The Critical Review of Social Sciences Studies

Online ISSN: 3006-7170
Print ISSN: 3006-7162
Volume 4, Number 1, 2026, Pages 5714 – 5726
Journal Home Page
https://thecrsss.com/index.php/Journal/about

Learning Management System (LMS) Quality and Digital Instructional Design in Karachi Schools: Evidence from Two Educational Networks

Narjis Shahid[1], Dr. Syeda Aliya Fatima[2] & Reema Noman[3]

[1]*Lecturer, College of Education, Ziauddin University*
[2]*Assistant Professor, College of Education, Ziauddin University, Email: aliya.fatima@zu.edu.pk*
[3]*M.Phil. Scholar, College of Education, Ziauddin University*

ARTICLE INFO

Article History:

Received:	*January*	*13, 2026*
Revised:	*February*	*25, 2026*
Accepted:	*March*	*06, 2026*
Available Online:	*March*	*27, 2026*

Keywords:

Learning Management System, Digital Instructional Design, System Quality, Information Quality, Service Quality, DeLone and McLean IS Model, Educational Technology, Karachi Schools.

Corresponding Author:
Dr. Syeda Aliya Fatima
Email:
aliya.fatima@zu.edu.pk

ABSTRACT

The rapid integration of Learning Management Systems (LMS) in educational institutions has transformed instructional delivery, classroom management, and digital learning environments. This comparative study examined LMS quality and digital instructional design practices in two adequately resourced private school systems in Karachi, Pakistan: Aga Khan Education Service, Pakistan (AKESP), and Beaconhouse School System (BSS). The study was theoretically grounded in the updated DeLone and McLean Information Systems (IS) Success Model, focusing on system quality, information quality, and service quality as key determinants of LMS effectiveness. A quantitative comparative research design was employed, and data were collected from 60 teachers through a structured Likert-scale questionnaire. Independent samples t-tests were applied to compare LMS implementation, instructional design integration, and perceived learning outcomes between the two educational networks. The findings revealed statistically significant differences between AKESP and BSS regarding LMS quality, digital instructional implementation, and learning outcomes ($p < .001$). The findings suggested that successful LMS implementation depends not only on technological access but also on instructional planning, institutional implementation, digital workflow systems, and teacher readiness.

Introduction

The rapid evolution of digital technology has impacted educational systems around the world. Institutions are adopting technology-based learning systems to streamline instruction, manage classrooms, and communicate and assess with greater effectiveness and engagement (Kalyani, 2024; Sailer et al., 2021). Technological advances in Learning Management Systems (LMS) are

some of the most significant educational technologies that complement and support digital instruction in schools, colleges, and higher education institutions (Holmes & Prieto-Rodriguez, 2018; Al-Fraihat et al., 2020).

Learning Management Systems are categorized as software applications that assist in the organization, implementation, and assessment of a learning process (Riipa, et al., 2026; Hossain, et al., 2025). Instructional communication, assignment and content delivery, classroom interaction, assessment, and monitoring of learners are some of the LMS services available to users (Furqon et al., 2023; Sánchez et al., 2024). The ease of use of LMS has supported the rapid growth of online and blended learning and learning that is enhanced through the use of technology. The LMS enables educational institutions to sustain teaching and learning processes, foster digital communication, and facilitate educational access (Pinto & Leite, 2020; Kumi-Yeboah et al., 2020).

Successful implementation of a learning management system (LMS) is reliant on more than the technology concerned with its application (Yeasmin, et al., 2026). In addition to the technology, there is a need for supporting systems, the readiness of teachers, adequate service, a commitment to a systematic workflow, and digital pedagogy (Bizami et al., 2022; Choi-Lundberg et al., 2023). Further, the newest version of DeLone and McLean's Information Systems Success Model posits system, information, and service quality as essential LMS success criteria (Rulinawaty et al., 2024; Al-Fraihat et al., 2020). To realize the success of LMS, educational organizations are urged to implement digital workflows, effective instructional design, teacher supports, and systems of accountability (Mohammadi et al., 2025; Ramírez-Aristizábal & De Oliveira Moraes, 2024).

Also, this study aims to investigate the quality of LMS and practice of digital pedagogy in Aga Khan Education Service, Pakistan (AKESP) and Beaconhouse School System (BSS) in Karchi, Pakistan (Zaidi & Sultana, 2023; Imran, 2022). The focus of the study is to understand system quality, information quality, service quality, quality of teaching, and quality of learning in LMS-based learning environments.

