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A systematic review on factors influencing learning management system usage in Arab gulf countries

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Abstract

Although the successful implementation of the Learning Management System (LMS) in most of the universities in the Arab Gulf Countries (AGC), little consideration has been paid to exploring LMS usage. This paper provides a systematic review of the current literature focusing on the most critical factors influencing LMS usage in AGC. The extant literature was identified through six electronic databases from 2013 to 2023. Academic articles were reviewed if they contained a relevant discussion of the factors influencing LMS acceptance and adoption conducted in AGC. Results from a systematic review of 34 studies showed that 15 studies were centred in Saudi Arabia. The results also, revealed that Technology Acceptance Model was the dominant model employed, and students were the main subject of studies. Moreover, the quantitative approach was the preferred design. Overall, forty-one factors were identified, and the results show that the following eight factors appear most frequently: Perceived Ease of Use, Perceived Usefulness, Social Influence, Performance Expectancy, Effort Expectancy, Facilitating Conditions, Self-efficacy, and Attitude. This review will be valuable for future research and helpful for higher education decision-makers who intend to use eLearning to overcome the challenges they face in using LMS effectively.

Keywords Learning management system · Technology acceptance · Usage · Arab Gulf Countries

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1 Introduction

The learning management system has proven to be an effective alternative to traditional classroom instruction, which has allowed educational programs at the vast majority of universities to continue operating normally despite the COVID-19 pandemic (Mailizar, et al., 2021). LMS presents educational institutions with a unique opportunity to innovate with respect to the delivery of conventional pedagogical practices due to its numerous advantages and benefits (Cao, et al., 2022). However, the Arab Gulf Countries present a challenge when it comes to the incorporation of technology into the educational systems of their countries (Alsswey, et al., 2020). This may result from several factors, such as those related to technology, culture, society, and the role of the instructor, which may inhibit the adoption of eLearning among lecturers. Besides, the speed of internet connections is increasing across all of the Arab Gulf Countries, including Saudi Arabia, Kuwait, Oman, Qatar, Iraq, and the United Arab Emirates (Weber & Hamlaoui, 2018). This is one of the most critical factors in the expansion of eLearning, which is a form of distance education. Although LMS is a powerful platform used by almost all the universities in developed countries (Phan, et al., 2022), the level of LMS usage is still low in AGC (Alsswey, et al., 2020). In order to increase the level of eLearning usage, countries in the Arab Gulf should understand the relevant models and theories of LMS adoption. Because of this, this study aims to offer a more in-depth comprehension of the implementation of LMS in these countries.

A view appointed by Alsswey et al. (2020) states that increasing demand for higher education in AGC cannot be met solely through traditional face-to-face learning delivery; therefore, it is advantageous to use modern approaches such as eLearning, blended and online learning, which are supported by LMSs. Further, in the view of Kunene and Maphosa (2020), LMS enables universities to better manage users, courses, and instructors with testing capabilities and to facilitate the generation of student transcripts, reports, and activity notifications. LMS can accelerate the teaching and learning process and enhance communication between users at all times and locations (Sinclair & Aho, 2018).

Despite the growing number of systematic reviews papers examining LMS adoption worldwide (Bervell & Umar, 2017; Gamage, et al., 2022; Granić & Marangunić, 2019; Ziraba, et al., 2020), none of these have exclusively investigated the utilization of LMS in AGCs. The rationale for conducting this study is to address this research gap. The aim is to enhance the current literature by providing a comprehensive overview of the most recent LMS research publications in AGC.

A key factor observed by prior studies has to do with the initial acceptance by potential lecturers and students who are to use it for pedagogical purposes. According to Alsswey et al. (2020), rejection rates are also high despite the advantages brought about by LMS. This development has increased awareness in the Arab context of the fact that LMS usage is still a novelty in the AGC. Diverse research findings have revealed dimensions of factors influencing LMS acceptance; however, no systematic review studies provide a comprehensive view of the diverse LMS adoption and use research conducted in the AGC. This provides a rationale for the need to collect these studies from the last ten years to establish a distinct focus on LMS adoption and use

in AGC to establish trends for future research. This systematic review paper seeks to fill the gap, by answering the following research questions:

1. Which countries have contributed to LMS studies within AGC?
2. Which models or theories have been used to study LMS adoption and use in AGC?
3. What methodologies have been employed in studying LMS adoption and use in AGC?
4. What are the critical factors influencing the adoption and use of LMS in AGC?

