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Awareness of the use of various learning management systems (LMS) and implementation of MOODLE (Modular Object-Oriented Dynamic Learning Environment) as a blended learning tool, among undergraduate medical students in central India – An interventional study

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Abstract

The medical curriculum imparts significant knowledge and instructional content to the students. E-learning is essential for helping students adjust to these changes in health professions education by providing an online, flexible learning environment. Moreover, the COVID-19 epidemic resulted in a prolonged closure of educational institutions, bringing E-Learning into the spotlight. The data about the awareness of the various Learning Management System (LMS) was collected through the Google questionnaire form (validated by faculty), from the second-year MBBS students (n=180) as per the 5-point Likert scale. Then MOODLE (Modular Object Learning Environment), a form of LMS, was introduced to the students through two contact sessions. Subsequently, they filled out the second 5-point Likert scale Google questionnaire form in which their perception of MOODLE was collected. The cumulative mean on a 5-point Likert scale was 2.68 to assess the awareness. The consensus was well below 50% with the mean value less than 2.5 in the majority of questions indicating less awareness. The cumulative mean of 3.66 and consensus was well above 60% in the majority of the questions indicating a positive perception of MOODLE. Most students were found to have a favourable opinion about the use of MOODLE.

Keywords: MOODLE, Awareness, Learning Management System (LMS), Blended Learning tool.

Article History

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Introduction

The modern medical curriculum must impart a significant quantity of knowledge and instructional content to the students, and changes in the way that content is delivered are happening extremely quickly. Every day, new instruments and technology are developed for this reason. E-learning is essential for helping students adjust to these changes in health professions education by giving them an online, flexible learning environment in which to share knowledge (Shikino et al., 2021). Many institutions have attempted to integrate distance learning programmes with their current curricula for many years, but have only partially succeeded in doing so because of technology limitations and a lack of awareness regarding implementation concerns Tashkandi (2021). However, over the last few years, numerous universities, including medical colleges, have reacted well to the implementation of e-learning. Furthermore, the COVID-19 epidemic has caused a prolonged closure of educational institutions, bringing eLearning and learning into the spotlight (Almaiah et al., 2020). This closure began at the beginning of 2020. Schools and institutions, particularly medical colleges, had to implement e-learning systems on an emergency basis to continue their ongoing classes Hoq MZ. (2020). As a result, efficient learning management was desperately needed. It was never simple to launch this programme without a solid infrastructure and a team-based strategy to make it succeed, regardless of COVID-19 status. The user-friendliness and cost-effectiveness of the learning management system (LMS) are the most crucial variables in the successful deployment of e-learning, however, there are many other significant factors as well. Consequently, the majority of colleges worldwide are currently using Moodle for their e-learning programs. The novel teaching-learning method Flipped Classroom can best be implemented by giving study materials before the lecture so that most of the time in the classroom is spent on the discussion part (Wagner et al. 2020).

Need/ Rationale of study

Currently, we don't have any LMS system for the learning of undergraduate medical students in our institute. Hence there was a need to develop such a system of blended learning.

Aim

The study of the utility of MOODLE as an effective blended learning tool among undergraduate medical students.

Objectives

1. To assess awareness of various LMS among undergraduate medical students.
2. To study the feasibility of implementing MOODLE as a LMS tool.
3. Identify the challenges in implementing MOODLE as a LMS tool.

Methodology

Study setting- The study was done in the Department of Forensic Medicine at NKP Salve Institute of Medical Sciences & Research Centre, Nagpur

Study duration- 6 months (Feb 2024 to July 2024)

Study design- Interventional study

Study participants- All the IInd year MBBS students (200)

Inclusion and Exclusion criteria (if any)-

Inclusion: All the IInd year MBBS students

Exclusion: All the students who didn't log in, remained absent from the contact sessions and have not done at least 50% of the online assignments.

Sampling method- Not applicable

Sample Size- 180

Data Collection Tool (if any), its designing, Validation, etc.-

The data collection will be done through a prevalidated Google form questionnaire as per the five-point Likert scale.

Data collection procedure/methodology-

The consent was taken from all the second-year MBBS students (n=180) to participate in the survey. The students may withdraw and the participation is purely on the choice of the students. The data about the awareness of the LMS was collected through the Google questionnaire form as per the 5-point Likert scale. Then MOODLE (Modular Object Learning Environment), a form of LMS was introduced to the students through two contact sessions in the form of a didactic lecture and practical demonstration. Subsequently, they were asked to fill out the second 5-point Likert scale Google questionnaire form in which their perception of using LMS MOODLE was collected. The student's feedback was taken and the necessary changes were made in the MOODLE to make it more student-friendly. The Medical Education Unit members validated both questionnaires. Subsequently, data analysis was done.

