Introducing 'MOODLE' as a Formative Assessment Tool : Perception of Medical Students

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ABSTRACT

Objective: The purpose of this study is to determine the perception of medical students regarding the use of MOODLE as formative assessment tool.

Study Design: Cross sectional study.

Place and Duration of Study: This study was conducted at the Fazaia Ruth Pfau Medical College, Karachi from January 2023 to April 2023.

Methods: A paid version of Moodle was used in this study. To be able to access Moodle, all students were provided username and password to be registered by teacher. The formative assessment was in the form of multiple-choice questions prepared by subject experts. The questions were subsequently posted on Moodle to gauge how well the fourth-year MBBS students understood the ENT material that was covered in block 1. After the formative quiz, a questionnaire was emailed to all the students to carry out the survey. The questionnaire was developed with the help of literature.

Results: The findings revealed that students concluded that formative evaluation is an essential component of learning in the classroom. (Mean=3.94, SD=0.92), in recognizing challenging ideas that students are having a hard time grasping (Mean=3.99, SD= 0.95), in facilitating teachers to recognize skills that students are struggling to adapt (Mean=3.92, SD=0.96).

Conclusion: Numerous pieces of literature have emphasized the value of assessments taken as formative to collect information regarding students' progress. By conducting assessments with the help of MOODLE platform, it is easy to provide feedback to students regarding their performance. The simplicity of use and interactive features aid in raising student involvement at the same time. The students appreciated the incorporation of formative assessments and use of MOODLE.

Key Words: Formative, Feedback, Quiz, Online

INTRODUCTION

In the realm of medical education, formative assessment, which has been credited as the evaluation for learning, is rising quickly[1]. It is described as a deliberate, sequential procedure in which different assessment tasks are placed in order to gather proof of student learning. This will result in modifications to teachers' lesson plans or adjustments to students' learning preferences.[2]

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The benefit of formative evaluation is that it helps students by providing feedback on their performance and encouraging them to advance under non-threatening circumstances.[3]. Formative assessments can be utilized in education in a variety of ways, such as the conventional method using paper and pencil tests or evaluations that make use of contemporary technology, such as online assessment tools for quizzes[4]. Reforming student engagement, which is essential for obtaining the learning outcome but a challenge for many higher education institutions and medical education, has resulted in outstanding efforts being made in this research area over the past few years[5]. New current technology is frequently predicted to have a greater impact on the sector of education. Mobile technology is expected to enhance how students study in the future and make learning more enjoyable[6]. In addition, thanks to improved WIFI coverage, the environment of higher education is growing increasingly accustomed to the usage of mobile devices. Comparatively to the early years, this has made it possible to practically incorporate such technologies into the classroom[7].

Research is being done on the use of Quizziz, Quizlet, Socrative, Moodle, Padlet, and Mentimeter as formative assessment tools to improve students' learning[8]. The full form of Moodle is 'Modular Object-Oriented Dynamic Learning Environment'. It is a web-based learning management system (LMS). Open-source software was developed to support on-site, blended, and hybrid teaching and learning activities [9.] Moodle consists of a variety of tools with assignment activity section that can be used with the intention of formative writing assessment [10].

The Moodle quiz is a far better option than the assignment activity since it offers a staggering array of possibilities to build the work and may call for students to either write a response or select from options offered. These assessments can be customized with various details that can facilitate teachers to design tasks according to learning objectives. In addition, teachers can provide structured guidance, promoting student-centeredness and high order thinking skills [11].

The literature shows studies implementing Moodle as a form of assessment tool. However, to the best of our knowledge, up to this moment, there has been no research in the medical undergraduate field that relates the utilization of Moodle platform as formative assessment tool and students perception regarding the same. The aim of this study was to introduce Moodle as a formative assessment tool in undergraduate medical education at Fazaia Ruth Pfau Medical College, and to determine the perceptions of the students regarding the same. The outcome of this research may provide implications for teaching students with digital assessment tools in content.

