Transforming Education in The Digital Age : How Technology Affects Teaching and Learning Methods

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DOI: https://doi.org/10.62872/s13px737

Abstract

The development of digital technology has brought significant changes to education, affecting teaching and learning methods. This article examines the impact of technology on education, especially in supporting more interactive, flexible and personalized learning. Various digital tools and platforms, such as online learning applications, educational software, as well as augmented reality and virtual reality technologies, enable more engaging and efficient learning experiences for learners. This research uses the literature study method to investigate scientific journal articles that discuss the transformation of learning in the digital era with the use of technology in modern education. The articles were selected based on criteria such as topic relevance, quality of research methodology and theoretical contribution. Searches were conducted in reputable academic databases such as Google Scholar and Sinta (Science and Technology Index) with the keywords "digital education transformation," "technology in education," and "educational innovation". Once relevant articles were identified, a selection was made to ensure quality standards and significant contributions to the literature. An in-depth analysis was conducted to identify the main themes, methodological approaches, and findings of each study. The results of the analysis are expected to provide insights into recent developments in the use of technology in education and help identify future trends, challenges and opportunities. The findings are expected to provide a basis for the development of more effective education policies and practices in the evolving digital age.

Keywords: Change, Digital Age, Digital Transformation, Technology

Introduction

Advances in digital technology have had a profound impact on various aspects of life, including education (Kampfen, 2018). Digital transformation in education offers significant opportunities and challenges that affect teaching and learning methods across the board (Alenezi, 2023). The presence of various digital tools, such as learning software, interactive applications and online-based education platforms, has led to substantial changes in traditional teaching methods (Reid, 2019). Digital technologies enable personalization of learning, expand

accessibility to educational resources, and increase student engagement through more engaging and interactive media (Gan, 2015). These changes not only alter the way teachers deliver material but also the way students interact with learning content (Harris, 2019). Challenges include the digital divide, the need for teacher training in the use of technology, and issues of privacy and data security (Hoyos, 2023). Understanding the impact of technology on teaching and learning methods is crucial, as are the strategies that can be adopted to optimally utilize technology in education (Straub, 2019). This review aims to provide a comprehensive understanding of the impact of technology on education and ways to optimize its use to improve learning outcomes. (Friedman, 2023). This transformation presents both opportunities and challenges, profoundly changing the educational landscape (Wilson, 2020). Technology enables personalized learning experiences according to students' individual needs (Schmid, 2019). Adaptive learning software uses data analysis to adjust content and pace, ensuring that each student receives instruction appropriate to their level of understanding (Krumn, 2022). Technology provides unprecedented access to educational resources. Online libraries, educational websites and digital textbooks allow students to access a wide array of information anytime and anywhere, bridging the education gap and offering equal learning opportunities. The rapid development of technology has brought significant impacts in various aspects of human life, including in the field of education (Keshav, 2022). Language education has not escaped the influence of transformations produced by technological advances (Rohayati, 2022). The role of technology in educational change in the digital era must be critically analyzed, taking into account the achievements that have been made, the problems faced, and the goals to be achieved through the integration of technology in the learning process (Kivunja, 2024).

Assessing technology's impact on teaching methods, learning materials, and educator-student interactions is essential. Technology has enhanced teaching with tools like interactive whiteboards and virtual reality, making lessons more engaging (Emron, 2020). Digital resources such as e-books and apps offer immediate access to diverse materials, supporting active learning. Online forums and video conferencing facilitate continuous communication and collaboration. Understanding these changes helps optimize technology use and address challenges to improve educational outcomes (Ertmer, 2022). Technology can offer various benefits such as wider access to educational resources and increased digital interaction, challenges such as technology access gaps, quality of digital content, and impact on face-to-face communication skills also need to be considered (Sych, 2021). This research will comprehensively discuss these various aspects, focusing on the achievements made, obstacles faced, and strategic goals to be achieved through the application of technology in education (Schneider, 2017). Interactive learning tools such as educational games, simulations and virtual labs make learning more engaging and effective.(Potkonjak, 2019). These tools encourage active participation, critical thinking, and problem-solving skills, shifting the focus from traditional memorization (Williams, 2022). Technology also facilitates collaboration and communication between students and teachers (Hughes, 2019). Online discussion forums, collaborative documents, and virtual classrooms allow students to work together on projects and assignments, regardless of their physical location, creating a more inclusive and interactive learning environment (Bower, 2020). Blended learning combines traditional face-to-face instruction with online learning activities, providing greater flexibility in teaching methods and learning schedules (Singh, 2021). Teachers can use online platforms to assign tasks, provide feedback, and track student progress, while face-to-face sessions can focus on practical activities and personalized support (Wang, 2020).

Recent years have witnessed rapid transformations in various aspects of life, including in the field of education (Frenk, 2020). The integration of advanced technologies has significantly changed educational practices, affecting teaching methods, teaching materials and interactions between educators and students. This shift towards the use of digital tools and resources has revolutionized the learning environment, offering new opportunities and challenges to improve educational experiences and outcomes (Dwivedi et al., 2020; Putra et al.,

2020). Technological developments have transcended the boundaries of time and space, dramatically changing the educational landscape (Zadorozhna, 2020). The Internet as the main information channel has redefined the traditional classroom model, but not without challenges and criticisms (Jimoyiannis, 2023). Distance learning and e-learning provide unprecedented flexibility and accessibility, there are also concerns regarding the quality of student interaction and engagement (Mapuva, 2019). Technology enables widespread access to information, but does not always guarantee that it is accurate or of high quality (Bandyopadhyay, 2021). Reliance on digital devices can also create a digital divide, where students from low socio-economic backgrounds may not have adequate access to devices or stable internet (Van De Werfhorst, 2022). The presence of technology in education may reduce the role of face-to-face interactions that are essential for the development of students' social and emotional skills (Zhan, 2023). Innovations in teaching methods and global collaboration between educational institutions offer great potential to improve the overall quality of education (Hayadi, 2024). Successful implementation of technology in education requires a planned and sustainable approach, as well as attention to ethical and privacy issues (Annan-Diab, 2020). While technology offers tremendous opportunities for educational transformation, it also requires careful balance and oversight to ensure that its benefits are equitably and responsibly realized (Jongbloed, 2021).

