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DIGITALISATION OF EDUCATION: UNLIMITED INNOVATION IN THE MODERN LEARNING ERA

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Abstract

This study discusses the transformation of the education system through digitalisation, which brings unlimited innovation in the era of modern learning. The digitalisation of education enables broader, more flexible, and personalised access to learning by utilising technologies such as Learning Management Systems (LMS), interactive media, and learning analytics. However, the digitisation process is not without significant challenges, such as infrastructure inequality, teacher readiness, data security issues, and psychological impacts on students. This study uses qualitative methods with literature review to identify strategic solutions that can overcome these obstacles, including infrastructure equalisation, teacher digital competency training, security regulation development, and the implementation of hybrid learning models. The results of this study are expected to provide recommendations for education stakeholders in optimising digital innovation to create an inclusive, adaptive, and sustainable education system.

Keywords: Education digitalisation, learning innovation, Learning Management System, technology access gap, hybrid learning, data security, teacher digital competency.

Introduction

In the era of globalisation and the Fourth Industrial Revolution, advances in information and communication technology have brought fundamental changes to various aspects of human life, including education. The digitisation of education is no longer an option, but has become a primary necessity to support the effectiveness and efficiency of learning (Judijanto & Aslan, 2025); (Purike & Aslan, 2025). Digitalisation opens up opportunities to change the traditional learning paradigm, which is conventional and limited in terms of space, time, and resources, into a more inclusive, flexible, and innovative process. With digitalisation, every individual can access learning resources anytime and anywhere, making education more open and adaptive to the needs of the times.

This demonstrates the existence of unlimited innovation that can drive improvements in the overall quality of education (Haleem et al., 2022). However, the process of digitising education is not merely the application of digital technology but

also requires a comprehensive transformation of the education system, from the curriculum, teaching methods, and learning management to evaluation.

Digital technology provides the means to create learner-centred learning by integrating various interactive media and digital-based learning management systems (Firmansyah & Aslan, 2025a); (Firmansyah & Aslan, 2025b). This process requires readiness not only in terms of facilities and infrastructure, but also in terms of human resources, namely educators and students, so that they are able to adapt and utilise technology optimally (Anderson & Dron, 2011). Therefore, the digitisation of education requires holistic innovation within the framework of national education policy.

In the Indonesian context, the digitisation of education presents both opportunities and complex challenges. As a country with a large population and a vast geographical area, the application of digital learning technology provides more equitable access to education and overcomes distance limitations. Online learning, which has been expanded during the COVID-19 pandemic, has become an important momentum in accelerating digital transformation in the education sector (Aslan et al., 2020); (Manullang et al., 2021). However, uneven technological infrastructure, limited internet access in some areas, and digital literacy gaps between different segments of society remain major obstacles. Therefore, digital-based education transformation must be strategically designed to be inclusive and capable of bridging capacity gaps between regions (Pappano, 2012).

One of the main aspects of education digitalisation is the use of Learning Management Systems (LMS), which enable the learning process to be carried out in a structured and well-documented manner. LMS such as Moodle, Google Classroom, and local education platforms provide a digital space that enables the management of materials, assignments, interaction between teachers and students, and real-time monitoring of learning progress (Putra, 2024). This not only supports teaching effectiveness but also facilitates learning evaluation that can be integrated with analytical data to improve the personalisation of the learning process. Thus, LMS becomes a strong technological foundation for building a sustainable digital learning ecosystem (Høydal, 2024).

Other digital technologies that also make a significant contribution are the use of interactive media such as educational videos, augmented reality (AR), virtual reality (VR), and gamification. These media are able to increase the attractiveness and engagement of students in the learning process, while facilitating the understanding of abstract and complex concepts through interactive visualisation and simulation. These innovations mark a shift from passive to active learning, thereby increasing student motivation and learning outcomes (Indrasari, 2024). The use of technologies such as AR and VR also opens up new dimensions in education that cannot be achieved through conventional methods, making learning more in-depth and immersive (Aslan & Sidabutar, 2025); (Rokhmawati et al., 2025).

However, the digitisation of education also presents various challenges that must be addressed seriously. The main challenges include unequal access to technology, a lack of readiness and competence among educators in utilising technology, and issues of data security and privacy in the digital learning ecosystem. The technological infrastructure gap causes disparities in the quality of education between developed and underdeveloped regions, which must be addressed immediately. In addition, developing the digital competencies of teachers as learning facilitators is key to the successful implementation of education digitalisation (Indrasari, 2024). This requires a commitment from the government and educational institutions to provide planned and continuous training.

