with the associated convenience. Self-paced learning can provide students additional time for reading and thought on subjects they might need more time to comprehend.
- Promote peer teaching and learning through supporting learner knowledge sharing and peer teaching communities of practice.
- Increase gender parity and participation of difficult-to-reach learner groups by removing societal barriers that are occasionally ingrained in structural frameworks. Need of integration of LMS in Higher Education (WHO, 2020)

Need of integration of lms in higher education

Without digital tools, it is nearly impossible to envision how student registration, lesson and schedule planning, or administration would be done. Big databases and information about students, teachers, knowledge programmes, expenditure, register books, study materials, certifications, and individual student status are handled by IT solutions. It has aided universities in being more productive and successful. The evolution of teaching methodology, or how we educate, is more recent. Many people now have easier access to more content because to online publishing of higher education materials like Open Course Ware and Massive Open Online Courses (MOOCs).Millions of students throughout the world have taken courses on online platforms like EdX, Coursera, and Future Learn, despite the criticism that MOOCs primarily draw students with advanced degrees (Mulder, 2018) [13]. The accessibility of internet resources has also spawned fresh pedagogical options, such teaching in a flipped classroom. Gaming in education and the rise of learning analytics are additional advancements. Although learning analytics have been around for a while, there are now a lot more chances to enhance and personalize education with the latest generation of learning management systems. Universities will be able to produce and analyze enormous volumes of educational data, which will aid staff in understanding how different students learn and what they already know and comprehend, among other things. In this way, learning Management system will assist institutions in delivering more individualized and fact-based teaching.

Moodle as a learning management system

Every Learning Management System (LMS) has a paradigm, or approach, that influences user interaction and promotes a particular usage pattern. By providing capabilities that enforce a specific order on each course, an LMS may promote extremely sequential learning. It might promote solo learning by giving the student plenty of opportunity to interact with the course materials while discouraging student-to-student interaction by providing few features that support it. This chapter will educate you how Moodle works and what your students and teachers may expect from the platform. Modular Object-Oriented Dynamic Learning Environment, which is mostly helpful to programmers and education theorists, is what the name Moodle originally stood for. Additionally, it is a verb that denotes the act of being lazy meandering through anything, acting on ideas as they come to you, a pleasurable fiddling that frequently results in insight and creativity As a result, it applies to both how Moodle was created an d how a student or teacher may approach learning from or instructing an online course. A Moodler is anybody who uses Moodle. (Breen, 2018) [3]. Teachers may organize, manage, and deliver course materials with MOODLE, which

focuses on providing educators with the greatest tools to manage and promote learning. Students can access course materials in many formats (text, image, sound) and communicate with instructors via message boards, forums, chats, videoconferences, and other communication tools through the Moodle platform (Sanchez & Hueros, 2010). From a functional standpoint, it offers a wide range of complementary tools to support the teaching and learning process, as well as features that are easily configurable, allowing the creation of student assessment processes and managing their tasks with their timetable.

Pedagogical orientations of moodle
Moodle's various resources and activities could be used as tools to improve an interactive digital learning environment (https://ipsrsolutions.com/academix/using-moodle-to-change-the-face-of-higher-education-system).

Resources Any static course content that can be utilised to offer non-interactive content is referred to as a "resource." Simple resources might include text, images, links, and URLs. There are additional resource types, including:

Label: On the course's home page, there are a few minor text components that can be utilised to appropriately arrange resources or activities..

Web page: This webpage is a part of the Moodle course. When information must be presented on a single, scrollable page, this is helpful..

Embedded video: The course can be improved with videos. But because films are so large and can use up a lot of bandwidth, hosting costs may go up. It is therefore preferable to upload videos on a practical video hosting site like YouTube and then embed the movie as necessary in the course pages. Without breaching the conditions of the copyright agreement, videos from subject-matter experts or news articles linked to the course material may also be embedded.

Book: A book is a multi-page resource with chapters and subchapters that is formatted like a book. Utilizing books prevents the course home page from being cluttered with several connections to relevant subjects. Ensure clear sequential access to the content.

