The role of new technology in teaching Physics: Use of LMS for learner centric interaction outside the classrooms

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Abstract— **Technological enhanced teaching through learning management systems (LMS) have become a potential interface for handling course registration, assigning students, their subject group, managing course contents and assessing students. Many Higher Educational Institutions across the country are still dependent on classroom teaching for covering the syllabus. A lot of effort is put in by the faculties to handle/manage, save and reuse the study material for repeating the topics of a particular course in next semester. This system bridges the gap between the student and the teacher to interact outside the classrooms as well. The efficient use of ICT in education is in high demands now to improve the quality of education in higher educational institutions. Thus, LMS serves to be one of the useful technological tools for the engineering graduates. Implementing different learning techniques, pedagogy and assessments strategies could be very challenging. More opportunities are provided to the teachers and the students to learn or assess their work through LMS. This study gives an overview about the use of innovative teaching, learning and evaluation techniques applied for the first year engineering undergraduate learners that can be adapted in an online or hybrid mode for understanding. With this intention, we have used customized Moodle based LMS for our engineering institution. LMS portal helps the faculties to upload the course contents, youtube video links, e-books, quizzes and assignments, which is accessible to the students anytime throughout their semester from anywhere. After various activities performed through LMS, it is observed that LMS helps in strengthening the learning process and motivates them thus showing a positive impact on achievement.**

***Keywords*— LMS, Moodle, Online grading, Flipped classroom, Blended learning, Pedagogy**

***JEET Category*— Practice**

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I. INTRODUCTION

The recent development of science education leads educators to explore new teaching and learning methodologies and reframe constructive classes and assignments to bring students' knowledge to the highest level of education by allowing learners to gain various skills that are reflected in their future. Including e-learning methods of teaching and learning are becoming unavoidable these days. The new pedagogy in the field of teaching and learning for the science subject implemented now a day includes: High-order thinking skills (HOTS), a concretely structured approach to science teaching and scientific skill enhancement using advanced digital technologies (Béres 2012). Corona virus outbreak (COVID-19) was one of the major causes that altered dramatically the education fraternity worldwide. Before the pandemic, there used to be limited use of ICT by the facilitators in sharing their knowledge. The opportunities for learning by using advanced digital means and technical support required were limited. Thus, engaging in learning or teaching using ICT supports the learning process of the students (Chandler 2013 and Blurton 1999). Due to sudden outbreak of Covid-19, the whole education system was transformed from an offline teaching to online teaching as the pedagogues were left with no option, but to adopt ICT and try to associate online classrooms with the offline ones to enhance interaction among learners. In physics teaching, we cannot separate the learning and academic achievements. The progress of learning will be reflected in students" academic achievement. The teacher's knowledge plays an important role in teaching physics. Here, a teacher's knowledge can be categorized into three parts as (i) Content knowledge: Physics teacher must be have in depth knowledge about the concepts, theories, principles and various laws applicable in physics (ii) Pedagogical knowledge: Physics teacher should be well aware of different techniques/strategies implied for learning; methods of teaching, assessments of student, managing the class etc. (iii) Technological knowledge: where the teacher is expected to have a command on how to conduct/deliver lecture/lab by using computers/laptops and presenting slides on projectors (Bauk 2015 and Li 2019). Physics teacher should be able to teach in order to enhance student's skill to

operate and to bring into play the new hi-tech methods in the applied science class (Köse 2010 and Amanah 2021). Now a day, the integration of ICT with the regular teaching in Physics class is modifying the traditional methods of teaching using chalk and board (Wang 2021, Aina 2012, Brekke 2010, Yazid 2016 and Dawes 2000). The studies done by Higgins (2003) suggested that; the constructive use of ICT in the class helps to influence the teaching methodology adapted by the educators which further improves student's learning. There are various teaching ways and means that are now available at different platforms and can be used to teach Physics effectively. ICT integration for teaching and learning Physics proves to be one of the best ways to improve student's academic achievement in the present dispensation. Use of ICT during the course of learning enables the students to have more peer interactions and helps to strengthen student's attention (Higgins 2003). An E-learning approach contributes to the educator as well as the learner to demonstrate and learn. It also bridges a gap between the facilitator and the learner. It provides the learners with progressive access to a range of information or resources like content, visuals and animated graphics. Learning management systems (LMS's) are considered to be largely applicable for teaching/learning tools for ICT. It is basically a software tool which is used for managing educational resources, content delivery by the instructor and tracking student's progress using assessment. The software has the facility to manage users, their role as a student or a teacher, information about the course, discussion forums, assessment/grading, and delivery of content. LMS in an institute allows the process of learner registration, tracks their progress by recording the test scores and indicating the course completions, thus allowing the instructors to assess the performance of their learners.