Education in the digital era is undergoing significant changes driven by rapid technological advances (Manan, 2023). This transformation covers various aspects, from teaching methods to the way students learn and interact with learning materials (Mahmudah, 2023). Technology not only expands access to information and educational resources, but also enables more innovative and interactive approaches to teaching (Urazova, 2020). The use of digital tools such as e-learning platforms, educational software, and multimedia has changed the traditional education paradigm (Canton, 2024). Technology enables learning that is more personalized and tailored to the needs of each student. The transformation of education in the digital era demands an active role from educators to adapt their teaching methods. Teachers and lecturers must master new technologies and understand how best to integrate them into the curriculum (Demmanggasa, 2023). This requires adequate training and support so that they can effectively utilize technology to improve the quality of learning. Digital transformation in education also presents challenges. The digital divide, data security concerns and the need to ensure that technology is used ethically and responsibly are some of the issues that must be addressed (Alberechtsen, 2019). A balanced and planned approach is essential to optimize the benefits of technology while minimizing the risks involved.

The role of technology in education has undergone a profound transformation, changing teaching and learning in unprecedented ways. With the use of tools such as video-based learning, simulations, and interactive applications, the learning experience has become more holistic and contextualized. Technology allows students to engage with subject matter in a more immersive way, giving them the opportunity to understand abstract concepts through visualization and hands-on interaction (Hew, 2023). Technology also facilitates more effective global collaboration. Online platforms allow students and teachers from different parts of the world to connect and collaborate on educational projects, broadening their horizons and encouraging a wider exchange of ideas.Technology offers significant flexibility in education, enabling learning tailored to individual needs (Maolana, 2023). Adaptive learning platforms in place, students can receive material tailored to their ability levels, increasing the efficiency and effectiveness of the learning process. Blended learning methods, which combine face-to-face instruction with online resources, provide a more flexible and adaptable alternative to various learning styles, increasing accessibility and inclusion in education. In addition to the direct benefits for students, technology also plays an important role in teacher professional development (Carillo, 2019). Online courses, webinars and digital resources offer opportunities for educators to update their skills and explore the latest teaching methods. This continuous

learning is important to ensure that teachers can utilize technology effectively in their practice, providing relevant and modern learning to their students (Chiu, 2016).

The lingering digital divide can create inequities in technology access, especially in underserved areas. Cybersecurity and data protection issues are also a major concern, requiring strict policies and practices to protect students' personal information (Nasukah, 2020).Realizing the full potential of technology in education requires a strategic approach involving all stakeholders, including governments, educational institutions and the technology community (Utomo, 2023). Collective efforts are needed to overcome these challenges and ensure that every student and teacher can utilize the benefits of technology. Planning and effective collaboration, technology has the potential to revolutionize education, making it more inclusive, engaging and effective (Leidner, 2023). Embracing these opportunities and addressing the challenges will pave the way for a more dynamic and adaptive educational environment in the digital age, preparing students to face future challenges with relevant skills and knowledge (Muthiarani, 2021).

Methods

This research uses a literature study method to investigate scholarly journal articles that address the transformation of learning in the digital age with the use of technology in modern education. The articles were selected based on several criteria, including the relevance of the topic to the research focus, the quality of the research methodology used, and the resulting theoretical contribution to the understanding of technology integration in educational contexts. The method involved searching for articles in reputable academic databases such as Google Scholar and Sinta (Science and Technology Index) using keywords such as "digital education transformation," "technology in education," and "educational innovation." Once relevant articles were identified, a selection process was conducted to ensure each article met high quality standards and made a significant contribution to the existing literature. The articles were then analyzed in depth to identify key themes, methodological approaches used, and findings or conclusions derived from each study. The purpose of this literature analysis is to build a solid theoretical framework on how technology affects the way teaching and learning is conducted in a modern educational environment. The findings of this literature review are expected to provide a deep insight into the latest developments in the use of technology in education, as well as help identify trends, challenges and opportunities relevant to education in the future. The results of this research are also expected to provide a solid foundation for the development of more effective educational policies and practices in the ever-evolving digital age.

Result And Discussion

Technology has changed the education paradigm in profound ways, significantly affecting teaching and learning methods. This transformation involves various aspects, ranging from increased access to changes in the way students and learning materials interact. Here are some important dimensions of the impact of technology in education:

A. Level of Technology Adoption in Learning

Technology adoption in the context of education is a complex process, influenced by various key factors that play an important role in its success, as outlined by Firmansyah (2022). Everett Rogers' Diffusion of Innovations model provides a basis for understanding how innovations, including educational technology, are received in educational settings (Adventy, 2023). The relative advantage of technology compared to conventional methods is one of the main factors (Pangondian, 2019). Technologies that can improve the efficiency, effectiveness or quality of learning are generally accepted more quickly. The suitability of the technology to the curriculum or the specific needs of the educational institution also influences its adoption rate (Fidesrinur, 2022). Technology complexity is a significant aspect; the more complicated the technology, the slower the adoption process, as users tend to look for simpler and easier-to-implement solutions. The availability of resources also affects; educational institutions with

adequate financial support and infrastructure are more likely to adopt educational technology (Maolana, 2023).

Effective communication of the benefits of technology and successful experiences from peers or similar institutions can accelerate the adoption process (Wilson, 2020). Technical support and training for teachers and education staff is crucial; without adequate support, they may be reluctant to use new technologies in learning practices (Amelia, 2023). Considering these factors holistically allows educational institutions to develop more targeted strategies for technology integration in learning (Rohmah, 2023). Challenges such as financial limitations, infrastructure and social impacts must be addressed with a critical approach. Variations in the level of technology adoption in different educational institutions indicate differences in enthusiasm and constraints to technology integration. Cultural, regulatory and leadership factors also influence technology acceptance and implementation (Nugroho, 2023). Technology can enrich the learning experience, but it is important to consider the social, health and privacy impacts that may arise, and ensure adoption is judicious to maximize its benefits for future education. Individual attitudes towards technology, which are influenced by cultural background, personal experience and evaluation of benefits and risks, also affect adoption rates (Miagusttin, 2019). Comprehensive digital education and literacy are important to improve understanding of the benefits and risks of technology, so that technology can be applied effectively without compromising essential values and balance in human life (Yulianti, 2024).

B. Dynamic Teaching Methods and Gamification as a Tool to Increase Student Engagement

Technology has opened up opportunities for more dynamic teaching methods through the use of multimedia and interactive tools (Melati, 2023). The use of videos, animations, and simulations not only presents concepts in a more visual and engaging way, but also gives students the opportunity to experience practical learning that is often difficult to achieve with conventional methods (Agustin, 2024). Virtual laboratory simulations allow students to conduct scientific experiments safely and effectively, overcoming the physical limitations and risks associated with experiments in real laboratories (Muthiarani, 2021). The adoption of this technology requires critical evaluation regarding its effectiveness in achieving learning objectives and potential dependency on digital devices. Gamification, the application of game elements in an educational context, is a significant technological innovation in modifying teaching methods (Carillo, 2019). Elements such as points, levels and badges are designed to increase student motivation by making the learning process more interactive and competitive. Gamification technology offers an attractive approach to increase student engagement and improve learning outcomes (Rohmah, 2023).. However, it is important to critically analyze the long-term impact of gamification on students' intrinsic motivation and the potential shift in focus from substantial learning to achieving game elements. A careful evaluation of the success of gamification in an educational context should consider the balance between the entertainment aspects and the achievement of academic goals.

