Implementation of Creating Technology in 21st Century Learning in Ibtidaiyah Madrasah Padalarang

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Article Info	Abstract
	The purpose of this research is to analyze the creation of technology by teachers in learning, the technology models used in learning, and to analyze the obstacles in creating learning technology. The research findings obtained through interviews indicate that educators in the Padalarang district have a view that technology in 21st century learning is inevitable and cannot be rejected. However, the creation of technology in 21st century learning is not yet optimal, as the facilities and infrastructure in each madrasah are not adequate, meaning they are not evenly distributed, especially in private madrasahs located in remote areas. Regarding the applications used by madrasah teachers in the Padalarang district, they include internet media, YouTube, Canva application, Kinemaster, AI, PowerPoint, social media platforms (TikTok, Facebook, Instagram), video, Powtoon, Murotal, CapCut, Google Forms, Slidego, Google Forms, Examora, Zoom meetings, and WhatsApp Groups. The obstacles faced by madrasah teachers in the Padalarang district in using technology in learning include network signal/Internet quota, reluctance to learn, resistance to change, monotonous teaching methods, difficulty in finding interesting content, incomplete mastery of technology, and not all areas have good network signals whereas technology requires a place with signal. The methodology used in this research is a qualitative approach, and the data collection technique involved conducting interviews with madrasah teachers in the Padalarang district.
Artikel Info	Abstrak
	Tujuan penelitian ini adalah menganalisis penciptaan teknologi yang dilakukan guru dalam pembelajaran, model-model teknologi yang digunakan dalam pembelajaran, dan menganalisis kendala-kendala dalam menciptakan teknologi pembelajaran. Temuan penelitian yang diperoleh melalui wawancara menunjukkan bahwa para pendidik di kecamatan Padalarang berpandangan bahwa teknologi dalam pembelajaran abad 21 merupakan keniscayaan dan tidak dapat ditolak. Namun penciptaan teknologi dalam pembelajaran abad 21 ini belum optimal, karena sarana dan prasarana di setiap madrasah belum memadai sehingga belum merata, terutama pada madrasah swasta yang berada di daerah terpencil. Mengenai aplikasi yang digunakan oleh guru madrasah se-kecamatan Padalarang antara lain media internet, YouTube, aplikasi Canva, Kinemaster, AI, PowerPoint, platform media sosial (TikTok, Facebook, Instagram), video, Powtoon, Murotal, CapCut, Google Form, Slidego, Google Formulir, Examora, rapat Zoom, dan Grup WhatsApp. Kendala yang dihadapi guru madrasah di kabupaten Padalarang dalam memanfaatkan teknologi dalam pembelajaran antara lain sinyal jaringan/kuota internet, keengganan belajar, penolakan terhadap perubahan, metode pengajaran yang monoton, kesulitan menemukan konten yang menarik, penguasaan teknologi yang belum lengkap, dan tidak semua daerah memilikinya. sinyal jaringan yang bagus sedangkan teknologi membutuhkan tempat dengan sinyal. Metodologi yang digunakan dalam penelitian ini adalah pendekatan kualitatif, dan teknik pengumpulan datanya berupa wawancara dengan guru madrasah di wilayah Padalarang.

I. INTRODUCTION

Technology is an inevitable part of today's digital society. The utilization and innovation of technology continue to evolve rapidly in various aspects of modern human life. If education in the digital era neglects the use of technology, then what will be the fate of future generations who will live in a world different from the present? Therefore, creativity in educational technology is essential to support learning. Bambang Q. stated, "Let us use technology as a tool, not be controlled by technology." In other words, technology serves as a medium for delivering educational

information and teaching students through available technological means.

Entering the era of information and communication, the importance of improving the quality of education becomes evident. By using educational technology, we can enhance the quality of learning by providing broad access to information and facilitating quality training. Specifically, the application of advanced technology and high-touch approaches, such as information technology systems in education, offers excellent, fast, efficient, and effective options for disseminating information world-wide. Technology develops in parallel with learning theories. Multimedia learning, such as computer-based learning (CBL) and online learning (e-learning), are forms of technology implemented in today's education (Sudjarwo, 1984:12).

Educational technology is the study and practice of assisting the learning process and enhancing performance by creating, using, and managing adequate technological processes and resources. The term "educational technology" is often associated with learning and instructional theories. While learning and instructional theories encompass the processes and systems involved in learning and instruction, educational technology includes other systems used to develop human capabilities (AECT, 2006:6, cited in Munir, 2008:211).

