



## **LEARNING INNOVATION: IMPROVING EDUCATIONAL EFFECTIVENESS IN THE DIGITAL AGE**

**Muhammad Mustafa<sup>1</sup>, Moh. Furqan<sup>2</sup>**

<sup>1,2</sup>Universitas Nurul Jadid, East Java, Indonesia  
Email: [mustafabond12@gmail.com](mailto:mustafabond12@gmail.com)<sup>1</sup>, [moh.furqan@unuja.ac.id](mailto:moh.furqan@unuja.ac.id)<sup>2</sup>

### **Abstract:**

The development of digital technology has had a significant impact on the education sector. Using technology in learning enables innovations to improve the effectiveness of the learning process. This article aims to analyze learning innovations that can enhance the effectiveness of education in the digital era. A literature review was conducted to explore the concept of learning in the digital era, identify the advantages and challenges faced in implementing technology in education, and examine the development of teaching innovations in the digital era. The research method used is a literature review of related research and an analysis of relevant data and findings. The results of this study provide a better understanding of the effectiveness of learning innovations in the digital era. Factors that influence the effectiveness of learning innovations are also analyzed to provide a comprehensive picture of the influence of technology in education. The discussion of this article highlights the effectiveness of learning innovations in the digital era, considering the advantages and challenges that arise. The implications of the findings of this study for learning practices are identified and presented, and relevant recommendations are provided to support the effective use of learning innovations in the context of digital education. This study concludes that learning innovations can improve the effectiveness of education in the digital era. However, it is important to consider the factors that influence the success of these innovations, such as teacher technological competence, infrastructure availability, and adequate policy support. This article makes an important contribution to understanding technology use in education and provides a basis for further research in this area.

**Keywords:** *learning innovation, educational effectiveness, digital technology, education in the digital era.*

### **INTRODUCTION**

Education is a key element in the development of society and plays a vital role in preparing future generations. However, the challenges faced by the education system never stop. One of the main challenges faced today is adapting to the rapid changes in digital technology. The digital era has brought significant changes in the way we live, work, and learn. Learning innovation in the digital era is an effort to improve the effectiveness of education by utilizing the potential of information and communication technology (ICT) (Bransford et al., 2000; Dede, 2010; Hattie, 2009).

Learning innovation in the digital era includes various approaches, such as the use of technology, online learning platforms, game-based learning, and many more. These approaches promise the potential to enrich the learning experience, increase student engagement, and prepare them for the increasingly complex demands of the future (Johnson et al., 2014; Siemens & Tittenberger, 2009). In this context, it is

important to understand the effectiveness of learning innovation in the digital era and how it can improve the quality of education. Previous studies have identified the benefits of learning innovations in the digital era, including increased learning motivation, increased accessibility, development of 21st century skills, and improved student learning outcomes (Kozma, 1991; Means et al., 2014).

However, a more comprehensive understanding of the effectiveness of learning innovations in the digital era is still needed. A comprehensive literature review can provide deeper insights into the various digital learning approaches, the advantages and disadvantages of each approach, and the factors that influence the successful implementation of learning innovations in the digital era (Puentedura, 2013; Zhao, 2009). In this study, we will use a literature study approach to compile a comprehensive literature review of learning innovations in the digital era. We will refer to reliable and relevant scientific literature (Bransford et al., 2000; Dede, 2010; Hattie, 2009; Johnson et al., 2014) to gain a better understanding of the effectiveness of learning innovations and their contribution to improving education. Thus, this research is expected to provide valuable insights for education practitioners, policy makers, and researchers in understanding learning innovation in the digital era and how to optimize its benefits to improve educational effectiveness.

## **RESEARCH METHODS**

This study was conducted using a literature review approach to investigate learning innovations in the digital era and analyze their effectiveness in improving education. This approach involves searching, selecting, and analyzing relevant literature to gain an in-depth understanding of the research topic. In the data identification stage, a literature search was conducted through academic databases such as scientific journals, peer-reviewed articles, textbooks, conferences, and research reports (Bransford et al., 2000; Dede, 2010; Hattie, 2009; Johnson et al., 2014). The keywords used include "learning innovation", "education in the digital era", "educational technology", "online learning platforms", "game-based learning", and so on.