Students' are interested in using technology of classroom innovations even after the pandemic got over. The blended learning mode seems to be a different method of learning physics when combined with in person interactive learning approach along with online teaching. Tayebinik & Puteh 2013 has reported some studies done on blended learning mode that proves to be more favorable than pure e-learning. Eliyasni 2019 has reported that using hybrid learning strategies also improves students' higher-order thinking skills (HOTS). The recent researches done on the need of blended learning and technology integration (Raza 2021) inspires the faculty to teach engineering physics, therefore, the authors have tried to implement the same strategically to enhance the routine learning experiences of students.

This paper signifies the distinguished approach of using the LMS in undergraduate Engineering Physics course for the first year engineering students of a famous engineering college of Mumbai. The authors are trying to unveil the ingenious technology-that supports new teaching/learning enriching techniques that can be adapted while creating blended learning environment for the students. The suggested teaching and learning techniques using online and offline platforms using LMS are a perfect combinations of teaching & assessment practices which helps extensively in strengthening the learning process and hence, it also improves students' learning outcomes. The paper thus inspires the physics educators to be more engaging and creative with the vast features that LMS has and adopt it for daily teaching learning evaluation method.

II. PEDAGOGICAL EXPERIENCES VIA LMS

Instructions by the educators can be made more effective by blending technology with offline learning and teaching. The task of the instructor changes to being an influencer/facilitator. LMS proves to be a useful tool when it comes to outcome oriented teaching pedagogy. It provides flexibility for the users to be incorporated in their advanced technology based teaching. LMS permits the instructor/facilitator to use different scaling system to assess assignments, quizzes, journal write-ups by giving grades. The instructors have the privilege to apply a scale to all the types of assessment activities that helps in making the courses more enriching, and engaging for the student learners which helps them to get more connected to the subject. It becomes difficult many times to keep a record of students' and hence can help them upgrade their understanding capabilities. Even after the teacher tries to upgrade his/her teaching methodology by continuously putting in large effort, still it becomes challenging for them to diligently pay heed on every learner and give special consideration to the needy ones. Therefore, finding an innovative solution that can extensively be used to fill in the void between traditional old ways and modern approaches to education is a need of today's time. Henceforth, an ICT based educational domain that offers upgraded studying scope, tracking learner's/students' progress and employing interactive engrossment is on high demands now a day by the teacher as well as the students. In this context, LMSs have emerged as a plethora that enables educational organizations to reconstruct their teaching practices and comply with the demands of the students. Therefore, a planned and systemic approach was adapted by the authors of this paper to motivate the students to get acclimated to institution's Moodle system regularly for their physics studies. Some of the methods used by the authors to facilitate the students are discussed below.

A. Flipped Classroom

Using the application of flipped classroom has many benefits for learning physics. The findings discussed in this paper clearly shows an improvement in the learning outcomes in engineering physics after applying flipped classroom activity in the class (Amanah 2021 & Wang 2021). Flipped classroom basically is an activity that involves moving the study material like extensive notes, video-recorded lectures or presentations outside the formal class timing and using the regular class time for students to engage in interactive activities (peer discussion) relevant to that material. This learning model proves to be an approach to education that emphasizes active learning among students. The education field was highly affected during the lockdown period due to Covid-19. It was very challenging time for the students as they could not understand the concepts properly which they studied in online mode. They also lacked the understanding of basic concepts and knowledge related to physics. The facilitators (authors) teaching the physics course also struggled with the same issue, and due to the time compulsion, spending much time clearing

the students' prerequisite knowledge was very short. Thus, the authors were left with an option of moving to the 'Flipped classroom' teaching method through LMS to address this challenging issue. Therefore, this teaching pedagogy was used to screen the pre-required knowledge about the new topics/concepts of the physics curriculum, revise and summarize the concepts. Study materials in the form of short videos, links to the videos, topic notes, power point presentation, formulae related to the concepts, numerical problems and there solutions were uploaded on LMS, which helped the students to discover the concepts before coming for the class (Fig. 1).

