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Role of Libraries in Promoting Learning Management Systems in Academic Environment: A Systematic Review

Kiran Ranavagol S*
Triveni Chandariki**
Kiran P. Savanur***

The purpose of this research is to investigate the potential for using learning management systems (LMS) in libraries. It looks at the research on how libraries can support learning management systems in a classroom setting. It examines the objective of libraries, their services, and learning management systems. It also focuses on the LMS research trends, its possible expansion into library services, and its hurdles in the academic context. The PRISMA technique is used to prepare the systematic review. We incorporated LMS papers that have a direct bearing on the provision of library services. Published in English over the previous years in the LMS and library services fields. A UNESCO report-2021 on education was also added to enhance its scope. 47 literature materials, including additional resources, published on LMS and the application of LMS in libraries were reviewed and analyzed for this study. The concept's overall investigation reveals that many academic institutions have started using LMS at various sites to build libraries to improve students' learning activities. Based on certain research, it was challenging to adopt the LMS in the educational sector due to a lack of ICT expertise, financial constraints, and hostility among teaching staff towards the system. There are various techniques for libraries to include LMS in their services. Overall, the LMS actively engages with students' expectations for online learning and helps them stay updated on their academic progress. LMS is giving instructors and teachers more advantages, particularly in the thoughtful organization of

* Research Scholar, Department of Library and Information Science, Rani Channamma Uinversity Belagavi – 591156, Email: ranavagolkiran@gmail.com

** Research Scholar, Department of Library and Information Science, Rani Channamma Uinversity Belagavi – 591156, E-mail: trivenichandriki723@gmail.com

*** Assistant Professor, Department of Library and Information Science, Rani Channamma Uinversity Belagavi – 591156, E-mail: kps@rcub.ac.in

educational content. The obvious progression from the conventional idea of incorporating library materials into course content is to integrate library assets into course content.

Keywords:*LMS, Library, Meta-analysis, Academic*

1 INTRODUCTION

According to a UNESCO report on education, more than 1.6 billion students were affected by Covid-19 and some are still suffering from its consequences in their educational environment.(*The State of the Global Education Crisis: A Path to Recovery*, n.d.). Many steps were taken to address and manage the pandemic situation. Online courses and e-tutors are rapidly improving without proper support systems, and remote teaching has proceeded*(Eissa, 2022)*.Using web technology and ICT in the library is not a new concept in the LIS domain, and it strengthens relationships between students and librarians, which facilitates e-learning *(Scholz et al., 2019)*. According to the Britannica web Dictionary, Remote teaching is " a system of education in which students study at home and communicate with their teachers over the internet" *(Oxford Advanced Learner's Dictionary, n.d.)*. A learning management system is a web-based learning activity in which students receive study materials through the use of the internet*(Nur et al., 2022)*.

Academic activity expansion has changed dramatically over the last decade. Face-to-face sessions were previously organized in the field of distance education to conduct learning activities; however, the later innovation of the internet introduced the Learning Management Systems (LMS) concept and web-based pedagogyin education*(Bell, 2016)*.The recently emerged trend is *Blended Learning*, which is a combination of modern and traditional techniques of teaching. According to the Education glossary "The term **blended learning** is generally applied to the practice of using both online and in-person learning experiences when teaching students"*(sabbott, 2013)*. A standard LMS supports inclusive growth in learning, and course designers should balance active learning with LMS. Many aspects of *blended learning* in India make it possible to implement in higher education, such as modern high-tech mobile technologies, low-cost and high-speed internet services, ease and cost-effectiveness, up-to-date and quick lesson delivery, and very appealing marketing *(Chandriki & Savanur, 2020)*. To provide effective and efficient service to usersand achieve the organization's goal the librarian must use a versatile toolkit and the most up-to-date technologies*(Read & Morasch, 2016).LMS Embedded librarianship* is a collaborative and creative venture. Collaboration of teachers with librarians in LMS courses is required to give information literacy teaching and answer specific research needs. The teacher embeds a librarian in his LMS course to give library resources, conduct in-class instruction, or require students to organize research consultations. As a result, librarians are being integrated into

more LMS courses, reaching more students than in a one-time user education program.*(Tumbleson, 2016)*