This study has the potential to contribute to the literature by systematically reviewing research on LMS adoption and use across the AGC and by providing more comprehensive evidence on the critical factors encountered in promoting LMS usage. In addition, it provides recommendations for future research areas. The report concludes with pertinent policy and practice recommendations for AGC technology integration based on the findings of all the reviewed studies. This paper is divided into several sections to present the study's findings in a clear and organized manner. The next section will summarize the previous studies and highlight recent studies. The third section will describe the methodology used for the review, including the scope of the study, the search strategy employed to identify relevant literature, and the methods used to analyze the data. The fourth section will present the study's empirical results, while the fifth section will discuss the implications of the findings. Finally, the paper will conclude with a summary of the essential findings and their significance in Sect. 6.

2 Previous studies

Although numerous systematic review papers have been published on LMS adoption worldwide, no published systematic reviews exist on LMS adoption in AGC. Among the existing systematic reviews related to AGC, only two have focused on mobile learning adoption. Alsswey et al. (2020) reviewed 31 publications to investigate the current evidence on the use of mobile learning in AGC among instructors and students. Their findings indicate that students' and instructors' acceptance and utilization of mobile learning are the most significant issues. Moreover, the study revealed that the lack of research on leadership and policy practices in AGC may lead to the failure of technology adoption. Similarly, Alsswey and Al-Samarraie (2019) systematically reviewed 24 research articles published between 2008 and 2018. The study revealed that the adoption of mobile learning in AGC is influenced by various factors, such as technological, educational, cultural, organizational, and individual factors. The study also identified several obstacles to adopting mobile learning in AGC. Therefore, the present study will review articles on LMS utilization among AGC.

In the early years of this century, an increasing number of universities in AGC have implemented learning management systems. However, research studies on LMS adoption did not emerge until 2010, when educators began recognising the advantages of LMS utilization. Al-Busaidi and Al-Shihi (2010) found that perceived

usefulness and ease of use were significant predictors of LMS adoption among instructors, whereas subjective norms and voluntariness did not significantly influence LMS adoption. Furthermore, various studies have examined the factors influencing AGC adoption and utilization of LMS in higher education contexts. For instance, Alkharang and Ghinea (2013) investigated the factors influencing the adoption of eLearning in Kuwait and found that facilitating conditions and behavioural intentions influenced users' eLearning use. Mouakket and Bettayeb (2015) studied the factors influencing the use of LMS, particularly by university instructors, and identified that perceived usefulness, instructors' intentions, user interface design, technical support, and training influenced Blackboard system satisfaction. Alharbi and Drew (2014) conducted research in Saudi Arabia and identified that perceived usefulness, ease of use, LMS availability, prior LMS experience, and job relevance were significant predictors of LMS adoption. Kurdi et al. (2020) presented an empirical investigation into the factors influencing the acceptance of eLearning by university students in the United Arab Emirates. The findings indicated that eLearning computer self-efficacy, social influence, enjoyment, system interactivity, computer anxiety, technical support, perceived usefulness, perceived ease of use, and attitude were the most significant predictors of behavioural intention to use eLearning.

Recent studies have identified several factors that influence the adoption and utilization of LMS in AGC. Sulaiman et al. (2023) found that perceived usefulness and perceived ease of use mediated the relationship between actual usage and predictors of LMS adoption in Iraq. Service quality, service quality, and government policy were also found to be significant predictors of LMS adoption in Iraq. Fattah et al. (2022) utilized the TOE framework to investigate LMS usage in Iraq and identified relative advantage, technical compatibility, education institutes sizes, top management support, and LMS knowledge as significant predictors of LMS adoption. Similarly, Altalbe (2021) investigated the moderating effect of instructor support on eLearning systems' utilisation in higher education during the COVID-19 pandemic in Saudi Arabia. The results indicated that the quality factors significantly influenced students' actual utilization more than the usability and interaction factors, which have weaker influences on actual usage. Moreover, Al-Mamary (2022) explored the factors influencing undergraduate students' LMS use in Saudi Arabian universities. The study adopted UTAUT as the theoretical framework to investigate the primary factors influencing students' behavioural intention to use LMS. The study found that performance expectations, effort expectations, and social influence significantly impact students' behavioral intent to use LMS. These studies highlight that technological, cultural, social, and institutional factors play a crucial role in adopting and using LMSs in AGC.

Overall, the available literature underscores the intricacies and diverse nature of factors that affect the adoption and usage of LMS in AGC, which are subject to the technological, cultural, social, and institutional settings. Hence, a systematic review of the extant literature is essential to consolidate the findings of earlier studies and discern the key drivers that impact LMS usage in this region.

3 Methodology

This paper adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) from Moher et al. (2009) to answer the research questions. The systematic procedure comprises four phases of PRISMA: identification, screening, eligibility, and inclusion criteria. The number of articles identified through online database searches during the identification phase. After removing duplicates, the researcher determined the total number of articles during the screening phase. In the eligibility phase, the number of articles that were evaluated and excluded because they do not fall within the scope of the study is indicated. Finally, the inclusion stage was conducted to determine how many articles were included in the final analysis.

