MEASURING THE USAGE OF LMS IN HIGHER EDUCATION INSTITUTIONS: AN ANALYSIS

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Abstract—Information and Communication Technology (ICT) is foreseen as a tool to overcome various challenges in education. Many education institutions have taken a keen initiative towards the usage of ICT based teaching-learning systems so as to enhance efficiency. In this context LMS has been identified as most accepted ICT based tool at present education system. Hence this paper brings out the significance and features of present LMS systems. An analysis is done to know the current utilization of LMS services in various educational institutions and the purpose for which it is being used.

Keywords - ICT, LMS, enhance, efficiency, teaching-learning

I. INTRODUCTION

The influence of Information and Communication Technology (ICT) has permeated all the realms of life such as education, entertainment, business, scientific research etc. ICT has increased the effectiveness and reach of development, enhanced good governance and lowered the cost of delivering basic social services at both micro and macro levels. ICT integration has brought significant changes in the field of education. ICT improved quality of education and encouraged learners to adapt technological integration. Revolutionary changes brought by ICT made new mantras in education “anywhere at any time” [1]. The technological enhancements have made radical changes in the concept of education. Education for human development in the learning society requires collaborative learning, and focuses on building knowledge. Great shifts in educational goals and new concepts in learning and knowledge creation are evolved. The orientation of education has been changed to learner-centred and the role of the teacher to a facilitator.

Technology enabled learning is very much concerned about higher education to expand access to students in geographically distant areas as well as to students who might not otherwise have opportunities to engage in higher education. The application of technology has been framed as a way to improve the quality of teaching and learning. The idea is to use information and communications technology to enhance student-faculty relationships, as well as student-student and faculty-student interactions [2].

There are numerous ICT tools implemented in education and the Learning Management System (LMS) is considered as the most important and effective tool for ICT enabled teaching-learning process [3].

LMS Definitions and Features

The Learning Management System (LMS) is an important tool for the development of curriculum design, management of students’ learning and their motivation to learn. The LMS is also useful in the development of student assessment. The LMS can manage all teaching and learning processes of registration, scheduling, checking availability of content, tracking the performance of the learner and issuing reports about it, facilitating communication among teachers and learners, etc. [4].

Many other terms also exist with LMS with similar meaning, such as course management system, content management system and e-learning platform. Alias and Zainuddin defined learning management system as “a software application or web-based technology used to plan, implement, and assess a specific learning process” [5], Baumgartner and Maier define LMS as “a server-side installed software, which assists in teaching of any learning material via the internet and supports the organisation of the necessary processes” [6]. “LMS means a suite of functionalities designed to deliver, track, report and manage learning content, student progress and student interactions. The term ‘LMS’ can apply to very simple course management systems, or to highly complex enterprise-wide distributed environments” [7]. Learning management systems such as Moodle, Blackboard, WebCT etc. focus on supporting teachers and administrators in creating, administering, and managing online courses. LMSs provide a great variety of features which can be included in the courses. They have become very successful in technology enhanced learning and are commonly used by educational institutions.

Learning management systems are of two types: proprietary systems and open-source systems. Blackboard, Desire2Learn and eCollege are examples for proprietary systems whereas moodle and sakai are the best examples for the open-source systems. Each of the learning management system has got innumerable features such as: grades, calendar, wiki, lessons and workshop, chat and messages, forum, notes and resources, online examinations, assessment, quizzes, uploading and sharing notes, reporting etc. [8]. The initial versions of an LMS focused on organizing and managing course content and learners.

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In the initial stage all the LMS were stand-alone systems which support the educational and administrative needs of the institution. The Introduction of Web 2.0 technologies brought about tremendous changes in the Learning Management Systems. It facilitates the usage of wikis, blogs, RSS, 3D virtual learning etc. It has made substantial changes in the student attitude from passive to active learners. LMS gives access to synchronous as well as asynchronous learning resources and activities. The current LMSs are hosted in the cloud, which makes the institutions and companies free from installing and maintaining in-house systems. Many of the current LMS provides features like mobile learning, virtual class room, video conferencing etc.

The ability to access the instructional components and contents from any location makes LMS user friendly and convenient. The new generation LMS reduces the time and cost in delivering the instructional content and make it affordable. They are capable of accommodating frequent changes happening in the technology changes without reworking the entire system. It has the ability to use instructional components in various applications [9].

II. THEORETICAL BACKGROUND

Issues in Present Teaching-Learning System

The Indian education sector, especially higher education, faces lots of challenges today. Globalisation and technological advancement brought tremendous changes in education sector throughout the world. The most important challenge in the Indian context is the Demand-Supply Gap. According to the recent report of the HRD ministry the present rate of students going for higher education is only 12.4 % [10]. In order to increase GER (gross enrolment ratio) from 12.4% to 30% by the year 2020 it would need another 800-1000 universities and over 40,000 colleges in the next 10 years [11].

