

A review of the utilization of learning management systems in the Saudi Arabian education system

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Abstract

This review was aimed at discussing the extent and methods of utilisation of learning management systems in the Saudi Arabian educational system. A total of 27 papers published since 2018 were used for this review. Apart from the standard Blackboard, other LMSs have also been in use in most Saudi universities. New Saudi-specific LMSs like Jusur, Future Gate, Tadarus, and Madrasati compare well with Blackboard, even if there are some limitations. Implementation of LMS is affected by some internal and external factors of the academic institution. The Covid-19 pandemic forced switch-over to online mode of all educational institutions, and this was facilitated by LMS. Training of faculty and students is important in the successful use of LMS. The perceptions and attitudes of students and teachers on the use of LMS for learning and teaching had been positive and many of them had suggestions for improvement. As the pandemic continues with new waves, a new normal will set in as a permanent feature in the education system. New LMSs may need to be developed using some of the emerging technologies for the full benefits of using them for significant positive outcomes of teaching and learning.

Keywords: Learning management system. Saudi Arabia, Education system, Education

Introduction

The definition for learning management system (LMS) is, "A learning management system (LMS) is a software application or web-based technology used to plan, implement and assess a specific learning process. It is used for eLearning practices and, in its most common form, consists of two elements: a server that performs the base functionality and a user interface that is operated by instructors, students, and administrators." (Brush, 2022). Mahnegar (2012) defined LMS as, "A Learning management system (LMS) is software used for delivering, tracking, and managing training/education. LMSs range from systems for managing training/educational records to software for distributing courses over the Internet and offering features for online collaboration." (p 148). These two and other definitions carry more or less similar ideas. So, any of these or any other similar definition of LMS may be acceptable.

This paper reviews the utilisation and associated factors of LMS in Saudi educational institutions with the help of published literature. The review will cover the characteristics of LMS used in the Saudi educational system, implementation factors, and perceptions and attitudes of teachers and students on the use of LMS for teaching and learning. Finally, the results of the review will

be compiled into conclusions. As only the papers published in 2018 and after are only reviewed, the impact of the covid-19 pandemic in facilitating the implementation of LMS in Saudi Arabia will also be a part of the review. Google scholar was searched for relevant papers published after 2018 and 27 papers were shortlisted.

Review

Characteristics of LMS used in Saudi Arabia

World-over, academic institutions are increasingly adopting LMS in their academic activities for better teaching and learning experiences. In Saudi Arabia, already in its 28 public universities have adopted LMS. A case study of LMS in Saudi universities by Aldiab, Chowdhury, Kootsookos, Alam, and Allhibi (2019) showed that Blackboard was the most popular LMS in 25 universities. The rest of Saudi universities used Moodle, Canvas, or D2L. None of the currently available LMS has the facility for the teacher to perform laboratory experiments in the distance education mode. Laboratory experiments are essential for science, engineering, and medical courses, for which virtual laboratories need to be developed.

The National Centre for E-learning and Distance Learning (NCEL) of Saudi Arabia designed its own LMS in collaboration with Meteor Group of Companies in Malaysia called Jusur, according to universal standards. It contains 17 tools covering courseware controls, course description, announcements, learning content management system, glossary, forum, general chat, file sharing, assignments, tests and assessment, virtual classroom, lecturer information, user administration, survey manager, questions bank, grad book, and tracking forum participation aspects (Aldiab, Chowdhury, Kootsookos, Alam, & Allhibi, 2019).

Implementation factors

The use of Jusur LMS for learning and teaching purposes is affected by both internal and external factors of the educational institutions, which were identified by (Aldiab, Chowdhury, Kootsookos, Alam, & Allhibi, 2019). The attitude, beliefs, and competencies of Saudi Arabian faculty members towards using LMS and e-learning were identified as the internal factors. Barriers in implementing LMS and demographic factors (gender, computer experience, and training) of faculty members were identified as the external factors. On the other hand, Jusur is user-friendly, easy to learn its operation, contains many instructional and administrative functions, facilitates rapid completion of tasks by students and uploading different types of files, have mechanisms for error recognition and corrections, anywhere anytime user access possible and student-student and student-teacher interactions are possible. However, failure of the search feature in the forum and difficulties in downloading course materials are two disadvantages. It requires a more organised approach. It features only English and Arabic content. The instructor cannot add or remove students from the system independently from the support centre. Its forum does not include a list of the users who are online at the time, as only two options of browsing the topics in the forum, like next, and last, exist. It is not possible to upload extensive files in the

form of compressed folders. Jusur has not been integrated with other systems used in the same university as faculty members' academic portal or registration portal. The theory of reasoned action (TRA) and the technology acceptance model (TAM) (Madden, Ellen, & Ajzen, 1992) were used as models for the study done by the authors.