METHODS

The study used questionnaire based cross sectional study. The Institutional review board of Fazaia Ruth Pfau Medical College, Karachi with number rb/58, approved the study. The study took place from January 2023 to April 2023 (4 months). 100 students enrolled in undergraduate fourth year medical students at FRPMC were included in the study. Those students who were absent throughout the module were not included.

This study utilized a premium version of Moodle. To be able to access Moodle, all students were provided username and password to be registered by teacher.

The formative assessment was in the form of multiple-choice questions prepared by subject experts. The questions were subsequently posted on Moodle to gauge how well the fourth-year MBBS students understood the ENT material that was covered in block 1. A small session was conducted with students to brief the details about formative assessments and use of Moodle for this purpose. The quiz was launched with questions shuffling. This shuffling reduces the chance of cheating or plagiarism. Limited time was provided with each formative assessment. After each quiz

activity, results were downloaded into an excel sheet and feedback was given to all the students. These quizzes helped the teacher to monitor the progress of their students.

After the formative quiz, a questionnaire was emailed to all the students to carry out the survey. The questionnaire was based on Likert scale from one (strongly disagree) to five (strongly agree). The questionnaire was developed with the help of literature. Group of experts validated the content of the questionnaire. It consists of 24 items that are related to demographic information (4 items), importance of using formative assessments (05 items), technology (01 item), motivation (01 item) and use of Moodle (13 items).

RESULTS

A total of 100 questionnaires were sent via email to all the participants. Out of which 83 students participated in the study (83% response rate). The socio-demographic data of the participants are displayed in Table 1.

Table No. 1: Socio-demographic Information.

Variables	n	Percentage
Gender		
Male	27	32.53%
Female	56	67.47%
Students' Age in Consolidate Form		
18 years old	2	2.41%
19 Years Old	27	32.53%
20 Years Old	46	55.00%
21 Years Old	6	7.23%
22 Years Old	1	1.20%
23 Years Old	1	1.20%
Have Own Desktop/Tablet/Laptop		
Yes	78	94.00%
No	5	6.17%

Table 2 displayed the results of the twenty survey items. to determine student's perception. About the importance of using formative assessments, five questions were asked. The findings revealed that students concluded that formative evaluation is an essential component of learning in the classroom. (Mean=3.94, SD=0.92), in recognizing challenging ideas that students are having a hard time grasping (Mean=3.99, SD= 0.95), in facilitating teachers to recognize skills that students are struggling to adapt (Mean=3.92, SD=0.96), in giving valuable information needed to bring changes in teaching and learning activities (Mean=3.82, SD=0.96), The students were asked if using technology for these assessments effects their learning in their learning space ,the findings indicated that they concur with mean= 3.87, SD= 0.92. About the incorporation of Moodle as a formative assessment tool, thirteen questions and one question for

motivation level were asked. Students agreed to be more motivated for the subjects with the addition of formative assessments (Mean=3.54, SD= 0.92). Regarding Moodle, students agreed that they felt comfortable in giving honest responses (Mean=3.96, SD=0.78), it helps students to get immediate feedback (Mean= 3.87, SD=0.97) and it helps in presenting responses of students in graphical manner (Mean=3.87, SD=0.98).