Research Objectives

1. To examine LMS quality in two private school systems of Karachi.
2. To compare digital instructional design practices between AKESP and BSS.
3. To investigate the influence of system quality, information quality, and service quality on LMS effectiveness.
4. To assess institutional implementation and digital workflow integration in LMS-supported environments.
5. To identify factors contributing to successful LMS implementation and digital instructional design.

Research Questions

1. How is LMS quality perceived in AKESP and BSS?
2. Are there significant differences in digital instructional design practices between the two school systems?
3. How do system quality, information quality, and service quality influence LMS effectiveness?
4. What role does institutional implementation play in digital workflow integration?

5. Which factors contribute most effectively to successful LMS-supported instructional environments?

Literature Review

Learning Management Systems in Contemporary Education

Learning Management Systems have become essential tools in modern education as they manage instruction, facilitate communication, organize classrooms, and handle assessments (Holmes & Prieto-Rodriguez, 2018; Al-Fraihat et al., 2020). LMS systems give schools centralized tools to arrange their learning materials, track student progress, manage interactions, and provide online teaching resources (Furqon et al., 2023; Sánchez et al., 2024). Rulinawaty et al. (2024) assert that LMS systems boost educational productivity when aligned with teaching. Schools are adopting LMS systems to provide blended courses, manage online training, organize interactive group work, and manage virtual teaching (Bizami et al., 2022; Choi-Lundberg et al., 2023).

The use of LMS systems gained popularity with the rise of online and hybrid teaching. Schools and universities have become reliant on digital teaching methods to maintain educational engagement and provide learning activities that go beyond the physical classroom (Thepwongsa et al., 2021; Pinto & Leite, 2020). Herniawati et al. (2025) and Zhafira et al. (2024) further assert that LMS systems help with teaching organization as they provide a structured digital space for communication, assessment, content, and classroom interaction (Imran, Khan, & Rani, 2025; Imran, Sultana, & Jat, 2023). It can thus be claimed that the successful use of an LMS system enhances educational management and teaching coordination.

DeLone and McLean Information Systems Success Model

The DeLone and McLean Information Systems Success Model focuses on evaluating the effectiveness of information systems and delineates three main areas of system success

1. System Quality
2. Information Quality
3. Service Quality

Quality of the system speaks to the overall design of the system. Researchers in education have argued the importance of LMS systems being user-friendly, having technical stability, and having accessibility features to be supporting for quality teaching and learning (Alshehri et al., 2020; Al-Fraihat et al., 2020). Quality of information addresses the content available in LMS and its usefulness and relevance. Instructional content of high quality improves engagement and learning while elevating the quality of instruction (Kalyani, 2024; Gameil & Al-Abdullatif, 2023).

Quality of service is determined by the technical and institutional supports offered during the LMS implementation, coupled with teacher training, and user supports (Imran, Akhtar, & Khan, 2026; Haider, et al., 2025). Strong support structures increase the likelihood that an institution will be able to achieve effective digital teaching and learning integration and enhanced learning (Kamath et al., 2025; Sailer et al., 2021). Rulinawaty et al. (2024) adds that the interplay of system quality, information quality, and service quality affect user satisfaction, the quality of teaching, the learning process, and learning outcomes in educational institutions.

Digital Instructional Design

Digital instructional design is concerned with the systematic organization of learning experiences with the aid of technology (Imran, Akhtar, & Khan, 2026; Zaidi, et al., 2024). It involves the

design of learning environments that integrate multimedia, communication, online assessment, and collaborative activities with the appropriate teaching sequencing (Bizami et al., 2022; Choi-Lundberg et al., 2023). According to Black (2020), instructional design is at the core of making education effective, as organized digital learning environments improve user engagement, participation, and consistency in instruction (Hasan, et al., 2026). It is the teacher's responsibility, therefore, to design and create digital instructional experiences in a way that contributes to the attainment of instructional goals (Khoso, et al., 2024; Sultana & Imran, 2024; Ahmad, Bibi & Imran, 2023).

This includes the management of workflow, organization of instruction, planning of communication, and the integration of assessment within the LMS. Schools that create a proper collaborative and organized digital learning experience have good design practices (Gameil & Al-Abdullatif, 2023; Martín-Rodríguez & Madrigal-Cerezo, 2025). Digital instructional design should be aligned to the various educational goals of an institution and the needs of the learner. Where technology is used to support instructional design that enhances learning, students get more engaged (Kumi-Yeboah et al., 2020; Attard & Holmes, 2020).