3.1 Search strategy

This systematic review paper searched six databases, including Google Scholar, Science Direct, Emerald, Springer, Scopus, and IEEE, for relevant research on the acceptance of eLearning and LMS in the AGC. Each selected Articles' reference list was also analyzed in order to collect additional relevant sources. The initial step started with searching for a combination and variation of a set of keywords; "eLearning" OR "Learning Management System" OR 'LMS' OR "Moodle" OR "Blackboard" OR "Course Management System" AND "adoption" OR "usage" OR "acceptance" AND "Arab Gulf Countries (including Iraq, Kuwait, Bahrain, Saudi Arabia, Qatar, United Arab Emirate and Oman) OR "higher education institutions" OR "universities". The terms "adoption", "usage", and "acceptance" are used interchangeably in this study because their meanings are so similar. The inclusion and exclusion criteria were then implemented. The researcher utilized Microsoft Excel to store and document the acquired articles.

3.2 Eligibility criteria

All retrieved studies pertaining to the LMS that met the inclusion and exclusion criteria were evaluated. This study analyzed articles on AGC lectures and students' perceptions of LMS usage. Eligible articles had to be written in English and utilize qualitative, quantitative, or mixed methodologies. In addition, the selected articles had to have been published from January 2013 till January 2023 in peer-reviewed journals. Articles focusing solely on the LMS implementation phase, training, and technical aspects were excluded from the study. Protocols, policy briefs, oral presentations, and reports from non-governmental organizations were excluded from the review.

Prior research on AGC discussed in this section revealed that essential factors should be investigated in future studies, which justifies the need for the current investigation (Alammary, et al., 2021). On the basis of previous research, this study will provide a novel perspective on identifying the essential factors required to comprehend LMS usage. Therefore, it is initial to identify critical factors that influence the LMS in AGC.

The results of the primary search of the relevant articles totalled 2525 articles without applying any inclusion or exclusion criteria. After removing all the duplicates, the total number of retrieved articles was (2498). It was decided not to include the research after reviewing the titles and abstracts (2153). The full texts of the remaining 372 papers were examined, and a comparison was made to both the inclusion and exclusion criteria. This led to the removal of 317 articles, which was then followed by the removal of 21 articles that did not discuss the factors that influence the adoption and use of LMSs in educational settings. This led to the production of thirty-four articles that met the criteria for inclusion in this study. Appendix A provides a summary of the reviewed articles that were chosen. Figure 1 summarizes the results of the literature search and screening procedures.

4 Empirical results

4.1 Countries have contributed to LMS studies within AGC

The preliminary results for AGC countries from which studies were conducted, along with the corresponding number of studies, are presented in Table 1.

With reference to Table 1, articles spanned across all countries in the AGC region except Bahrain. With respect to the number of studies, Saudi Arabia had 15, being the highest number of studies, representing 44.12% out of the total number of 34. This was followed by Iraq with 7 studies and the United Arab Emirates with six studies. Three studies were conducted in Oman, followed by Kuwait with two studies. Only one studies conducted in Qatar.

4.2 Models or theories have been used to study LMS adoption and use in AGC

In an effort to respond to the second research question, this section examines the various theories and models utilized in acceptance and adoption studies in AGC. Table 2 displays the outcomes.

Highlights from Table 2 indicate that most studies (13) representing 38.23% employed the TAM as the theoretical model suitable for their research. The second model of preference was the UTAUT, being utilized in 7 studies representing 20.59%. This was Followed by UTAUT2 with three studies. Only two studies adopt ECM. Seven out of the 34 studies representing 20.59% did not use any model for their studies. The other models presented in the table, such as TOE and DOI were employed in only one study each.

4.3 Methodologies have been employed in studying LMS adoption and use in AGC

The information in Table 3 pertains to the research design and methodology utilized in the various AGC studies.

