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**Learning Management System: An Approach Towards Virtual Education**

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**ABSTRACT**

*With India's rapid educational growth towards virtual education, the education system has intensified. India has gone through critical condition like COVID-19. There is huge increment in the implementation of online learning management system. This helped the educational institutions to manage their education system without being physically present in the institution. This paper is presenting the challenges required by institutions to transform their manual education system into virtual/online education system. The online learning management system has enhanced the way of teaching and learning process of students. This study will tell us about how online LMS has speeding up the quality of education for the On-Campus enrolled students as well as distance learning students also. In general, LMS are built to provide the course material in a static way only. The modern LMS has the ability for the group discussion which is helping the student to achieve the qualities of team-working.*

**Keywords:** *Learning Management System; Research Design; Manual System; Features; Training; Cloud-Based System.*

**1.0 Introduction**

With increasing in the quality of education, to meet the requirements of the current youth in the critical situations like COVID-19, An advanced system of learning has been developed to overcome the problems of student. In this, students do not have to present physically at their institution for gaining information. It is a faster way ever as all the course materials will be provided through this system only. Students can submit their assignment, talk directly to their respective teachers. They will be able to save their time in managing the course notes or transportation time. This is an in-house learning system. The teachers can provide live lectures to the students. Also, they can have pre-recorded lecture videos if they missed the lectures, which will be available all through their semester. Students will have live doubt clearing sessions with their faculties. LMS is very easy application which does not require huge maintenance. It only cost once for the institution while integrating it. Now, an admin alone can control over the functions provided within the system. He has

the power to control which user should be allowed to access this course or which faculty has the right to update or delete the course. LMS provides a feature to the faculty that they can monitor the performance of each and every student with the aspect of past and future preferences. Now, teachers are able to take quiz and assignment through LMS and they do not need to examine for each and every question of students. There is an automatic functionality of examining multiple choice questions (MCQs) and generating results on the basis on choices selected by the students. Reports can be downloaded based on the best priority results which can be further used for analysis purpose.

Many researches from international point of view does not point out the reach of online learning management system in rural areas. These areas have barely access to good education. These areas do not have good electricity and internet connection as well. In most of the countries where most of the areas are surrounded by tribals they are very literate. So, this the place where this idea of online learning fails so far.

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Some villages who are able to understand this concept but then also they are not able to get because of unaffordable rates of internet or they may be very poor. So, they have very much difficulty in accessing to the internet (Febrianto, 2020). In addition to this, there are some of the problems which should be kept in mind while implementing the model. There are so many disadvantages like while presenting a mathematics chapter there is no standard format of displaying the mathematical equations. Mathematics can be understood best while applying practical equipment to it or solve using the real-world problems. Beside this, mentor are not able to give full view of programming in an expanded form. But in this system, it is hardly able to meet our expectations (Irfan et al, 2020). So, keeping in eyes about the above situation, educational institutions must start a platform where a mentor can present the study material in a practical way so that it will meet the expectations related to understanding the practical view of mathematical equations, programming algorithms, some scientific problems etc.

As observed by the students, learning through online mode do not gives complete output of the input given by the teachers because teaching in online mode can not give proper influence of the teacher to the students. Based on the several studies, it was analyzed that online learning gives the freedom to the students, they can learn their topics at any time, any day. There are no such time or day limits. They can learn wherever they are, whenever they can, independently. Now a days, Online learning have a feature of Video conferencing that helps to understand the topics pretty well. By this feature, student can have the pre-recorded videos which they can see any time, as many time to prepare themselves. Pre-recorded lectures are recorded one time only and they are useful to the student as many times as they want. This reduces the teacher's hard work. Also, the students can take the lectures unlimited. A limitation comes here is that by providing the video conferenced lecture, teachers are not able to give moral education to the students because it requires exact physical presence of teacher and students. On applying several studies, we have found that, teacher's feel so much load for preparing the materials of the special subjects like physics and mathematics. There presentations require much attentions at every step. They consist of various

equations and to expand or shrink these equations, teachers are not able to decide whether how to present it very effectively. So, they start sharing their hand made stepwise solved equations through social-media platforms to the students. This is a comfortable way but not considered as official in respect to institutions because they are using third party applications.