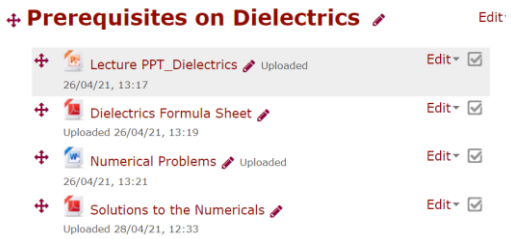

Fig. 1. Prerequisites for Flipped classroom activity

Other activities blended with flipped classroom involved active learning strategies used in offline mode like think-pair-share, peer discussion, topic presentation etc. during regular lecture timings. Therefore, the flipped Classrooms activity in the hybrid mode helped teachers formulate teaching and hence, also promotes an in depth understanding and conceptualization which likely enhances students determination in learning physics.

B. Guest lectures in online mode and beyond classroom activities

Using online guest lectures has mixed view on the strengths and weaknesses as compared to the guest lectures organized in an offline mode. Arranging an online guest lectures is an adjustable way which is accessible to the students and guests both as they can join from anywhere. This provision tends to affects the collaboration among the learners and the guest speakers as compared to face-to-face interaction that influences learning in a negative way (Fulton 2020, Li 2014). Literatures have presented the aspects of guest lectures in an online mode that involves strategy and planning required arranging for such kind of activities. This activity cannot be used often in offline mode due to logistics involved along with economic and time constraints. Using the advanced digital means for blended learning by conducting guest lectures and uploading the content on LMS, this technological tool was used throughout the semester. The inclusion of informal and blended learning through these activities conducted, we provide a way of engaging the learners. As per the feedback obtained from the students, they consider the guest lectures as an eye opener. The students realized that the theory studied in the course usually needs alterations, interpretations and remodeling of the diverse contexts. Also, the methodologies/tools implemented for learning/teaching looks to be simple, standardized, and is applied in a meticulous way whereas; the utilization can be hypothetical. Therefore, student suggests bringing a connectivity between the guest lecture and the course syllabi which always remains in demand. Fig. 2 shows the knowledge that is rendered to the students using uploaded videos, links for extra information and other study materials required during the discussion in the classroom or the follow-up quiz.

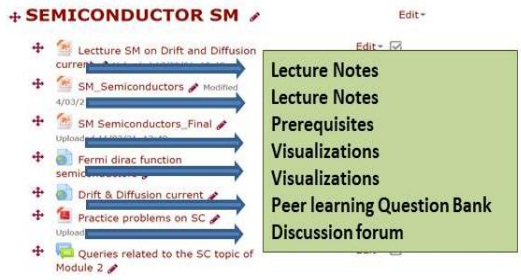

Fig. 2. Illustration of various activities practiced on LMS

C. Lecture notes & Question banks Through LMS

As the sub-topic covered in the classroom comes to an end, the lecture notes, PowerPoint presentations, numerical, solutions and other resources are regularly provided to the students. The practice of regularly updating resources on the LMS makes the lectures more flexible and convenient for the students. All the learners acknowledge this feature of the Moodle based LMS due to the reason that it provides a quick access & is always available for 24 hours at one place. It is easy for the students to refer the content that has already been covered in the class, anytime and from anywhere outside the college campus. The students learning abilities strengthens up because of the repetition of same content. Question bank for theory as well as application based numerical for each and every the topic is also uploaded on the LMS for regular revision. This question bank covers an extensive range of theory or numerical questions varying from moderate level to an expert level. This feature helps and prepares students for the most of the summative assessments scheduled during the semester. This feature also motivates the students to regularly use the LMS course page to see subsequent updates made by the teacher. A feedback survey was floated among the students to get an understanding whether they are benefitted after the use of LMS or not. The survey taken by the students to judge if LMS was beneficial for them or not, the results shown in