After the search was conducted, a selection of literature that was in accordance with the research topic was carried out based on the abstract, title, and content summary (Kozma, 1991; Means et al., 2014; Siemens & Tittenberger, 2009). Relevant articles and literature were selected for further analysis. Next, a literature analysis was conducted on the selected literature. The analysis includes identifying the main themes, differences, similarities, advantages, and disadvantages of various learning innovations in the digital era (Puentedura, 2013; Zhao, 2009). The data and findings found in the literature were then synthesized to obtain a comprehensive understanding of the effectiveness of learning innovations. In the literature analysis process, relevant references were used to strengthen the arguments and support the findings presented in the study (Schrum & Levin, 2013). The references used include reliable sources and are related to the research topic.

## **RESULTS AND DISCUSSION**

### **1. Effectiveness of Learning Innovation in the Digital Era**

The effectiveness of learning innovation in the digital era is a focus of attention in efforts to improve the quality of education. Various learning innovations using information and communication technology (ICT) have been implemented with the aim of achieving better learning outcomes. In this discussion, we will outline several aspects that influence the effectiveness of learning innovation in the digital era along with explanations and references. The opinion of Prof. Anies Baswedan, Minister of Education and Culture of the Republic of Indonesia, provides an important view on the application of technology in education. He stated that technology can be a catalyst for positive educational change, enabling more effective and relevant learning with the times (Baswedan, 2020). In his perspective, learning innovation in the digital era is not just the use of technology, but also a paradigm shift in the learning approach.

In the context of Islamic education, Prof. Dr. Muhadjir Effendy emphasized the

importance of integration between technology and Islamic values in learning. He argued that learning innovation in the digital era must remain rooted in religious and moral values. This approach harmonizes the development of technological skills with a strong understanding of religious values (Effendy, 2019). In learning innovation in the digital era, the following aspects play an important role in increasing learning effectiveness:

a) Accessibility and Affordability:

Learning innovations in the digital era provide opportunities for students and educators to access learning resources widely (UNESCO, 2020). In Prof. Anies Baswedan's perspective, technology can expand access and increase the affordability of education (Baswedan, 2020).

b) Interactive and Interesting:

Learning innovations in the digital era offer interactive and interesting learning experiences through the use of multimedia elements, simulations, and games (Johnson et al., 2014). Prof. Anies Baswedan's opinion emphasizes the importance of creating interesting and active learning experiences (Baswedan, 2020).

c) Personalization of Learning:

Learning innovations in the digital era allow educators to provide learning materials that are tailored to the ability level, learning style, interests, and learning needs of each student (Vander Ark & Schneider, 2019). Prof. Anies Baswedan's opinion encourages a personalized learning approach (Baswedan, 2020).

d) Real-time Evaluation and Feedback:

Learning innovations in the digital era provide the ability to collect learning data in real-time and provide immediate feedback to students (Hattie, 2009). In the view of Prof. Anies Baswedan, timely evaluation and feedback are important in improving learning (Baswedan, 2020).

In the Indonesian context, the views of Prof. Anies Baswedan and Prof. Muhadjir Effendy are an important foundation in understanding the importance of learning innovation in the digital era and its relevance in increasing the effectiveness of education. From an Islamic perspective, the integration of technology and religious values provides a strong moral and spiritual foundation for students.

## **2. Factors Affecting the Effectiveness of Learning Innovation**

In the era of reform in Indonesia, there are several educational figures who provide important views on the factors that affect the effectiveness of learning innovation in the digital era. Prof. Dr. Anis H. Bajrektarevic emphasizes the importance of a paradigm shift in education in the digital era, by encouraging students to become active, critical, and creative learners (Bajrektarevic, 2018). This is in line with the views of Prof. Dr. Arief Rachman who emphasizes the importance of skills-based learning in the digital era, by developing 21st century skills (Rachman, 2007). In addition, in the Society 5.0 era, Prof. Dr. Sugata Mitra provides an important perspective by prioritizing the self-organized learning environment (SOLE) approach, which encourages students to learn independently and collaborate in finding solutions to the challenges they face (Mitra, 2018).

The opinions of these educational figures show that the effectiveness of learning innovation in the digital era is greatly influenced by changes in learning paradigms, the development of 21st century skills, and student empowerment in the learning process. In facing global changes and technological demands, education in Indonesia needs to adopt an inclusive, active, and collaborative approach, which allows students to develop skills and competencies that are relevant to the future.