Essential details from Table 3 demonstrate that the quantitative research design dominated most of the studies. This is underpinned by the fact that 30 out of the total

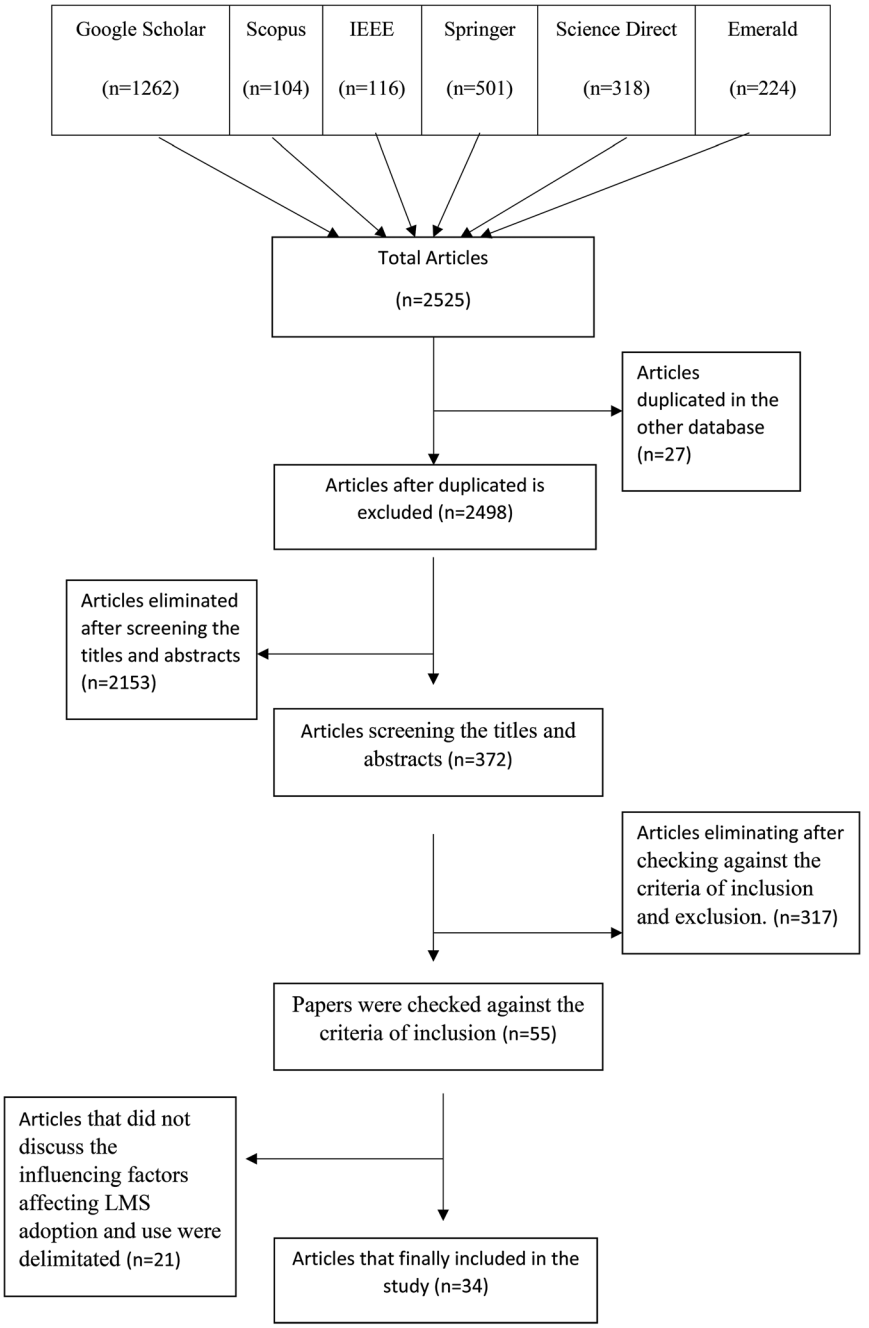

Fig. 1 Flow diagram of the selection process for including articles

Table 1 Arab Gulf Countries with number of studies

Country	Number of studies	Percentage
Saudi Arabia	15	44.12%
Iraq	7	20.59%
United Arab Emirates	6	17.65%
Oman	3	8.82%
Kuwait	2	5.88%
Qatar	1	2.94%
Total	34	100%

Table 2 Models Used in Studies

Model	Number of studies	Percentage
TAM	13	38.23%
UTAUT	7	20.59%
UTAUT2	3	8.82%
ECM	2	5.88%
TOE	1	2.94%
DOI	1	2.94%
No theory	7	20.59%
Total	32	100%

Table 3 Methodologies Used in Studies

Design	Number of studies	Percentage
Quantitative	30	88.23%
Qualitative	3	8.83%
Mixed Method	1	2.94%
Total	34	100%

Table 4 Subjects Used in Studies

subject	Number of studies	Percentage
Students	17	50%
Instructors	11	32.35%
Both Instructors and Students	6	17.64%
Total	34	100%

studies representing 88.23% employed this research design. This was followed by the qualitative recording 3 (8.83%). Only one study used a mixed method approach, the least used method. Conversely, the subjects selected for studies are depicted in Table 4, which provides information on the subject in the 34 articles selected for this study.