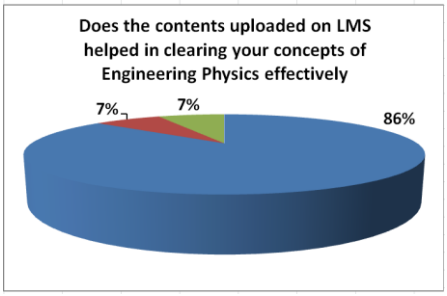

Fig. 3. Survey on understanding concepts through LMS

Fig. 3 clearly indicates that 86% of students have agreed that the uploaded contents of the study materials on LMS were very much beneficial to them and have helped them to rectify the queries related to the concepts more constructively (Fig. 3). The remaining 14% of the students were not sure about the benefits of LMS due to different issues. The given statistics clearly indicates that almost all the students accessed the contents uploaded on LMS. Around 80% of the students raised queries which were solved by the faculty during their in-class activities or discussion forums etc. to facilitate students who prefer an interactive environment.

D. Promotes Self-learning and group study

LMS brings together the consolidated and updated data/facts about the course. Through the e-teaching learning techniques demonstrated with the active learning offline strategies, the authors regularly uploaded the course related resources on LMS in a meticulously structured manner. Students can refer to these materials as per their comfort and explore them as per their pace of learning. The question banks are also provided to students for further practice that serves to be another way of motivating students for self-learning and peer interaction that helps them understand the concepts more clearly. This also allows the students to find the relevant data required for the course and thus, it encourages self-learning and promotes group studies among the students. This practice has shifted the role of a teacher from an instructor to a facilitator. The task of a facilitator is to design lessons with reinforced activities, to inspire students and to become proficient in their knowledge from the accessible materials that helps them to use their technique to get the solution. As depicted in Fig. 4, 95% of students voted about this feature which they feel were the most helpful in learning Engineering Physics as we can clearly see that this feature also makes the students to be an active user on LMS to see the available updates frequently.

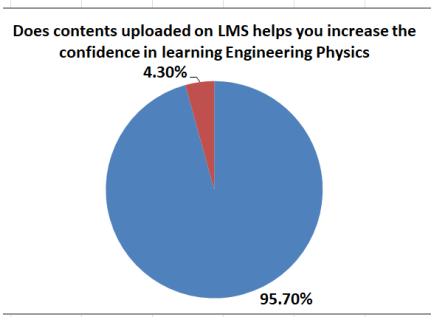

Fig. 4. Students survey on promoting Self/Peer learning using LMS

III. INNOVATIVE ASSESSMENT TECHNIQUES THROUGH LMS

Outcome Based Education (OBE) has one of the critical aspects termed as Continuous Assessment (CA) (Aina & Adedo 2013). We have efficiently planned internal assessments (IA-1 & IA-2) with the help of KJSCE-LMS which is one of the important components of CA. This tool benefits faculty as well as the students after the analysis of assessment based outcomes which assists them to their success. Thus, the conclusion of the hybrid learning prototype using advanced technological means could prove beneficial for the management level of the college and higher educational authorities. This tool proves to be helpful in defining the assessment policy that impacts classroom practice. The innovative form of assessment and pedagogical practices plays a prominent role in designing the curriculum that reflects student progress (Lock, Kim, Koh & Wilcox, 2018). The assessment tools incorporated in LMSs are the most sought after as they combine productivity taking into account the feedback survey and potency of the evaluation process by assessing the learners' progress. The assessment tools in LMS assist the educator extensively for the evaluation process along with providing feedback to students (Dudley, 2015).

A. Self-evaluation/graded Quiz

Quiz based on multi choice questions are the most regular assessment format in teaching pedagogy. Along with MCQ based quizzes, many more varieties of activity such as short answers, fill in the blanks, match the pair, shuffling the options etc. are ready for use in LMS to curate an effective evaluation tools for the course. Authors have tried to implement all the types of assessment strategies involving quizzes, single answer MCQ, multiple answers MCQ, assignments with rubrics etc. A mock quiz was also conducted as an easy going assessment tool that was aimed to self-evaluate students based on their pre-acquired knowledge in the physics courses before attempting the graded quizzes. Student's knowledge of physics concept discussed in the class is judged based on the grades indicated and accordingly the topic needing revision is done again before starting the applied physics course.