We can conclude from above situations that learning in an online way does not give the proper outcomes also teachers are not able to create the interaction to students and students feels the topics are very difficult, continuously losing the interest towards education. So, before the condition continues, we must find a way to overcome all these problems because if this problem continues, this can degrade the quality of education for the upcoming generations. We have an alternate option for the teachers to be implemented is that, teachers can use online learning systems which are based on Moodle (Gunawan, 2015). If a institute implements this Moodle based system, then they will definitely get best outcome, this has been proved by Ariesta et al (2019). In addition to this, it was observed that teachers have created their interest they are getting familiar with the features of online software. Day by day, features are getting updating to the system. Also, by taking the surveys, Moodle creators can improve their features as required by the users (Gunawan et al, (2019). In Moodle, various types of material can be studied by this platform whether it is physics or mathematics. Teachers can attach their materials in the form of different computer-based entities like PPT, PDF, VIDEO, AUDIO, LINKS etc. There are some features which are integrated with this Moodle platform like quiz, surveys, time-table, student-bio, college information, registration details, fee-details, attendance, report card, proctor contact, attendance etc. This management system can be modified as per the institution's requirement like themes, feature, software, hardware etc.

## **2.0 Literature Review and Related Works**

According to Al. Busaidi, 2012; Selim, 2007; Sun et al., 2008, The traits of student and teacher's impact have an important role in acceptance of online learning management system. Learning management system are of different types, based on their,

features requirement, cost etc. PLATO is a type of LMS which is referred to Programmed Logic for Automated Teaching Operations<sup>TM</sup>. This was first coming into play in 1960. According to W-Win website, 2011, The Learning Manager<sup>TM</sup> (TLMTM) was another type of LMS which came into play in 1980. Another was Andrew project which was first introduced in 1982. According to Carnegie Mellon University, 2011, This Andrew project has advanced features at that passage of time. This project consists of sending and receiving mails, document, programs etc. Also, user can access these resources from anywhere. This is independent of place. According to Carnegie Mellon University, 2011, After Andrew project, a new project came in 1986 named as EKKOTM. This is a type of conferencing system. At the time of this system helped about 4000 customers, which consists of teachers, professors, students, etc. According to Balkovich, Lerman, & Parmelee, 1985, After EKKOTM served their customers very effectively, ATHENA was introduced in 1983 by the students of MIT but it needs some clarifications and updating, so it was publicly used customers in 1990.

By the end of 1990, Davis, Carmean, & Wagner (2009), says that there was a huge distance between traditional and online way of education. Student were getting education from their places. This was effectively very beneficial for the distance learning students. The traditional way of education is being transformed into e-learning system. This system was continuously implementing by the educational institutions. With the huge response by the student teachers, the software providers companies started working on every tiny functionality of their system. So, that it can work with types of computers which were having less hardware compatibility. According to Davis, Carmean, & Wagner, 2009, page 4, the traditional way of learning is now completely transformed into computer-based system which can work along with internet connection. In the new age of learning management system, it got transformed to a new system with a change from computer-based system with the help of internet to a message-based service. This is a reduced form of past system. In 1997, Davis, Carmean, & Wagner (2009) said that LMS application was first successful developed by the company named Blackboard and Saba. This application has enterprise level features and server management services are also integrated. So, that the institutions can work on a large scale. Also, these

institutions can modify their functions according to their official requirement. According to that time, this application has most advance features as compared to other applications. This is also called as commercial LMS. According to this application, it has the ability to generate study materials for the teachers and students in a digital form. This application gives the right to share these materials over the internet and manage the required materials according to the usability. Now, admin is able to manage the user's data, their user permissions. Grant and revoke functions which is only accessible by the admin so that he can grant and revoke the credentials of the respective users. By the change in our generations, LMS became the most important software application used by the educational institutions. Now, this learning management system is working from school to higher degree colleges. With this application, everyone is getting benefitted with their features. Schools are now maintaining their course materials on their application only. Student are getting benefitted by taking their online and pre-recorded lecture as many times as they want. With the newly introduced internet technologies, the internet is in reach to many rural areas and many common people also. This has led to increase in number of teachers and students also. In the last sixteen years, LMS took his impact in nearly all over the world. The learning management systems which were successfully introduced in 1990 are now transformed into new generations LMS [1]. The above two statements may look similar but they very different from each other. Earlier system of learning was focused only on delivering the material successfully to the users but the new generation LMS has took a great impact in enhancing the learning of the students [2]. In the past LMS was made as a part of simple webpages which does not contain any special functions. But the newly developed project is now based on template webpages for the course management application.