Details from Table 4 indicate that half of the 34 studies used university students as their subject of study. For the remaining studies, 11 (32.35%) used instructors as a subject of study. Only 6 (17.64%) out of the 34 studies focused on both instructors and students for their research.

4.4 Factors influencing adoption and use of LMS in AGC

In an effort to answer the fourth research question of this study, the researchers compiled a list of the various factors reported across the reviewed studies as LMS usage intention determinants. The analysis of these studies yielded 41 factors with their occurrence frequencies. Figure 2 illustrates the outcomes.

With reference to the statistics in Fig. 2, there is an indication that higher frequencies of 18 19 go for Perceived Ease of Use, which is considered the first important factor, followed by the second important factor, Perceived Usefulness, with 18. The third critical factor were Social Influence, Effort Expediency, Performance Expectancy and Facilitating condition, with 12 each. Self-efficacy was the next important factor, with a frequency of 8, followed by Attitude with 7. Subsequently, technical support and training with a frequency of 4 each. Followed by quality factors such as System Quality, Information Quality and Service Quality which are the last important factor with a frequency of 3 each, followed by Top Management Support with a frequency of 2. Last of all, the remaining factors mentioned in Fig. 2 are repeated only one time.

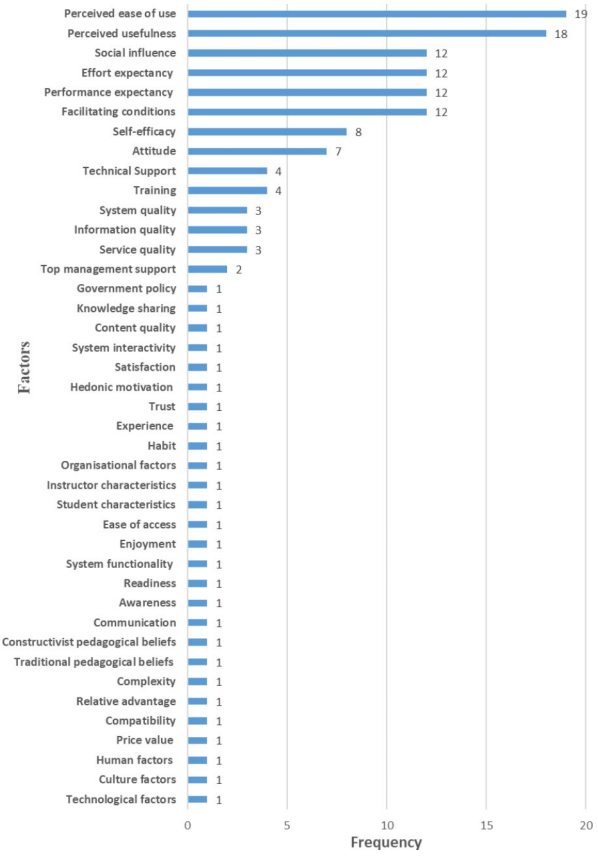

Fig. 2 Critical factors of LMS usage

5 Discussion of the finding

According to the results of the study, Saudi Arabia had the highest number of LMS acceptance studies. According to the World Bank's report on country classification by income from 2021, Saudi Arabia was classified as a high-income country. Since 2010, Saudi Arabia, a country with a high per capita income, has invested in the integration of technology into higher education. This led to the rise of eLearning programs in Saudi Arabian higher education institutions, necessitating additional LMS acceptance studies (Asiri, 2012). Iraq ranked second in Table 1 after Saudi Arabia. Within the Iraqi context, Jamil (2017) indicated that there was a trend of institutions of higher education acquiring LMS platforms, particularly Moodle. Sulaiman et al. (2019) provide a conceptual framework indicating factors that are supposed to be examined in the Iraqi context. Moodle LMS was implemented successfully at the University of Kufa, leading to an increase in eLearning in Iraq (Abdulmohson, et al., 2022). This prompted Iraqi researchers to seek out variables that affect LMS utilization.

The United Arab Emirates (UAE) ranked third in Table 1 behind Iraq, which UAE also considered a high-income nation. It has been stated by Daouk and Aldalaien (2019) that UAE invested heavily in the incorporation of Information and Communication and Technology (ICT) into the learning process. UAE invest heavily in the incorporation of ICT into the learning process (Cao, et al., 2022). Oman ranked fourth with three studies according to Table 1. In the Omani context, Al-Busaidi and Al-Shihi (2010), is the first article in the AGC published on the LMS adoption to explain the challenges facing LMS acceptance among Omani instructors. This encourages Omani researchers to examine the most critical factors influencing LMS acceptance. This partially explains the justification for why those Arab nations were researched in LMS studies.

