



New Era of Pedagogic Learning: A Systematic Review

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Abstract

Aim: The fourth industrial revolution was characterized by the pervasive application of technology in many spheres of daily life, including education. Regarding learning, technology is used to impart new information, not new beliefs or principles. This article investigates the concept of pedagogical learning as a potential alternative approach to learning in the modern era of digital technology.

Methodology: The writing method uses a systematic review by drawing on previous research pertaining to 2019-2022.

Findings: According to the study's findings, digital pedagogy is an approach that is not only based on the teacher's skills in using technology but also on how the teacher, in the role of a facilitator, uses technology to build thinking skills and develop students' affective aspects. Learning centers on the students, and technology fosters a dynamic learning atmosphere. Learning, which is inquiry-based and requires students to observe and construct the existing reality, is made possible through technology. This will help develop a critical mindset, curiosity, empathy, and the desire to seek solutions to real-world problems; consequently, it will build knowledge and social intelligence. Learning in the digital age can be supplemented with an alternative approach called digital pedagogy. This approach seeks to cultivate young people capable of critical thinking, flexibility, and social intelligence to meet the challenges posed by the industrial revolution 4.0.

Implications/Novel Contribution: The discipline of digital pedagogics arose from efforts to assist educators in developing the abilities required to thrive in the twenty-first-century classroom. The teacher's ability to use technology is merely one component of the digital pedagogical method. This research provides insight into digital learning that will assist practitioners in understanding the value of digital learning and how it can be effectively applied.

Keywords: Digital pedagogic, critical thinking, learning, systematic review, teacher's skills, technology.

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INTRODUCTION

Due to the rapid advancement of technology, the educational sector is facing significant challenges. Today's students have a very different personality and set of needs than those of the past, who were educated more traditionally. Unnoticed and inevitable, constant technological progress creates several voids and roadblocks to the spread of technology-based learning. Preparing superior, qualified, competitive human resources is the principal capital in today's world of intense global competition, so it's important to have an education system that aims to foster this (Yufita, Sihotang, & Tambunan, 2021).

The success or failure of an educational system rests heavily on the shoulders of its educators, making it one of the most important factors in developing top-tier human resources. It is not enough for a teacher to know how to use the various pieces of hardware and software at their disposal in the classroom; instead, they must also be able to strategically arrange these elements to best support the various learning activities of their students (Jam, Donia, Raja, & Ling, 2017; Rasilah, Dahlan, & Sudirman, 2021). Since modern educators must facilitate a process of learning that rests on UNESCO's "four pillars of learning" (learning to know, learning to do, learning to be, and learning to live together), finding qualified educators in the twenty-first century has become increasingly challenging (Elvis, 2020; Gam, 2018).

In-depth knowledge acquisition is what we mean when we say "learn to know." The goal of "learning to do" is to acquire the skills necessary to put one's newly acquired knowledge into practice in one's everyday life.

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Learning "to become someone of use," "learning to be" here refers to how a person can improve themselves through formal education. They were learning from one another or becoming capable of learning together for common ends. For a guru to be effective, they must be able to foster growth in their students (Daryanto, 2019; Jam, Khan, Zaidi, & Muzaffar, 2011).

There is a steady increase in the number of students enrolling in online courses across all disciplines in today's rapidly developing digital era. In addition to incorporating cutting-edge technological media into learning, online learning also provides students with a great deal of portability; they can study when and where it's most convenient for them without having to adhere to rigid timetables. In addition, students can pick and choose which topics to study based on their interests and the skills they most need to develop (Mi-Youn, 2021; Syahid, Hernawan, & Dewi, 2022). Teachers today need to be problem solvers who can adapt to the rapid pace at which technology is being integrated into the classroom. Educators today need to be able to use technology effectively, but they also need to be able to use it responsibly. Students today must be able to navigate the digital world to succeed in today's society. Meanwhile, the future students we will teach belong to the digital age. Students' varied learning styles necessitate a flexible approach to education.