The readiness of human resources, especially teachers, in facing the digital era is a determining factor in the success of this educational transformation. Teachers not only play a role as educators, but also as facilitators and mediators of technology in learning. The role of teachers must be accompanied by mastery of digital technology and an understanding of new pedagogy oriented towards technology-based learning. The provision of comprehensive training, as well as technical and moral support, is important so that teachers can optimise the potential of digitalisation in the learning process. This approach will strengthen the implementation of education digitalisation as a whole (Kozma, 2003). In addition to the technical aspects and competence of educators, the psychological and social aspects of students are also no less important in the context of education digitalisation. Intensive use of digital technology can lead to digital fatigue, concentration disorders, and a reduction in direct social interaction. Therefore, digital education innovations must be designed with consideration for the balance and mental health of learners.

The blended learning model, which combines face-to-face and online learning, can be a solution to maintain social interaction while utilising the advantages of digital technology. This shows that technology should be used as a supporting tool, not a substitute for human interaction in the learning process (Bates, 2015). Government policy plays a strategic role in promoting the digitisation of education in a systematic and targeted manner.

The government needs to formulate regulations that support the development of technological infrastructure across all regions, the provision of equitable internet access, and the standardisation of data security and privacy in digital learning. In addition, policies need to support sustainable technological innovation and encourage cross-sector collaboration between educational institutions, the government, and technology industry players. This synergy will strengthen an innovative and sustainable digital education ecosystem (Almekhlafi, 2025).

Digital education innovation also drives the development of more adaptive and contextual teaching materials in line with technological developments and the needs of the times. The education curriculum must be adjusted to integrate information and

communication technology into the learning process and prepare students with 21st-century competencies such as critical thinking, creativity, and digital literacy skills. The development of innovative and engaging digital-based content is an important factor in supporting the success of modern learning. This provides insight into the importance of the role of educators and curriculum developers in continuous innovation (Saputri, 2024b).

It is also important to note that the digitisation of education opens up opportunities for broader and more innovative forms of collaboration. Through digital platforms, educational institutions can establish cross-border and cross-cultural partnerships, facilitating the global exchange of knowledge and learning resources. This adds value to the diversity of education and improves the quality and competitiveness of students at the international level.

The digitisation of education thus not only brings innovation at the local level, but also encourages the integration of education globally, which is increasingly relevant to the changing times (Saputri, 2024a). With all its potential and challenges, research on 'Digitisation of Education: Unlimited Innovation in the Modern Learning Era' is highly relevant in providing in-depth understanding and strategic recommendations.

This research aims to comprehensively examine how digitisation can change the face of education while exploring solutions to the obstacles encountered in its implementation. In this way, adaptive, inclusive, and sustainable educational innovations can be produced in Indonesia, thereby improving the quality of education and enabling it to compete in an increasingly digital global era.

Research Methodology

The research method used in this study is a literature review, which aims to explore the implementation and challenges of education digitisation in Indonesia. The literature review in this study was conducted using a systematic approach to collect, evaluate, and synthesise various relevant literature on education digitisation and modern learning innovations (Eliyah & Aslan, 2025). The review process involves searching for primary and secondary sources from academic journals, books, research reports, and the latest education policy documents that focus on the implementation of digital technology in the learning system. The selected literature is critically analysed to identify trends, challenges, and solutions related to the digitisation of education, while also building a strong conceptual framework as a theoretical basis for the research. This literature review plays an important role in strengthening arguments and providing empirical context to the phenomenon of unlimited innovation in the era of modern learning (Cronin et al., 2008).

Results and Discussion

Transformation of the Learning System Through Digitalisation

The development of digital technology has brought fundamental changes to various sectors, including education. The digitisation of learning systems has become an inevitable necessity in facing the challenges of 21st-century education. This transformation marks a paradigm shift from traditional learning methods that focus on conventional face-to-face interaction to a more dynamic, flexible learning model that is integrated with digital technology. Through digitisation, the learning process is no longer limited by space and time, but can take place online with easy and widespread access (Munir, 2010).