C. The Impact of Technology on Learning Outcomes

Technology has become an integral part of modern education, influencing various aspects of learning. Its use not only expands access to information sources, but also changes the way students learn and teachers teach. According to Yusuf Tri Herlambang in his book "Pedagogic Critical Studies of Education in Multiperspectives" (2018), technology integration in the context of education has great potential to improve the quality of learning and student academic outcomes, but its use must be wise and aligned with solid pedagogical principles. The positive impact of technology on student learning outcomes can be seen from several perspectives. Technology provides easy and quick access to various sources of knowledge and learning materials. It allows students to access up-to-date information, explore complex concepts, and improve their understanding of the material studied. Herlambang asserts that

technology enriches students' learning experience by providing wider access to knowledge (Cartono, 2022). Technology supports more interactive and engaging learning. By using multimedia, interactive learning applications and simulations, students can be actively involved in the learning process. This not only increases their motivation to learn, but also deepens their understanding of the concepts taught. The integration of technology in education is done by considering the compatibility with appropriate teaching methods, thus creating a learning environment that triggers students' interest and participation. Technology should not be considered as the main solution without considering other factors that affect student learning outcomes (Chiu, 2016). The quality of learning materials, the ability of teachers to deliver materials, and the availability of resources still play an important role in educational success. As stated by Herlambang, technology must be integrated wisely and balanced with a solid pedagogical approach to maximize its potential in supporting the achievement of better educational goals for students.

Technology has made its way into education with a significant impact on student learning outcomes, as revealed in a study published in the journal "Educational Technology Research and Development" (2020). The use of technology in online learning, particularly in subjects such as science and math, has been shown to improve academic achievement. However, the impact of technology on learning is not only positive but also poses challenges that need to be taken seriously. On the positive side, technology provides wide access to information and learning resources. The internet and online education platforms such as Wikipedia and Google Scholar allow students to access learning materials easily, which expands their knowledge. In addition, the use of multimedia, simulations and interactive learning applications make learning more interesting and help students understand complex concepts.

The platform also supports personalized learning with intelligent algorithms that tailor materials to each student's ability level, and facilitates collaboration between students and teachers. Negative impacts to watch out for. Uncontrolled use of technology can lead to distraction from academic tasks, especially through social media and entertainment apps (Vempati, 2023). In addition, over-reliance on technology for information can reduce students' ability to think critically and solve problems independently. Not all students have equal access to technology, which can exacerbate the gap in learning outcomes. Furthermore, excessive use of electronic devices can also negatively affect students' physical and mental health, such as eyestrain and sleep disorders. In addition to these challenges, data security and privacy are also serious concerns in the use of technology in education. Improper management of students' personal data can present serious risks of privacy violations (Kolevski, 2021). Therefore, while technology offers great potential to enhance learning, its use should be wisely regulated and equipped with adequate safeguards against the risks and challenges that may arise.

D. Integration of technology in modern Education

Ease of access to various learning resources, students can independently explore academic concepts and build deeper understanding. Technology supports more relevant and contextualized learning for students. The use of e-learning platforms allows teachers to structure learning materials and conduct assessments more efficiently. Research conducted by Tsai et al. (2020) added that the application of augmented reality (AR) technology in education can improve students' concept understanding and critical thinking skills. The application of 3D object visualization and interactive simulations, students can internalize learning materials more concretely and relate them to real-life situations (Cheng, 2021). In this context, Dunleavy and Dede (2014) suggested that virtual reality (VR) technology provides an immersive and engaging learning experience. Through the use of VR, students can experience situations or environments that are difficult to physically replicate in the classroom, which in turn can improve their understanding of the material being studied. The use of technology in education needs to be supported by a mature strategy and thoughtful approach (Leidner, 2023). Technology can serve as an effective tool in creating an optimal learning environment for

students (Hirumi, 2022). Approaches that can have great potential to enrich learning experiences, prepare students for future challenges, and improve the overall quality of education.

The utilization of digital technology in education, often referred to as Technology Enhanced Learning (TEL) or e-Learning, has brought a significant impact on the learning process. Yusuf Tri Herlambang (2021) explains that educators can design more engaging learning experiences by utilizing digital technology. This includes a combination of face-to-face and online learning, which allows students to actively engage in self-exploration of learning resources and build a deeper understanding of concepts. The move towards digital learning is a dominant trend in education, driven by advances in information and communication technology (Chomal, 2023). This transformation presents not only challenges but also opportunities for educational institutions, students and educators. The emergence of Society 5.0 suggests that education is also evolving along with the increased use of information technology (Gupta, 2024). The development of science and technology has significantly changed human civilization (Maddikunta, 2022). From primitive times to the modern era, humans continue to develop science to fulfill various needs of life, from simple tools to technology that is now inseparable from every aspect of life such as economics, social, and education (Nurcahyo, 2024). Innovations in science and technology not only facilitate human work but also produce significant developments in daily life (Herlambang, 2021). The integration of technology in education is not just a tool, but an effort to enrich students' learning experiences and prepare them for future challenges (Jenita, 2023). Digital learning has become an important aspect in the modern educational context, where the use of digital technology is used innovatively during the teaching and learning process (Permana, 2024).

This approach is often referred to as Technology Enhanced Learning (TEL) or e-Learning (Fauziah, 2020). The utilization of digital technology provides an opportunity for educators to design more engaging and effective learning experiences (Said, 2023). This approach not only involves a combination of face-to-face meetings and fully online learning, but also emphasizes the importance of technology integration in the entire learning process (Rizki, 2024). Technology infrastructure is crucial for educational institutions to ensure the availability of stable internet access, adequate hardware, and necessary software (Muttaqien, 2023). Accessibility to technology and digital learning resources must be ensured equally for all students, taking into account specific needs and subsidizing where necessary (Alifian, 2023). The development of quality digital content is also a key focus, as this supports the effectiveness of digital learning (Utomo, 2023). Good content curation ensures that educational institutions have adequate access to relevant and diverse learning resources. Adequate training for educators in the use of technology and effective learning strategies is also crucial, so that they can optimize the use of digital tools and platforms (Melati, 2024). Interaction and collaboration between students and teachers remain important aspects of digital learning (Fatmawati, 2019). The platforms and tools used should be designed to support productive social and collaborative interactions, without neglecting the essential values of face-to-face interaction (Anderson, 2020). Effective evaluation of student progress in digital learning should also be implemented, along with ongoing monitoring of student engagement and the quality of learning delivered (Henrie, 2021). Data security and privacy are also major concerns, where appropriate security measures should be implemented to protect student and educational staff data (Yandra, 2024).