The Technology Acceptance Model (TAM) was the most prevalent model employed by researchers in LMS studies in AGC. This was previously supported by Venkatesh and Davis (2000), who stated that TAM was the most widely used model in research on users' technology acceptance. However, this review found that most of the studies in AGC that utilized TAM were basically based on the original TAM developed by Davis et al. (1989). The original TAM positions view perceived ease of use as an independent variable for both perceived Attitude and Perceived Usefulness (Dishaw & Strong, 1999). This eliminates the direct effects of perceived usability on intent to use. Subsequently, UTAUT was the second model among reviewed studies in terms of frequency of use. Thus, UTAUT remains unpopular in AGC research despite twenty years of existence. Park (2009) used TAM to explain how individuals adopt and utilize eLearning or online learning systems.

Alternatively, UTAUT and UTAUT2 could be more valuable since they have all four variables (Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions). Recent research has demonstrated that determining Behaviors Intention outperforms all other technology acceptance models (Venkatesh, et al., 2003). Using moderators within the UTAUT and UTAUT2 models, regionally specific contextual factors could be tested for the occurrence of differences in intentions. As indicated by Venkatesh and Bala (2008), cultural differences are crucial in

determining technology use intentions. Therefore, additional research with UTAUT and UTAUT2 is required in AGC to confirm this claim.

Regarding the research design, the majority of reviewed studies employed a quantitative method (30 out of 34). A limitation of the quantitative approach is the omission of narrative details that could be useful for enhancing the quantitative analysis findings (Creswell, 2012). Although a quantitative approach is rigorous, the addition of a qualitative component will make it more effective. According to Creswell (2012), in recent years, mixed method procedures, which combine quantitative and qualitative techniques, have gained in popularity. Mixing quantitative and qualitative research methods has the potential to benefit the majority of research projects (Chen & Hirschheim, 2004). In information systems research, Venkatesh et al. (2012) argue that there is a need to close the gap between quantitative and qualitative data. The advantages of mixed methods research design provide a superior method for explaining and comprehending the complexities of organizational and social phenomena, particularly in terms of technology acceptance (Venkatesh, et al., 2012). Thus, it be incumbent on information system researchers in AGC to utilize mixed methods to conduct research. This will facilitate the use of structured and open-ended questionnaires or interview guides in the data collection process to compensate for weaknesses that may arise when only one instrument type is employed (Creswell & Creswell, 2018).

In terms of subject of the study, 50% of the studies utilized students as research subjects, as evidenced by the review's findings. There were only 11 studies that focused on instructors alone. In recent literature, the significance of instructors' technology adoption beliefs has been highlighted. For instance, Tondeur et al. (2017) suggest that to support the complex interrelationships between instructors, students, and the educational setting as a whole, it is necessary to comprehend instructors' views on technology. This stance was earlier supported by Cheng et al. (2021), who stated that it would be very beneficial for research to be more greatly and explicitly focused on instructors' beliefs. This context is where instructors typically extend their influences, shaping students' beliefs. This is especially crucial when addressing educational reform issues such as using LMS for instruction. In addition, some scholars have criticized the use of students as research subjects, specifically in LMS acceptance studies (Alshehri & Alahmari, 2021; Alturise, 2022; Mohamed Riyath & Muhammed Rijah, 2022). Suzanne et al. (2019) criticized the use of students as subjects in LMS technology acceptance research, arguing that results cannot be generalized to the real world because students are primarily motivated by grades and other factors. On the other hand, instructors unaffected by grades or favour are more likely to identify genuine obstacles to LMS usage (Al-Busaidi & Al-Shihi, 2010). When instructors have a favourable view of technology integration, they are likely to influence students to use it positively and vice versa (Gautreau, 2011). As instructors are direct implementers of technology in the teaching and learning process and can serve as quick guides and role models for students, focusing on their usage intentions becomes necessary.

This study revealed that Perceived Ease of Use and Perceived Usefulness were the most influential factors of LMS utilization in order of priority and significance. The Perceived Ease of Use and Perceived Usefulness of a learning management sys-

tem by instructors and students are positively correlated with their frequency of use. When instructors and students perceive that LMS usage will be simple and beneficial for them, they are more likely to value it, which increases their desire to use it (Alshammari, 2020). Their perceptions of usefulness lead them to realize that the use of LMS will have positive effects on teaching and learning.