Knowledge and digitalization have increased dramatically in today's globalization age, profoundly affecting people's lives. Teachers, as educational implementers, are responsible for ensuring that specific standards are met to maintain their profession's legitimacy and ensure that their students receive an excellent education. The teaching profession will thrive if it can adapt to new circumstances and new eras because education, in practice, continually adapts to new circumstances and new eras (Perdani & Andayani, 2021). As part of their jobs, teachers can raise the bar on schooling for students and bring about much-needed reforms. This paper was written because of the prevalence of digital pedagogics, an initiative to develop the skillsets of educators vital to the success of the Fourth Industrial Revolution.

RESEARCH METHODS

Generally speaking, researchers set out to learn something new, establish something solid, or create something new. This study employs a Systematic Literature Review from articles published in 2019–2021, following the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines for reporting. The systematic review highlights the methods for locating, assessing, and deducing meaning from research findings. Secondary information is gathered from books, articles, and previous studies (Sitompul, 2022).

RESULTS AND DISCUSSION

Education and Technology Challenges

The term "technology" is used to describe the science of engineering. It's a practical example of combining findings from science and nature with technical know-how. Scientific science is based on rationally formulated experiments and observations. In comparison, technology refers to how scientific science has been implemented in everyday life after extensive trial and error. This innovation is the product of practical study. Much hard work, time, and money go into cost-benefit analyses. Thus, countries with a robust scientific work ethic and a sizable budget will be the ones to dominate future technological advances. Countries with hard-working populations and a willingness to persevere through adversity to achieve their goals, such as the United States, Japan, Korea, Finland, and China, are at the forefront of technological innovation (Asdiniah, 2021).

Although humans create technology, it already has a distinct identity by the time it's born. These characteristics were not inherent to technology but were imparted to it by human beings. A portion of the fruit of human reason can be found in this technology. The human mind ought to be technologically subservient to human will. But the truth is quite different. All technology forms have unique personalities, identities, and even ethics. Any individual who wishes to use such technology must do so in a manner consistent with his essential nature (Asmoro, Faridah, & Dwinugraha, 2021). People will only be able to use technology to their advantage if they're motivated to act in ways that are consistent with their identities, values, and personalities. Because of this, those who wish to take advantage of technology must first be exposed to and accustomed to using the technology through training activities, internships, learning by doing, etc. The technological community has its own unique identity and way of life. Traditional technologies can be as basic as a hoe (Sintawati & Indriani, 2019). However, logical considerations

must be taken into account before one can put it to use, such as how to hold it, swing it, where the user stands, what direction is being targeted, and so on. If one were to follow his reasoning blindly, the ** he crafted would become a "master's eating weapon." Instead of loose soil, you'll end up with loose limbs. The same can be said for digital technology; it may be artificial, but it follows specific rules. For it to be helpful to a human, that person must adhere to his reasoning (Hanik et al., 2022).

The educational possibilities of the digital age are vast. Teachers can change the status quo of the learning, instructional materials, and student learning outcomes as they pertain to the knowledge-learning process (Khodijah, 2018). On the flip side, educators in the digital age face new challenges, such as ensuring student privacy, dealing with cultural shifts, and preserving national identity.

Digital Pedagogy: The Demands of Transformation in Learning

Due to the rapid technological advancements brought about by digital transformation, the field of education has undergone radical change over the past few decades. People in the modern era need to make the transition to digital lifestyles. This transition to digital technology marks the start of the development of novel approaches that will eventually replace conventional methods. This is done by adapting and using existing technologies (Al Fatah & Amirudin, 2022; Lismawati & Trihantoyo, 2022; Sulistyarini & Fatolah, 2022).

One aspect of this digital transformation in education is the rise of online learning. Depending on their approach, educational institutions can seize an opportunity or be challenged by digital transformation. Not only has online education been transformed by digital learning, but so has the entire field of education. Because of this, we can absorb as much learning as possible as new technologies emerge (Suyamto, Masykuri, & Sarwanto, 2020). It has the potential to inspire new ideas and make learning more exciting.