System Quality and LMS Effectiveness

The quality of learning management systems impacts teaching and learning because of their system quality and the usability of technology. Therefore, educational institutions need LMS systems that are available, organized, technologically reliable, and operationally effective (Alshehri et al., 2020; Al-Fraihat et al., 2020).

The presence of poor navigation systems and technical malfunctions that cause inconsistent functionality and accessibility have negative impacts on the quality of teaching and learning and the satisfaction of users (Boelens et al., 2017; Ramírez-Aristizábal & De Oliveira Moraes, 2024). Thus, LMS systems need to provide stable and safe digital spaces for users.

The systems increase quality and the unimpeded flow of work on organized systems and platforms for assignments, communication, the monitoring of assessments, and the coordination of teaching (Furqon et al., 2023; Sánchez et al., 2024). Therefore, educational institutions with high system quality are more equipped to conduct effective digital instructional engagements.

Information Quality and Instructional Effectiveness

Quality of Information represents a framework for evaluating content structure and educational value of resources within Learning Management Systems (LMS). An effective digital learning ecosystem is composed of educational content that is structured, accurate, relevant, interactive, and purposeful (Kalyani, 2024; Gameil & Al-Abdullatif, 2023). Researchers in education have underscored that good quality instructional content fosters learner engagement and enhances the quality of instruction noticeably. LMS systems will be utilized by students and teachers in a more efficient manner when digital resources create valuable and meaningful educational experiences (Herniawati et al., 2025; Furqon et al., 2023).

Shen (2025) explains that instructional content that is well structured along with multimedia educational resources fosters user engagement and participation within digital instructional content. Therefore, quality of information is a pivotal factor for the success of LMS.

Service Quality and Institutional Support

Service quality includes the various types of institutional support systems associated with the implementation of a Learning Management System (LMS) such as technical support, professional development, support for teachers, and support for administrators. For the successful integration of

technology, educational institutions must work to support these systems continuously (Kamath et al., 2025; Sailer et al., 2021). According to Mohammadi et al. (2025), technology and digital instruction support systems provided to teachers, along with coaching, are key factors in the effective use and application of technology. In contrast, the absence of these support systems indicates poor integration of LMS and digital workflows in the school (Danish, Akhtar & Imran, 2025; Mankash, et al., 2025; Hafeez, Yaseen & Imran, 2019). LMS implementation also depends on institutional accountability. Educational leaders' active supervision of the implementation of digital workflows and teaching and learning practices greatly influences the outcome.

Digital Workflow and Institutional Implementation

Digital workflow management refers to the design and management of processes involved in digital instruction across all educational settings. Well-designed digital workflows encompass systematic communication, task management, instruction and assessment, and coordination of classroom activities (Choi-Lundberg et al., 2023; Bizami et al., 2022).

Educational researchers find that schools with organized digital workflows show higher instructional and managerial consistency (Ramírez-Aristizábal & De Oliveira Moraes, 2024; Thepwongsa et al., 2021). Digital workflow accountability fosters coordination and the execution of instruction across the organization.

Schools that manage systematic digital instruction across all teaching units in the organization are better positioned to sustain quality instruction. Digital workflow management provides the foundation for managing instructional consistency in LMS-based teaching and learning environments.

Challenges of LMS Implementation

Even with the educational advantages of LMS platforms, institutions still face several challenges during the implementation stage. Educators could face challenges with technology adoption, digital lesson planning, workflow issues, and integrating these systems into their classes (Boelens and others, 2017; Attard and Holmes, 2020).

According to Ali and Georgiou (2024), integrating LMS systems into educational institutions will fail to meet its goals if its technology adoption is prioritized over integration into teaching. Schools can have high-end digital systems, and teaching can be ineffective because of poor integration of systems and a weak teaching focus (Sailer and others, 2021; Pinto and Leite, 2020).

Lack of teacher training, poor management of digital systems, and insufficient support from the systems can make LMS unproductive (Kamath and others, 2025; Holmes and Prieto-Rodriguez, 2018). Therefore, a technology, teaching, and accountability integration systems will be needed to successfully integrate systems.

Methodology

Research Design

This study employed a quantitative comparative research design to analyze the quality of LMS and digital instructional design in two private school systems in Karachi, Pakistan. As the study sought to compare the LMS implementation, instructional quality, and digital workflow efficacy between two educational institutions, quantitative research was deemed appropriate.

Population of the Study

The study's participants were teachers employed in Pakistan's Aga Khan Education Service, Pakistan (AKESP), and Beaconhouse School System (BSS). These educational systems were chosen since they have developed digital learning environments and employ Learning Management Systems (LMS) to facilitate instructional delivery and management of classroom activities. The study targeted teachers who use technology in their instructional practices and who have engaged with the development of digital learning.