Under Vision 2030, the Ministry of Education, Saudi Arabia started the implementation of the Future Gate initiative to digitally transform K-12 learning and teaching. Future Gate offers an LMS for all public middle and secondary schools of the country. It also established the infrastructure required for the LMS in the classrooms. Phase 3 of the implementation of Future Gate was just over in June 2020. It is in phase 4 now. Phase 3 aimed to cover 25000 schools, 500000 teachers, and 4500000 students. The LMS used in different regions were different. The challenges, criteria of selecting different LMS in different regions, and infrastructure requirements were listed and discussed by the authors. The key performance indicators were close to the international standards. These performance indicators and other quantitative results were related to the performance of the teachers (Al Ohali, Al Suhaibani, Palavitsinis, & Koutoumanos, 2018).

The survey results obtained by Alshahrani, Saudagar, and Alkhatabi (2018) showed that implementation of LMSs in Saudi universities has been successful. Blackboard was a better LMS than Tadarus according to the opinion of students and statistical test results. Further, both LMSs saved time, enhanced self-learning skills, improved accessibility to learning material anywhere anytime, and time management. On the other hand, there were weaknesses of poor technical support and notification system, limited interactions between students and teachers, poor quality of online recorded lectures, inactivation of features like assignment and e-tests. Students suggested improvement of infrastructure capacities like internet connections and server capacity and technical support, activation of available features and informing students about them, integrating different social media with the LMS for direct communications between students and lecturers, and making LMS smartphone-friendly.

The aim of the study by Abdelhmed (2020) was to recognise the reality of applying an e-learning management system (Blackboard) according to the QM Standards at Faculty of Social Work, Princess Nourah Bint Abdulrahman University, Saudi Arabia and identify the obstacles against its application and the suggestions to overcome these obstacles to transfer this expertise to the social work faculties in Egyptian universities. A high compliance level of the faculty members to apply the Blackboard e-learning management system following QM standards was noted. High levels of obstacles to implementing QM standards and the requirements relevant to technology support, faculty members and students, to apply Blackboard LMS in social work education, were also observed.

A review article, Alnahdi (2019) noted that the Jusur was introduced in Saudi universities as an LMS for blended learning. Several research works are available on LMSs, e-learning platforms, like the Blackboard. But little work has been conducted on LMSs provided by publishing

companies, like McGraw Hill Education. The course management systems of these LMSs are available for a range of courses and are in use throughout the world. The authors evaluated the effectiveness of McGraw Hill Education's Connect on improving student grades in a pre-calculus course at a university in a Gulf Cooperation Council (GCC) country. The students in this university were EFL or ESL students. Pre-calculus courses were taught in Spring and Fall semesters, using traditional methods. McGraw Hill's Connect was used for homework and quizzes. Although Connect had many advantages, it provided access to only the e-books published by McGraw Hill. The results of the tests showed a significant correlation between performance grades and online assignments given through Connect. Two predictive models were constructed and validated for this linear relationship. The name and country of the university are not mentioned although the author was located at the American University of Sharjah.

Based on the finding that organizational infrastructure, resources, and technical and administrative support have a significant positive impact on the commitment to use technology by the Hail university faculty and other employees, Khan, et al. (2021) concluded that the in-service and trainee faculties can obtain the benefits of using learning management system. A positive learning environment in online classes can facilitate their benefitting from the high investment in ICT by the ministry of higher education. In addition to training teaching staff in the use of technology, learners should also be provided a platform to increase and improve their digital literacy. Frequent workshops for both faculties and learners will be useful. Additional and out of the class support given by the faculty will facilitate the adoption of technology by reluctant and weak students.

Covid-19 impact

The effectiveness of Blackboard LMS in EFL teaching of English during this covid-19 pandemic was reviewed by Al-khresheh (2022) mainly in the Saudi context of the rapid switch to online learning necessitated by the rapidly increasing covid-19 pandemic. A positive influence of Blackboard LMS on teaching EFL classes was generally noted. The advantages seemed to outweigh the disadvantages in using Blackboard, although there remained some technical challenges. These challenges could be addressed by training, motivating, and encouraging the teachers for a collaborative approach with students to use Blackboard LMS. A success story of using Blackboard and certain other LMS in a Saudi university to address the challenges of the covid-19 pandemic was described by Khan (2020). As distance learning was found to be the only way to minimise the effect of the covid-19 pandemic, the technologically advanced higher education institutions like King Abdulaziz University (KAU), Saudi Arabia rapidly converted to online mode with Blackboard LMS. During the covid-19 period, regular updates on information were provided to both teachers and students to ensure that academic activities were not seriously interrupted by the pandemic. Although the installation of Blackboard LMS is not difficult, its maintenance is a challenge. Regular attendance on maintenance by the KAU technical team ensured no serious issues. KAU also utilised Microsoft Teams, Google Hangouts, and Zoom for

various academic and non-academic purposes. A laptop, internet access, wi-fi connections, training on the method of using the apps in the LMS were provided to all faculty members. Other methods and tools for various academic and non-academic were also used by KAU at various times as appropriate. All these efforts of KAU led to the achievement of all of its targets despite being forced to switch to distance learning mode mid-semester.