Educational institutions need to consider parental inclusion and involvement in the digital learning process (Fadilah, 2024). Support provided to parents in understanding and supporting their children's learning process at home can improve the overall effectiveness of learning (Kamila, 2021). Flexibility and adaptability are important aspects in dealing with technological change and evolving learning needs (Woznicki, 2020). Educational institutions need to be ready to adapt to such changes, while ensuring a learning approach that remains inclusive and equitable for all students (Arnaiz Sánchez, 2019). Equality and equity must always be maintained in the context of digital learning. It is important to ensure that digital

technologies do not increase disparities in educational access and outcomes, but rather create equitable and inclusive learning environments for all students (Gottschalk, 2023). Educational institutions can take appropriate steps to optimize the potential of digital learning, thereby improving the quality of education and preparing students to face the challenges of an increasingly digitally connected world (Sarker, 2019).

E. Challenges in Technology Integration

Technology integration in education faces several significant challenges that need to be addressed (Hew, 2023). Effective staff training is one of the main issues, as lack of training can hinder the acceptance of new technologies and increase resistance among educators (Ningsih, 2024). Compliance with ever-changing regulations adds to the complexity, forcing educational institutions to commit more deeply to meeting applicable standards. Change management is key in facing this challenge (Wartono, 2024). The transformation process often requires a deep overhaul of existing procedures, which requires meticulous planning, efficient coordination and continuous monitoring (But, 2020). System compatibility issues can also hinder progress, especially when new technologies must be integrated with outdated or incompatible legacy systems (Rinta-Kahila, 2023). External pressures from industry competition and market changes also force organizations to constantly adapt and innovate, often outpacing existing internal readiness. A strategic and holistic approach is needed to address these challenges (Nasukah, 2020). Careful planning, proper investment in infrastructure and training, and effective implementation of policies to manage risk and change are key to successful technology integration (Zahir Irani, 2020). The research reveals that, while technology has great potential to improve education, challenges such as the digital divide, information consistency and the decline of face-to-face interactions must be addressed with a proactive and balanced approach (Ferri, 2020). A careful and critical balance is needed for technology to improve education without compromising the quality and well-being of students.

Conclusion

The digital era has fundamentally transformed the nature of education, shifting it from a static, teacher-centered model to a more dynamic and interactive approach. This evolution is driven by the integration of advanced technology, which has reshaped learning environments and methods. The adoption and effective use of technology in education are influenced by various factors, including its perceived advantages, the availability of resources, and the attitudes of educators and learners towards technological innovations. Technology offers substantial benefits, such as improved learning outcomes, enhanced access to information, and the facilitation of interactive and collaborative learning experiences. These advancements enable personalized learning, foster student engagement through multimedia resources, and support collaborative efforts that bridge geographical distances. Such features contribute to a more engaging and effective educational experience that meets the needs of the modern world. Despite these advantages, several challenges accompany the integration of technology in education. The digital divide highlights disparities in access to technology and internet connectivity, affecting different socio-economic groups. Additionally, there is a need for improved technological literacy among both educators and students, alongside infrastructural challenges related to the deployment and maintenance of digital tools. Addressing these issues requires a comprehensive approach. Educational institutions have a crucial role in overcoming these challenges. Investing in technology infrastructure is essential to ensure equitable access for all students and teachers. Moreover, comprehensive training programs for educators are necessary to develop their skills in integrating technology effectively into their teaching practices. Forming strong partnerships with government agencies, industry leaders, and technology providers can also facilitate resource acquisition, support, and innovation. Curricula and teaching methods must be adjusted to optimize the use of technology while adhering to sound pedagogical principles. This includes designing learning experiences that effectively

incorporate technological tools and ensuring they enhance, rather than undermine, educational objectives. Addressing the digital divide and promoting digital literacy are vital for creating an equitable learning environment. Additionally, managing data security and privacy concerns is crucial for maintaining trust and protecting sensitive information. Continuous evaluation and monitoring of technology integration are necessary to gauge its effectiveness and alignment with educational goals. Regular assessments of technological tools and strategies allow for informed decision-making and adjustments to improve educational outcomes. By focusing on strategic investments, fostering partnerships, and adapting curricula, educational institutions can fully harness the potential of technology to enrich learning experiences and outcomes. This proactive approach ensures that education continues to evolve and benefit future generations in the digital age.

References

Adventy, M. I. Y., Permatasari, I., Nengyanti, N., & Rafinzar, R. (2023). Inovasi Model Kebijakan dalam Meningkatkan Kualitas Layanan Kemahasiswaan: Suatu Tinjauan Literatur. *PESIRAH: Jurnal Administrasi Publik*, *4*(2). https://doi.org/10.25077/jakp.5.1.86-113.2020

Agustin, M. R., Mulyatno, C. B., & Antony, R. (2024). Pengalaman Guru Dalam Memaknai Kerjasama Kreatif Menyelenggarakan Pembelajaran Berbasis Digital. *Nusantara: Jurnal Ilmu Pengetahuan Sosial*, *11*(4), 1435-1445. https://doi.org/10.31604/jips.v5i1.2018.20-23

Albrechtsen, E., & Hovden, J. (2009). The information security digital divide between information security managers and users. Computers & Security, 28(6), 476–490. https://doi.org/10.1016/j.cose.2009.01.003

Alenezi, M., Wardat, S., & Akour, M. (2023). The Need of Integrating Digital Education in Higher Education: Challenges and Opportunities. Sustainability, 15(6), 4782. https://doi.org/10.3390/su15064782

Alifian, M. A., Zahro, A., & Widyartono, D. (2023). Teknologi Asistif Sebagai Media Pembelajaran Bahasa Indonesia Siswa Berkebutuhan Khusus. Hasta Wiyata, 6(2), 123–140. https://doi.org/10.21776/ub.hastawiyata.2023.006.02.02

Anderson, T., & Kanuka, H. (2006). On-Line Forums[1]: New Platforms for Professional Development and Group Collaboration. *Journal of Computer-Mediated Communication*, 3(3), 0–0. https://doi.org/10.1111/j.1083-6101.1997.tb00078.x

Annan-Diab, F., & Molinari, C. (2017). Interdisciplinarity: Practical approach to advancing education for sustainability and for the Sustainable Development Goals. *The International Journal of Management Education,* 15(2), 73–83. https://doi.org/10.1016/j.ijme.2017.03.006

Armawan, I. (2021). Strategi Komunikasi Pembangunan Masyarakat . *Da'watuna: Journal of Communication and Islamic Broadcasting*, 1(2), 84–95. https://doi.org/10.47467/dawatuna.v1i2.498

Arnaiz Sánchez, P., De Haro-Rodríguez, R., & Maldonado Martínez, R. M. (2019). Barriers to Student Learning and Participation in an Inclusive School as Perceived by Future Education Professionals. *Journal of New Approaches in Educational Research*, 8(1), 18–24. https://doi.org/10.7821/naer.2019.1.321

Bandyopadhyay, D., & Sen, J. (2011). Internet of Things: Applications and Challenges in Technology and Standardization. Wireless Personal Communications, 58(1), 49–69. https://doi.org/10.1007/s11277-011-0288-5.