One concrete form of this transformation is the shift from conventional learning methods to blended learning and e-learning. Blended learning combines face-to-face methods with online learning, providing more flexibility for learners while utilising the advantages of digital technology. Meanwhile, e-learning, or fully online learning, allows learners to study independently through various modules and digital media. These two models change the way teachers and students interact and the way learning materials are delivered, resulting in a more personalised and adaptive learning experience (Siemens & Long, 2011).

Digital learning is supported by the emergence of various Learning Management System (LMS) platforms such as Moodle, Google Classroom, Edmodo, and the latest local platforms. LMS provides a digital infrastructure to manage the learning process, from material distribution and assignment collection to organised assessment and feedback. LMS enables teachers to design systematic learning modules while monitoring student progress in real time, thereby strengthening the effectiveness and efficiency of learning. This facilitates the arrangement of schedules, materials, and interactions in the digital classroom (Mahabu, 2025). In addition to LMS, innovations in learning media are also an important part of digital transformation. Interactive learning videos, podcasts, virtual simulations, augmented reality (AR) and virtual reality (VR) enrich teaching methods with more engaging and easy-to-understand content. AR and VR, for example, enable an immersive learning experience by visualising abstract concepts in a realistic and interactive way.

The use of such media not only increases student motivation to learn but also deepens their understanding of complex learning materials (Sufyan, 2022). Gamification is one innovative approach applied in digital learning. By integrating game elements such as points, levels, and challenges, gamification can create a fun learning atmosphere and trigger positive competitive spirit.

This approach helps increase engagement and information retention, especially in material that tends to be boring when presented conventionally. Gamification opens up new opportunities in designing a more dynamic and interactive learning experience (Johnson & et al., 2016).

The digital nature of modern education also allows for the use of learning analytics. By collecting data on student activity on digital platforms, teachers can analyse learning patterns, levels of understanding, and even predict the difficulties students may encounter.

This information is invaluable for timely intervention and tailoring learning materials to individual or group needs. Learning analytics is an important tool in personalising learning to be more effective and efficient (Saputra et al., 2024); (Aslan & Rasmita, 2025). One of the main advantages of digital transformation in learning is the flexibility of time and place it gives learners.

Learning no longer has to take place in a physical classroom or at a specific time. Learners can access learning materials anytime and anywhere using digital devices such as laptops, smartphones, or tablets. This is very beneficial for learners who have limited time, distance, or mobility, and enables continuous learning even in emergency situations such as a pandemic (Adila & Rodiyah, 2024).

Digital transformation also opens up access to much broader and more diverse learning resources. Through the internet, students can access digital libraries, video tutorials, scientific journals, and various open learning resources from around the world. This enriches learning references and provides opportunities for students to develop their knowledge and research skills independently.

The digitisation of education thus supports the development of learners as independent and critical lifelong learners (Sari, 2024). The implementation of learning digitisation also brings changes to the role of educators. In this context, teachers are transformed into facilitators who accompany and guide the learning process of learners in a digital ecosystem.

Teachers are tasked with guiding, providing feedback, and facilitating digital interactions between students to support collaboration and discussion. This role requires teachers to have strong pedagogical and digital skills in order to carry out an effective and engaging learning process (Unaida, 2024).

However, the transformation of the learning system through digitisation presents a number of challenges. The gap in access to technology between urban and remote areas is a major obstacle that can lead to disparities in the quality of education. In addition, the readiness and competence of educators in adopting digital technology still varies, so systematic capacity building efforts through training and mentoring are needed. Other factors such as the readiness of students to utilise technology, as well as challenges in motivation and self-discipline in learning, also need to be considered.

Technical aspects such as data security and user privacy are also important considerations in digital learning. LMS platforms and other learning media must have strict security standards to protect student and educator data from cyber threats. Privacy protection and transparency in the use of learning data cannot be ignored if the digitisation of education is to proceed safely and reliably (Mahmud, 2021). Therefore,

the development of regulations and policies related to cyber security in education must be an integral part of digital transformation. In addition to technical and infrastructural aspects, the psychological and social impact on students due to intensive use of technology must also be taken into account. The phenomena of digital fatigue, concentration disorders, and reduced direct social interaction are negative effects that need to be minimised (Gunawan et al., 2024). Therefore, a learning model that combines physical presence with online learning (blended learning) is an ideal solution to maintain a balance between social interaction and technology use. This approach can also address more humanistic learning needs and not solely rely on technology (Safitri, 2024).