The 21st-century skills globally encompass four categories: (a) Ways of thinking: creativity and innovation, critical thinking, problem-solving, decision-making, and learning to learn; (b) Ways of working: communication and collaboration; (c) Tools for working: general knowledge and information and communication technology (ICT) skills; (d) Ways of living: career, personal and social responsibility, including cultural awareness and competence (Binkley et al., 2018). These definitions of 21st-century skills relate to various disciplines and many aspects of life. These skills do not hold a specific position in the curriculum. Education in the 21st century involves skill development and understanding, but it also emphasizes creativity, collaboration, speaking skills, technology, behavior, moral values, and places a strong emphasis on critical thinking and communication skills, which present challenges in the process.

In addition to developing educational technology and supporting infrastructure, efforts to improve the quality of education can be realized through learning activities, such as utilizing educational technology. Educational technology is a system that can assist teachers and students in a more comprehensive, diverse, and complete learning experience. With the features provided by the system, students can learn independently anytime and anywhere, without limitations of space and time. The learning materials they engage with are more varied, including not only verbal representation but also various forms of text, images, audio, and animations. Therefore, the objective of this article is to analyze how to create educational technology and its application in learning in Padalarang Ibtidaiyah Madrasah.

Developing a 21st-century learning frame-work that demands students to possess skills, knowledge, and abilities in the fields of technology, media, and information, learning and innovation skills, as well as life and career skills. Critical thinking and problem-solving skills involve the ability to think critically, laterally, and systemically, especially in the context of problem-solving. Communication and collabora-tion skills focus on effective communication and collaboration with various stakeholders. Creativity and innovation skills involve developing creativity to produce innovative breakthroughs. Information and communications technology literacy encompasses utilizing information and communication technology to enhance performance and daily activities. Contextual learning skills involve engaging in contextual self-directed learning as part of personal development. Information and media literacy skills involve understanding and using various communication media to convey diverse ideas and engage in collaborative activities and interactions with various parties.

Teachers must be able to keep up with technological advancements in education and teaching methods by utilizing technology. Competence in mastering technology is a necessity for 21st-century educators. The creativity of teachers in utilizing platforms or their ability to create technology becomes an educational tool. The goal is for students to have 21st-century skills characterized by digital literacy.

21st-century skills are not only concepts that students should possess as educational products. They serve as a catalyst for educators to consistently position themselves as role models in terms of trust, openness, perseverance, and commitment to their students in facing the realities of the 21st-century digital life. Educators

are expected to be aware and transform traditional teaching approaches into more relevant digital approaches to meet students' needs. The transition process from traditional to digital methods varies depending on the educators and educational institutions' responses and adaptations.

II. METHOD

1. Approach and Research Method

Considering the characteristics of the problem addressed in this study, a qualitative research method is used, which focuses on the analysis of descriptive data in the form of written words that are observed. The qualitative approach is used to analyze the implementation and creation of technology in education. The research design employed is a qualitative study with a case study approach. Data collection is conducted through observation, interviews, and documentation. The data analysis technique follows the model by Miles and Huberman, which includes data collection, data reduction, data presentation, and drawing conclusions. In this study, the researcher will directly observe the creation and implementation of technology in education at the Islamic Elementary School (Madrasah Ibtidaiyah).

2. Type and Sources of Research

Data collection involves primary and secondary sources. In this study, primary data is obtained directly from the subjects (Islamic Elementary School, school principal, educators). The secondary data sources in this research include documents or literature related to the research problem, such as educational technology and the creation of educational technology.

3. Data Collection Techniques

Data collection techniques involve observation, interviews, and documentation. The focus of observation in this study is the creation and implementation of technology in education at the Islamic Elementary School. Data collection also involves interviews to obtain information and explanations regarding the creation and implementation of technology in education at the Madrasah Ibtidaiyah. Data analysis in this study utilizes qualitative descriptive analysis, which aims to describe and summarize various conditions, situations, or phenomena of reality as

characteristics, features, models, signs, or representations of specific conditions, situations, or phenomena. The data analysis follows the steps outlined by Miles and Huberman, which include (1) data collection, (2) data reduction, (3) data presentation, and (4) drawing conclusions.

III. RESULT AND DISCUSSION

1. Research findings and discussion

In this section, the researcher will present a general overview of the research findings, which are obtained from interviews and document studies. The research findings, including complete data obtained from empirical field observations, interviews, and documentation, will be presented in full detail in the data findings section. Based on the interviews conducted with the respondents, the following data were obtained:

Gambar 1. Overview of researchers' findings

Based on the structured interview results, educators' views on technology in 21st-century education in Padalarang district indicate that the presence of technology is inevitable and cannot be rejected. It is considered essential for progress and greatly aids in accessing teaching materials from the internet, YouTube, and other sources. Educators emphasize that technology is useful for creating engaging learning methods using easily accessible applications from the internet. It helps in finding learning resources for students' homework, but it requires parental and teacher supervision to ensure responsible and beneficial use.