Definitions

Education is abasic need of humankind and it is life long process, according tothe *Oxford Advanced American Learners Dictionary(Oxford Advanced American Dictionary, n.d.),* Education is" a process of teaching, training, and learning, especially in schools or colleges, to improve knowledge and develop skills". Rapid growth in the education sector and increased demand for education caused it to spread throughout the country. To achieve this vision, many academic institutions are implementing various strategies and technologies.Content Management is the latest development trend in the creation of websites and maintenance. System for Content Management (CMS) CMS refers to a content management system (CMS) that separates design, interactivity, and content to make it easier for content producers to provide material *(ICMR, 2010)*.Learning Management System is the part of CMS concept,and(LMS) provides numerous opportunities for learners to learn as well as for teachers to engage the class. According to Cambridge online dictionary*(LMS, 2023)*,a "LearningManagement System is a type of Content Management software for managing internet education or training courses". To use LMS services effectively many institutions are integrating this concept into their library services. Thus as of now, many libraries are participating in various levels to integrate LMS and deliver an effective service and assist prospective development in the education area.

2 METHODOLOGY

Design and eligibility criteria:The PRISMA technique is used to prepare the Systematic Review. We incorporated LMS papers that have a direct bearing on the provision of library services. Published in English over the previous years in the LMS and library services fields. A UNESCO report-2021 on education was also added to enhance its scope. MS-excel software is used for the tabularization of data and plot diagrams.

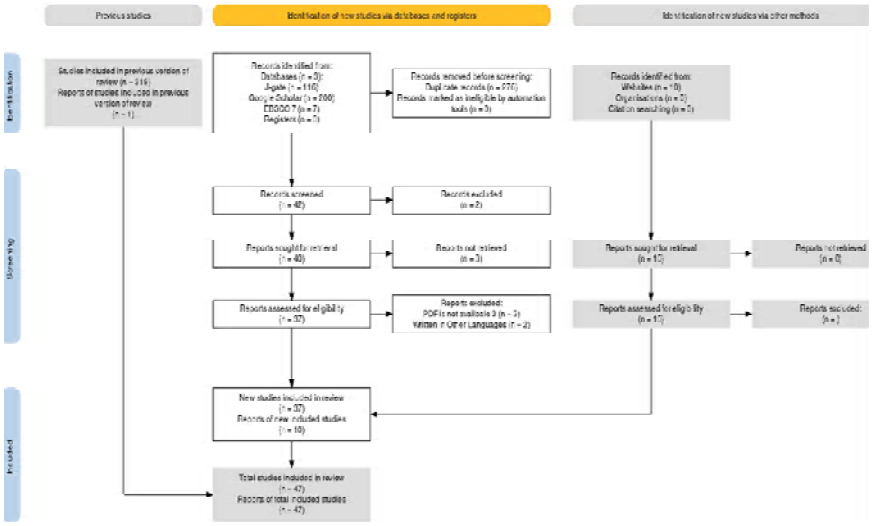
Search strategy

To identify published scholarly literature in LMS and its role in Library services, we framed the advanced search strategy in Google Scholar, J-gate+, and EBSCO. The query is LMS OR Learning Management Systems OR E-learning AND Libraries OR Library and we searched from December 2022 to January 2023.

3 RESULT AND DISCUSSION

We found 318 papers on LMS in Libraries,200 papers in Google Scholar,

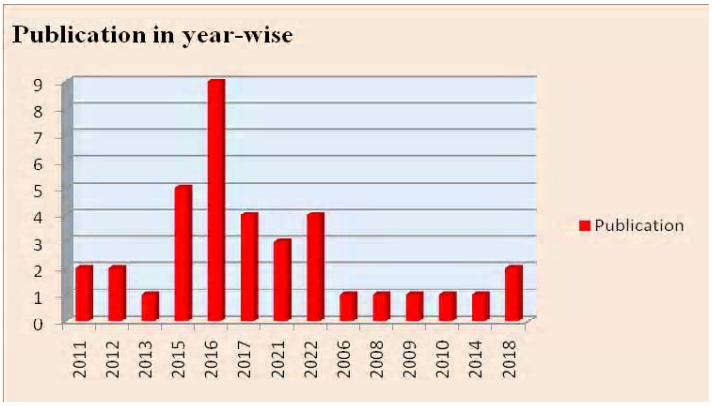
116 in J-gate, and 7 in EBSCO. In addition, 10 website pages of dictionaries and encyclopedias were used for definitions, in the UNESCO-2021 report on Education, and some sites were used to enrich the study. We created a flow chart, filtered the results, and then examined and reviewed the papers using the PRISMA-2021 checklist.