File: Any file on your PC or one that has already been uploaded to the Moodle server could be this. In order to provide thorough course materials without clogging the course website, files can be handy. Making additional activities contingent on this knowledge, such as passing a relevant quiz, will encourage students to study the files.

Folder: Moodle's folders are comparable to those in other systems. They serve as hosts for other files and directories. The folder enables the grouping of relevant content so that it can be accessed from a single link on the course home page and organised as needed.

Content Package: These reusable e-learning resources (IMS, SCORM, etc.) are built on specific technical standards. Such packaged learning materials can be added to a Moodle course whenever they become available. The work you have completed in one Moodle course can be exported and packaged using these technologies.

Activities In Moodle, a student is required to complete a "activity." This is typically participatory, and there is some sort of interaction with the instructor or other students. Among the tasks in Moodle are:

Assignments: Teachers may give students assignments that they can complete online or generate offline and upload the files to. Teachers have the option of commenting or grading student work.

Quiz: By distributing a variety of questions to the students, quizzes enable teachers to administer online exams. These can be configured to be evaluated automatically, with the students receiving pertinent feedback and comments.

Database: Students can work together to compile pertinent data in a database.

Glossary: Students can work together to compile a list of definitions that can be used as a resource in the future.

Forum: A variety of forums, including those for peer review, discussion, and research, may exist. In essence, a forum enables instructors and students to hold asynchronous conversations via various discussion threads.

Wiki: Using the collaborative "Wikipedia" format, the "wiki" feature of a course enables students to add to and edit a collection of subject-specific web pages.

Feedback: Using this tool, teachers can periodically survey students to get their opinions on the course.

Chat: Using this tool, students can have live conversations with each other or the teacher.

H5P Activity: With the help of this activity, instructors can generate interactive HTML5 content that can be used throughout the course.

Lesson: The lesson activity gives teachers a variety of options for presenting material to their students, followed by options for gauging their understanding. Students may be given different resources or activities that customise and improve their learning based on their responses.

External Tool(s): The Learning Tools Interoperability (LTI) standard enables the use of learning resources from one website on a variety of websites. If such instruments are accessible, they might be used. Even without this, other external tools may be integrated into the course or connected to from the course to improve Moodle functionality.

Mentimeter: Live polling, quiz, etc. that is interactive.

Padlet: Padlet enables the building of interactive boards that let users add ideas either anonymously or with their names.

Google Forms: Use Google Forms to run surveys or collect feedback.

Kahoot: With Kahoot!, a platform for game-based learning, you can mix quiz questions with slides, polls, puzzles, and other types of questions.

Moodle as proficient platform for digitization of higher education
In recent years, technological innovation has profoundly changed higher education and increased the efficiency of both administration and instruction (Sife *et al*. 2007) [17] The Moodle platform's inclusion as an LMS was required by the university's Management Information System (MIS) for data harmonization, the creation of a digital learning environment, the enhancement of digital student feedback, the advancement of student digital abilities, and the digital evaluation process. A digitization plan was developed at the university level as a result of the variety of solutions and platforms utilized in the educational process, which ensured a system of safety and security of data and users of these platforms to assure high standards in the teaching process. The Moodle e-learning platform, which aims to simplify by utilizing new digital technology and working methodologies, has been a crucial pillar in this strategy. It guarantees adherence to uniform standards across the university and digitalizes academic procedures in accordance with evaluation criteria needed by quality standards (Iordan, Bîzoi,

Alexandra and Herman) For security and to foster a personalized learning environment where students feel supported to make errors as they learn, Moodle filters out anyone not enrolled as a student at the institution or in a module or course. But the problem is that it's much too frequently seen as a binary decision-a course is either public or private. The Institutes must abandon this "either/or" mindset and allow the learning community to decide for itself which portions are public and which are private(Kenned, Neumann, Rowett and Strawbridge, 2017) [11].