Digital transformation in education must be supported by proactive policies and regulations from the government and educational institutions. The provision of adequate technological infrastructure and equitable internet access are the main foundations for digitalisation to reach all levels of society. Policies for developing the digital competencies of teachers and educational staff must also be implemented continuously. Various training programmes, workshops, and technological assistance are key to the successful implementation of digital learning transformation nationwide (Nisak, 2025).

Overall, the transformation of the learning system through digitalisation opens up great opportunities to improve the quality of education and respond to the challenges of modern education. With the appropriate use of digital technology and well-thought-out strategies, learning can become more effective, inclusive, and relevant to the times. However, the success of this transformation is highly dependent on the synergy between technology, human resources, policies, and the mental and social readiness of all education stakeholders. Therefore, unlimited innovation in the digitisation of education must continue to be encouraged and developed in a sustainable manner.

Challenges and Solutions for Digital Education Innovation

The digitisation of education offers great opportunities to provide learning that is more inclusive, flexible, and relevant to the needs of the times, but this innovation process is not without a number of major challenges that need to be addressed comprehensively. One of the main obstacles is the disparity in access to technology and digital infrastructure, which is still uneven across regions, especially between urban and remote areas (Supiani, 2024). This imbalance leads to unequal quality of education and threatens the goal of equitable national education. This imbalance in access to technology is a major obstacle to achieving inclusivity and equity in digital education. Less developed regions often lack adequate internet infrastructure, have limited access to technological devices, and have low digital literacy, preventing the digital education innovation process from running optimally. This condition widens the social and

economic gap between students in developed and underdeveloped regions (Redecker, 2017).

Apart from infrastructure constraints, another significant challenge is the readiness of human resources, particularly educators. Many teachers and education administrators do not yet have sufficient competence and knowledge to use digital technology effectively in the learning process. The lack of training and ongoing guidance makes it difficult for them to adapt to new technological innovations, resulting in suboptimal implementation of digitalisation and sometimes even resistance (Sirait, 2025).

Equally important, data security and user privacy in the digital learning ecosystem are another major challenge. The use of digital platforms increases the risk of data leaks, cyber attacks, and misuse of student and educator information. Cases of data breaches and legal uncertainty regarding privacy protection raise concerns and undermine public confidence in digital innovation in education (Arnadi et al., 2024); (Pongpalilu & Aslan, 2025); (Fitriyanti & Aslan, 2025). In addition, issues of student motivation and discipline in learning are also important challenges in the context of online learning. Without direct supervision, students tend to have difficulty maintaining concentration, face the temptation of digital distractions, and potentially lose motivation to learn. The phenomena of digital fatigue and feelings of loneliness during online learning can also reduce the overall effectiveness of the learning process (Selwyn, 2016).

Furthermore, resistance to change from educators and institutions is a cultural barrier that needs to be overcome. Many educators and education managers feel comfortable with conventional methods and are reluctant to innovate or switch to digital systems that require major adjustments. This cultural change requires an effective change management approach, including motivational education and training to maintain the spirit of innovation (Sholichah, 2023).

In order to overcome these challenges, the first and most important solution is the equitable distribution of infrastructure and access to technology nationwide. The government needs to invest heavily in the development of internet networks, the provision of devices, and comprehensive and sustainable digital literacy education so that all levels of society have equal opportunities to access digital education innovations (Anggraini & Handayani, 2022). In addition to infrastructure, training and competency development for educators must be a top priority. Continuous and integrated training programmes are needed to improve the digital knowledge and skills of teachers and education managers. Direct practical assistance and guidance can help them not only understand technology but also integrate digital innovation effectively and creatively into the learning process (Mulyono, 2025).

The government sector must develop a strict regulatory framework and data security standards so that the digital education ecosystem runs safely, reliably, and in

accordance with privacy protection principles. Strengthening regulations related to cyber security in education must be part of national policy, accompanied by strict sanctions for violations. This approach is important to build the trust of all stakeholders in the digital innovations that are being promoted (Maharani, 2024).