(Haddaway et al., 2022)

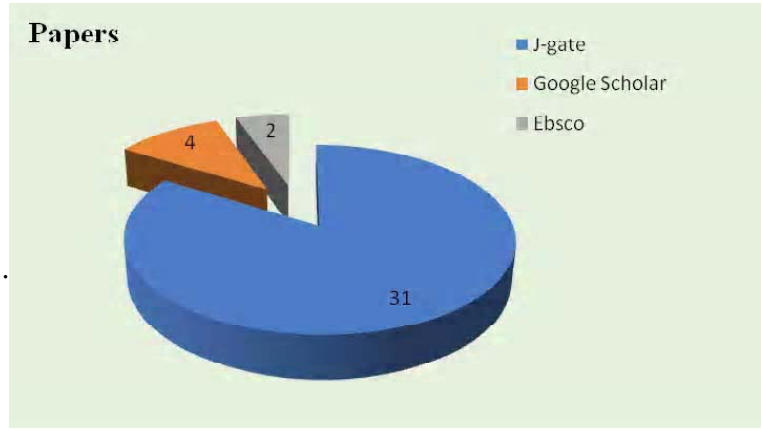
3.1 YEAR-WISE PUBLICATION

This study included 37 research papers from three databases: Google Scholar, EBSCO, and J-gate. Most papers were published in 09 papers (24.324%) in 2016, followed by 05 (13.514%) in 2015, 4 (10.811%) in 2017 and 2022, and 03 in 2013. And in six yearshave 1 (2.703%) paper each. Based on the results LMS and Library connections are increasing gradually.



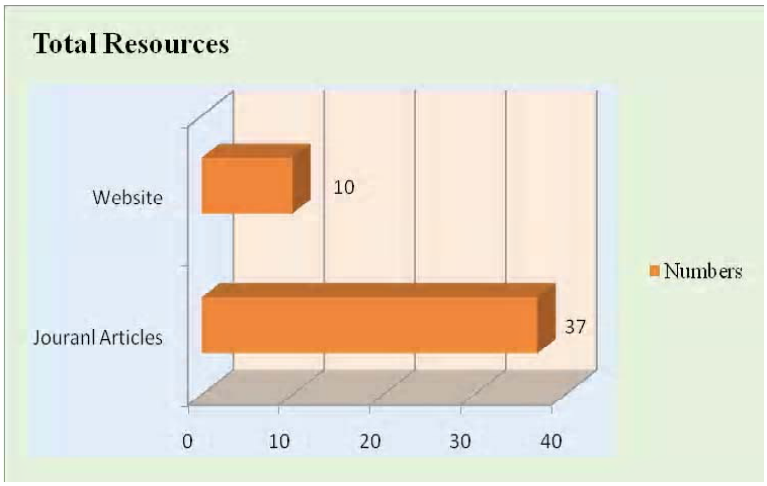
3.2 DATABASE-WISE PUBLICATION

We considered 37 papers to review from three databases: Google Scholar, EBSCO, and J-gate. J-gate had 31 (83.78%) publications, Google Scholar had 04 (10.81%), and EBSCO had 02 (5.41%) papers. Overall, J-gate is making it easier to obtain the most recent published papers in the field of LMS and library services



4 TYPE OF RESOURCES

Based on search results, we found 37 (78.72%) scholarly literature in three databases, and we supplemented the study with 10 (21.28%) websites (including online Dictionary, Encylopedia, and some LMS other sites).



5 LEARNING MANAGEMENT SYSTEM

E-learning is increasingly being used in education courses, which dynamically improves the capability of existing education systems. Web

technologies, e-commerce, computer simulation, information and communication technologies, and cloud & mobile computing are all examples of effective implementation of ICT in blended learning through various learning management systems. Many LMSs are available, ranging from proprietary to open source, including Moodle, Edmodo, Sakai, Blackboard, Desire2Learn, and ATutor.TheLMS market reached1.9 billion dollars in 2013 and2.55 billion dollars in 2014 and after awareness about LMS, a significant increase in buying*(Kampa, 2017)*.The most popular open-source LMS software is MOODLE (Modular Object-Oriented Development Learning Environment)*(Despotoviæ-Zrakiæ et al., 2012)*. The main objectives of implementing LMS on campus are to focus on individual interest, course administration, conducting quizzes, intelligent solutions, creativity in classes, and collaborative performance. Students from both modes (online and offline) enroll in an online course in greater numbers. LMS history began with *Computer-based Instruction*(CBI) and later, in the last decade, gradually advanced to *Computer Assisted Learning Systems* (CALS). There are now different shades of LMS categories such as Course Management Software, Learning Content Management Software, and Learning Objective-Oriented Software, etc. These systems support both synchronous and asynchronous video streaming activities *(Bradley, 2021)*, E-mail, Video Conference, and MMS are the most preferred tools in online learning. Many works, including MERN, advocate for the integration of LMS models into libraries. MERN (Mean stack, Expressjs, Reactjs, Nodejs) operates on a JAVA script via the registered user system. This concept is intended to provide free education while also assisting in the management of the library*(What Is The MERN Stack?, n.d.)*.