Table No. 2: Descriptive Statistics for the use of formative assessment

No.	Items	Mean	SD
1.	Formative assessment should be an essential part of classroom learning.	3.94	0.929
2.	Formative assessment helps teachers identify difficult concepts that students are struggling to understand.	3.99	0.956
3.	Formative assessment helps teachers identify skills students are having difficulty acquiring.	3.92	0.965
4.	Formative assessment gives information needed to adjust teaching and learning while it is happening	3.82	0.965
5.	Formative assessment is guiding teachers and students in making decisions about how to move forward to reach their goals.	3.76	1.019
Descriptive Statistics for Using Technology			
6.	Technology-based formative assessment has an impact on students' learning outcomes in the classroom.	3.87	0.921
Descriptive Statistics for Students motivation			
7.	Using Moodle made me more motivated about the subject.	3.54	0.928
Descriptive Statistics for the Moodle			
8.	Moodle assessment helps students get immediate feedback.	3.87	0.972
9.	Moodle is basic for teachers to use in the class.	3.65	1.053
10.	Moodle enables teachers to gather data for formative assessments in real-time.	3.80	0.894
11.	Moodle helps in storing students responses for later use.	3.78	0.898
12.	Moodle helps in showing students responses graphically.	3.87	0.960
13.	I like it when teachers use Moodle quizzes in the classroom.	3.73	0.938
14.	I feel comfortable in giving honest responses when teachers use Moodle.	3.96	0.788
15.	Moodle allows students to deduce what incorrect answers are and why they are incorrect.	3.30	1.045
16.	Students feel excited when Moodle is used for the first time as formative assessment tool.	3.76	0.945
17.	Moodle helps in checking students' progress and understanding of the content	3.57	0.900
18.	I plan to use Moodle for formative assessment with my students when I become a teacher.	3.77	0.915
19.	I would pay more attention to the materials if the teacher taught like this all the time	3.75	0.839
20.	Moodle made me positively attend (perceive) the course.	3.63	0.807

DISCUSSION

The literature supports the formative evaluation of students that enhance their ability to track on going learning. The students appear to value the use of formative evaluations to assess their medical knowledge and other difficult skills. A study conducted by Dhindsa, Omar, and Waldrip concluded the similar findings when they looked at how advanced science students perceived formative exams [12]. Another study concluded that these assessments provide productive impact on learning of first year BDS students. It supported that formative assessment does influence teaching and learning activities planned by facilitators[13].

The millennial generation clearly enjoys using technology in their daily lives, and numerous academics have found that doing so in the classroom helps them learn[14]. Much research has demonstrated how technology significantly enhances teaching, learning, and evaluation strategies that have a favorable influence on students' knowledge and abilities [15]. These findings are in line with the results of this study.

If formative assessment has been created to excite the extrinsic parts of student motivation, it can have a major impact on motivation and accomplishment [16]. The findings suggested Moodle as a potential external factor in promoting lifelong learning, which could improve academic success.

A study conducted in Oman in year 2023 also concluded that using Moodle in the classroom has a

greater influence on student-centered learning strategies that motivate and engage students. Additionally, students show a stronger inclination to cooperate and share with their teachers and peers [17]. Another study by Jurgelaitis in 2019 concluded that gamification through Moodle significantly increases the motivation level of students of modelling course. [18]

Conduction of formative assessment by means of online platforms could decrease administrative time, optimize scores, encourage immediate feedback, move forward at the push of a button, and provide several opportunities for practise using the vast array of exam items available in question banks.[19]. The study findings favored the use of Moodle for conducting formative assessments. The students appreciated that Moodle makes them comfortable in giving honest responses, students getting immediate feedback or teachers collecting student's real time data. Soares and Lopes (2018) supported that use of Moodle for formative assessment is very beneficial, as it has built in learning management system features [20]. According to the literature, Moodle has gained acceptance as a suitable platform for use in higher education.[21].

Students who might be having trouble understanding the material or who are hesitant to raise questions in a traditional academic setting can benefit from immediate feedback. Additionally, instant feedback gives a brief overview of the cohort's level of subject matter comprehension [22]. Quizzes and real-time feedback are being integrated into university teaching courses using platforms like Moodle. Moodle quizzes may encourage interaction and provide instant response since they have the capacity to combine a number of multimedia options, including audio and video.[23]. These findings are in accordance with the perception of this study participants.

CONCLUSION

Numerous pieces of literature have emphasized the value of assessments taken as formative to collect information regarding students' progress. By conducting assessments with the help of MOODLE platform, it is easy to provide feedback to students regarding their performance. The tool's simplicity of use and interactive features aid in raising student involvement at the same time. The students appreciated the incorporation of formative assessments and use of MOODLE.