The opinions of educational figures from the reform era and the Society 5.0 era provide diverse but complementary perspectives. By integrating the views of these figures, we can gain a more comprehensive understanding of the factors that influence the effectiveness of learning innovation in the digital era. The following is a discussion of the factors that influence the effectiveness of learning innovation in the digital era, complete with references:

a) Technology Infrastructure:

The main factor influencing the effectiveness of learning innovation in the digital

era is the available technology infrastructure. This factor includes stable internet access, the availability of hardware such as computers or tablets, and the reliability of online learning platforms (UNESCO, 2020). Without adequate technology infrastructure, the implementation of learning innovation in the digital era can be hampered.

b) Educator Competence:

Educator competence in using technology and implementing learning innovations in the digital era plays a crucial role in its effectiveness (Kearney et al., 2012). Educators who have a good understanding of technology and the ability to integrate it effectively into the learning process can improve student learning outcomes.

c) Relevant Learning Design:

Learning design that is relevant to the learning context in the digital era also plays an important role in the effectiveness of learning innovations (Johnson et al., 2014). Learning design that considers student needs, is interesting, and activates student engagement can improve learning effectiveness.

d) Institutional Support:

Support from educational institutions and school management is also an important factor in the effectiveness of learning innovations in the digital era (Alzaza & Yaakub, 2019). This support includes the provision of resources, educator training, supportive policies, and effective management in managing the implementation of learning innovations.

These factors interact with each other and contribute to influencing the effectiveness of learning innovations in the digital era. In implementing learning innovations, it is important to pay attention to and manage these factors in order to achieve optimal learning outcomes. It is hoped that this discussion will provide a comprehensive overview of the factors that influence the effectiveness of learning innovation in the digital era.

### **3. Implications of Findings for Learning Practices**

In the context of education in the digital era, Indonesian education figures and Islamic figures in Indonesia provide relevant views. Dr. Anies Baswedan, Minister of Education and Culture of the Republic of Indonesia, stated the importance of utilizing digital technology in the learning process to improve the quality and accessibility of education in Indonesia (Baswedan, 2019). Dr. Anies Baswedan also emphasized the importance of developing 21st-century skills so that students are ready to face changes in the world of work influenced by technology (Baswedan, 2019). On the other hand, Prof. Dr. Quraish Shihab, an Islamic figure in Indonesia, emphasized the importance of integrating Islamic values in learning in the digital era. He emphasized that digital technology must be used wisely to support learning based on Islamic values (Shihab, 2017).

These views underline the importance of utilizing technology in learning, developing 21st-century skills, and aligning Islamic values with learning approaches in the digital era. In implementing learning practices, educators can combine the use of technology with an inclusive, collaborative, and Islamic value-based approach. By considering the views of Indonesian education figures such as Dr. Anies Baswedan and Islamic figures such as Prof. Quraish Shihab, educators can design relevant, innovative, and effective learning practices in facing the challenges of learning in the digital era, while upholding Islamic values and preparing students for a future filled with technological advancements.

The findings from the literature review and data analysis of this study have significant implications for learning practices in the digital era. These implications can provide direction and guidelines for educators in improving the effectiveness of learning in the digital era. Here are some implications of the findings:

- a) Integration of Technology in Learning: The research findings show that the use of digital technology can increase student engagement and motivation in learning. Therefore, educators need to integrate technology wisely in their learning practices.

This can be done through the use of online learning platforms, mobile applications, and other interactive tools that can increase student interaction and participation in the learning process (Johnson et al., 2017; Kebritchi et al., 2017).

- b) **Active Learning Approach:** The research findings show that an active learning approach, which engages students in exploration, collaboration, and problem-solving activities, is more effective in improving student understanding and skills. Therefore, educators need to apply learning methods that encourage students to actively participate in the learning process, such as group discussions, problem-based projects, and simulations (Prince, 2004; Hmelo-Silver et al., 2007).
- c) **Collaborative Learning:** Research findings suggest that collaborative learning, where students work together to achieve learning goals, can improve students' social skills, problem-solving, and understanding. Educators need to create learning environments that support collaboration, whether in the form of physical group work or through online collaborative platforms (Dillenbourg, 1999; Kirschner et al., 2018).
- d) **Formative Evaluation and Quality Feedback:** Research findings suggest that ongoing formative evaluation and quality feedback can help students improve their understanding and performance. Educators need to implement evaluation strategies that allow them to track individual student progress, provide constructive feedback, and facilitate student reflection on their learning (Hattie & Timperley, 2007; Black & Wiliam, 2009).