Sample and Sampling Technique

The sample population for this study is comprised of 60 teachers: 30 teachers representing AKESP and 30 teachers from BSS. The convenience sampling technique was used in this study because of the ease of access and willingness of teachers to be part of the research. Convenience sampling was optimal for this study owing to the availability of participants and the ease of collecting the appropriate data from the chosen education systems.

Research Instrument

DeLone and McLean Information System Success Model was utilized to design a structured questionnaire. Five key areas of focus would include System Quality, Information Quality, Service Quality, Digital Instructional Design, and Learning Outcomes. This instrument is designed to explore the quality of Learning Management Systems (LMS) as perceived by educators, the digital instructional engagement, and its educational impact in the context of blended learning.

A five-point Likert scale was employed to facilitate the option to express a range of agreeability. The scale was as follows: “1” meaning “Strongly Disagree,” “2” meaning “Disagree,” “3” meaning “Neutral,” “4” meaning “Agree,” and “5” meaning “Strongly Agree.” The questionnaire was designed with an efficient, clear, and consistent format in order to optimize the quality of quantitative data collected from the respondents.

Data Collection Procedure

Data collection involved the use of Google Forms that were distributed to selected teachers in both school systems. Participation was not mandatory; however, participants were provided with details regarding the research objectives and purpose prior to completing the survey. Measures for anonymity and confidentiality were observed throughout the research process to ensure ethical collection of information.

Data Analysis

Data analysis was performed using the Statistical Package for Social Sciences (SPSS). Independent samples t-tests were used to compare LMS quality, digital instructional design, and learning outcomes between AKESP and BSS. The application of these statistical techniques was aimed to determine the differences in the LMS effectiveness and the digital instructions brought forth by both these educational frameworks.

Results and Analysis

This study aimed to analyze the quality of learning management systems and the implementation of digital instructional design at AKESP and BSS. The researchers performed independent samples t-tests to find statistically significant differences in the quality of systems, quality of information, quality of services, instructional implementation, and learning outcomes of the two educational institutions.

Table 1: Comparative Statistical Analysis of LMS Quality and Digital Instructional Design

Construct	AKESP Mean	BSS Mean	t-value	p-value	Statistical Significance
System Quality	4.12	4.56	13.79	< .001	Highly Significant
Information Quality	4.32	3.05	8.45	< .001	Highly Significant
Service Quality	4.05	2.92	7.12	< .001	Highly Significant
Digital Instructional Design	4.42	3.11	10.23	< .001	Highly Significant
Learning Outcomes	4.28	2.84	9.81	< .001	Highly Significant

Note: *Significance level set at α = 0.05.*

Table 1 results indicate that AKESP and BSS show statistically significant differences across most LMS dimensions and the instructional implementation dimensions. Although BSS showed stronger baseline system and technological organizational integration, AKESP showed much stronger information and support service, instructional implementation, and learning outcomes.

The results indicate that the system and integration of baseline technologies do not directly result in the fulfillment of learning outcomes. Rather, LMS-supported learning environments are a function of digital instructional design and the subsequent integration of the LMS at the level of the institution. Figure 1 indicates that AKESP is superior to BSS in most of the instructional and implementation dimensions of LMS and instructional integration, even when BSS surpasses AKESP in the baseline integration of organizational and instructional Systems and Technologies.