5.1 ROLE OF LIBRARIES IN PROMOTING LEARNING MANAGEMENT SYSTEMS

Several papers have been published in the last decade on the integration of LMS in academic institutions; it is a unique tool in the field of education as well as libraries*(Vess, 2017)*. The core aspects of an academic setting are teaching, learning, research, and extension.Learning management seriously influences students' information literacy. At the beginning of the new academic year, many different institutions use quiz models in libraries and on LMS websites to grasp pedagogical, learning, and assessment goals. It serves as the foundation for determining the student's level of competency. *(Lowe et al., 2014)*. The ideal practice in an organization is to integrate library resources such as subscribed as well as open access e-content and services with learning management, and there are numerous ways to do this. Many aspects are involved in this, including individual interest, organizational interest and policy, curriculum, and impediments*(Haggerty et al., 2022)*. STLE Learning management is the best example of an online library platform, offering over

100 products and services in LMS packages. Members can find the simplest way to learn here, and learners can understand course patterns as well*(Fowler, 2022)*.Google's numerous products, such as Google Docs, Slides, Forms, and YouTube, reach out to people all over the world. Many academic institutions have adopted Google Classroom as a simplified LMS in the education sector, which is flipped and unified classroom management, and can provide content and supporting materials with the assistance of libraries*(Izenstark & Leahy, 2015)*.

5.2 LMS IN LIBRARY SERVICES

The *'Health stream'https://www.healthstream.com/*(*HealthStream - Healthcare Workforce Solutions*, n.d.)networking system provides information on general health professional queries; it is based on the LMS concept, which is EMR (Electronic Medical Records), and it logically fits in library systems *(Hayes & Heyd, 2015)*. These institutions linked library sites to student portals to boost information literacy among students. Such as Web-OPAC, Custom services apps, Libguide tool, Ask librarian assistance, and online EBSCO services *(Chew et al., 2017)*.It is the greater expansion of library services that maintains, sustains access to resources with good evaluation, and they also developed their LibGuide called 'CANADIAN'https://libguides.lib.umanitoba.ca *(Valmestad, n.d.)* that provides services to users very logically*(Daly, 2010)*.The National Science Digital Library (NSDL)supports 'K-16' and it has four main branches Science, Technology, Engineering, and Mathematics (STEM) to extend services in thisdomain NSDL developed LAR (Learning Application Readiness). Many projects are using this initiative in their respective fields to develop metadata objectives and provide services*(Ginger & Goger, 2011)*.The Blackboard site is an online learning concept in services that empower information literacy; its presence in education creates demonstrable and impressive academic library services such as RSS feeds, Podcasts, Library links, and blogs*(Karplus, 2017)*.Even during modern ICT development, many Canadian libraries are integrating their library resources with LMS courses via their services. Open access and digital repositories are critical components of any domain that provides common people with easy and reliable access to knowledge.

5.3 LMS IN HIGHER EDUCATION LIBRARIES:

Digital libraries and Learning Management Systems (LMS) are commonly employed in institutes with no local integration. Many universitiesutilize LMS as a training event administration tool. LMS is a component of e-learning solutions, commonly known as portal learning*(Itmazi, 2010)*.The LMS facilitates access to the syllabus, study materials, PowerPoint presentations, streaming videos, and other resources, *Jaipur Institute of Technology*(JIM) has

implemented LMS in two stages: micro and macro.*(Kampa & Kaushik, 2016)*.Many universities, including Wawasan Open University (WOU) and other distance education institutions, have adopted e-learning as a serious contender to meet individuals' learning needs. These type of initiatives in the organization has changed web application role in the day-to-day life of students *(Piyumantha et al., 2022)*.The *Tool Kit* approach is the most recent LMS innovation at Ohio State University, as well as one of the previous institutions in the field of library science. This concept is beneficial not only to learning but also in decentralize the academic environment. Because the University utilizes the *Desire2Learn* learning management system, the work done at the Rochester Institute of Technology (RIT) to connect specific areas of their library website to courses and the single web space is dealing with learning activity in Ohio library services*(Black, 2008)*. In the USA, the University of Michigan developed three tools-based learning management systems called '*C-tools*' (Formerly Course Tools) which are developed by Sakai architecture https://www.sakailms.org/*(Sakai Learning Management System, n.d.)* and 80% of the faculty members and 98% of the University students are using these services in their teaching, learning and research activities*(Leeder et al., 2012)*.