Students' perceptions and attitudes

Almost all studies, discussed below, show positive attitudes and perceptions of students on the use of LMS for their learning. However, there are also challenges and barriers and sometimes, students have proposed certain improvements to overcome the barriers. Unified Theory of Acceptance and Use of Technology (UTAUT) was used as the research framework in most of these studies.

In a blended learning context, the Saudi students' perceptions of the use of LMS for Arabic learning were studied by Taufiqurrochman, Muslimin, Rofiki, and Abah (2020). The students called the ten most popular LMS tools and their 16 advantages. The students were satisfied that all LMS applications could be used for learning Arabic, especially for speaking, writing, and grammar (Sharaf and Nahwu) skills.

The latest version of Unified Theory of Acceptance and Use of Technology (UTAUT) of Venkatesh, Morris, Davis, and Davis (2003) was used by Alshehri, Rutter, and Smith (2019) to evaluate how tertiary education students of Saudi Arabia accepted and used Blackboard LMS. Performance expectancy, social influence, and technical support directly contributed to the behavioural intention of students to use LMS. Technical support emerged as the most important factor for acceptance and use of the LMS.

Using Technology Adoption Model (TAM) as the research framework, Alshammari (2020) explored the factors influencing students' use of LMS in three Saudi universities. The survey results showed a significant influence of technical support, instructional design, and perceived self-efficacy on students' use of LMS. The LMS used by the three universities were Blackboard, DesiretoLearn (D2L), and Moodle. These effects operated through perceived usefulness, perceived ease of use and behavioural intention, and actual use of the TAM model.

In a similar study, using a survey of a large sample of students of three public universities, Binyamin, Rutter, and Smith (2019) observed perceived ease of use affected by six factors consisting of content quality, system navigation, ease of access, system interactivity, instructional assessment, and system learnability. Perceived usefulness was influenced by content quality, learning support, system interactivity, instructional assessment, and perceived ease of use.

Unified Theory of Acceptance and Use of Technology (UTAUT), with six additional usability variables, was used by Alshehri, Rutter, and Smith (2020) to evaluate the moderating effect of

gender and age on LMS in the tertiary learning context of Saudi Arabia. A Survey of 605 students revealed that both gender and age moderated the relationship between facilitating conditions and actual use. Female and younger students perceived this relationship higher than others.

In a survey study, Alharbi, et al. (2021) used the Unified Theory of Acceptance and Use of Technology (UTAUT) elements of Effort Expectancy (EE), Performance Expectancy (PE), Perceived Functionality (PF), Facilitating Condition (FC), Social Influence (SI), Behavioural Intention to use (BI) and Usage Behaviour, to identify which of these factors influenced the acceptance of the Blackboard LMS at King Abdulaziz University, Saudi Arabia. PE, PF, FC, and SI factors directly influenced students' BI Blackboard. Both PE and FC were second factors affecting students' intention and the EE factor did not have any impact on the student's BI.

In the survey studies of AlJasser, et al. (2022) only 57% of the health science students at King Saud University, Saudi Arabia preferred to use Blackboard as their e-learning platform. The most preferred platforms were Zoom (81%) and YouTube (66%). The students noticed a gender-related and age-related difference among faculty members for e-resources usage. The online sources recommended by faculty members were credible. The academic performance of students was influenced by the organization/logic of the content, the credibility of the video, and up to date "look and feel" of the videos. Gender and age influenced the use of e-resources by faculty members.

The predictive factors of intention to use mobile Blackboard LMS by Hail university students were identified by Alkhaldi and Abualkishik (2019) through a survey. Self-management of learning, social influence, perceived playfulness, previous experience, performance expectancy, and effort expectancy were identified as the predictive factors. Cost negatively influenced the intention of adoption. Previous experience of the students had a negative moderating influence on the relationship between effort expectancy and intention of adoption. On the other hand, the previous experience did not affect the relationship between intentions to adopt mobile blackboard with performance expectancy factor. Mobile adaptation of Blackboard is a novel approach in this study.

In the survey studies on the students of Imam Abdulrahman Bin Faisal University by Alsmadi, et al. (2021) the lack of interaction and poor internet connections affected comfortable and successful learning of physics and mathematics. Two-third of the students were satisfied with learning management systems and were able to understand the assignments making it easier to deal with them comfortably. About three-quarters of students were able to understand course materials. Most students were satisfied with the virtual guidance provided by teachers. The materials provided via LMS could address most of the questions by students. However, frequent disruptions due to poor internet connection were a negative factor. Based on these results, the authors recommended some steps for the future of online learning. Male students were more

positive in their responses than female students. Saudi students were more positive in their responses than the non-Saudi students.