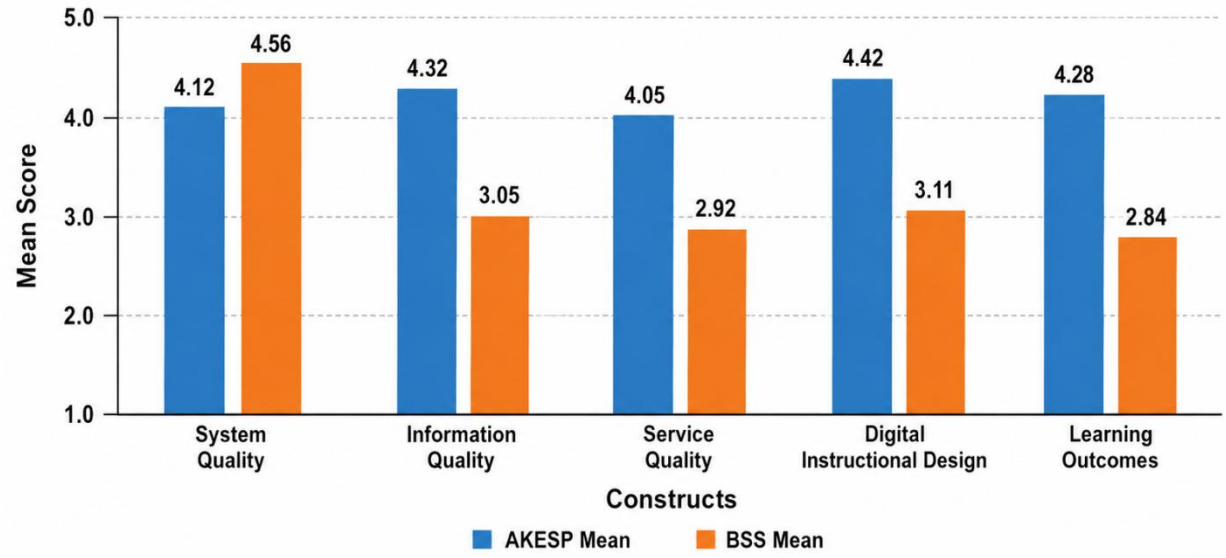


Figure 1: ***Comparative Analysis of LMS Quality and Digital Instructional Design***

System Quality

The findings show that BSS's system quality was higher than AKESP's, as BSS reported better technology organization, standardization of learning management systems, and the accessibility of the learning management systems platforms.

The findings indicate that BSS had a more advanced technology infrastructure and a more centralized digital systems. BSS teachers reported that LMS provided a more organized system of digital communication and a more consistent and reliable system of technology.

Nevertheless, advanced technology systems, in part, explain the quality of the instructional design and the learning outcomes.

Information Quality

In a comparison against BSS, AKESP exhibited superior information quality. Responding instructors appreciated the organization of instructional content, efficient use of multimedia, organization of learning materials, and inclusion of pertinent educational resources. Quality of instructional content is an important factor for user engagement and instructional effectiveness. BSS instructors in embedded Learning Management System (LMS) instructional environments demonstrated more successful meaningful integration of educational resources than AKESP instructors.

Service Quality and Institutional Support

AKESP also showed improvement with service quality and support systems of the institution. Teachers reported the availability of and better assistance with instruction, administrative support, professional development, and technical assistance. The results show that the effectiveness of an LMS is heavily dependent on the institutional context of an organization. Educational institutions that provide continuous support and accountability to teachers about their work are more likely to accomplish the integration of effective digital instruction in their organization.

Digital Instructional Design

The results indicated that AKESP and BSS had major discrepancies in digital instructional design practices. AKESP teachers had better skills in sequencing instructional steps, structuring assignments, managing classrooms, and employing digital workflows. AKESP teachers also had better skills in the incorporation of communication systems and integrated collaborative learning and instructional monitoring activities. Their instructional planning skills are essential in the LMS-supported learning environments.

Learning Outcomes

AKESP educators noted more positive learning outcomes with instruction supported by a learning management system (LMS). Within digital learning environments, students showed better engagement, participation, interaction, and coordination of activities. These results suggest that the direct impact of teaching and support available in the institution on the effectiveness of learning is greater than the available technology infrastructure.

Table 2: Comparison of Teachers' Experience and Institutional Strengths

Institution	Average Teaching Experience	Major Institutional Strengths
AKESP	15.1 Years	Strong instructional implementation, workflow accountability, digital instructional planning
BSS	7.5 Years	Strong technological organization and system standardization

The results show that technology integration in teaching and workflow implementation was more pronounced in experienced teachers in AKESP than in the teachers in BSS.

Discussion

This study focuses on the importance of LMS quality and digital instructional strategies in technology-enhanced teaching/learning environments. Despite both school systems having robust

technology infrastructures, AKESP showed substantially higher levels of instructional implementation, service quality, digital workflow management, and learning outcomes (Rulinawaty et al., 2024; Al-Fraihat et al., 2020). The findings favor the revised DeLone and McLean Information Systems Success Model for LMS and the need to consider the interaction between system quality, information quality, and service quality (Rulinawaty et al., 2024; Alshehri et al., 2020). Despite having stronger technological standardization and baseline system quality, BSS lags behind AKESP in instructional integration and institutional implementation (Sánchez et al., 2024; Ramírez-Aristizábal & De Oliveira Moraes, 2024).

The results imply that having a robust technological infrastructure is insufficient for educational effectiveness. To optimize the use of LMS, educational institutions need to organize digital instructional workflow, set planning systems, teacher support systems, and strengthen the institutional workplace accountability system (Sailer et al., 2021; Ali & Georgiou, 2024).