Four UTAUT related factors, namely Social influence, Performance Expectation, Effort Expectancy, and Facilitating Conditions, are considered the second most influential factors on LMS use and adoption. According to Venkatesh et al. (2003), When potential adopters of an information system believe that using the system will result in a promotion, salary increase, or increase in output gains, their intention behaviour is positively affected. Social influence reflects the impact of other people's (peers, instructors, and friends) beliefs on the Intention or use behaviour of individuals (Venkatesh, et al., 2003). Alshammari et al. (2016) reported that employees are socially influenced by the beliefs of their peers regarding eLearning, which in turn affects their behavioural Intention regarding LMS usage. However, performance mainly depends on an individual's ability to use the system. When novel adopters anticipate the minimal effort required to use a system, they attach importance to it, positively influencing their acceptance intentions. The behavioural intentions of instructors and students to utilize LMS are also influenced by environmental and social intervention factors. Aside from the efficiency and usability of an information system, end users may only utilize it if they are motivated by influential others, who then influence their attitude and behaviour (Venkatesh, et al., 2003). The implication is that instructors and students rely more heavily on the encouragement of social acquaintances and relevant referents when deciding to use LMS for pedagogical purposes.

Self-Efficacy and Attitude as personality factors have been found to have a significant association with successful LMS use intentions in numerous studies (Al-Mamary, 2022). A productive self-efficacy and positive attitude towards LMS use have a substantial effect on acceptance and vice-versa. Self-Efficacy and Attitude of instructors and students are influenced by certain factors such as training and technical support.

As the most critical organizational factor, Technical Support and Training are the fourth most important factor. Technical Support and Training are regarded as crucial organizational factors that have been the subject of numerous studies (Alshammari, 2020), covers providing service to academicians and training them via workshops and practical courses to enhance their LMS (Zheng, et al., 2018). When academicians face a technical problem and receive no assistance from the IT unit, they will feel that working with an LMS is a waste of time because of the time it takes to resolve the problem (Baleghi-Zadeh, et al., 2017). As a result, if they don't train well, it is possible that they will give up working with it altogether. The findings suggest that, in actuality, the likelihood of lecturers finding LMS usage simple will increase in proportion to the quality of the training and technical support offered to them by their institutions in order to assist them in the resolution of technical problems.

Quality factors such as System Quality, Service Quality and Information Quality come as the last vital factors listed in Fig. 2. Quality factors are critical factors in predicting eLearning acceptance (Ababneh, 2016; Alharbi & Sandhu, 2018; Alshurideh, et al., 2021; Wang & Wang, 2009). It is essential for businesses involved in eLearning

to improve the quality of learning management systems in order to boost the lecturers' system usage, as well as to assist the lecturers in learning how to use their LMS with less time and effort. If the eLearning industries produce the LMS system with the highest possible quality, the LMS users may be able to limit the number of technical issues that occur. Additionally, there is a lack of training and connection between the IT unit and LMS users, which results in users being unaware of the significance of the system's service quality.

6 Conclusion

The purpose of this study was to conduct a literature review of studies on learning management system acceptance and adoption, with the end goal of identifying the predominant models used by researchers to predict LMS acceptance in AGC. It provided a more in-depth explanation of the methodologies that were utilized for these studies. In the end, it investigated the findings of the milestones as well as the factors that influence LMS utilization in AGC. Like other studies, this study has limitations because it focused solely on LMS acceptance intentions in higher education in AGC and neglected to pay attention to schools and institutions. Other studies have addressed these limitations. In addition, the research concentrated solely on LMS as its primary technology of interest, ignoring all other technologies in the process. The findings of this study stress the importance of putting in place support systems that will make it much simpler to use LMS. Because the researchers were unable to locate any studies that had been carried out in the educational context of Bahrain, it could be suggested that future research should concentrate on factors that are specific to that country. The finding of this study suggests that future studies should investigate factors like governmental policy, pedagogical beliefs, and organizational culture. These are all factors that were not present in the studies that were reviewed, but the researchers believe that they are significant. In addition, the research suggests that future studies ought to place a greater emphasis on making use of mixed method design in order to discover acceptance and adoption factors in LMS research about AGC. In addition, upcoming research ought to make greater use of UTAUT on usage intentions of LMS in AGC and investigate moderators with contextual value. In addition, the intention of instructors to use learning management systems should be a primary focus of future research.