Bower, M., Lee, M. J. W., & Dalgarno, B. (2016). Collaborative learning across physical and virtual worlds: Factors supporting and constraining learners in a blended reality environment. *British Journal of Educational Technology,* 48(2), 407–430. Portico. https://doi.org/10.1111/bjet.12435.

Butt, J. (2020). A Conceptual Framework to Support Digital Transformation in Manufacturing

Using an Integrated Business Process Management Approach. Designs, 4(3), 17. https://doi.org/10.3390/designs4030017

Cantoni, V., Cellario, M., & Porta, M. (2004). Perspectives and challenges in e-learning: towards natural interaction paradigms. *Journal of Visual Languages & Computing*, 15(5), 333–345. https://doi.org/10.1016/j.jvlc.2003.10.002

Carrillo, D. L., García, A. C., Laguna, T. R., Magán, G. R., & Moreno, J. A. L. (2019). Using Gamification in a Teaching Innovation Project at the University of Alcalá: A New Approach to Experimental Science Practices. *Electronic Journal of E-Learning*, 17(2). https://doi.org/10.34190/jel.17.2.03

Cartono, C. (2022). The Importance Of Technology Integration In Biology Learning In The Digital Era. *Infokum: Computer and Communication*, *10*(5). https://doi.org/10.5958/2456-9399.2021.00016.x

Cheng, Y., & Wang, S.-H. (2011). Applying a 3D virtual learning environment to facilitate student's application ability – The case of marketing. *Computers in Human Behavior*, 27(1), 576–584. https://doi.org/10.1016/j.chb.2010.10.008

Chiu, M.-H., Lin, J.-W., Yen, M.-H., Liang, J., & Guo, C.-J. (2016). Examining the Factors That Influence Students' Science Learning Processes and Their Learning Outcomes: 30 Years of Conceptual Change Research. *EURASIA Journal of Mathematics*, Science and Technology Education, 12(9). https://doi.org/10.12973/eurasia.2016.000600a

Chomal, V. S., & Saini, J. R. (2013). A study and analysis of paradigm shifts in education triggered by technology. *International Journal of Research in Economics and Social Sciences*, *3*(1), 14-28. https://doi.org/10.1109/iitc.2013.6615548

Demmanggasa, Y., Sabilaturrizqi, M., Kasnawati, K., Mardikawati, B., Ramli, A., & Arifin, N. Y. (2023). Digitalisasi pendidikan: akselerasi literasi digital pelajar melalui eksplorasi teknologi pendidikan. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 4(5), 11158-11167. https://doi.org/10.56114/maslahah.v4i1.533

Dewi, A. C., Maulana, A. A., Nururrahmah, A., Ahmad, A., & Naufal, A. M. F. (2023). Peran Kemajuan Teknologi dalam Dunia Pendidikan. *Journal on Education*, *6*(1), 9725-9734. https://doi.org/10.31237/osf.io/e2cfn

Dolmans, D. H. J. M., De Grave, W., Wolfhagen, I. H. A. P., & van der Vleuten, C. P. M. (2005). Problem-based learning: future challenges for educational practice and research. Medical Education, 39(7), 732–741. https://doi.org/10.1111/j.1365-2929.2005.02205.x

Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N. P., Sharma, S. K., & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *International Journal of Information Management*, 55, 102211. https://doi.org/10.1016/j.ijinfomgt.2020.102211.

Emron, S., & Dhindsa, H. S. (2010). Integration of interactive whiteboard technology to improve secondary science teaching and learning. *International Journal for Research in Education*, *28*, 1-24. https://doi.org/10.4324/9780203769195-3

Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. Computers & Education, 59(2), 423–435. https://doi.org/10.1016/j.compedu.2012.02.001.

Fadilah, A. D., Adinda, N. T., & Rahman, I. F. (2024). Mewujudkan Pendidikan Inklusif Dan Berkelanjutan Dengan Literasi Digital: Peran Teknologi Di Era Sdgs 2030. *Merdeka: Jurnal Ilmiah Multidisiplin*, *1*(5), 106-121. https://doi.org/10.59024/jipa.v2i3.752

Fatmawati, Z., & Wathon, A. (2019). Pengembangan Alat Permainan Edukatif Melalui Klasifikasi Media Pembelajaran. *Sistim Informasi Manajemen*, *2*(1), 188-214. https://doi.org/10.30596/jmes.v4i2.16151

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. Societies, 10(4), 86. https://doi.org/10.3390/soc10040086

Fidesrinur, F., Shah, A. H., & Amelia, Z. (2022). Peran Dosen Pembimbing Lapangan dalam Meningkatkan Efektifitas Program Kampus Mengajar. *Jurnal Al-Azhar Indonesia Seri Humaniora,* 7(2), 73. https://doi.org/10.36722/sh.v7i2.1133

Firmansyah, D., & Dede. (2022). Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian: Literature Review. Jurnal Ilmiah Pendidikan Holistik (JIPH), 1(2), 85–114. Hps://doi.org/10.55927/jiph.v1i2.937

Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Fineberg, H., Garcia, P., Ke, Y., Kelley, P., Kistnasamy, B., Meleis, A., Naylor, D., Pablos-Mendez, A., Reddy, S., Scrimshaw, S., Sepulveda, J., Serwadda, D., & Zurayk, H. (2010). Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. The Lancet, 376(9756), 1923–1958. https://doi.org/10.1016/s0140-6736(10)61854-5

Friedman, R. S., & Deek, F. P. (2023). Innovation and education in the digital age: reconciling the roles of pedagogy, technology, and the business of learning. IEEE Transactions on Engineering Management, 50(4), 403–412. https://doi.org/10.1109/tem.2003.819650.