Quality of education is another major concern. According to a recent government report two-third of Indian colleges and universities are below standard [12]. There are high-quality institutes like IITs, IIMs, NITs and IIsc, but the numbers of seats in such institutes are very limited.

Lack of research and development is other major problem faced by Indian education scenario. Only 0.8 percentage of GDP (gross domestic product) was used for R&D in the field of Science and Technology [13]. Indian universities and higher education institutions are poorly connected to research centres. Faculty Shortage is also a great challenge in the education system. Many of the top level institutions like IITs and IIMs are facing faculty shortage and around one-third of the posts are vacant. According to a report published by MHRD around 35% posts are vacant in central universities. Similar is the case with other universities and higher education institutions.

Impact of Learning Management Systems

Learning management systems began as a registration and documentation software to manage course content delivery. Learning management systems have been part of ICT from its very inception for more than a decade. In the first decade of e-learning LMS was a hub of all online activities. LMS was introduced in the market in the year 1990 so as to redesign the traditional class room system to computer –mediated content delivery and online system [14]. The evolution of LMS brought revolutionary changes in the teaching-learning process. The process of learning has gone beyond the class room and it made available to the students 24x7 basis. LMS was more of a stand-alone system in the beginning catering the administrative as well as instructional needs of the institution. The advent of web.2.0 technology made radical changes in the LMS in features and functionalities. The web enabled LMS is more interactive, user friendly and inclusive.

In the recent past LMS has moved to its third phase of growth that to the cloud environment. There are more than 250 LMS available on the market. Many companies and educational institutions have developed their own LMS. Shakeel Iqbal conducted a survey to find out the functionalities and teaching methodologies that LMS should support. Result emphasizes on the importance of technical specification and support, well designed course repository, course administration capability and interaction among users. The most sought features and desired functionalities included creation of student groups for group activities, availability of discussion forum, announcement board, online quizzes and file sharing/transfer functionality [15].

The usage of LMS was very much prevalent in the education sector for the past one decade. Various analysis and studies done in this aspect shows that the management aspect is more prominent than that of the intended educational aspect [16]. In many of the institutions the LMS was used for administrative and management purposes than teaching-learning process. It has to be monitored and controlled and a proper blend of administrative as well as educational aspects has to be harmoniously synchronised.

The theoretical framework of blended learning has four major components: Administration, Content, Communication and Activities. Each component can be incorporated into a course to enhance learning in a variety of ways. In each component, there are tools devoted to provide information, to motivate students, to setup activities, to assist interaction and to promote production of new knowledge.
There are various stakeholders for any Learning Management System, such as students, parents, teachers, mentors, administrators, etc. LMS provides a collaborative pedagogic approach in which each of the stakeholders is actively involved.

Within short span of time LMS has grown to a great extent where it became an unavoidable element in 21st century teaching-learning process. But at the same time there are various challenges for the Learning Management Systems such as adaptability, accessibility etc [17]. Now the greatest challenges of any LMS system are adaptability with the frequent changes in the software and hardware technology. Most of the LMSs are not capable to adapt these technology changes. Accessibility is another major concern because the young generations want to access the LMS with all sorts of smart devices like smartphones, tabs, iPad etc. So the challenge is the LMS should be compatible with all these technology changes and should be accessible from anywhere using any device. Integration of LMS with social media like Facebook, Twitter etc is another concern.

### Unique features of LMS Enabled Learning [18]:

- Learning is self-paced and gives students a chance to speed up or slow down as necessary.
- Learning is self-directed, allowing students to choose content and tools appropriate to their differing interests, needs, and skill levels.
- Accommodates multiple learning styles using a variety of delivery methods geared to different learners; more effective for certain learners.
- Designed around the learner.
- Geographical barriers are eliminated, opening up broader education options.
- 24/7 accessibility makes scheduling easy and allows a greater number of people to attend classes.
- On-demand access means learning can happen precisely when needed.
- Travel time and associated costs (parking, fuel, vehicle maintenance) are reduced or eliminated.
- Overall student costs are frequently less (tuition, residence, food, etc).
- Potentially lower costs for companies needing training, and for the providers.
- Fosters greater student interaction and collaboration.
- Fosters greater student/instructor contact.
- Enhances computer and Internet skills.
- Draws upon thousands of years of established pedagogical principles.
- Has the attention of every major university in the world, most with their own online degrees, certificates, and individual courses.

### III. OBJECTIVE AND METHODOLOGY

**Objective of the Study:**
The objective of this paper is to examine the extent of usage of ICT tools especially the Learning Management Systems in the teaching-learning process.