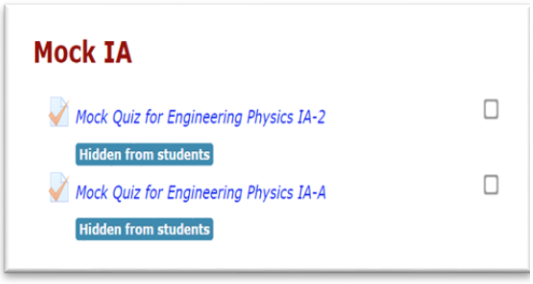

Fig. 5. Assessment tools used under LMS

The quiz based assessment technique motivates students to amend concepts that are already available on LMS uploaded by the instructor. The questions framed for the quiz was discussed in class in order to reinforce their learning. Two graded quizzes were conducted in the whole semester. LMS has an additional feature to offer distinctive types of quizzes that solves the purpose of graded activity. This type of quiz offers an opportunity to the facilitator to create variable questions based on the different data set. Internal assessments technique using quizzes guides the instructor to check the reflection on the students by grading their problem solving skills (Fig. 6 (a-e)). An extensive set of theory and numerical

based question bank is created by the facilitator which later is utilized to create random quizzes for different forms of internal assessments. With the help of this question bank teachers can form sets of various questions' variants during the conduction of the assessment.

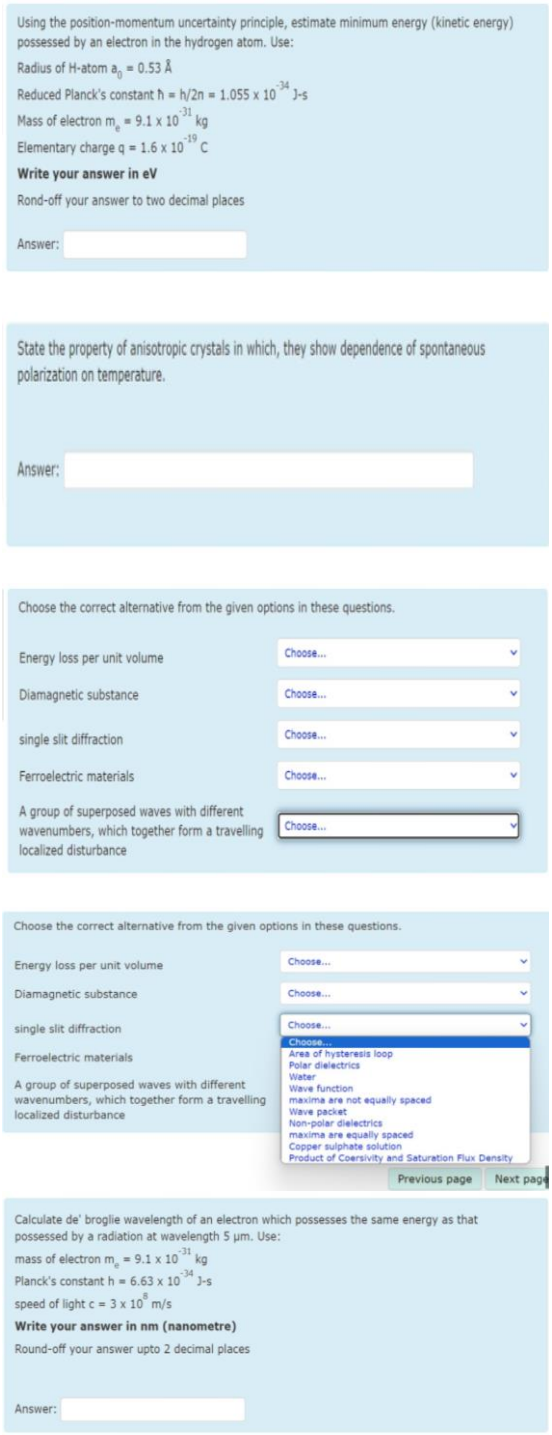

Fig. 6 (a-e). Represents the examples of questions asked in embedded quiz

These quizzes are automatically graded and allow the students to go through their grades on LMS to understand the misinterpretation done. The quick and accurate evaluation of the work enables the teachers and students to get fast and timely feedback of the activities. The teacher can contribute to design the future teaching strategies with the help of the feedback survey by the students. This helps the students to recognize their weak points/mistakes and hence, can improve them in the stipulated time. In order to develop students' interest in the research aptitude to find generalized hypothesis in physics we used LMS extensively to design graded activities in blended mode.