Usage of moodle in teaching- learning process
ICT and internet resources have been effectively integrated to help and aid students' learning. Among these, Moodle has gain popularity among instructors and students due to its many benefits like a software programme with open source materials that is available for users and a catalyst for developing strong educational ideas are applied in online learning communities (Beatty and Ulasewicz 2006) [2]. Broadly It is used to support a variety of teaching modalities, including ubiquitous and blended learning, and flipped classrooms (Costello, 2013) [6]. More than 86 million users from 74,000 registered sites across 228 countries were supported by Moodle by 2015. (Moodle, 2015). According to the literature, Moodle's acceptance in universities in those nations of North America and Europe can be ascribed to both its usability and the variety of services it offers (chat, forums, questionnaires, etc.) (Escobar-Rodriguez and Monge-Lozano 2012; Pinto-Llorente *et al*. 2017) [7]. Additionally, the adoption of Moodle can increase student involvement and create significant linkages and links across different course sections (Carvalho *et al*. 2011) [4], facilitate user-to-user conversation and discussion, and enable professors to give pupils quick, formative feedback (Rubin *et al*. 2010) [16]. Finally, users could utilise the software on any technological equipment they may have, such a computer or mobile device, and upload and download things whenever and wherever they wanted (Teo, Zhou, Chun and Fan, 2019) [18].

Usage of moodle in administration process
Moodle addresses security and stability issues while introducing many additional beneficial functions. Technically speaking, The plugins on the platform have all been updated and suitable for use among the most recent Moodle version. The study of server and platform logs, as well as input from academics and students, are all part of the ongoing process of keeping the platform up to date. The Moodle platform's connection with the University Management System (UMS) is judged by how well the standard data is synced:

- The university's academic structure
  - Its faculty members
  - Its study cycles (bachelor, master, doctoral, postgraduate)
  - Its type of education
  - study years
  - curriculum in academic structure

- The role of professors in the current curriculum
- Students and their up to date situation/status within the academic system

The Moodle platform's structure is automatically created As

the start of the academic year arrives and these data are imported from UMS.

Usage of moodle usage in evaluation process
The evaluation of learner's performance in e-learning settings is a hard and challenging work for the professors. Moodle provide various assessment tools such as quizzes, scales, "classic" rubrics, etc. The evaluation of students should focus on their involvement, cooperation with group projects, quality of contributions, innovation in product development, helpfulness, etc. Recently, new methods of evaluation have been presented, along with tools like learning analytics that give teachers a greater knowledge of their students' online activities. one among the most recognisable open source systems, Moodle, has begun incorporating these learning analytics techniques and capabilities (Petropoulou, Kasimatis, Dimopoulos and Retalis, 2014) [14].

Case study

Table 1: Depicts moodle usage in Central University of Jammu

Total Number of MOODLE users	2468
Total Number of departments that use Moodle	22
No. of courses that run on Moodle (2022-23)	65

This data describe how faculty of CUJ have used Moodle in real-life situations to teach more effectively. Moodle has been working very successfully in integrating ICT in teaching and learning, often fundamentally changing the ways subjects are taught and the ways in which members of the University community work, study, communicate and collaborate and create the digital environment.

Conclusion and Future Recommendation
The use of technology in everyday life is becoming more and more common in the digital age. E-learning and blended learning usage in educational settings is crucial. Given the disparity amid the profit that technology offer to education and their restricted use, in addition to the paucity of studies on Moodle use in higher education for digitalization, an empirical study is required to recognize the existing situation and steer future research in this area. University life is changing. In an era when information is readily available and new enterprises and career paths are opening up, students nowadays want to be more than just book smart. Students must be engaged in their education and given the chance to improve both their technical and social skills for learning to be effective. They desire the independence and flexibility to fit their studies into their daily lives, regardless of where they are based. MOODLE is the platform of choice for online learning at the universities in the world because of this. The adaptable and potent features of Moodle LMS go beyond serving as a time-saving tool to support students in developing their full potential through innovative thinking, collaborative learning, and independent learning.

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