Ethical Aspects /IEC –

The IEC approval was taken from our Institutional Ethics Committee on 28/03/24 and permission was taken from the Dean of the college to conduct the study. The students may withdraw from the study and participation is purely by the choice of the students.

Data Analysis

For the data analysis, version 23 of the Statistical Packages for Social Sciences (SPSS) was used. The data analysis was performed using the mean, consensus, and cumulative mean from a 5-point Likert scale questionnaire. The mean value and consensus of each question were taken into account for calculation and data interpretation. The cumulative mean was used to calculate the overall perception of students. To show the results, frequency tables were generated. Appropriate tables, graphs, and percentages were used to assess the comparison of the various factors.

Observations and results:

Table 1. Awareness of various LMS platforms: It shows the response frequencies with Mean, cumulative mean & Consensus for each question. The cumulative mean on a 5-point Likert scale was 2.68 where 1 was considered as strongly disagree and 5 as strongly agree. The consensus was well below 50% with a mean value of less than 2.5 in the majority of questions indicating less awareness about the various Learning Management System (LMS). However, the majority of the students have a consensus that the various LMS platforms offer flexibility in learning resulting in higher mean value and consensus.

Table 2: Perception about the implementation of MOODLE- LMS. It shows mean, Consensus & Cumulative mean for questions. The cumulative mean of 3.66 and consensus was well above 60% in the majority of the questions indicating a positive perception of LMS-MOODLE among students. However, the majority of students faced problems regarding the logging and registration process and had abstained from the use of discussion forums resulting in lower mean and consensus values in the majority of such questions.

Discussion

The present study outlines our preliminary thoughts regarding the incorporation of a learning management system within the medical curriculum and the use of MOODLE-LMS as a blended learning tool. According to our research, students considered MOODLE LMS's registration and login process to be tedious and inconvenient as only 40.58 % and 41.86 % of students have a consensus on that issue. After the registration and login, the user interface was convenient, approachable, and easy to use. The study is in contrast to (Luo et al., 2017), where they have reported the login and registration process in MOODLE to be incredibly simple. The reason might be the fact since the LMS MOODLE was recently introduced, there was a problem with the server space of the college website. The issue was later resolved after the study. The main purpose of the LMS Moodle is to facilitate interactive conceptual

learning. We also made the tool available to the students so they could receive lectures and reading materials, and they embraced this feature wholeheartedly. In our study, 62.37 % of students have consensus that they completely loved the flexible aspect of the learning process, and 64.15% of them said it was very easy to download the lecture notes. The study is in consistent with earlier research by (Seluakumaran et al., 2011; Subedi et al., 2020).

About 60.39 % of students have consensus that the previous readings and lectures encouraged students to learn actively and helped them better understand the content in the classroom. They feel that more and more time is spent on discussion in the classroom which makes it easier for them to absorb the information and prepare for exams. However, it turned out that a few of the professors uploaded their lectures following in-person meetings because they were worried about the missing of scheduled lectures by the students. Our findings were consistent with those of other writers, including (Devis MJ et al., 2003; Cader R and Mc Govern M, 1997). In contrast, (De Lange P et al., 2003) study found that downloading lecture notes ahead of time to a classroom did not have an impact on students' attendance. As a result, we also urged instructors to publish beforehand so that students could understand the lectures more fully and much of the time be utilized for discussion in the classroom. In addition, skimming the lectures beforehand will prepare them to ask the questions at the end. Additionally, pre-lectures relieve students of the pressure of taking notes during lectures and allow them to focus more intently on the material being covered.

Relevantly, according to student responses to our survey, just 52.35% had a consensus that taking part in a discussion forum encourages collaborative learning. It was noted that a very small proportion of students (31.66 %) regularly used the discussion function. Similar findings were made by (Li L et al., 2020) in their study, which revealed that although students frequently visited and watched the discussions, they were still hesitant to get involved. This can be a result of their tutors' lack of support and encouragement. Therefore, it is strongly advised that tutors update students' cognitive learning and foster analytical thinking by leaving passionate comments and responses in discussion forums. About 60.45% of students have consensus that they used assignments routinely for learning. One possible explanation for the student's reluctance to turn in their assignments could be their unfamiliarity with web-based online systems. Our study is consistent with the study done (Susilowati et al., 2021). We also used formative assessments to grade intellectual achievement, and both the final and formative rounds concluded that the computer-based testing was a helpful tool. According to a study conducted by (Susilowati et al., 2021) in

conjunction with this, the LMS can help students perform better on assessments, as evidenced by the fact that they perform very well in formative assessments using LMS-MOODLE.