Feedback survey from the learners is an important tool in improving learning experience for the students. This has a significant effect in professionalizing teaching in the higher education institutions. Therefore, it is high time for the facilitator to take students feedback/survey on the graded quiz used to assess their knowledge on the concepts of the subject taught. The survey of the students was taken based on the following points: (i) Overall, do you think EP IA-A was designed with a mixture of different types of questions testing your learning skills - both, theoretical and analytical?
(ii) Which platform do you find better for such type of quizzes?

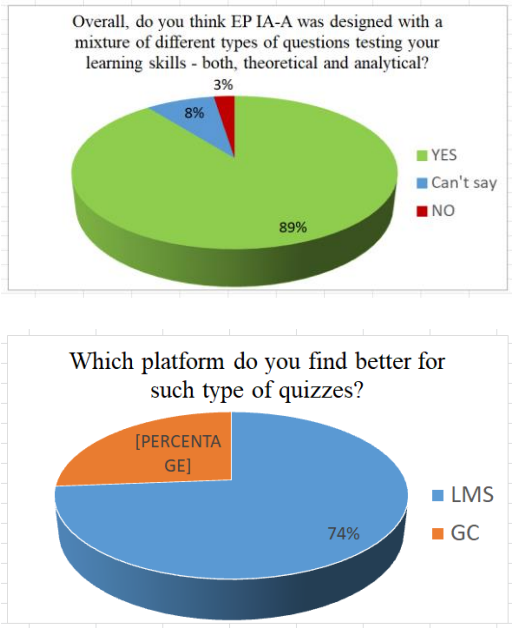

Fig. 7. Analysis of students' feedback received from the survey

89% of the students agree that the graded quiz taken on the MOODLE system had mixture of all the types of question testing their learning in theoretical as well as analytical skills. At the same time, 74% of the students prefer using LMS MOODLE system for the quiz as compared to Google classroom.

B. Assignments

The problem-solving skills to evaluate the students and their preparedness to present the solution precisely are essential. Several assignments were aimed to assess the performance of the students. The assignments like term work and IA were assessed using rubrics, while some were graded without the help of rubrics. The assessment of these assignments can easily be done on the LMS, and can also comments on the students' task in the discussion forum. The students can

always visit the page again and refer to their work. As there are no chances of losing the papers of the assignment, hence the students can revise their results with the help of feedback given by the teachers'. Students were required to submit every assignment with in the given stipulated time. Fig. 8 represents the lab experiments and the assignments submitted by the students in online mode on the LMS within the given timeline. The submission for each assignment was assessed individually. Fig. 9 depicts the normalized distribution of marks for the graded assessment obtained by the participants/students. It shows the performance of the students varying on the scale that clearly reflects the understanding levels of the students.

Fig. 8. Assignments submission links for the students

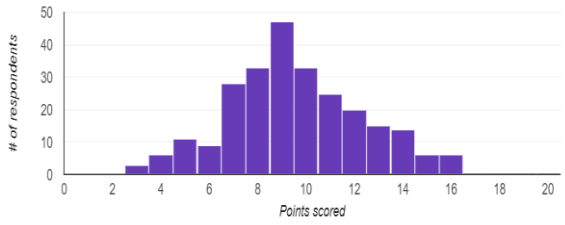

Fig. 9. Students achieving grade ranges

C. *Rubrics for the assignments*

Few guidelines need to be used to promote the consistent application of learning expectations, objectives, learning standards or to measure their attainment against a consistent set of criteria is defined in the rubrics.

Attribute	Excellent (5 Marks)	Very Good (4 Marks)	Good (3 Marks)	Fair (2 Marks)
Regularity	Performed and submitted experiment in regular schedule	Performed experiment in extra schedule but submitted on time.	Performed experiment in extra schedule.	Performed the experiment with other experiment
Procedure and Readings	Followed correct procedure and recorded readings were found to be correct.	Followed correct procedure and many recorded reading were found to be correct.	Followed correct procedure but recorded readings were found to be incorrect.	Few recorded readings were found to be correct.
Data and Graphs	All Data are presented in proper manner with proper units and graphs are correctly plotted with title, labeled axes and line of best fit.	All Data are presented in proper manner with proper units but graphs are not correctly plotted with title, labeled axes and line of best fit.	Either Data are not presented in proper manner with proper units or graphs are missing title, labeled axis or line of best fit.	Data are not presented in proper manner with proper units and graphs are missing title, labeled axis or line of best fit.
Calculations/ Results	Sample calculations are correctly presented in a neat, orderly fashion. Result is correct and presented in proper manner. All formulas and units are present.	Sample calculations are correctly presented in a neat, orderly fashion. Result is correct and presented in proper manner. Few formulas and units missing.	Sample calculations are present but includes minor errors or not presented in a neat, orderly fashion or missing formulas or units.	Sample calculations are missing or there are some major errors in the calculations and result is incorrect.
Understanding/ Conclusion	Understood the results and the validity of the experiment including experimental error. Suggests methods of improvement.	Understood the result and the validity of the experiment including experimental error but unable to suggest methods of improvement.	Understood the result and the validity of the experiment but not experimental error and unable to suggest methods of improvement.	Understood only the result.