Gan, B., Menkhoff, T., & Smith, R. (2015). Enhancing students' learning process through interactive digital media: New opportunities for collaborative learning. Computers in Human Behavior, 51, 652–663. https://doi.org/10.1016/j.chb.2014.12.048

Gupta, A. K., Aggarwal, V., Sharma, V., & Naved, M. (2023). Framework to Integrate Education 4.0 to Enhance the E-Learning Model for Industry 4.0 and Society 5.0. The Role of Sustainability and Artificial Intelligence in Education Improvement, 151–167. https://doi.org/10.1201/9781003425779-8

Hadisi, L., & Muna, W. (2015). Pengelolaan teknologi informasi dalam menciptakan model inovasi pembelajaran (e-learning). *Al-TA'DIB: Jurnal Kajian Ilmu Kependidikan*, *8*(1), 117-140. https://doi.org/10.17977/um031v1i12014p020

Hayadi, B. H., Yusuf, F. A., & Nurwaningsih, I. (2024). Menghadapi Tantangan Perubahan Dalam Sistem Pendidikan Indonesia Dalam Pendekatan Strategis Dan Alat Intervensi Yang Efektif. *Technical and Vocational Education International Journal (TAVEIJ)*, *4*(1), 329-337. https://doi.org/10.20885/unisia.vol12.iss11.art5

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. Computers & Education, 90, 36–53. https://doi.org/10.1016/j.compedu.2015.09.005

Herlambang, Y. T. (2021). *Pedagogik: Telaah kritis ilmu pendidikan dalam multiperspektif*. Bumi Aksara. https://doi.org/10.35568/naturalistic.v7i2.3371

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types. Journal of Research on Technology in Education, 41(4), 393–416. https://doi.org/10.1080/15391523.2009.10782536

Hew, K. F., & Brush, T. (2023). Integrating technology into K-12 teaching and learning: current knowledge gaps and recommendations for future research. Educational Technology Research and Development, 55(3), 223–252. https://doi.org/10.1007/s11423-006-9022-5

Hirumi, A. (2002). Student-centered, technology-rich learning environments (SCenTRLE): Operationalizing constructivist approaches to teaching and learning. *Journal of Technology and Teacher Education*, *10*(4), 497-537. https://doi.org/10.1057/978-1-349-94941-0_2

Hoyos Muñoz, J. A., & Cardona Valencia, D. (2023). Trends and challenges of digital divide and digital inclusion: A bibliometric analysis. Journal of Information Science, 016555152211483. https://doi.org/10.1177/01655515221148366

Hughes, E. S., Bradford, J., & Likens, C. (2018). Facilitating Collaboration, Communication, and Critical Thinking Skills in Physical Therapy Education through Technology-Enhanced Instruction: A Case Study. TechTrends, 62(3), 296–302. https://doi.org/10.1007/s11528-018-0259-8.

Jenita, J., Harefa, A. T., Pebriani, E., Hanafiah, H., Rukiyanto, B. A., & Sabur, F. (2023). Pemanfaatan Teknologi Dalam Menunjang Pembelajaran: Pelatihan Interaktif Dalam Meningkatkan Kualitas Pendidikan. *Community Development Journal: Jurnal Pengabdian Masyarakat*, *4*(6), 13121-13129. https://doi.org/10.33394/jtp.v8i1.6049

Jimoyiannis, A., Tsiotakis, P., Roussinos, D., & Siorenta, A. (2013). Preparing teachers to integrate Web 2.0 in school practice: Toward a framework for Pedagogy 2.0. Australasian Journal of Educational Technology, 29(2). https://doi.org/10.14742/ajet.157.

Jongbloed, B., Enders, J., & Salerno, C. (2008). Higher education and its communities: Interconnections, interdependencies and a research agenda. Higher Education, 56(3), 303–324. https://doi.org/10.1007/s10734-008-9128-2

Kamila, I., & Wathon, A. (2021). Pengembangan Media Rumah Pelangi Dalam Meningkatkan Kemampuan Berhitung Anak Usia Dini. *Sistim Informasi Manajemen*, *4*(1), 118-139. https://doi.org/10.29408/jga.v4i01.2073

Kämpfen, F., & Maurer, J. (2018). Does education help "old dogs" learn "new tricks"? The lasting impact of early-life education on technology use among older adults. Research Policy, 47(6), 1125–1132. https://doi.org/10.1016/j.respol.2018.03.017.

Keshav, M., Julien, L., & Miezel, J. (2022). The Role Of Technology In Era 5.0 In The Development Of Arabic Language In The World Of Education. Journal International of Lingua and Technology, 1(2), 79–98. https://doi.org/10.55849/jiltech.v1i2.85.

Kivunja, C. (2014). Do You Want Your Students to Be Job-Ready with 21st Century Skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Constructivism to Critical Thinking, Problem Solving and Siemens' Digital Connectivism. International Journal of Higher Education, 3(3). https://doi.org/10.5430/ijhe.v3n3p81.

Kolevski, D., Michael, K., Abbas, R., & Freeman, M. (2021). Cloud Data Breach Disclosures: the Consumer and their Personally Identifiable Information (PII)? 2021 IEEE Conference on Norbert Wiener in the 21st Century (21CW). https://doi.org/10.1109/21cw48944.2021.9532579

Krumm, A., Means, B., & Bienkowski, M. (2018). Foundations of Collaborative Applications of Educational Data Mining and Learning Analytics. Learning Analytics Goes to School, 80–107. https://doi.org/10.4324/9781315650722-5.

Leidner, D. E., & Jarvenpaa, S. L. (1995). The Use of Information Technology to Enhance Management School Education: A Theoretical View. MIS Quarterly, 19(3), 265. https://doi.org/10.2307/249596

Maddikunta, P. K. R., Pham, Q.-V., B, P., Deepa, N., Dev, K., Gadekallu, T. R., Ruby, R., & Liyanage, M. (2022). Industry 5.0: A survey on enabling technologies and potential applications. Journal of Industrial Information Integration, 26, 100257. https://doi.org/10.1016/j.jii.2021.100257

Mahmudah, M., & Paramita, N. P. (2023). Transformasi Pembelajaran Bahasa Arab di Era Digital: Tantangan dan Peluang dalam Pendidikan. *Prosiding Pertemuan Ilmiah Internasional Bahasa Arab*, *14*(1), 841-858. https://doi.org/10.47625/fashluna.v4i1.492

Manan, A. (2023). Pendidikan Islam dan Perkembangan Teknologi: Menggagas Harmoni dalam Era Digital. SCHOLASTICA: Jurnal Pendidikan dan Kebudayaan, 5(1), 56-73. https://doi.org/10.23969/wistara.v3i1.11239