Institutional implementation appeared to be the single most important factor affecting LMS-supported instructional effectiveness. AKESP teachers reported stronger digital workflow accountability, instructional support, professional support, and communication systems compared to those in BSS. Findings show that the quality of technology implementation of an organization is determined by the effectiveness of the organization's leadership (Mohammadi et al., 2025; Kamath et al., 2025). The study also showed that the quality of information and the organization of instruction is a direct contributor to the effectiveness of instruction. Organized instructional resources and effective digital instructional design of the teaching staff of the educational institutions increases the chances of having a teaching and learning environment that is supported by innovative educational technology (Black, 2020; Gameil & Al-Abdullatif, 2023).

Furthermore, service quality was identified as an important element impacting the effectiveness of the LMS. It was noted that teachers who were provided continuous technical support, training, and administrative support were better able to integrate instruction and maintain digital workflows (Holmes & Prieto-Rodriguez, 2018; Herniawati et al., 2025). The results also showed that more experienced teachers were able to implement the digital instructional system more effectively, due to their advanced skills in instructional design and classroom management. This indicates that the readiness's of teachers, as well as their professional skills, are important factors when integrating an LMS (Bizami et al., 2022; Choi-Lundberg et al., 2023).

Challenges and Limitations

The study revealed several limitations:

1. The study used self-reported data from teachers.
2. The sample only comprised two private school systems.
3. Students' perspectives were not included in the study.
4. The study only examined well-resourced schools.
5. The findings do not apply to the public sector education system.

Recommendations

Regarding the findings of this study, it is suggested that:

1. Digital instructional planning and workflow accountability systems should be strengthened across all educational organizations.
2. Continuous professional development in LMS integration and digital instructional design should be offered.

3. More attention should be paid to the quality of services offered through technical support and teacher training.
4. Educational leaders should consistently track the use of digital workflows and the integration of instruction.
5. Instructional integration should be a greater focus than the growth of technology in schools.
6. Future studies should sample participants of larger sizes and include students.

Conclusion

This study compares the quality of Learning Management Systems (LMS) and digital instructional design across two private schools in Karachi, Pakistan. The results showed that the two schools differ statistically in the quality of their LMS in terms of system quality, the quality of information, the quality of services, digital integration of instructional services, and the quality of learning outcomes. BSS demonstrated better technological management and integration of systems compared to AKESP, while AKESP demonstrated better instructional digital integration, digital accountability, and learning outcomes. The results indicate that the implementation of Learning Management Systems (LMS) is dependent not on the technological systems alone, but also on on/instructional strategies, organizational strategies of the institution, digital workflow, teachers, and service support. The study also concluded that for the Learning Management Systems (LMS) to be more beneficial to the learning environments supported by technology and to improve the learning activities, educational institutions should go beyond the initial stage of technology integration and embrace meaningful digital instructional integration.

References

1. Ahmad, D. N., Bibi, N., & Imran, M. (2023). Effects of Teacher's Motivation On Students' academic Performance At Public Secondary Schools In Karachi Pakistan. *Available at SSRN 5165741*.
2. Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2020). Evaluating E-learning systems success: An empirical study. *Comput. Hum. Behav., 102*, 67-86. https://doi.org/10.1016/j.chb.2019.08.004.
3. Ali, R., & Georgiou, H. (2024). A process for institutional adoption and diffusion of blended learning in higher education. *Higher Education Policy, 38*(3), 523–544. https://doi.org/10.1057/s41307-024-00359-y
4. Alshehri, A., Rutter, M., & Smith, S. (2020). The Effects of UTAUT and Usability Qualities on Students' Use of Learning Management Systems in Saudi Tertiary Education. *J. Inf. Technol. Educ. Res., 19*, 891-930. https://doi.org/10.28945/4659.
5. Attard, C., & Holmes, K. (2020). An exploration of teacher and student perceptions of blended learning in four secondary mathematics classrooms. *Mathematics Education Research Journal, 34*, 719 - 740. https://doi.org/10.1007/s13394-020-00359-2.
6. Bizami, N., Tasir, Z., & Kew, S. (2022). Innovative pedagogical principles and technological tools capabilities for immersive blended learning: a systematic literature review. *Education and Information Technologies, 28*, 1373 - 1425. https://doi.org/10.1007/s10639-022-11243-w.
7. Black, E. L. (2020). Instructional design for single information literacy sessions. *Public & Access Services Quarterly, 16*(3), 161–171. https://doi.org/10.1080/15228959.2020.1775753
8. Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review, 22*, 1-18. https://doi.org/10.1016/j.edurev.2017.06.001.