Attitudes and perceptions of teachers

In most studies, the teachers also expressed positive attitudes and perceptions on the use of LMS for teaching purposes. The training was an important requirement highlighted by them to improve their method of using LMS for maximum benefits in teaching and learning.

Madrasati (My school) platform was introduced by the Saudi Ministry of education as the formal teaching and learning platform in the distance education mode of public education. The results of a survey by Alkinani and Alzahrani (2021) showed that teachers were satisfied using this technically well-designed platform. The platform had high usability and it enhanced teaching quality. Teachers' perceptions of its usefulness were influenced by the quality of its content and this, in turn, led to their positive attitude towards Madrasati. The authors used extended TAM as the research framework for this study. A few barriers of its use expressed by the teachers were inadequate technical support, extra work unrelated to course work, inadequacies of skills, and network bandwidth issues. Notably, almost all responses to the survey questions were near the maximum acceptance/agreement levels.

Using a mixed approach and applying the UTAUT model, Alshammari M. H. (2020) investigated the factors influencing the adoption of LMSs by faculty members in Saudi Arabian higher education. There was a strong positive correlation between performance expectancy and behavioural intention for Blackboard usage. Effort Expectancy, Facilitating Conditions, and Social Norms were significant predictors of Behavioural Intention for Blackboard usage. There were no moderation effects of age, gender, perceived voluntariness, and computer self-efficacy on Performance.

Research on the need for online training for female faculty members of Saudi Arabia had been very scarce. The unified theory of acceptance and use of technology (UTAUT) was used by Alsaaid and Razak (2020) for the survey of female English instructors of Saudi universities. The results of the survey showed that the UTAUT components of performance expectancy, effort expectancy, social influence, and facilitating conditions influenced the behavioural intention and actual use of Blackboard as the LMS in these universities. The title said 'a... Saudi universities.' The methodology section does not say how many universities were sampled.

Blackboard LMS plays an important pedagogical role in teaching and learning. Therefore, the perceptions of instructors are important. A survey was undertaken by Ibrahim, Mohamed, Aldhafeeri, and Alqdah (2019) to study the perceptions of faculty members on the usefulness of Blackboard LMS in the teaching system at Hafr Al-Batin University. Blackboard LMS has been in the use of the University since the academic year of 2012/2013. The faculty members of the University perceived usefulness and enjoyment most positively. The conclusion from these results is that there is a positive attitude among faculty members for the implementation of

Blackboard LMS in the University. Based on the conclusions, the authors recommended regular training of both faculty members and students.

Attitudes of students and teachers

In an isolated work, using a survey on a case study of Abdulrahman Bin Faisal University, Saudi Arabia, Alshorman and Bawaneh (2018) tried to identify the attitude of teachers and students on LMS in teaching and learning. A positive attitude was expressed by both teachers on teaching and students on learning. The academic year especially affected students' attitudes, progressing from the first year to the final year. Training of teachers and students in using the LMS may enhance the effectiveness of teaching and learning and thus, return more positive attitudes among them.

Conclusions

This paper reviewed the utilisation of learning management systems in the Saudi education system under the topics dealing with characteristics of LMS, implementation of LMS and its factors, Covid-19 impact, perceptions and attitudes of students and teachers. Most papers discussed the use of Blackboard LMS in the Saudi education system. Jusur, Future Gate, Tadarus, and Madrasati were a few LMSs specifically developed for the educational context of Saudi Arabia. They compared well with Blackboard albeit with some limitations.

Many internal and external factors have been identified for the successful implementation of LMS in the Saudi education system. Internal factors relate to infrastructure, internet access, devices, training of employees, students, and administration. External factors relate to policies and strategies of the government on education and use of LMS, community acceptance of LMS for the education of their children, and external barriers of LMS implementation.

The rapid spread of the Covid-19 pandemic resulted in the Saudi educational institutions switching to online mode and this was facilitated by LMS. The extent of preparedness of the institutions, faculty, and students were important determinants of its success.

Both students and teachers expressed positive perceptions and attitudes about using LMS for learning and teaching. Adaptation of teaching and learning methods to the new system, especially as they were forced by the covid-19 pandemic, took a little time. In some papers, students and faculty gave suggestions to improve the LMS based on their experiences.

Overall, LMS has a bright future. With the new wave triggered by Omicron, the covid-19 pandemic appear to stay some more time. New normal of education are being set by the use of LMS in the online environment and this could continue as a blended learning approach even beyond the covid-19 period. This means, more research towards the perfection of LMS for its all intended use need to be undertaken on priority. New types of LMS using artificial intelligence, augmented reality, virtual reality, and other evolving technologies could be developed and tested.

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