Maolana, I., Darmiyanti, A., & Abidin, J. (2023). Strategi Kepemimpinan Kepala Sekolah Yang Efektif Dalam Meningkatkan Kualitas Guru Di Lembaga Pendidikan Islam. *Innovative: Journal Of Social Science Research*, *3*(4), 83-94. https://doi.org/10.22236/jpi.v14i02.13384

Melati, E. (2024). Analisis Efektifitas Penggunaan Media Digital Dalam Pembelajaran Bahasa Inggris. *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, *7*(3), 7080-7087. https://doi.org/10.23969/wistara.v5i1.13954

Melati, E., Kurniawan, M., Marlina, M., Santosa, S., Zahra, R., & Purnama, Y. (2023). Pengaruh Metode Pengajaran Berbasis Teknologi Terhadap Kemampuan Berbicara Dalam Pembelajaran Bah asa Inggris Di Sekolah Menengah. *Jurnal Review Pendidikan Dan Pengajaran (JRPP)*, *6*(4), 14-20. https://doi.org/10.24036/ld.v2i1.7356

Miagusttin, A. P., Syakori, K. R., Nurhangesti, M., Septiani, R., Alifiya, S. N., & Ningrum, T. S. (2019). Penerapan Teknologi Dalam Pembelajaran: Menghadapi Era Digital di Abad ke-21. https://doi.org/10.31219/osf.io/puys8

Muthiarani, T. E. (2021). Studi Komparasi Keefektifan Pelaksanaan Praktikum Menggunakan Laboratorium Virtual dan Laboratorium Riil dalam Pembelajaran Kimia. In *International Education Conference (IEC) FITK* (Vol. 1, No. 1, pp. 161-168). https://doi.org/10.24014/konfigurasi.v1i2.4354

Nasukah, B. (2018). Urgensi dan prinsip penerapan pendekatan manajemen sumber daya manusia strategis pada institusi pendidikan. *Tarbiyatuna: Jurnal Pendidikan Ilmiah*, *3*(1), 51-81. https://doi.org/10.32493/jjsdm.v1i2.926

Ningsih, E. P. (2024). Implementasi Teknologi Digital dalam Pendidikan: Manfaat dan Hambatan. *Journal EduTech*, *1*(1), 1-8. https://doi.org/10.51878/edutech.v3i2.2358

Nugroho, A. S., Dwi Retnandari, N., & Djunaedi, A. (2023). Faktor Faktor Yang Mempengaruhi Digitalisasi Layanan Cukai Di Direktorat Jenderal Bea Dan Cukai. Jurnal Perspektif Bea Dan Cukai, 7(2), 213–236. https://doi.org/10.31092/jpbc.v7i2.2163

Núñez-Canal, M., de Obesso, M. de las M., & Pérez-Rivero, C. A. (2022). New challenges in higher education: A study of the digital competence of educators in Covid times. Technological Forecasting and Social Change, 174, 121270. https://doi.org/10.1016/j.techfore.2021.121270

Nurcahyo, G., Hasanah, D. A., Maharani, A., & Ribawati, E. (2024). Ekonomi Tradisional Dan Perubahan Sosial. *Sindoro: Cendikia Pendidikan*, *5*(3), 91-100. https://doi.org/10.32729/edukasi.v3i3.217

Pangondian, R. A., Santosa, P. I., & Nugroho, E. (2019, February). Faktor-faktor yang mempengaruhi kesuksesan pembelajaran daring dalam revolusi industri 4.0. In Seminar Nasional Teknologi Komputer & Sains (SAINTEKS) (Vol. 1, No. 1). https://doi.org/10.29080/jai.v8i1.740

Permana, B. S., Hazizah, L. A., & Herlambang, Y. T. (2024). Teknologi pendidikan: efektivitas penggunaan media pembelajaran berbasis teknologi di era digitalisasi. *Khatulistiwa: Jurnal Pendidikan Dan Sosial Humaniora*, *4*(1), 19-28. https://doi.org/10.55606/khatulistiwa.v4i1.2702

Potkonjak, V., Gardner, M., Callaghan, V., Mattila, P., Guetl, C., Petrović, V. M., & Jovanović, K. (2016). Virtual laboratories for education in science, technology, and engineering: A review. Computers & Education, 95, 309–327. https://doi.org/10.1016/j.compedu.2016.02.002.

Rani, S. (2023). Transformasi Komunikasi Dakwah dalam Era Digital: Peluang dan Tantangan dalam Pendidikan Islam Kontemporer. AL-MIKRAJ Jurnal Studi Islam Dan Humaniora (E-ISSN 2745-4584), 4(1), 207–216. https://doi.org/10.37680/almikraj.v4i1.3513. m

Reid, Dr. L. (2019). Learning Management Systems: The Game Changer for Traditional Teaching and Learning at Adult and Higher Education Institutions. Global Journal of Human-Social Science, 1–14. DWT. https://doi.org/10.34257/gjhssgvol19is6pg1

Rinta-Kahila, T., Penttinen, E., & Lyytinen, K. (2023). Getting Trapped in Technical Debt: Sociotechnical Analysis of a Legacy System's Replacement. MIS Quarterly, 47(1), 1–32. https://doi.org/10.25300/misq/2022/16711

Rizki, U., Putri, E., Amin, A., Citra, D., Andini, E. P., & Abu, W. (2024). Efektivitas Model Blended Learning Dalam Meningkatkan Pembelajaran. Cendekia: Jurnal Pendidikan dan Keagamaan, 1(2), 90-95. https://doi.org/10.19105/rjpai.v2i2.4833

Rohayati, Y., Bangkara, B. M. A. S. A., Jacob, J., Dzauharoh, S., & Iskandar, A. (2022). Expert

opinion on the implementation of e-government efforts to improve village apparatus performance in Indonesia. International Journal of Health Sciences, 1659–1673. https://doi.org/10.53730/ijhs.v6ns9.12731.

Shofia Rohmah, N. N., Markhamah, Sabar Narimo, & Choiriyah Widyasari. (2023). Strategi Penguatan Profil Pelajar Pancasila Dimensi Berkebhinekaan Global Di Sekolah Dasar. Jurnal Elementaria Edukasia, 6(3), 1254–1269. https://doi.org/10.31949/jee.v6i3.6124

Said, S. (2023). Peran teknologi digital sebagai media pembelajaran di era abad 21. *Jurnal PenKoMi: Kajian Pendidikan Dan Ekonomi*, *6*(2), 194-202.

