



Learning Management Systems through Moodle and Google Classroom for Education

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Authors' contributions

This work was carried out in collaboration between both authors. Author SV designed the study, performed the comparative study and wrote the first draft of the manuscript. Author CSS managed the literature searches. Both the authors read and approved the final manuscript.

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ABSTRACT

Information and Communication Technologies have become more prevalent in the last few years and has made a great impact on society. Worldwide, a lot of education programs offer new forms of education that are frequently supported by information and communication technology (ICT) to cater to young minds. E-learning in particular has been adopted by educational institutions all over the world and it is being used as a part of "blended learning" where it is incorporated into systems along with traditional classroom learning. Nowadays, it has become more relevant than ever due to the COVID-19 pandemic that the world is facing. Although these systems differ from classroom learning, they allow easy communication among teachers and students at any time necessary and provide an entire repository for students to use. For teachers, it acts as an environment for creating courses, assignments, giving feedback and grading students. In this paper, two such E-learning platforms namely Moodle and Google Classroom are compared and contrasted based on their usability and simplicity.

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1. INTRODUCTION

The rise of technology has influenced all areas of society in the last few decades. It has made a significant impact in the domain of education through the means of E-learning. These days, many educational institutions are relying on virtual learning environments due to the effect of COVID. Delivering instructions which gives better outcomes than face-to-face learning systems is the main goal of introducing ICT [1]. Virtual learning environments have become a system that can be used along with traditional classroom learning and in some cases; completely replace the physical classroom setup. It creates an environment for education at any place and time for people who rely on such platforms [2]. Many institutions have advocated and used these platforms for handling several courses [3].

When comparing to traditional classroom instructions, the advantages of E-learning are reducing geographical barriers and using remote teaching. But the learning material must be properly designed to engage the learners and promote the process of learning, which decides the success. There are many situations and problems which make E-learning ineffective. For example, many students drop out of online courses. Non-participation of the students' in the learning process plays an important role in high dropout rates in online learning [4].

These learning environments provide the teachers with various features such as course creation, sharing of files, tracking the performance of their students etc., It helps students maintain communication with fellow students and teachers at any time necessary through the use of forums, discussion boards and chat rooms. Since they are designed in a user- friendly way, people don't find it hard to learn and understand their capabilities. One can adopt either an open source platform or a commercial platform. In this paper, we consider two learning platforms, Moodle and Google Classroom to find out the individual specialties and uses of each while also looking at their limitations. This will help the learners and teachers to know the pros and cons of each platform for effective teaching and learning.

2. LITERATURE REVIEW

When it comes to E-learning, communication is important and plays a major role. The messages

need to be received well and understandable which can help the students. This makes the system attractive and operational [5]. Thus, the success depends upon effective communication that occurs between teachers and students [6]. E-learning systems are effective in many ways and are very different. It was stated that the issue of the effectiveness of E-learning cannot be concerned with people alone or with technology alone [7]. It involves interaction between the teachers and learners in coordination with the technology (i.e. standards and processes aspect like course content, technology, Learning Management System (LMS), etc). Hence it is considered as a complex process involving the interaction of the above parameters.

It is reported that though ICT represents a fundamental material condition for E-learning, it does not have a statistically significant influence on the effectiveness of E-learning [8]. Similarly, it was reported that there is no statistically significant differences between classical and online learning [9]. The mixed technology of E-learning in Moodle and face-to-face lectures lead to increased performance of students [10]. It's observed that there is a huge research gap regarding the contributions of socio-demographic factors of students to their academic performance. Very few studies have been carried out in this angle [11].

Factors such as gender, location, level of education don't seem to have much effect on student performance. However, factors like family issues, lack of teachers support in terms of motivation and online workload affect the performance of students [12]. Due to the gap that exists between generations, a teacher-centered approach isn't the best approach for learning. It applies particularly for students who are diverse in their abilities [13]. Hence any effort to increase the engagement of the students in learning activities may leads to new inventions, which is essential for the success of the platform.

2.1 E- Learning Platforms

There exist many theories of E learning. But the main principle behind is the act of knowing the principles behind the multimedia and their usability based upon the requirement. It is not only the E learning but also the remote teaching. Google Classroom is a free web service learning environment developed by Google that is used for E-learning. Recently this learning

environment has been widely used and has provided effective communication between teachers and students [14]. It was established in 2014 and since then millions of teachers and students in institutions around the world are using Google classroom. Besides this, students can also interact with each other in the online space. It is concluded that Google classroom has an important role in English learning and teaching [15]. In Google Classroom, teachers can freely hand out a scientific assessment and provide an independent assignment to the students.

Meanwhile, students can post their queries and clarify their doubts. Moreover, along with being able to give instructions and share writing prompts as well as other additional resources, teachers can send their students' comments and feedbacks through Google Classroom, which may significantly contribute to the outcomes. In addition, professors can also open spaces for online discussion among students. In a recent research conducted on Google Classroom was evaluated using ISO, and the results showed that collaborative learning flourished when using it [16]. Teachers who let their students work in groups and submit their project via Google Classroom mention collaborative learning works great [17].

Some of the advantages of this system are its quick and convenient settings, time saving, increase in communication, data storage and sharing of resources [18]. In a study done at an Institute in Indonesia, some limitations of Google Classroom were found. Firstly, not all students had a Google account and there was a lack of smart phone availability. Secondly, the Wi-Fi in the campus was weak and students didn't have proper internet to attend online discussions or to submit their assignment. This throw lights on what could go wrong with such systems and shows the future initiatives that should be taken related to accessibility, connectivity and affordability among the users [19]. Furthermore, a Google Classroom study shows it encouraged writing and editing since students did not have to recopy their work [20].