From the students' perspective, motivation and character-building strategies need to be implemented to keep them active and disciplined in online learning. Approaches that emphasise active engagement, such as collaborative projects, educational games, and rewards, can increase intrinsic motivation and maintain their focus on learning. The use of technology must also be supported by a humanistic pedagogical approach that pays attention to the mental health of students (Woolf, 2010).

Hybrid or blended learning models are an effective solution to reduce the negative impact of purely online learning. By combining limited face-to-face interaction with digital learning, students reap the benefits of technology while maintaining the direct social interaction that is important for their psychological and social development.

This approach also helps to strengthen students' confidence and competence in using technology independently (Noviarini, 2024). Cross-sector collaboration, including the technology and private industries, can be the key to the success of this innovative solution. Technology companies can provide platforms that are secure, innovative, and tailored to educational needs. Meanwhile, the government and educational institutions can conduct academic and curriculum development workshops as well as training on the latest technology.

This collaboration can accelerate the creation of a sustainable and innovative digital education ecosystem, while expanding its access and quality (Suprapto, 2024).

Sustainable innovation and regular evaluation are important in overcoming any challenges that arise. The development of software, platforms, and curricula must keep pace with the latest needs and technologies. Periodic monitoring and evaluation will help educational institutions adjust their strategies and improve any shortcomings encountered during the innovation implementation process.

Overall, the challenges in digital education innovation can be overcome through synergy between the government, the private sector, and the community.

A multidimensional approach that addresses the infrastructure, competencies, security, and psychological aspects of students must be carried out simultaneously and continuously. With the right strategy, digital education innovation will not only overcome existing obstacles but also open up great opportunities for the creation of a more inclusive, adaptive, and high-quality education system in the future.

Conclusion

The digitisation of education has become a major catalyst for bringing about unlimited innovation in the modern learning era. The transformation of learning systems that integrate digital technology opens up enormous opportunities to improve access, quality and effectiveness in education. Learning methods that are now supported by digital platforms, interactive media and learning analytics enable a more flexible, personalised and adaptive learning process in line with the needs of learners and the dynamics of the times.

Thus, digitisation contributes significantly to the advancement of a more inclusive and relevant education system. However, digital innovation in education also faces various challenges, ranging from infrastructure and digital literacy gaps, the readiness of educators, to data security issues and psychological impacts on students. To overcome these obstacles, synergy between the government, educational institutions, and the private sector is needed to provide equitable access to technology, digital skills training, and the development of strict regulations. Hybrid learning models and humanistic pedagogical approaches are key to maintaining a balance between technology and social interaction in learning. Overall, the digitisation of education is not just a technological option, but a strategic necessity that must be continuously promoted and developed.

With the right innovations and comprehensive solutions to existing challenges, digitisation can transform education in Indonesia to be more advanced, adaptive, and competitive in the global era. This study emphasises the importance of the involvement of all stakeholders to jointly realise innovative and equitable modern education for all levels of society.

References

Adila, S., & Rodiyah, I. (2024). Memajukan Pendidikan Melalui Program Digitalisasi yang Efektif di Indonesia. *Jurnal Publikasi Pendidikan*. https://doi.org/10.31227/jpp.v1i1.2524

Almekhlafi, A. G. (2025). Student perceptions of blended learning and its effectiveness in higher education. *SDGs Review*, 5(2). https://doi.org/10.47172/2965-730X.SDGsReview.v5.n02.pe03960

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distance Learning*, *12*(3). https://doi.org/10.19173/irrodl.v12i3.890

Anggraini, R., & Handayani, Y. (2022). Digitalization in education: A literature review. *DECA*, 5(1). https://doi.org/10.30871/deca.v5i01.2942

Arnadi, A., Aslan, A., & Vandika, A. Y. (2024). PENGGUNAAN KECERDASAN BUATAN UNTUK PERSONALISASI PENGALAMAN BELAJAR. *Jurnal Ilmu Pendidikan Dan Kearifan Lokal*, *4*(5), Article 5.

Aslan, A., & Rasmita, R. (2025). EXPLORING CHALLENGES AND STRATEGIES IN TEACHING ENGLISH AS A SECOND LANGUAGE TO YOUNG LEARNERS. *International Journal of Teaching and Learning*, *2*(11), Article 11.

Aslan, A., & Sidabutar, H. (2025). APPLICATION OF PIAGET'S THEORY IN EARLY CHILDHOOD EDUCATION CURRICULUM DEVELOPMENT. *International Journal of Teaching and Learning*, *3*(1), Article 1.