Fig. 10. Rubrics for the assignments

Rubrics therefore sets up academic expectations for students and improvises consistency in the evaluation of academic work of different students, their assignments related to the course (Fig. 10). Rubrics are also used to determine grades or the degree to which learning standards have been approved or attained by students. Rubrics are provided and explained to the students prior to an assignment to ensure a clear communication about the learning expectations that should be understood by students. A well-defined rubric further helps in avoiding the effect of personal biasing. An efficiently designed rubric can be attached or uploaded to a graded assignment in the LMS for the students to refer.

D. *Grade book*

The gradebook gets generated automatically in the LMS that is based on all the evaluated activities conducted for the course. The grade book can be divided into different sections based on the requirement and the activities can be added to the relevant segments of the grade book. The marks allotted for the different activities are decided by the teacher for the final grade calculation. These immeasurable characteristics of LMS serve as a magnificent tool to make the teacher's job comparatively easy for the grade-related work. Therefore, a superior LMS satisfies the need for a systematically structured and a productive assessment tool in an overall manner (Fig. 11).

16010320085	9987911840	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	20.00
16010320091	9867782417	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	25.00
16010320123	9987629150	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	21.00
16010320086	9969558704	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	19.00
16010320098	9653342042	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	13.00
16010320082	7208268619	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	15.00
16010320116	7573013378	ELECTRONICS AND TELECOMMUNICATION ENGINEERING	20.00

Fig. 11. Generation of gradebook compiling the marks/grades for every assignment

IV. STUDENTS' SURVEY AND RESULTS

Students can put forth their opinion, their requirements, and the preferences by giving a feedback to the instructor in order to modify their method of giving instruction so that the students' performance can be improved. A physics teacher, C. Pagan, by analysing his students' conduct, got an understanding that the students aren't able to meet his demands (Minero 2016). The instructor can design the activities in a way that decides with what ways they will be able to learn the most, what kind of inside classroom activities would help them in improving their learning process. Thus, by employing this practice, we understand that feedback is an essential component of the educational system. It can be incorporated as one of the tool for indirect assessment that can enhance teaching and learning techniques as it shows an immediate impact on the process of acquiring knowledge. Feedback survey provides clear instruction on how to improve

their learning methodology that also assists the students to thoroughly understand the conceptual subject.
Henceforth, students gain confidence, improves self-awareness, and enthusiasm for what they are learning. It also helps in strengthening their academic/fieldwork performance.

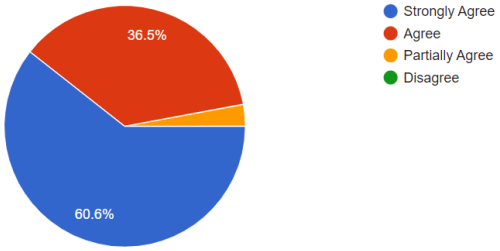

Fig. 12 (a). Does the contents uploaded on lms helps in boosting the confidence level for learning physics

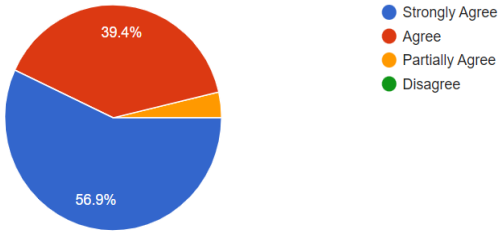

Fig. 12 (b). Are you satisfied with the resource/contents uploaded on lms for learning physics