### **3.0 Usage of Lms Around the World with the Help of Internet**

After so many researches by many researchers, the target of there is to find the effective way of usage of internet in leaning management systems. They have observed that internet is using in the large parameters in meeting the requirement of using LMSs.

They have concluded that nearly all the educational institutions are using internet at large scale for maintaining their education system.

Basic research shows that the learner's who were studying in the college on Malaysia are using the internet for managing their studies. The learners who have good knowledge of internet are getting much benefit from this learning application. Also, they are able to complete their task using their system only. In this research it has found that student is having great interest towards the use on LMS application for improving their quality of education.

In India, the students who are studying in University of Delhi, has proven the usage of internet in maintaining their daily activities or reach to the internet. Many students are using the internet at large scale because of the reduced cost of internet facility around the world. 71% peoples shows that they are engaged in internet for completing their daily tasks, 15% of the people shows that they are using it average three times in a week. 11% of people says that they are not much interested because their work is not more contains usage of internet. So, they hardly use it a day of week. 2% people says that they use the internet only when their work can't be completed without internet. Internet is now helping the educational institutions in solving their problems related to their staffs, rising costs, increase in number of students and meeting the general demands of academic needs [3].

Systematic management in institutions gives rise to enhancement of the level of academics. It will lead to higher quality of education. With the help of internet, now accessing the information with help of internet is a common thing. But internet is not accessible to everyone because of its higher cost as it was concluded by the research from the Rajshashi University, situated at Bangladesh [4]. In Nigeria, the University of Ibadan, said that they are effectively using the internet to help the students and teachers in managing their academic activities. In 2003, research was conducted, which concluded the use of internet in the academic activities at the Obafemi Awolowo University, Ile-Ife, Nigeria. The analysis says that, 17% of the usage of internet is being involved in searching the academic activities. After that 53% of the students are using the internet to get in academic materials through email communication [5]. The above research concluded that internet is used by the

academics in institutions are continuously increasing at large scale in their departments. By the usage of internet, it has observed that students are using the internet for their academic's activities on a large scale [6]. Also, it does not matter where they are residing because this is independent of place. At last, we can conclude that students are using the internet for accessing the academic resources.

#### **4.0 Learning Management System (Lms)**

In our fast-moving generations, where students are getting benefitted with the internet for most daily activities. It is very essential for academic institutions that they should integrate the best online learning management systems by observing the reach of internet to the students. This system not only helps the student and instructors but also helps other departments in managing the staff related activities. The online academic management system helps the students to search their study materials with the help of internet [7]. The LMS is a computer-based application that works with the help of internet and are used by most of the higher academic institutions all around the world. There are different types of learning management systems which are using by the educational institutions as per their requirements. For this paper, we are only working on the current e-learning system that is Learning Management System (LMS) [8]. This is an e-learning system which is used by all the schools and colleges.

The Learning Management system can be called as Virtual Learning System. LMS is a type of application which helps the teacher and students in their academic's communication. This is a tool which works with the help of internet for accessing their academic activities. LMS provides a platform to the instructor to present the academic material in various forms. They can have video-conferencing lecture with the help of steady focused camera, the applications and internet. By attending the video-conferenced classes, students are now getting the experience of virtual education from their homes. This application provides the chat feature for directly assistance from the teachers. Commenting and replying on any topic is the very basic function which can be viewable to all the teachers and students. However, the chat between a particular teacher and student are private but comments are public.

LMS is not supporting some special feature related to their institutions like college information, faculty information, course information, course registration details, results from every semester. LMS also give live updates about the colleges like every notice from high management will be instantly available in the homepage. Student do not need to physically approach to the notice board for getting the updates. LMS are now featuring a time-table function which will provide the time-table to every student of the course enrolled. LMS now provides the feature of taking the online quiz and examining online only. This helps teachers to get the each and every student's record in their portal only. Also, they can analyze the performance of each and every student and generate the report of student. This helps in saving a lot of time and physical paper work. Teacher are now able to track the presence of the student within their portal only. They can conclude which student needs attention towards their academics.