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REFERENCES

1. Blanco M, Ginovart M. On how moodle quizzes can contribute to the formative e-assessment of first-year engineering students in mathematics courses. Int J Educational Technol Higher Educ 2012;9(1):354.
2. Chen Z, Jiao J, Hu K. Formative assessment as an online instruction intervention: Student engagement, outcomes, and perceptions. Int J Distance Educ Technologies (IJDET) 2021;19(1): 50-65.
3. Using Kahoot! as a formative assessment tool in medical education: a phenomenological study. BMC Med Educ 2019;19(1):1-8.
4. Moin H, Majeed S, Irshad K, Shafi R, Yousaf A, Ashraf I. Introducing' Socrative' as a formative assessment tool in undergraduate medical curriculum. Pak J Physiol 2020;16(2):21-5.
5. Parsons J, Taylor L. Improving student engagement. Current Issues Educ 2011;14(1).
6. Marini A, Nafisah S, Sekaringtyas T, Safitri D, Lestari I, Suntari Y, et al. Mobile augmented reality learning media with Metaverse to improve student learning outcomes in science class. Int J Interactive Mobile Technologies 2022;16(7).
7. Franklin OU, Ismail ZM. The future of BYOD in organizations and higher institution of learning. Int J Information System Engineering 2015;3(1): 110-28.
8. Dahal N, Manandhar NK, Luitel L, Luitel BC, Pant BP, Shrestha IM. ICT tools for remote teaching and learning mathematics: A proposal for autonomy and engagements. Advances in Mobile Learning Educational Research 2022;2(1):289-96.
9. Fernando W. Moodle quizzes and their usability for formative assessment of academic writing. Assessing Writing 2020;46:100485.
10. Simanullang NH, Rajagukguk J. Learning Management System (LMS) based on moodle to improve students learning activity. In J Physics : Conference Series 2020;1462(1): 012067.
11. David J. Nicol & Debra Macfarlane-Dick. Formative assessment and self-regulated learning: a model and seven principles of good feedback practice, Studies in Higher Education 2006,31:2,199218.
12. Dhindsa HS, Omar K, Waldrip B. Upper secondary Bruneian science students' perceptions of

assessment. Int J Science Educ 2007;29(10): 1261-80.

13. Riaz F, Yasmin S, Yasmin R. Introducing regular formative assessment to enhance learning among dental students at Islamic International Dental College. J Pak Med Assoc 2015;65(12):1277-82.

14. Schell J, Lukoff B, Mazur E. Catalyzing learner engagement using cutting-edge classroom response systems in higher education. In Increasing student engagement and retention using classroom technologies: Classroom response systems and mediated discourse technologies. Emerald Group Publishing Limited 2013; 233-261.

15. Elmahdi I, Al-Hattami A, Fawzi H. Using Technology for Formative Assessment to Improve Students' Learning. Turkish Online J Educational Technology-TOJET 2018;17(2):182-8.

16. Cauley KM, McMillan JH. Formative assessment techniques to support student motivation and achievement. The clearing house: A J Educational Strategies, Issues Ideas 2010;83(1):1-6.

17. Al-Ani WT. Blended Learning Approach Using Moodle and Student's Achievement at Sultan Qaboos University in Oman. J Educ Learning 2013;2(3):96-110.

18. urgelaitis M, Čeponienė L, Čeponis J, Drungilas V. Implementing gamification in a university-level UML modeling course: A case study. Computer Applications Engineering Educ 2019;27(2):332-43.

19. Prasetya RE. The Usage of Online Assessment Moodle LMS and Google Classroom Environment for English Language Teaching. PANYONARA: J English Educ 2022;4(2):136-58.

20. Deliwe AP. The Use of Learner Management System (MOODLE) in promoting teaching and learning. Universal J Educational Res 2020; 8(12B):8383-92.

21. Aydın CC, Tirkeş G. Open source learning management systems in distance learning. The Turkish Online J Educational Technol 2010; 9(2):175-84.

22. James R. Tertiary student attitudes to invigilated, online summative examinations. Int J Educational Technol Higher Educ 2016;13(1):1-3.

23. Gamage SH, Ayres JR, Behrend MB, Smith EJ. Optimising Moodle quizzes for online assessments. Int J STEM Educ 2019;6(1):1-4.