9. Choi-Lundberg, D., Butler-Henderson, K., Harman, K., & Crawford, J. (2023). A systematic review of digital innovations in technology-enhanced learning designs in higher education. *Australasian Journal of Educational Technology*. https://doi.org/10.14742/ajet.7615.
10. Danish, F., Akhtar, N., & Imran, M. (2025). AI-Driven Personalization in Educational Marketing: A Framework for Enhancing Student Recruitment and Retention. *Journal of Political Stability Archive*, *3*(2), 559-590.
11. Furqon, M., Sinaga, P., Liliasari, L., & Riza, L. (2023). The Impact of Learning Management System (LMS) Usage on Students. *TEM Journal*. https://doi.org/10.18421/tem122-54.
12. Gameil, A., & Al-Abdullatif, A. (2023). Using Digital Learning Platforms to Enhance the Instructional Design Competencies and Learning Engagement of Preservice Teachers. *Education Sciences*. https://doi.org/10.3390/educsci13040334.
13. Hafeez, A., Yaseen, G., & Imran, M. (2019). Management Paradigm Change in Pak¬-Turk (International Schools & Colleges) After a Failed Military Coup in Turkey: A Case Study.
14. Haider, S., Mirwani, R., Imran, M., & Haider, H. (2025). The Emotional Landscape of Organizational Change: A Qualitative Study of Teachers in Lasbela, Balochistan. *Journal of Political Stability Archive*, *3*(3), 1482-1502. https://doi.org/10.63468/jpsa.3.3.98
15. Hasan, S., Rahman, K. A., Ahmed, F., & Hossain, A. (2026). An Integrated AI-Driven Framework for Maternal Resource Intelligence Shortages Across US Hospital. *Journal of Angiotherapy*, *10*(1), 1-12.
16. Herniawati, A., Holifah, L., & Syakur, A. (2025). Effectiveness of Learning Management System (LMS) Use in Higher Education. *International Journal Corner of Educational Research*. https://doi.org/10.54012/ijcer.v4i1.625.
17. Holmes, K., & Prieto-Rodriguez, E. (2018). Student and Staff Perceptions of a Learning Management System for Blended Learning in Teacher Education. *Australian Journal of Teacher Education*, *43*, 21-34. https://doi.org/10.14221/ajte.2018v43n3.2.
18. Hossain, A., Tasnim, A. F., Akhter, F., Semi, M. M. A., Khan, R., Rahman, R., ... & Sabeena, A. A. (2025). Transforming Healthcare Decisions in the US Through Machine Learning. Artificial Intelligence, 1(2).
19. Imran, M. (2022). Drawbacks of E-Learning for the Toddlers and their Possible Solutions: A Detailed Study. *Spry Contemporary Educational Practices*, *1*(1).
20. Imran, M., Akhtar, N., & Khan, N. (2026). Ethical Leadership in Early Years Education: Implications for Teacher Professional Ethics and the Learning Environment–A Qualitative Study. *Journal of Political Stability Archive*, *4*(1), 260-281. https://doi.org/10.63468/jpsa.4.1.15
21. Imran, M., Khan, N., & Rani, H. (2025). Analyzing the Effectiveness of AI Tools in Academic Writing for ESL Learners. *Advanced Research in Emerging Technologies and Digital Systems*, *4(1)*, 9-18.
22. Imran, M., Sultana, Z., & Jat, Z. G. (2023). Education as A Social Agent of Culture Change: Literature Review. *Benazir Research Journal of Humanities and Social Sciences, 2(1)*.
23. Kalyani, L. (2024). The Role of Technology in Education: Enhancing Learning Outcomes and 21st Century Skills. *International Journal of Scientific Research in Modern Science and Technology*. https://doi.org/10.59828/ijsrmst.v3i4.199.
24. Kamath, S., Nayak, K., Nayak, V., & Verma, S. (2025). Leveraging learning management systems in medical education: a scoping review of use, outcomes, and improvement pathways. *Medical Education Online, 30*. https://doi.org/10.1080/10872981.2025.2603805.