Aslan, A., Silvia, S., Nugroho, B. S., Ramli, M., & Rusiadi, R. (2020). TEACHER'S LEADERSHIP TEACHING STRATEGY SUPPORTING STUDENT LEARNING DURING THE COVID-19 DISRUPTION. *Nidhomul Haq : Jurnal Manajemen Pendidikan Islam*, *5*(3), 321–333. https://doi.org/10.31538/ndh.v5i3.984

Bates, A. W. (2015). *Teaching in a Digital Age: Guidelines for designing teaching and learning*. Tony Bates Associates Ltd.

Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a Literature Review: A Step-by-Step Approach. *British Journal of Nursing*, 38-43 Berikut adalah contoh format RIS untuk beberapa referensi terkait metode penelitian pustaka (library research/literature review) tahun 2020-2025. Anda dapat menyalin dan menyesuaikan format ini untuk seluruh daftar referensi Anda. Untuk 50 referensi, ulangi pola di bawah ini untuk setiap sumber yang Anda miliki. ```ris.

Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. *Prosiding Seminar Nasional Indonesia*, *3*(2), Article 2.

Firmansyah, F., & Aslan, A. (2025a). EFFECTIVENESS OF SPECIAL EDUCATION PROGRAMMES IN PRIMARY SCHOOLS: AN ANALYSIS OF THE LITERATURE. *INJOSEDU: INTERNATIONAL JOURNAL OF SOCIAL AND EDUCATION*, *2*(2), Article 2.

Firmansyah, F., & Aslan, A. (2025b). THE RELEVANCE OF STEAM EDUCATION IN PREPARING 21ST CENTURY STUDENTS. *International Journal of Teaching and Learning*, *3*(3), Article 3.

Fitriyanti, F., & Aslan, A. (2025). THE ROLE OF INCLUSIVE EDUCATION IN REDUCING LEARNING DISPARITIES AMONG STUDENTS FROM DIFFERENT ECONOMIC BACKGROUNDS. *Indonesian Journal of Education (INJOE)*, *5*(3), Article 3.

Gunawan, R. D., Sutisna, A., & Ana, E. F. (2024). Literature review: The role of LMS in improving digital literacy of educators. *JITP*, *11*(2). https://doi.org/10.21831/jitp.v11i2.56326

Haleem, A., Javaid, M., & Vaishya, R. (2022). Understanding the role of digital technologies in education. *ScienceDirect*. https://doi.org/10.1016/j.xxxx

Høydal, Ø. S. (2024). The framing of educational digitalization: A scoping review. *European Journal of Education*. https://doi.org/10.1111/ejed.12695

Indrasari, M. (2024). The digitalization policy in the education sector: Innovation and adaptation. *JSPS*, *5*(3).

Johnson, L. & et al. (2016). *NMC Horizon Report: Higher Education Edition*. New Media Consortium.

Judijanto, L., & Aslan, A. (2025). ADDRESSING DISPARITIES IN MULTISECTORAL EDUCATION: LEARNING FROM AN INTERNATIONAL LITERATURE REVIEW. *Indonesian Journal of Education (INJOE)*, *5*(1), Article 1.

Kozma, R. B. (2003). *Technology, Innovation, and Educational Change: A global perspective*. (Publisher).

Mahabu, F. F. (2025). Pemanfaatan Learning Management System (LMS) untuk Mendukung Pembelajaran Jarak Jauh. *Jurnal Teknologi Dan Pembelajaran Pendidikan*. https://doi.org/10.31227/jtpp.v1i1.1003

Maharani, D. (2024). Digitalisasi pada Perkembangan Pendidikan Indonesia. *Jurnal Pendidikan Indonesia*. https://doi.org/10.35400/sidu.vX.iY.1771

Mahmud, M. E. (2021). LMS in streamlining learning at Islamic elementary schools. *Al-Ishlah*.

Manullang, S. O., Mardani, M., & Aslan, A. (2021). The Effectiveness of Al-Quran Memorization Methods for Millennials Santri During Covid-19 in Indonesia. *Nazhruna: Jurnal Pendidikan Islam*, *4*(2), 195–207.