In implementing these implications, it is important for educators to consider the context, needs, and characteristics of their students. Educators also need to keep abreast of technological developments and digital learning trends to ensure that their learning practices remain relevant and effective. Thus, implementing these implications in learning practices in the digital era can help improve the effectiveness of student learning and prepare them to face the demands of the future marked by technological advances.

## CONCLUSION

In this discussion, it can be concluded that learning innovation has a crucial role in improving the effectiveness of education in the digital era. The use of digital technology, active and collaborative learning approaches, and the development of 21st century skills are important aspects in efforts to improve the quality of education. Factors that influence the effectiveness of learning innovation include adequate policy and infrastructure support, educator training, active student participation, and support from family and society. Research findings and views of Indonesian education figures also highlight the importance of integrating Islamic values and cultural values in the use of technology in learning. This will ensure that learning in the digital era does not only prioritize technological aspects, but also forms good character and morals in accordance with the values upheld in society.

The implications of the findings for learning practices are the importance of utilizing technology as an effective tool in learning, implementing active and collaborative learning approaches, and developing 21st century skills. Collaboration between the government, educators, and education stakeholders is also key to creating an adaptive and innovative learning environment in the digital era. In conclusion, education in the digital era needs to continue to develop learning innovations that are relevant and responsive to technological developments and the demands of the times. Thus, education can make a significant contribution to increasing the effectiveness of education, preparing students to face changes in the world of work, and forming good character and morals in accordance with the values that are upheld. Islamic

## REFERENCES

- Alzaza, N. S., & Yaakub, A. R. (2019). Factors Affecting Effective Implementation of E-Learning Program at Universitas Terbuka, Indonesia. *International Journal of Instruction*, 12(1), 93-110. doi: 10.29333/iji.2019.1216a
- Bajrektarevic, A. H. (2018). Education and Effective Learning in the Era of Digital Disruption. *Journal of Education Culture and Society*, 9(2), 1-11.

- Baswedan, A. (2019). Pembelajaran di Era Digital. Retrieved from <https://www.kemdikbud.go.id/main/blog/2019/07/pembelajaran-di-era-digital>
- Baswedan, A. (2020). Pendidikan di Era Digital. Presentasi dalam acara Forum Merdeka Barat 9: Menggerakkan Indonesia Maju Melalui Pendidikan. Jakarta, Indonesia.
- Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability*, 21(1), 5-31.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How People Learn: Brain, Mind, Experience, and School: Expanded Edition*. Washington, DC: National Academies Press.
- Dede, C. (2010). Comparing Frameworks for 21st Century Skills. In J. Bellanca & R. Brandt (Eds.), *21st Century Skills: Rethinking How Students Learn* (pp. 51-76). Bloomington, IN: Solution Tree Press.
- Dede, C. (2010). Comparing Frameworks for 21st Century Skills. In J. Bellanca & R. Brandt (Eds.), *21st Century Skills: Rethinking How Students Learn* (pp. 51-76). Bloomington, IN: Solution Tree Press.
- Dillenbourg, P. (1999). Collaborative learning: Cognitive and computational approaches. *Advances in Learning and Instruction Series*. Oxford: Elsevier Science.
- Effendy, M. (2019). *Transformasi Pendidikan: Membangun Generasi Millennial*. Yogyakarta: Deepublish.
- Hattie, J. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. New York, NY: Routledge.
- Hattie, J. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. New York, NY: Routledge.
- Hattie, J. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. New York, NY: Routledge.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81-112.
- Hmelo-Silver, C. E., Duncan, R. G., & Chinn, C. A. (2007). Scaffolding and achievement in problem-based and inquiry learning: A response to Kirschner, Sweller, and Clark (2006). *Educational Psychologist*, 42(2), 99-107.
- Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 K-12 Edition*. Austin, TX: The New Media Consortium.
- Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 K-12 Edition*. Austin, TX: The New Media Consortium.
- Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2017). *NMC/CoSN Horizon Report: 2017 K-12 Edition*. The New Media Consortium.
- Johnson, L., Adams, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, TX: The New Media Consortium.
- Johnson, L., Adams, S., Estrada, V., & Freeman, A. (2014). *NMC Horizon Report: 2014 Higher Education Edition*. Austin, TX: The New Media Consortium.
- Kearney, M., Schuck, S., Burden, K., & Aubusson, P. (2012). Viewing Mobile Learning from a Pedagogical Perspective. *Research in Learning Technology*, 20(1), 14406. doi: 10.3402/rlt.v20i0.14406
- Kebritchi, M., Lipschuetz, A., & Santiago, L. (2017). Issues and challenges for teaching successful online courses in higher education: A literature review. *Journal of Educational Technology Systems*, 46(1), 4-29.
- Kirschner, P. A., Sweller, J., & Clark, R. E. (2018). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41(2), 75-86.
- Kozma, R. B. (1991). Learning with Media. *Review of Educational Research*, 61(2), 179-211.
- Kozma, R. B. (1991). Learning with Media. *Review of Educational Research*, 61(2), 179-211.
- Means, B., Bakia, M., & Murphy, R. (2014). *Learning Online: What Research Tells Us About Whether, When, and How*. New York, NY: Routledge.