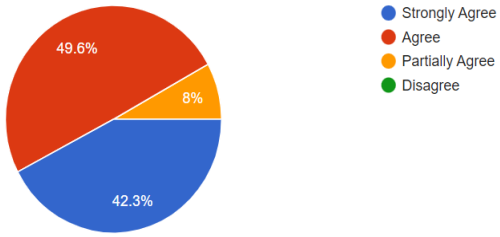

Fig. 12 (c). Does the contents uploaded on lms helps you relate physics with other engineering fields and real life applications

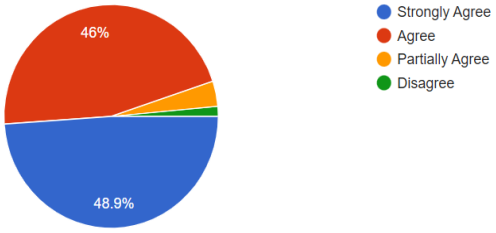

Fig. 13. Guest lectures on some special topics were helpful in getting additional knowledge of the topics from experts in the field

A student survey based on their participation and containment on using the LMS for the graded/ungraded activities engaged in-class and out of the classroom activity was taken by the instructors (authors). The feedback survey form was floated among 320 students out of which 300 students responded (Fig. 12 (a-c)).

In response to the question about boosting confidence and satisfaction level most of the students strongly agreed that the features of LMS were helpful to them. Consistent uploading of lecture notes on LMS by the instructor also helped them in going through the concepts thoroughly on a regular basis. The statistics displayed in this paper also confirms that the contents uploaded by the teacher on LMS helped the students to understand the concepts extensively. The contents uploaded on LMS helped in increasing their attention toward physics learning. Fig 12 (a) clearly reveals that 96% of the students after using LMS see an increase in their confidence in learning physics. Fig 12 (b) shows 97% of the students were delighted with physics learning with the help of LMS in the teaching learning pedagogy and assessment. Moreover, approximately 92% of the students acknowledge that the contents uploaded for beyond syllabus activity like guest lectures on LMS helped them to relate application of physics in other engineering fields and in real life.
Fig. 13 shows that 95% of the students feel that the Guest lectures organized were helpful in acquiring additional knowledge about the subject. As per the statistics and their activity logs on to Moodle, it is observed that most of the students prefer to go with the integrated approach to teaching. Though it is clear that the students were more active on LMS during their exams but they still continued to access the contents even after the exams. This clearly shows the benefits students are getting from the Moodle platform along with online/in-class teaching. We also found significant amount of time spent by the students on Moodle. The results displayed in Fig. 12 & 13 clearly depicts the interest of Moodle participants' in e-learning as well as the substantial amount of time spent on LMS outside the classroom.

V. LIMITATIONS OF THE STUDY

Many different forms of LMS platforms are used now a day and different students have different learning styles and grasping capacity. Some of them listen to the instructor quietly during the lecture hour absorbing all the words of the instructors while others may feel the need to repeatedly ask questions and clear their queries throughout the duration of the lecture. While traditional learning platform allows this freedom to the students, online learning restricts this learning through interaction. The complete substitution of traditional face-to-face teaching by Moodle/LMS is apprehensive for students as they feel disconnected from the in-class environment which seems to be justifiable too.

VI. CONCLUSION

This paper tries to attempt the main struggle faced by the faculty that is to make physics easily understandable for students by using advanced technology-based digital means and assessment techniques. The systematic and intelligent approach of implementing LMS by the instructor helps to create an interaction based active learning environment & dynamic classrooms for physics. LMS proves to be a supporting tool in various aspects that include managing resources and implementing efficient strategies planned for the students. The paper explains the appropriate use of LMS that makes learning of physics topics easy, more effective and

meaningful. The teachers have utilized the LMS system to create dynamic classrooms for in class and out of the class activities. The teachers have executed inventive teaching methodology to achieve relevant learning outcomes. Different learning styles are also catered by the teachers to the students using the LMS for various other subjects in online or offline learning mode. The perfect blend of innovative technology based online teaching and assessment techniques suggested here supports the offline education that creates a completely new blended learning environment constructed for students. This blended learning environment also motivates students to improve their way of studying physics. Anonymously distributed survey results display exceptional feedback from learners about the redesigned structure of online teaching/learning, resource materials, and overall satisfaction with the strategies followed on LMS to improve learning.

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