What we mean by "competence in digital pedagogy" is the ability of educators to effectively manage the learning process or interact with students using digital tools. The term "digital pedagogy" refers to teaching methods that incorporate digital tools. The emphasis is not on the technology itself but on how to use it to facilitate communication and collaboration among educators, students, and scientists in the realm of science. For distance learning to be successful, educators must use appropriate digital technology. Some of the hallmarks of digital pedagogy include a focus on increasing students' critical understanding of the digital environment; the encouragement of creativity, play, and problem-solving; the promotion of public participation, collaboration, and engagement; and the facilitation of a sense of community (Purfitasari, Masrukhi, Prihatin, & Mulyono, 2019; Zubaidah, 2020).

In response to the next set of requirements, educators must devise a plan to bring pedagogical expertise, subject matter expertise, and technological fluency together. If educators can successfully integrate all three into the learning, students will benefit from learning that is both more relevant and more robust. Educators should study and refine digital pedagogy for at least these four reasons: In the first place, today's students are part of the first generation for whom digital technology has always been an integral part of daily life and which has come to be seen as both a necessity and a way of life. Second, it will encourage students to learn more and keep them actively involved in the class. Their immediate environment is digital, and the principle of portability means that students can participate in class regardless of their schedule or location. Third, it facilitates a paperless, quicker, and more efficient workplace. Fourth, foster critical thinking skills, as it is easier for machines to investigate abstract and complex ideas thanks to the rise of digital technology (Lismawati & Trihantoyo, 2022).

The ability to effectively use technology in the classroom is only part of what constitutes "digital pedagogics." Educators who adopt this strategy also need to be adept at incorporating digital tools into lessons that foster students' critical thinking and positive responses to digital media (Purfitasari et al., 2019). Teachers are counted on to steer their charges toward critical thinking to become accustomed to it and develop a strong sense of personal accountability (Asdimiah, 2021). Similarly, Hendriani, Nuryani, and Ibrahim (2018) argue that people need to be taught to think critically about the world around them to make informed decisions about drinking.

All-digital learning is only one learning of digital pedagogics; educators employing digital pedagogics are also held to a higher standard of ethics in using digital resources (Pentury, Rangka, & Anggraeni, 2021). Teachers should not randomly cite books or plagiarize student work without their consent. Teachers must be savvier in their responses to the flood of information to identify and select only reliable sources to share with their students. Due to

the rapid pace of information dissemination in the digital age, educators need reliable ways to verify student reports of events before class. After verifying them and their legitimacy, educators should only relay facts and figures (Somantri, 2021). Teachers, likewise, need to be able to convey information to students in a way that meets their requirements for learning.

Teachers can create more exciting learning experiences for their students by experimenting with digital tools; these experiences can be delivered entirely online or through blended learning that incorporates face-to-face learning. Teachers need to learn the qualities or potential of digital learning to make the most of it for their student's learning, as it is a method or means of communication that can provide significant benefits for the interests of researchers, teachers, and students. Digital learning has the benefit of being engaging, so students are more likely to use it (Diplan, 2019).

Educators who can create engaging learning media and use learning media digitally are in high demand as part of the movement to raise teachers' professional standing in the wake of the Fourth Industrial Revolution. Teachers also need to be able to demonstrate to their students how to integrate technology effectively into their daily lives (Zohidova & Azamjon, 2022). The quality of teacher preparation programs directly affects the growth of competent educators. Their professional demeanor greatly aids the competence and application of educators in the learning process.

Teachers now face exciting new possibilities and formidable challenges due to the rapid development of information technology. To meet the challenges of a modern, interconnected world, educators everywhere must continually hone their pedagogical, personal, social, and professional competence. Educators in the millennial era face several unique challenges, including the need for technological fluency and an awareness of broader IT trends (Al Fatah & Amirudin, 2022).