However, we found that inadequate resources—such as power outages, shoddy internet connections, and students' lack of experience with computer-based assessments—created a significant barrier to this tool's maximum efficacy Li Q (2004). Moreover, MOODLE-LMS provides flexibility in learning as evidenced by the fact that 62.37% of students have consensus on this issue. The findings are consistent with the study done by (Wagner et al., 2020; Subedi et al., 2020). As per our study, Moodle can improve students' performance achievement and cognitive learning. Consistent with this, several additional studies were conducted by (Dantas AM et al., 2008 and Pinilla S et al., 2021) and came to the same conclusions as Link TM and Marzn R (2006), Dantas and Kemm (2008). Overall, the results of our study showed that LMS-MOODLE offers students consistent, constructive learning experiences for self-evaluation and learning, robust peer knowledge sharing, and helpful teacher engagement to support their academic performance and learning capacities Dantas and Kemm (2008).

Conclusion

The initial awareness among students about the various LMS was poor among the students. The intervention of MOODLE through contact sessions as a blended learning tool brought a drastic change in the perception of the students. Now, the majority of students at NKP Salve Institute of Medical Sciences were found to have a favourable opinion and experience with the use of Moodle as a learning management system and a blended learning tool in medical curricula. Additionally, it can aid in the creation of future e-learning programmes that will further enhance students' learning experiences. Moreover, the feedback from questionnaires aids in improving the MOODLE and making it more user-friendly.

Limitations

1. The study needs to be undertaken on all the phases of the MBBS curriculum instead of a particular phase for better acceptability of MOODLE as an E-learning platform and a blended learning tool.
2. The study needs to be repeated on the same set of students in subsequent years for better acceptability of the software.

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Conflict of interest

No conflicts of interest are disclosed by the authors.

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Table 1: Awareness of various LMS platforms (n=180)

Sr. no	Questions	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Consensus(%)
1	Familiar with the concept of Learning Management Systems (LMS)	12	28	32	50	58	2.36	50.19%
2	Used any Learning management system for learning	18	28	36	42	56	2.5	45.86%
3	I am aware of the following LMS platforms like Moodle, Blackboard, Canvas	19	40	52	34	35	2.85	51.92%
4	The use of a learning management system contributes positively to your learning	15	28	50	35	52	2.55	49.14%
5	Provides Flexibility in learning (anytime, anywhere)	60	65	20	19	16	3.74	51.56%
6	E-learning is an effective mode of education	15	26	38	54	47	2.48	50.89%
7	E-learning is better than traditional classroom-based learning	18	24	35	40	63	2.41	45.32%
8	My satisfaction level with previous e-learning experiences was good	16	37	34	40	53	2.57	45.69%
						Cumulative mean- 2.68		

Table 2: Perception about the implementation of MOODLE- LMS (n=180)

Sr. no	Question	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	Consensus (%)
1	It is easy to log in	32	19	22	58	49	2.59	40.58%
2	The process of registration is simple	30	35	34	37	44	2.83	41.86%
3	The interface is user-friendly	65	74	20	12	9	3.96	63.23%
4	Materials and lectures are easy to download	63	76	20	13	8	3.96	64.15%
5	Online study material before lecture/ practical improves the learning experience	65	72	21	10	12	3.93	60.39%
6	Used assignments routinely	71	60	20	17	12	3.98	60.45%
7	Used discussion forums routinely	16	41	39	47	28	2.82	52.35%
8	The learning provides flexibility (anytime, anywhere)	70	61	29	14	6	3.97	62.37%
9	Highly motivated to use LMS- Moodle	55	71	20	15	9	3.87	60.68%
10	Computer-based testing is useful as an assessment tool	65	68	27	13	7	3.95	63.11%
11	Training given about the use of discussion forums, quizzes, and assignments enhances my skills	71	69	19	9	12	3.98	60.75%
12	Contributes positively to my learning experience	75	60	26	11	8	3.98	62.86%
13	Was overall a smooth and exciting experience to use LMS technology in medical education	55	77	26	15	7	3.87	63.66%
						Cumulative mean- 3.66		