LMS is now independent of time, place where most of the student and teachers are getting benefitted. If any student missed their lecture, then it can be fund in the portal in a pre-recorded form. These pre-recorded lectures can be viewed as many times as the student wants. Also, this has reduced the load from teacher to recite the lecture again and again to the students. According to some researches, it was founded that the implementation of this system in academics has led to some restrictions to the students like teachers can restrict them to write comment or directly chat with them. This statement was concluded by Ramayah's study. Some teachers who are not trained to operate this system restrict themselves from uploading their course materials, reply to comments, chat, forum, discussion. So, a very important role comes into play is that training for the system is very necessary. If the instructor is not trained to use the system, then he will feel inferior to use this system. This is a very important point for the institutions that if they are going to implement the system, they must plan about the training to their instructor and students as well. Staff members uses discussion forums for the feedback of course related problems. But due to restrictions for the student, staff will not be able to get proper feedback. This will impact the future planning of the institution. Now a days, there are so many attractive features are available in the LMS which helps in creating the interests of students in an interactive way. According

to Wahlstedt and Honkaranta, he found a large distance in between the physical material and multimedia course material which uploaded by the instructor. Student does not access this material because they are not interested in watching the recorded lectures instead of this, they prefer physical lecture and physical course materials. According to Almarashdeh, Noraidah, Nor Azan and Alsmadi), To reduce this gap, this system has compromised many changes in their feature for making it customizable at tiny stages. Also, this application is made to compatible to work different computers with their different configurations and systems. Various researches on LMS proved that online learning management system are increasing the quality of education. Also, they are enhancing the way that the instructors are using the technology for their activities. To clearly say about the actual benefits of using this system, institutions are focusing their interests towards the online users of LMS. Research done in 2011, which says that students and teachers are using the LMS very effectively for increasing their learning productivity. It was concluded that increase in learning productivity is more important that the full usage of this application. Some teachers who are not trained to operate this system restrict themselves from uploading their course materials, reply to comments, chat, forum, discussion. So, a very important role comes into play is that training for the system is very necessary. If the instructor is not trained to use the system, then he will feel inferior to use this system. This is a very important point for the institutions that if they are going to implement the system, they must plan about the training to their instructor and students as well. Staff members uses discussion forums for the feedback of course related problems. But due to restrictions for the student, staff will not be able to get proper feedback. This will impact the future planning of the institution.

## **5.0 Materials and Methods**

We have used different approaches and methods in defining this study. We have analyzed the problems with the experimental approach. According to Sukmadinata, he said that research done in an experimental way is almost complete research and this can give most predictable results. By following these methods, we can complete all the requirement as stated in the research objectives. According to the

research of Babussalam, this study was experimented on the students of pre-intermediate class in SKMS school. This research was started with collection of data from the students with the help of short surveys. Students have interactively given their views on this topic. The views were based on the current condition of their online portal which are currently working in their school. They have conducted this research in that school just because it has good internet facility and all the student and instructor has enough access to the computers. The student has told their advantages and limitations of their current management system in these surveys. In the surveys, it was found that the online portal was started in 2013 in their school. There was different way of studying in that school. Actually, school is operating on the basis of general education and education related to their religion also. This has led to the instructor to teach the topics together. They can not be taught separately. The situation arises here is somehow looking interesting and we have to implement the system according to meet all the necessities of their system. So, we came to final decision that the Learning Management System can give proper solution to these problems. Therefore, the schools can implement the customized way of Moodle application to overcome this problem and confidently it can surpass all the situation arise during the study.

A good feature was involved in this system while researching. They have implemented the quiz-based system to extract the favors of the students. Questions were given in the form of multiple-choice questions and the answers were pre-defined in the system to cross check the answers rapidly and get results in no time. In this system, a data analysis feature was integrated to judge the results and performance quantitatively.

We have calculated the N-gain score by analyzing the data which we got from the quizzes. This experiment given an unexpected result.

Also, the data was not only in theoretical form but we got these data in the form of pictorial charts, graphs etc. They have not taken any test related to normality. So, this all research done to get outcome of using Moodle, we have successfully found better results from all the experiments.

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## 6.0 Results and Discussion

Data which we got from above all the researches have successfully proven that online learning management system has successfully taken the steps in creating virtual approach of learning. In this, study we have solved the problem of presenting the mathematical equations and physics derivations. Based on their quizzes, the scores concluded that Moodle is an application to get the lecture in online mode. It is very easy to use. Now, students can take their pre-recorded lectures as many times as they want. This will give a free hand in their preparation. Students can see their time-table from their portal only. They can check new updates from their management in the homepage of their website.

They can check the college information as well. Teachers can successfully take the online quizzes from the students and extract their performance in a very interactive way by displaying the results in various forms like pie-chart, table, graphs etc.

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