A teacher's ingenuity and creativity are essential in learning instructional plans, particularly those incorporating technological tools. Yet, the fact remains that many Indonesian educators need more skills to integrate technology into the classroom effectively. There are still plenty of educators who still need to prepare for the widespread adoption of these tools. Whereas at present, digitalization has been applied to every facet. According to Rahayuningsih and Muhtar (2022), teachers need digital pedagogic competence to keep up with the rapid learning of digitalization and help their students succeed in the 21st century.

According to Perdani and Andayani (2021), a teacher's technological fluency indicates that they are prepared to impart knowledge to their students. Therefore, a teacher needs to be technologically proficient. Although teachers may face difficulties implementing it, they must be prepared to accept all risks and maintain professional conduct (Rasilah et al., 2021). The same is true of that educator, as reported by (Budiana, 2022). A teacher in the twenty-first century must adapt to the era's challenges by constantly honing his skills and learning as much as possible. Since educator is a change agents, they must undergo personal transformation and be able to pass this knowledge and experience on to their students.

The challenges of 21st-century education require more than just learning in science and technology, so teachers must also provide students with lessons in character and personality. Because of this, a teacher needs to know a lot, be able to think critically, be prepared for a wide range of challenges, and at all times exercise sound judgment when confronted with difficulties. However, a discrepancy exists between what is expected and what is possible, specifically regarding digitalization's impact on educators' capacities (Syahid et al., 2022).

However, not all instructors have been adept at using available resources. Some educators, for instance, need help with basic computer literacy due to inexperience and a lack of resources (such as classroom computers and internet access). Some educators, however, may be comfortable with computers but lack the skills necessary to utilize a variety of learning applications effectively; in such cases, the educator must engage in ongoing professional development, such as frequent training on the use of digital teaching media or participation in a variety of webinar activities organized by the Ministry of Education and Culture. This agrees with the belief that teachers' pedagogical competence in learning can be enhanced through training in the use of technology (Yufita et al., 2021).

CONCLUSION

The proper implementation of technology in the classroom is an urgent matter that needs to be addressed by teachers as soon as possible. This is necessary to ensure that learning goals in the digital age can be achieved

while also satisfying the demand for education brought on by the technological disruption that is currently taking place. Because digitalization occurs in many fields, today's young people are forced to become digital learners. This means they require new learning methods to meet their expectations and fulfill their requirements to seize opportunities and meet future challenges. The digital ability of teachers is an alternative solution in digital era learning that aims to produce a young generation that is critical, adaptive, and has the social intelligence to face the demands of the industrial era 4.0 and has even gone to the industrial era 5.0. This solution was developed to produce a young generation that can face the demands of the industrial era 4.0 and have even gone to the industrial era 5.0.

A teacher in today's day and age needs to have a firm grasp of digital pedagogics to be equipped with the skills necessary to use technology in the classroom effectively. This allows the teacher to better assist their students in learning the challenges of the modern world. It is expected of educators they have the academic qualifications and professional competencies, pedagogic competence, personality competence, and quality social competence necessary to meet the challenges of the times. Teachers can provide an angle to give birth to thinkers and students trained to convey ideas if they keep up with the latest technological developments and do their best to stay abreast of those developments. Students are taught practical oral communication skills so that they can go on to become commuters. Students are placed in different classes according to the range of their intelligence to foster the development of collaborative relationships. Students are educated to foster the development of inventive individuals.

The field of digital pedagogics emerged out of efforts to help educators develop the skills they'll need to succeed in the 21st-century classroom. The ability of the teacher to use technology is only one component of the digital pedagogic approach. The teacher also needs to be able to employ technology in a way that helps students develop their critical thinking skills and fosters positive attitudes among students regarding their interactions with technology. In addition, it is hoped that with the mastery of digital pedagogics by educators, it will be possible to restore cultural values that have been lost as a result of the detrimental effects of globalization. Therefore, teachers in the 21st century have a good level of competence in the requirements of safe environments.

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