Appendix

Appendix A Summary of the reviewed studies

No	Sources	Country	Model	Sample	Design & instruments	Statistical tool
1	Alfalah (2023)	Saudi Arabia	UTAUT	258 Students	Quantitative: Online-based questionnaire	Structural Equation Modelling

Appendix A Summary of the reviewed studies

No	Sources	Country	Model	Sample	Design & instruments	Statistical tool
2	Sulaiman et al. (2023)	Iraq	TAM	393 Lecturers	Quantitative: Questionnaire	Structural Equation Modelling
3	Al-Mamary (2022)	Saudi Arabia	UTAUT	277 Students	Quantitative: Online survey	Structural Equation Modelling
4	Cao et al. (2022)	United Arab Emirates	UTAUT	569 Students	Quantitative: survey	Structural Equation Modelling
5	Fattah et al. (2022)	Iraq	TOE	580 Students & 130 Lecturers	Quantitative: Online-based questionnaire	Regression Analysis
6	Mujalli et al. (2022)	Saudi Arabia	UTAUT	198 Students & 24 Faculty members	Quantitative: Questionnaire	Structural Equation Modelling
7	Sulaiman et al. (2022)	Iraq	TAM	393 Lecturers	Quantitative: Questionnaire	Structural Equation Modelling
8	Alhumsi and Alshaye (2021)	Saudi Arabia	TAM	248 Students	Quantitative: Questionnaire	Structural Equation Modelling
9	Alshehri and Alahmari (2021)	Saudi Arabia	No theory	274 Faculty members	Quantitative: Questionnaire	Structural Equation Modelling
10	Altalbe (2021)	Saudi Arabia	TAM	160 Students	Quantitative: survey	Regression Analysis
11	Hussein et al. (2021)	Iraq	TAM	120 Instructors	Mixed method: Questionnaire and open-ended questions	Regression Analysis
12	Rabaa'i et al. (2021)	Kuwait	ECM	387 Students	Quantitative: Questionnaire	Structural Equation Modelling
13	Shishakly (2021)	United Arab Emirates	TAM	520 Students	Quantitative: Questionnaire	Structural Equation Modelling
14	Almaiah et al. (2020)	Saudi Arabia	No theory	30 Students 31 Experts	Qualitative Interview	Thematic Analysis
15	Al Mulhem (2020)	Saudi Arabia	TAM	380 Students	Quantitative: survey	Regression Analysis
16	Alshammari (2020)	Saudi Arabia	TAM	400 Students	Quantitative: Questionnaire	Structural Equation Modelling
17	Kurdi et al. (2020)	United Arab Emirates	TAM	365 Students	Quantitative: survey	Structural Equation Modelling
18	Alharthi et al. (2019)	Saudi Arabia	No Theory	187 Instructors	Quantitative: survey	Structural Equation Modelling
19	Binyamin et al. (2019)	Saudi Arabia	TAM	833 Students	Quantitative: Questionnaire	Structural Equation Modelling
20	Daouk and Aldalaien (2019)	United Arab Emirates	DOI	4 Instructors	Qualitative Autoethnography	Thematic Analysis

Appendix A Summary of the reviewed studies

No	Sources	Country	Model	Sample	Design & instruments	Statistical tool
21	Salloum et al. (2019)	United Arab Emirates	No Theory	251 Students	Quantitative: Online-based questionnaire	Structural Equation Modelling
22	Zwain (2019)	Iraq	UTAUT2	553 Students 228 Faculty members	Quantitative: Questionnaire	Structural Equation Modelling
23	Zwain and Haboobi (2019)	Iraq	UTAUT2	184 Students 113 Faculty members	Quantitative: Questionnaire	Structural Equation Modelling
24	Alhabeeb and Rowley (2018)	Saudi Arabia	No Theory	306 Faculty members	Quantitative: survey	Regression Analysis
25	Al-Hajri et al. (2018)	Oman	No Theory	800 Students	Quantitative: Questionnaire	Structural Equation Modelling
26	Alharbi and Sandhu (2018)	Saudi Arabia	TAM	353 Students	Quantitative: Questionnaire	Regression Analysis
27	Sarrab et al. (2018)	Oman	No Theory	806 Students and faculty members	Quantitative: survey	Analytic Hierarchy Process
28	Abdullah and Toycan (2017)	Iraq	TAM	256 Students	Quantitative: Questionnaire	Regression Analysis
29	Ahmed and Seliaman (2017)	Saudi Arabia	UTAUT	260 Students	Quantitative: Questionnaire	Structural Equation Modelling
30	El-Masri and Tarhini (2017)	Qatar	UTAUT2	833 Students	Quantitative: Questionnaire	Structural Equation Modelling
31	Saleem et al. (2016)	Oman	UTAUT	14 Faculty members	Qualitative Interview	Thematic Analysis
32	Mouakket and Bettayeb (2015)	United Arab Emirates	ECM	158 Instructors	Quantitative: Questionnaire	Structural Equation Modelling
33	Alharbi and Drew (2014)	Saudi Arabia	TAM	105 Academics	Quantitative: Questionnaire	Regression Analysis
34	Alkharang and Ghinea (2013)	Kuwait	UTAUT	123 Faculty members	Quantitative: Questionnaire	Regression Analysis

Data availability Not applicable.

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