

REL Pacific Ask A REL Response

Data Use
December 2020

Question:

What are evidence-based components of a learning management system (LMS)?

Response:

Following an established REL Pacific research protocol, we conducted a web-based search for resources related to components of learning management systems that are evidence-based (see Methods section for search terms and resource selection criteria). During our search, we found that the majority of research focuses on higher education; while we include articles addressing higher education environments, we have prioritized studies that focus on K–12 environments. Importantly, we found that there were no studies that met the What Works Clearinghouse evidence standards; as such, the components described in the listed references cannot be labeled, “evidence-based.”

References are listed in alphabetical order, not necessarily in order of relevance. Descriptions of the resources are quoted directly from the publication abstracts. We have not evaluated the quality of references and the resources provided in this response. We offer them only for your reference. Also, our search included the most commonly used research resources, but they are not comprehensive and other relevant references and resources may exist.

Research References

Chaw, L. Y., & Tang, C. M. (2018). What makes learning management systems effective for learning? *Journal of Educational Technology Systems*, 47(2), 152–169. <https://eric.ed.gov/?id=EJ1196828>

From the abstract: “Learning management systems (LMSs) may provide learners with resources in various formats, such as videos, quizzes, and forum discussions to support their learning, but having access to an LMS does not necessarily mean that learning has occurred effectively. Despite its apparent usefulness, whether the use of the LMS can indeed help learners learn more effectively remains an interesting matter for course providers, LMS vendors, and learners. Therefore, this study adopted the updated DeLone and McLean information system success model to examine whether LMS system quality, information quality, and service quality affect learners' system use and user satisfaction, and ultimately their learning effectiveness. Through a questionnaire survey, responses collected from 123 university students who studied in a blended learning environment at a university were analyzed. Findings showed that system quality and service quality, but not information quality, had a significant relationship with system use. In turn, system use had a significant relationship with learning effectiveness.”

Daniela, L., & Rüdolfa, A. (2018). Learning platforms: How to make the right choice. In L. Daniela (Ed.), *Didactics of Smart Pedagogy: Smart Pedagogy for Technology Enhanced Learning*. Springer.

https://link.springer.com/chapter/10.1007/978-3-030-01551-0_10

From the abstract: "Learning through online platform opportunities is one way of organizing a technology-enhanced learning process. This chapter provides an overview of the place and role of learning platforms in the pedagogical process, defines the differences between learning platforms and learning management systems and offers a toolkit for evaluating learning platforms. The toolkit includes 22 criteria divided into 43 sub-criteria, which can be evaluated at 3 levels. This tool can help teachers, school administrators and other stakeholders to make a pedagogically based choice when it comes to choosing which learning platform solutions to use to scaffold student learning in a transformed learning process that is affected by digitalization."

Note: REL Pacific was unable to locate a free link to the full-text version of this resource. Although REL Pacific tries to provide publicly available resources whenever possible, this resource may be of sufficient interest to the reader to warrant finding it through university or public library systems.

Edmunds, B., & Hartnett, M. (2014). Using a learning management system to personalise learning for primary school students. *Journal of Open, Flexible and Distance Learning*, 18(1), 11–29.

<https://eric.ed.gov/?id=EJ1079832>

From the abstract: "This paper reports on one aspect of a descriptive multiple-case study which set out to explore the role of a learning management system (LMS) in personalising learning for students from the perspective of three teachers in one primary school in New Zealand. The intention was to provide insight into the role the LMS could play in classrooms when personalising learning. The research project involved gathering multiple sources of data from interviews and observations, and documentary information from the LMS. The findings suggest that the LMS has the potential to be a key part of a primary classroom environment when it is built on components that personalise learning. For the teachers in this project, one salient component of personalised learning involved ensuring learning was based on assessment for learning pedagogy and the use of the LMS as a tool to support learning. The findings highlighted the interconnected nature of personalised learning pedagogy, the LMS and classroom practice."

Garrote Jurado, R., Pettersson, T., Regueiro Gomez, A., & Scheja, M. (2014, November). *Classification of the features in learning management systems*. Paper presented at the XVII Scientific Convention on Engineering and Architecture, Havana City, Cuba. [https://www.diva-](https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A887965&dswid=-5874)

[portal.org/smash/record.jsf?pid=diva2%3A887965&dswid=-5874](https://www.diva-portal.org/smash/record.jsf?pid=diva2%3A887965&dswid=-5874)

From the abstract: "A Learning Management System (LMS) can be analyzed by sorting the features into four groups; tools for distribution, tools for communication, tools for interaction and tools for course administration. This classification was used for the first time when the use of LMS at the School of Engineering, University of Borås, in the year 2004 and the academic year 2009-2010 was investigated. The results from this longitudinal investigation confirmed the suspicion that lecturers used the available LMS predominantly to distribute documents to students, and that the pattern of use did not change over time. In this article the authors assert that this classification is necessary to convincingly demonstrate the pattern of use and to analyze the pedagogical application of an LMS."

The classification system works regardless of what brand of LMS is used, and it allows the connection between educational procedures and features in the LMS to be analyzed. Today, platforms, similar to a LMS are used in industry and government to handle information, staff development and internal communication. The possibility to analyze the use of such platforms may have beneficial effects on society beyond and outside universities.”

Piña, A. A. (2013). Learning management systems: A look at the big picture. In Y. Kats (Ed.), *Learning management systems and instructional design: Best practices in online education* (pp. 1–19). IGI Global. <https://www.igi-global.com/chapter/learning-management-systems/76181>; full text available at <https://api.semanticscholar.org/CorpusID:63637819>

From the abstract: “In this chapter, the reader is taken through a ‘big picture’ view of learning management systems, with an emphasis on systems that are used in higher education. Included in this view is a description of common features found in learning management systems and the advantages and limitations of these systems. Also included is the report of a large research study identifying the features used most commonly by students and which of these features are the most and least valued. In addition, the reader is presented with specific resources and options for evaluating, selecting and deploying learning management systems. The chapter concludes with a series of brief profiles of the leading learning management vendors and systems.”