- Means, B., Bakia, M., & Murphy, R. (2014). *Learning Online: What Research Tells Us About Whether, When, and How*. New York, NY: Routledge.
- Mitra, S. (2018). The Future of Learning. In G. C. Ozawa & R. J. Roepke (Eds.), *Educational Innovations and Contemporary Technologies: Enhancing Teaching and Learning* (pp. 1-13). Singapore: Springer.
- Mudarris, Badrul, And Mohammad Syifaur Rizal. 2023. "Manajemen Strategi Kepemimpinan Kepala Sekolah Dalam Meningkatkan Kedisiplinan Guru Dan Karyawan Di SMA Nurul Jadid." *JIIP-Jurnal Ilmiah Ilmu Pendidikan* 6(12):10265–71.
- Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, 93(3), 223-231.
- Puentedura, R. (2013). SAMR: Substitution, Augmentation, Modification, Redefinition. Retrieved from <http://hippasus.com/blog/archives/227>
- Puentedura, R. (2013). SAMR: Substitution, Augmentation, Modification, Redefinition. Retrieved from <http://hippasus.com/blog/archives/227>
- Rachman, A. (2007). Pembelajaran Inovatif dan Pendidikan Kewirausahaan di Perguruan Tinggi. *Jurnal Inovasi Pendidikan Tinggi*, 2(2), 106-116.
- Rizal, Mohammad Syifaur. 2024. "Educational Evolution: Sustainable Returnment With Country In The Development Of The Trainer." Pp. 28–36 In *Proceeding Of International Conference On Education, Society And Humanity*. Vol. 2
- Schrum, L., & Levin, B. B. (2013). *Leading 21st Century Schools: Harnessing Technology for Engagement and Achievement*. Thousand Oaks, CA: Corwin Press.
- Shihab, Q. (2017). Pendidikan Islam di Era Digital. Retrieved from <https://www.republika.co.id/berita/dunia-islam/khazanah/17/08/16/ot7t4k366-pendidikan-islam-di-era-digital>
- Siemens, G., & Tittenberger, P. (2009). *Handbook of Emerging Technologies for Learning*. University of Manitoba.
- UNESCO. (2020). *Education in a Post-COVID World: Nine Ideas for Public Action*. Paris, France: UNESCO.
- UNESCO. (2020). *Education in a Post-COVID World: Nine Ideas for Public Action*. Paris, France: UNESCO.
- Vander Ark, T., & Schneider, C. (2019). *Power of Place: The Opportunities and Challenges of Personalized Learning*. San Francisco, CA: Jossey-Bass.
- Zhao, Y. (2009). *Catching Up or Leading the Way: American Education in the Age of Globalization*. Alexandria, VA: ASCD.
- Zhao, Y. (2009). *Catching Up or Leading the Way: American Education in the Age of Globalization*. Alexandria, VA: ASCD.