**Methodology:**
The methodology comprised of instrument development, sampling, data collection, and data analysis. A research instrument was created using 5 point likert scale and was administered to faculties and students of 25 institutions. Systematic stratified random sampling was used as a sampling technique.

### IV. ANALYSIS AND INFERENCES

The secondary data to find out the impact of ICT implementation and LMS usage in teaching-learning process was collected through the Review of Literature. In order to substantiate the findings of the review of literature primary data was collected using a research instrument. The research instrument was developed using 5 point likert scale and administered to know the current utilization of LMS and its impact in teaching-learning process. The research instrument was administered among the teachers and students who use LMS systems in their academic endeavors. The primary data collection was done through personal interview with technical experts and academicians, survey among the teachers and students and field visit and analysis in various institutions. Analysis and interpretation of the primary data gives a clear picture of the usage of LMS and its impact in teaching-learning process. The research instrument was executed mainly to identify the level of usage of LMS in the teaching-learning process. A detailed survey was conducted in various colleges and universities to analyse the level of usage of LMS and the limitations of present LMS systems. This analysis highlights the level of usage of LMS and its impact among students.

**A. The usage of LMS in denary wise:**
Learning Management System is widely used in all the disciplines. It is important to know the usage of LMS in denary wise to analyse its impact in teaching-
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The following diagram gives the amount of usage of LMS in each of the denary. It is quite evident from graph: 1 that the usage is below average in the case of law students and minimal in the case of engineering students. This will help the management and faculty to rearrange the curriculum more LMS friendly, so that the teaching-learning process can be made more effective and productive.

### Table 1: Usage of LMS features

<table>
<thead>
<tr>
<th>Category</th>
<th>Usage Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grades</td>
<td>37 %</td>
</tr>
<tr>
<td>Calendar</td>
<td>0.15</td>
</tr>
<tr>
<td>Wiki</td>
<td>0.1</td>
</tr>
<tr>
<td>Lessons and workshop</td>
<td>0.15</td>
</tr>
<tr>
<td>Chat &amp; Messages</td>
<td>0.03</td>
</tr>
<tr>
<td>Questionnaire</td>
<td>0.17</td>
</tr>
<tr>
<td>Forum</td>
<td>0.65</td>
</tr>
<tr>
<td>Notes &amp; Resources</td>
<td>0.85</td>
</tr>
<tr>
<td>Online Examination</td>
<td>0.75</td>
</tr>
<tr>
<td>Quizzes</td>
<td>0.55</td>
</tr>
<tr>
<td>Share Notes</td>
<td>0.81</td>
</tr>
<tr>
<td>Upload files</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Interest has to be generated among the students and teachers to use the modern features of LMS system such as mobile learning, virtual class rooms, video conferencing, wikis etc. Most of the students prefer technology blended learning than the traditional class room learning. This will definitely make the learning process more challenging and qualitative. Adequate training has to be provided from the part of the management to improve the quality of LMS usage. The students have possibility to access to the world of information; LMS should provide opportunity by incorporating the most-modern features of the information communication technology.

### D. Impact of LMS in Learning Process:

A detailed study has been conducted to analyse the impact of LMS in teaching-learning process. It analysed various components of learning process such as interest of the students to attend the lectures, attendance, involvement in learning process within the class room and outside the class room, peer discussions, study groups, learning outcome, etc. Results proved that introduction of technology and Learning Management Systems make tremendous changes in the attitude and outcome. The following graph depicts the major components of teaching-learning process in the traditional lecture method and technology or LMS enabled model.
Hence it is very much evident that the students of the 21st century prefer to have technology enabled learning. The increase of attendance itself shows that the students are pro to technology enabled learning system. Student engagement in the learning process improved a lot while integrating technology. Students have changed from passive-listeners to active-learners. When the total objective of the learning process changed to student-centric, the outcome of learning process has gone very high. The young generation have a passion for technology and when it is integrated in the teaching-learning process they welcome it whole heartedly. Integration of LMS to the teaching-learning process improves the total quality of education.

**CONCLUSION**

The 21st Century is known as the knowledge age in which the use of information and communication technology (ICT) tools including learning management systems (LMS) plays a vital role. The implementation rate of LMS in universities and colleges is very promising. LMS helps to go beyond the traditional face-to-face class room communication and provides an opportunity for the students to acquire knowledge in their own pace and convenience. Modern LMS can create a virtual class room in which the students can interact with the experts and teachers through video conferencing and other interactive mechanisms. This study sheds light to the level of usage of LMS in various educational institutions and reminds the need of technology enhancement in the teaching-learning process. Based on these benefits, LMS implementation in the institutions can be strengthened further to enhance efficiency. Technological advancements need to be seen as means to several potential ends, not just as ends in themselves.

**REFERENCES**


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