These tools are beneficial for students having problems with punctuation, spelling and grammar. It provides free spelling, punctuation checkers and suggests correction which helps them get better in learning and improving their English. This method of learning motivated and encouraged students in writing because they could reach a wider audience. An experiment

with the adoption of Google classroom in language teaching was conducted and it was reported that the experimental group who used Google classroom in addition to physical classroom had higher average points in their writing test compared to the control group although the difference was not remarkably big [21]. Questionnaires and interviews showed that students' eagerness in writing improved noticeably.

Moodle is an open-source E-learning platform that is used by different educational institutions all over the world [22]. It's easily customizable and available in different languages. It can be easily installed on a server by an admin who can then provide access to teachers and students who just need to have a device with internet connection. Communication can be done in a non-synchronized manner through the forums or in a synchronized manner through the chats [23]. The University of Aveiro(UA), Portugal conducted a study on Moodle and found that it was majorly used as a repository of materials. Moreover, students understood the importance of the other functionalities in the platform [24].

When it comes to course management, it can be organized in two different format namely Topics format and Weekly format. The former allows the courses to be arranged into unique topics and can be separated from each other whereas the latter uses a weekly block depending on how long it is. Google Classroom despite being newly introduced in education receives many positive reviews from educators and specialists. It is believed to greatly support language teaching and learning. Moodle has been a familiar platform for more than 15 years among the educators and it is still a continual evolution. Moodle as a knowledge platform has boosted and moved existing learning environments online. Both platforms have certain similarities as well as dissimilarities in working as well as in functionality.

2.2 Similarities

In both platforms, face to face interactions are avoided. But there are collaborative interactions between the students and teachers to the expected level. Both platforms can be used to create as many classrooms and courses as required and can be managed by the teacher depending on his/ her ability. These platforms help the teachers to enroll the students in an easy way. They provide the teacher with the functionality to upload resources such as

PowerPoint presentations, PDF files, word files, images, audio, video files and animations.

They also enable the teachers to create assignments and grade the assignments submitted by the students. Once the resources have been created they are accessed by the teachers and students 24 x 7 provided there is internet connectivity. Students instantly gain benefits in both the platforms and can follow the teachers instructions, submit their assignments as per the given instructions and are also able to get the feedback from the teachers for the work they have executed.

2.3 Differences

The differences are given in Table 1.

2.4 Challenges

While Moodle and Google Classroom function efficiently to help students in the virtual world, challenges exist in both the platforms.

- They can be used by institutions only to a certain extent as only limited technological support is offered to the students in Google classroom.
- Moodle doesn't have a dedicated 24*7 support. In case the users have some issues, they have to go through the forums and post their problems or issues and wait for a response. This is not a suitable scenario.
- Though the Moodle interface has been revised since its development, it takes time to get familiar in using it. Its features may not be user-friendly for beginners. Moodle is imagined to supplement the traditional education because it helps institutes for monitoring the records, documents and manage the student profiles, track student progression and streamline delivery of educational courses or training programs. However, while implementing such a system in educational Institutions, one needs to be cautious and go ahead only if the infrastructure needed is consistently available and if it is practicable as a long term measure.
- Ads are displayed in Moodle free accounts which is sometimes distracting.

Table 1. Differences between Google Classroom and Moodle

Google Classroom	Moodle
In this platform, training is not essential for course creation and enrolling the students.	In this platform, trained educators with good experience in Moodle environment can create courses and enroll students and teachers effectively.
It is designed in a simple and efficient way.	It is relatively bigger and has many options to work with.
It can be used to create private websites and has limited number of options that can be edited.	It includes a lot of modifiable options based on our need and it is often used to create private websites that can only be accessed by people registered in the course.
It is device independent due to its simplicity and works well on both computers and phones.	The Moodle app functions well on different smart phones but it's more complicated. It is rather user friendly with desktop computers and laptop.
It has about 10 add-ons that can be used to extend and improve the functionality of the resources.	Despite the complexity, it offers more than thousands of add-ons.
The course titles are not displayed on the middle of the page.	The course titles are available even in the middle of the page for easy access.
To sign up, the institution should register for the education package. If the free version is used, it has limitations.	It is an open-source platform free to download and install. However, paid plans can be opted when more users need to be added.
It focuses on organization and collaboration of resources and activity.	It focuses more on interaction and collaborative content construction.
It suits people who are new to virtual learning.	It suits more experienced and trained users due to its complex nature.

3. CONCLUSION

In the current situation due to COVID 19 there is a shift in the education platform and a lot of E-learning platforms are being used by the educationalist and students for teaching and learning. Hence, this comparative study between Google Classroom and Moodle platforms would make teachers and students aware that there exist free E-learning platforms which can be used for learning. This study also details the above mentioned platforms, so that teachers and learners can choose them according to their requirements.

Lot of studies exist relating to E-learning platforms, but for the current situation teachers explore for free learning environment which can be used effectively for teaching without spending much. Since both platforms can be used freely this comparative study has been carried out.

The results of this study show that implementation of Google Classroom or Moodle E-learning platform would create a virtual classroom which creates an effective teacher and students' communicative environment. However, availability of computer devices and good bandwidth are the major constraints. Future research can be conducted comparing the all features of Google Classroom and Moodle platforms in order to get more comprehensive and significant findings.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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