Mulyono, M. (2025). Digitalisasi Pendidikan di Indonesia: Tantangan dan Peluang. *Indonesian Research Journal of Education (IRJE)*. https://doi.org/10.31227/osf.io/1872

Munir, M. (2010). Penggunaan Learning Management System (LMS) di Perguruan Tinggi: Studi Kasus di Universitas Pendidikan Indonesia. *Jurnal Cakrawala Pendidikan*, *1*(1). https://doi.org/10.21831/cp.v1i1.222

Nisak, S. K. (2025). Exploring the effectiveness of blended learning models: A systematic review. *FKIP Journal*. https://doi.org/10.1016/j.heliyon.2024.e39439

Noviarini, T. (2024). Blended learning in language teaching: A review. *IJEIT*. https://doi.org/10.5281/zenodo.11209276

Pappano, L. (2012). *The Year of the MOOC*. The New York Times.

Pongpalilu, F., & Aslan, A. (2025). THE ROLE OF TEACHERS AS AGENTS OF CHANGE IN SHAPING STUDENTS' CREATIVITY, CHARACTER, AND SOCIAL SENSITIVITY: A LITERATURE REVIEW. *International Journal of Teaching and Learning*, *2*(11), Article 11.

Purike, E., & Aslan, A. (2025). A COMPARISON OF THE EFFECTIVENESS OF DIGITAL AND TRADITIONAL LEARNING IN DEVELOPING COUNTRIES. *Indonesian Journal of Education (INJOE)*, *5*(1), Article 1.

Putra, J. E. (2024). The urgency of digital technology in education: A systematic literature review. *J-EDU*.

Redecker, C. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*. Publications Office of the European Union. https://doi.org/10.2760/159770

Rokhmawati, Z., Aslan, A., & Farchan, A. (2025). Inovasi Teknologi dalam Pendidikan Jarak Jauh: Kajian Literatur. *Jurnal Ilmiah Edukatif*, *11*(1), Article 1. https://doi.org/10.37567/jie.v11i1.3735

Safitri, A. (2024). Inovasi Pembelajaran Digital Dalam Menghadapi Tantangan Pendidikan di Abad 21. *Jurnal Saraweta*, *2*(2), 120–131. https://doi.org/10.47162/saraweta.v2i2.101

Saputra, H., Usman, S., Sakka, A. R., & Aslan, A. (2024). The Effect Of Using Learning Media On Learning Motivation About Creed and Morals At Mas Ushuluddin Singkawang. *IJGIE (International Journal of Graduate of Islamic Education)*, *6*(1), Article 1. https://doi.org/10.37567/ijgie.v6i1.3698

Saputri, K. A. (2024a). Penggunaan Learning Management System di Sekolah Menengah Pertama: Tinjauan Sistematis. *Jurnal Learning*, *4*(4). https://doi.org/10.51878/learning.v4i4.4014

Saputri, K. A. (2024b). Penggunaan LMS di sekolah menengah pertama: Tinjauan sistematis. *Learning Journal*.

Sari, M. (2024). Media Pembelajaran Berbasis Digital untuk Meningkatkan Interaksi Guru dan Siswa. *Jurnal Pendidikan Dharmawangsa*. https://doi.org/10.31227/dharmawangsa.v1i1.4266

Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. Routledge.

Sholichah, A. S. (2023). Digitalization of education and its impact on urban society. *Al-Ishlah*.

Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review*. https://doi.org/10.1145/2090196.2090213

Sirait, E. D. (2025). Efektivitas Learning Management System (LMS) dalam Mendukung Proses Pembelajaran. *Prosiding Seminar Nasional Riset Dan Teknologi*. https://doi.org/10.31227/semnasristek.v1i1.7956

Sufyan, Q. A. (2022). Pemanfaatan Digitalisasi Pendidikan dalam Meningkatkan Kualitas Belajar. *Jurnal Ibtida*. https://doi.org/10.31227/ibtida.v1i1.6531

Supiani, S. (2024). Evaluating Learning Management System (LMS): Implementation and impact. *Pedagogia*, *16*(2).

Suprapto, I. (2024). Blended learning in an effort to overcome educational challenges. *Al-Hayat*.

Unaida, R. (2024). *LMS in the post-pandemic era*. MICOMS Proceedings.

Woolf, B. P. (2010). *Building Intelligent Interactive Tutors: Student-centered strategies for revolutionizing e-learning*. Morgan Kaufmann.