Sarker, M. N. I., Wu, M., Cao, Q., Alam, G. M., & Li, D. (2019). Leveraging Digital Technology for Better Learning and Education: A Systematic Literature Review. International Journal of Information and Education Technology, 9(7), 453–461. https://doi.org/10.18178/ijiet.2019.9.7.1246

Schmid, R., & Petko, D. (2019). Does the use of educational technology in personalized learning environments correlate with self-reported digital skills and beliefs of secondary-school students? Computers & Education, 136, 75–86. https://doi.org/10.1016/j.compedu.2019.03.006.

Schneider, M., & Preckel, F. (2017). Variables associated with achievement in higher education: A systematic review of meta-analyses. Psychological Bulletin, 143(6), 565–600. https://doi.org/10.1037/bul0000098.

Setyasih, E. T. (2022). TRANSFORMASI DIGITAL PEMERINTAH DAERAH DI ERA SOCIETY 5.0: STUDI KASUS DI PROVINSI JAWA BARAT. PAPATUNG: Jurnal Ilmu Administrasi Publik, Pemerintahan Dan Politik, 5(3), 59–66. https://doi.org/10.54783/japp.v5i3.657.

Siegel, A. A., Zarb, M., Alshaigy, B., Blanchard, J., Crick, T., Glassey, R., Hott, J. R., Latulipe, C., Riedesel, C., Senapathi, M., Simon, & Williams, D. (2021). Teaching through a Global Pandemic. Proceedings of the 2021 Working Group Reports on Innovation and Technology in Computer Science Education. https://doi.org/10.1145/3502870.3506565.

Singh, J., Steele, K., & Singh, L. (2021). Combining the Best of Online and Face-to-Face Learning: Hybrid and Blended Learning Approach for COVID-19, Post Vaccine, & Post-Pandemic World. Journal of Educational Technology Systems, 50(2), 140–171. https://doi.org/10.1177/00472395211047865.

Straub, E. T. (2009). Understanding Technology Adoption: Theory and Future Directions for Informal Learning. Review of Educational Research, 79(2), 625–649. https://doi.org/10.3102/0034654308325896

Sych, T., Khrykov, Y., & Ptakhina, O. (2021). Digital transformation as the main condition for the development of modern higher education. Educational Technology Quarterly, 2021(2), 293–309. https://doi.org/10.55056/etq.27

URAZOVA, M. R. (2020). INNOVATIVE TECHNOLOGIES IN TEACHING AND STUDYING ENGLISH. Austrian Journal of Humanities and Social Sciences, 5–6, 28–37. https://doi.org/10.29013/ajh-20-5.6-28-37

Utomo, F. T. S. (2023). Inovasi Media Pembelajaran Interaktif Untuk Meningkatkan Efektivitas Pembelajaran Era Digital Di Sekolah DASAR. Pendas : Jurnal Ilmiah Pendidikan Dasar, 8(2), 3635–3645. https://doi.org/10.23969/jp.v8i2.10066

Van de Werfhorst, H. G., Kessenich, E., & Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. Computers and Education Open, 3, 100100. https://doi.org/10.1016/j.caeo.2022.100100.

Vempati, S., Bhuma, M. K., & Fiaidhi, J. (2020). Fear of Missing out, Social Media Engagement, Smartphone Addiction and Distraction Moderating Role of Tracking Apps in the Youth.pdf. https://doi.org/10.36227/techrxiv.12094107.v1.

Wartono, T. (2024). Manajemen Perubahan Organisasi: Strategi Efektif dalam Menghadapi Tantangan Global. *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, *7*(2), 4086-

4092. https://doi.org/10.55352/edu.v1i1.456

Wang, Y., Chen, N.-S., & Levy, M. (2010). Teacher training in a synchronous cyber face-to-face classroom: characterizing and supporting the online teachers' learning process. Computer Assisted Language Learning, 23(4), 277–293. https://doi.org/10.1080/09588221.2010.493523.

Williams, S. (2002). Making Better Business Decisions: Understanding and Improving Critical Thinking and Problem-Solving Skills. https://doi.org/10.4135/9781452231181.

Wilson, B., Sherry, L., Dobrovolny, J., Batty, M., & Ryder, M. (2002). Adoption Factors and Processes. Handbook on Information Technologies for Education and Training, 293–307. https://doi.org/10.1007/978-3-662-07682-8_18

Wilson, E. (2016). Transforming Higher Education in Afghanistan: Success amidst Ongoing Struggles by Fred Hayward. Ann Arbor, MI: Society for College and University Planning, 2015. 176 pp. $10.00 (e-book). ISBN 978-1-937724-51-1. Comparative Education Review, 60(3), 605–607. https://doi.org/10.1086/687041.

Woznicki, J., Krasniewski, A., & Toczylowski, E. (2020.). On Providing Flexibility, Adaptability, Efficiency And Quality In Engineering Education. 1996 Annual Conference Proceedings. https://doi.org/10.18260/1-2--6218

Yandra, R., Mahfudnurnajamuddin, M., & Suriyanti, S. (2024). Implementasi Teknologi dalam Manajemen Pemasaran Pendidikan: Tantangan dan Peluang. Journal of Education Research, 5(2), 2008–2024. https://doi.org/10.37985/jer.v5i2.1071

Ying, Y. H., Siang, W. E. W., & Mohamad, M. (2021). The Challenges of Learning English Skills and the Integration of Social Media and Video Conferencing Tools to Help ESL Learners Coping with the Challenges during COVID-19 Pandemic: A Literature Review. Creative Education, 12(07), 1503–1516. https://doi.org/10.4236/ce.2021.127115

Yulianti, W. (2024). *Kompetensi Profesional Guru Dalam Mengembangkan Akselerasi Transformasi Sekolah Penggerak* (Doctoral dissertation, Universitas Jambi).

Yulianti, H., Mukni'ah, M., & Iswanto, E. (2024). Use of Technology in Increasing the Effectiveness of Class Management at Madrasah Ibtidaiyah Negeri 3 Jember. Khalifah : Jurnal Pendidikan Nusantara, 2(1), 23–30. https://doi.org/10.62523/khalifah.v2i1.10

Zadorozhna-Kniahnytska, L. V. (2020). Building The Individual Educational Trajectory Of Masterstudents – Future Education Managers Through Professional Training. Innovate Pedagogy, 1(20), 125–129. https://doi.org/10.32843/2663-6085-2020-20-1-26

Zahir Irani, P. E. (2020). The propagation of technology management taxonomies for evaluating investments in information systems. *Journal of management information systems*, *17*(3), 161-177.

Zhan, Z., & Mei, H. (2013). Academic self-concept and social presence in face-to-face and online learning: Perceptions and effects on students' learning achievement and satisfaction across environments. Computers & Education, 69, 131–138. https://doi.org/10.1016/j.compedu.2013.07.002.