The library and information center play an important role in research and development. The University of North Alabama (UNA) uses open-source LMS software to provide information literacy skills,and services to research scholars.Such as Bigbluebotton*(BigBlueButton org., n.d.)*https:// bigbluebutton.org/schools/integrations/ and Canvas *(Canvas Overview, n.d.)* (https://www.instructure.com/canvas). The impact of synchronous online videos and instructions on information literacy has had an impact on research, these steps include hybrid and online modes*(Malone, 2015)*.*Cape Peninsula the University of Technology* (CPUT) uses the Blackboard site in knowledge management and processing in LMS. And it supports a blended learning environment. They started this service as an *Extended Curriculum Program* (ECP) to support sharing of knowledge between students and lecturers through emails and meetings which include librarians as well. One of the major barriers is which includes students' experience of offline learning *(Kleinveldt et al., 2016)*.

Miami University, Middletown, Middletown, OH., is offering LM-Embedded Librarianship on their campus. This concept came into being in 2009. Later, in 2014, it expanded to include three librarians, 35 teaching faculty, and 90 courses with a total enrollment of 2000 students. Now, the library can reach a greater number of users in a single shot. It has completely transformed reference services and information literacy among students. Many services, such as course instruction, research consultation, library site desk, and reference services, are available through one single platform *(Tumbleson, 2016)*. LMS is not only restricted to any one domain it also existed in health science institutions

and it is the most prominent in society, and data management in health science libraries is fundamental work, which has some challenges. Establishing networking relationships with other counterpart libraries is an important step towards overcoming these challenges and creating new opportunities in the fields. The learner-centered approach is the best teaching practice not only in the offline mode but also has an impact in the online mode. Many systems have attempted to achieve this in higher education, but it is difficult to overtake. Seminars and other teaching activities are conducted through the LMS, but the lack of digital and technological scarcity has made it difficult*(Gibeault, 2018)*.Project Information Literacy research on the use of library guides in learning management systems (LMS) The researchers rely on more than just Web usage statistics.

5.4 BARRIERS TO IMPLEMENTINGLMS IN LIBRARIES:

Implementing the LMS in the library is a challenging task because it requires users to manage skilled library staff as well as other parameters such as managing course materials, managing courses, and maintaining the library. Many students and teachers on campus are unaware of the LMS and related technologies*(Leeder & Lonn, 2017)*. One possible answer is *embedded librarianship*, however,maintaining this approach takes a significant amount of time and work. Librarians face hurdles in providing information literacy teaching in these growing digital contexts because the delivery of instruction involves expertise in navigating an LMS as well as sophisticated technology skills*(Mune et al., 2015)*.The potential hurdle is multiple courses and a lack of a learning objective repository *(Farkas, 2015)*. Many teachers are still very much comfortable with the traditional way of teaching methods, and it is creating a gap between LMS and its users. Many institutions are failed to create an environment of e-learning and usability and access support on campus *(Contrado, 2016)*.Faculty hashostile feelings towards LMS regardingits use and its effectiveness in the pedagogical arenas.As the University of Ghana reported, there is no doubt that LMS creates a virtual space for students and fosters diversity in learning, but it lacks adequate counseling support services when students face difficulties*(Amponsah et al., 2021)*.Off-campus students are handled by Open Distance Learning (ODL), and two important concepts that influence this activity are e-resources and LMS. Social demographic status (Region, Gender, Education Level, and Income) influences LMS implementation. AtWawasan Open University (WOU), high internet and device expenses made low-income and Chinese-origin students less aware of the LMS and its use*(Ng & K.G. Tan, 2017)*.

6 CONCLUSION

The libraries have many ways to integrate LMS into their services. Overall, the LMS actively engagesin their online learning expectations and assists them in tracking their academic performance. LMS is providing more benefits to instructors and teachers, particularly in the constructive arrangement of pedagogical content.Integrating library materials into course content is a natural step from the traditional idea of incorporating library materials into course content. Feedback from students and librarians was gathered to determine whether students found the guides useful and what design approaches improved utilization*(Daniel, 2016)*.Whatever the structure, the attitudes, expectations, and perceptions of students and faculty are at the heart of structuring the library footprint in a given course. On the other hand, students should access and utilize all available support resources to improve their educational life.

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