Rusch, A. P. (2019). *Examining the structure and efficacy of learning management systems* (Publication No. 106179) [Doctoral dissertation, University of Illinois at Urbana-Champaign]. IDEALS. <http://hdl.handle.net/2142/106179>

From the abstract: “Over the past 20 years, Learning Management System (LMS) software has become a standard part of teaching practices in higher education institutions. These platforms were developed and sold with the promise of increasing student involvement, supporting teaching pedagogies, and enabling more distance learning programs. While instructors and administrators have embraced various platforms that they feel will serve them best, there is need of a better theoretical framework to compare them. In this dissertation I present a Model of Engaged Online Learning to explain the balance between human and technical elements of the situation of learning. My model examines interactions among three points: LMS Design and Affordances; Pedagogical Philosophy and Course Design; and Learner Characteristics and Motivations. In my model I explore the concept that any change to one factor will affect and be affected by the other factors. Most importantly, this relationship means that the design of LMS platforms results in a groove that biases the users to follow a designated pedagogy or a path of least resistance. I believe my model can be used to guide comparisons of the structure and efficacy of LMS platforms. I demonstrate this with two studies that show the interaction of instructors and learners with learning technologies. The first study uses a mixed methods evaluative framework to compare the three largest LMS platforms by market share (Blackboard Learn, Moodle, and Instructure Canvas), along with an experimental social knowledge platform (Common Ground Scholar) being developed by University of Illinois researchers. The second study uses an ethnographic framework to study a core course in the Master of Education program as it is offered online. Further questions and recommendations for future research are offered.”

Santelli, B., Stewart, K., & Mandernach, J. (2020). Supporting high quality teaching in online programs. *Journal of Educators Online*, 17(1). <https://eric.ed.gov/?id=EJ1241555>

From the abstract: “The increasing popularity of standardized online course design mandates that administrators and course designers understand faculty and student perceptions of the value of specific course components in the online learning management system (LMS). The results of a survey sent to online faculty and students revealed that both groups value the inclusion of videos in course design; however, the perceived value varied as a function of faculty status (full time or adjunct) and student level (undergraduate, master's or doctoral). While students value instructional videos, they believe that rubrics and sample assignments have the greatest potential impact on their learning. The discussion explores the practical implications of meeting both groups' needs in large online programs utilizing standardized course design.”

Additional Resources to Consult

Watson, W. R., & Watson, S. L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends*, 51(2), 28–34.
<https://eric.ed.gov/?id=EJ774588>

From the abstract: “The application of computers to education has a history dating back to the 1950s, well before the pervasive spread of personal computers (Reiser, 1987). With a mature history and varying approaches to utilizing computers for education, a veritable alphabet soup of terms and acronyms related to computers in education have found their way into the literature, most of them non-standardized. Learning Management System (LMS) is one approach to the application of computers to education which holds great potential and important concepts, yet is often misunderstood and the term misused. This article will clarify the use of the term LMS by presenting a history and definition of LMS, differentiating it from similar terms with which it is often confused, and discussing the role it can play in education. It will then describe current application and available features of LMS's, and conclude by identifying trends and recommending future research.”

Wright, C. R., Lopes, V., Montgomerie, C., Reju, S., & Schmoller, S. (2014). Selecting a learning management system: Advice from an academic perspective. *EDUCASE Review*.
<https://er.educause.edu/articles/2014/4/selecting-a-learning-management-system-advice-from-an-academic-perspective>

From the abstract: “Although faculty and students are the primary learning management system users, administrators and IT experts often select the system. This article stresses the importance of involving all stakeholders in the selection process, offers a step-by-step guide to LMS selection, and enables readers to develop a customized list of LMS features that align with their institution's instructional and learning priorities.”

Methods

Keywords and Search Strings

The following keywords and search strings were used to search the reference databases and other sources:

- “Learning management system”
- “Learning management system” and “components”
- “Learning management systems” and “K-12” and “components”

Databases and Resources

We searched ERIC, a free online library of more than 1.6 million citations of education research sponsored by the Institute of Education Sciences, for relevant resources. Additionally, we searched the academic database Google Scholar.

Reference Search and Selection Criteria

REL Pacific searched ERIC and other academic journal databases for studies that were published in English-language peer-reviewed research journals within the last 15 years. Sources included in this document were last accessed in December 2020.

REL Pacific prioritized documents that are accessible online and publicly available, and prioritized references that provide practical information based on peer-reviewed research for the education leaders who requested this Ask A REL. For questions with small or nonexistent research bases, we may rely on, for example, white papers, guides, reviews in non-peer-reviewed journals, interviews with content specialists, and organization websites. Additional methodological priorities/considerations given in the review and selection of the references were:

- Study types—randomized control trials, quasi experiments, surveys, descriptive data analyses, literature reviews, etc.
- Target population, sample size, study duration, etc.
- Limitations, generalizability of the findings and conclusions, etc.

This memorandum is one in a series of quick-turnaround responses to specific questions posed by education stakeholders in the Pacific Region (American Samoa, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, Guam, Hawai‘i, the Republic of the Marshall Islands, and the Republic of Palau), which is served by the Regional Educational Laboratory (REL Pacific) at McREL International. This memorandum was prepared by REL Pacific under a contract with the U.S. Department of Education’s Institute of Education Sciences (IES), Contract ED-IES-17-C-0010, administered by McREL International. Its content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.