25. Khoso, F. J., Shaikh, N., Dahri, K. H., & Imran, M. (2024). Educational Nurturing in Underdeveloped Contexts Unraveling the Dynamics of Student Teachers' Holistic Development. *Spry Contemporary Educational Practices*, *3*(1).
26. Kumi-Yeboah, A., Sallar, A., Kiramba, L., & Kim, Y. (2020). Exploring the Use of Digital Technologies from the Perspective of Diverse Learners in Online Learning Environments. *Online Learning*. https://doi.org/10.24059/olj.v24i4.2323.
27. Mankash, M. A., Ahmed, S. T., Shabbir, N., & Imran, M. (2025). Second Language Learning in the Digital Age: How Technology Shapes Language Acquisition at Universities in Karachi, Pakistan. *Liberal Journal of Language & Literature Review*, *3*(1), 182-199.
28. Martín-Rodríguez, A., & Madrigal-Cerezo, R. (2025). Technology-Enhanced Pedagogy in Physical Education: Bridging Engagement, Learning, and Lifelong Activity. *Education Sciences*. https://doi.org/10.3390/educsci15040409.
29. Mohammadi, M., Paasivara, M., & Kasurinen, J. (2025). Blended learning in higher education: good practices in platforms and teachers support, enhancing students motivation. *Education and Information Technologies*, *30*(18), 26001–26024. https://doi.org/10.1007/s10639-025-13770-8
30. Pinto, M., & Leite, C. (2020). Digital technologies in support of students learning in Higher Education: literature review. *Digital Education Review*. https://doi.org/10.1344/der.2020.37.343-360.
31. Ramírez-Aristizábal, C., & De Oliveira Moraes, R. (2024). Learning management systems success in the Covid-19 post-pandemic blended learning context: Empirical evidence from a Brazilian engineering school. *Education and Information Technologies, 29*, 16541 - 16570. https://doi.org/10.1007/s10639-024-12518-0.
32. Riipa, M. B., Ahmed, F., Rony, M. K. K., Hossain, A., Islam, A., Utsho, M. R., ... & Tasnim, A. F. (2026). The role of artificial intelligence in predicting cardiovascular outcomes: a systematic review and meta-analysis. *Biostatistics & Epidemiology*, *10*(1), e2670804.
33. Rulinawaty, Samboteng, L., Purwanto, A. J., Kuncoro, S., Jasrial, Tahilili, M. H., Efendi, Y., & Karyana, A. (2024). Investigating the influence of the updated DeLone and McLean information system (IS) success model on the effectiveness of learning management system (LMS) implementation. *Cogent Education*, *11*(1). https://doi.org/10.1080/2331186x.2024.2365611
34. Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning in schools: What does it take beyond digital technology?. *Teaching and Teacher Education*. https://doi.org/10.1016/j.tate.2021.103346.
35. Sánchez, L., Penarreta, J., & Poma, X. (2024). Learning management systems for higher education: a brief comparison. *Discover Education, 3*. https://doi.org/10.1007/s44217-024-00143-5.
36. Shen, Y. (2024). Examining the efficacies of instructor-designed instructional videos in flipped classrooms on student engagement and learning outcomes: An empirical study. *Journal of Computer Assisted Learning*, *40*(4), 1791–1805. https://doi.org/10.1111/jcal.12987
37. Sultana, Z., & Imran, M. (2024). Challenges Faced by English Teachers in Pakistan. *Spry Journal of Literature and Linguistics*, *2*(1).
38. Thepwongsa, I., Sripa, P., Muthukumar, R., Jenwitheesuk, K., Virasiri, S., & Nonjui, P. (2021). The effects of a newly established online learning management system: the perspectives of Thai medical students in a public medical school. *Heliyon, 7*. https://doi.org/10.1016/j.heliyon.2021.e08182.

39. Yeasmin, S., Semi, M. M. A., Rony, M. K. K., Das, S., Sabeena, A. A., Rahman, R., & Hossain, A. (2026). Artificial Intelligence for Mental Health Monitoring: A Solution for Digital Behavioral Health Care and Education—An Umbrella Review. *Health Science Reports*, *9*(1), e71703.
40. Zaidi, S. S., & Sultana, Z. (2023). Influence of Internet in Shaping the Emotional Maturity of Adolescents: A Review Study. *Spry Journal of Humanities and Social Sciences*, *1*(1).
41. Zaidi, S. S., Imran, M., Khoso, F. J., & Sultana, Z. (2024). Impact of Technologies and Co-Curricular Activities on Students' Academic Achievement at the Undergraduate Level. *Journal of Social & Organizational Matters*, *3*(3), 75-90. https://doi.org/10.56976/jsom.v3i3.99
42. Zhafira, D., Simangunsong, I., & Harahap, S. (2024). Analyzing The Utilization Of Learning Management Systems To Support Student Learning In An Online Learning Environment. *Proceedings of International Conference on Education*. https://doi.org/10.32672/pice.v2i1.1376.