According to other respondents, technology is crucial for teaching and learning activities to keep up with the times. It makes learning more appealing to students. However, it is acknowledged that

technology has both positive and negative aspects. While technology offers various educational tools for progress, it can be misused. Students today are more tech-savvy and attuned to technological advancements compared to their teachers.

Furthermore, some respondents state that the use of technology in 21st-century education is not yet optimal due to inadequate facilities and unequal distribution, particularly in remote private schools. Technology has a significant impact on student development in both positive and negative aspects. Regarding the second question about the use of technology, Madrasah teachers in Padalarang district mention that in the era of the 4.0 revolution, the learning process has changed and requires constantly updated technology. Teachers need to acquire skills to educate students effectively, ensuring they are well-informed and equipped with modern skills for the future. Some respondents express that technology is globally used, highly beneficial, convenient, and makes learning enjoyable for both teachers and students.

Conventional/traditional teaching methods are no longer relevant in the 21st century. Some Madrasah teachers in Padalarang only partially use technology, believing that traditional teaching methods can still be implemented in certain subjects. Some teachers do not extensively use technology, while others use it sparingly or have limited knowledge of its applications. Regarding the applications used by Madrasah teachers in Padalarang district, they include internet media, YouTube, applications like Canva, Kinemaster, AI, PowerPoint, social media platforms (TikTok, Facebook, Instagram), video tools, Powtoon, Murotal, CapCut, Google Forms, Slidego, Google Forms, Examora, Zoom Meetings, and WhatsApp groups. This indicates that some teachers are tech-savvy and utilize various social media platforms and applications for implementing technology in their teaching.

The challenges faced by Madrasah teachers in Padalarang when using technology in education include poor network signals or limited data plans, resistance to change from monotonous teaching methods, difficulty finding engaging content, insufficient mastery of technology, and inadequate signal coverage in certain areas. Some respondents also mention limited supporting devices, inadequate facilities, lack of knowledge and skills among teachers in utilizing technology. Additionally, there is a shortage of tools such as laptops and computers, and some teachers have not fully mastered or understood how to use technological devices.

The educators in Padalarang district have several expectations from institutions and stakeholders. They emphasize the need for continuous learning opportunities for older generation teachers by providing IT training. They also call for improving infrastructure and equipping every classroom to enable seamless implementation of technology in teaching. They desire the freedom to use technology in the learning process and suggest providing the necessary technological resources for each classroom. Furthermore, they stress the importance of enhancing teachers' knowledge and skills in using and leveraging technology for education.

2. Discussion

Based on the structured interview results, data obtained show that the views of educators in the Padalarang district regarding technology in 21st-century education reveal that the presence of technology should be accepted and cannot be rejected. They believe that technology is essential for progress and greatly assists in finding teaching materials that can be accessed from the internet, YouTube, and other sources. Educators state that technology is useful for creating engaging teaching methods using easily accessible applications from the internet. They also mention that technology is crucial for finding learning resources for students' homework, but it requires parental and teacher guidance to ensure responsible use and to prevent misuse of technology for less beneficial purposes.

As stated by Bambang Qomaruzaman, technology should be used as a tool, and we should not be enslaved by technology. Similarly, Salisbury states that technology is the systematic application of scientific knowledge to solve practical tasks

(Salisbury, 2007:2). Technology is not limited to physical tools and machines; virtual technology, such as software and business methods, are also included in this definition. Technology can also be seen as activities that shape or transform culture. Additionally, technology involves the application of mathematics, science, and various arts for the benefit of life, as seen in today's world. A modern example is the emergence of communication technology, which reduces barriers to human interaction and has given rise to new subcultures, such as the cyber culture based on internet and computer developments (Fachmi, Eri Hadiana: 2021, Jurnal Naratas Vol. 01 No. 01: 2021). Another respondent states that technology is highly necessary for teaching and learning activities to keep up with the times. However, it is acknowledged that technology has both positive and negative aspects. As Rosenberg (2001:8) suggests, the use of ICT in learning processes has brought about shifts: from the classroom to anywhere and anytime, from paper-based to online or digital channels, from physical facilities to networked facilities. The most recent development is the emergence of "cyber teaching" or online teaching, which involves learning processes conducted using the internet. Another popular term nowadays is e-learning, which is a learning model that utilizes Information and Communication Technology, particularly the internet.

According to Sudibyo (2011:182), the negative impacts of technology include: a) e-learning leading to the displacement of teachers and the creation of individuals with individualistic tendencies due to learning being carried out individually, b) students accessing the internet for purposes other than utilizing information technology optimally, such as accessing inappropriate content like pornography or online games, which can result in cyber-relational addiction, c) students experiencing information overload, d) students becoming excessively dependent on the virtual world, e) an increase in cybercrime, and f) the development of apathy among individuals, both students and educators, which can be observed in virtual or e-learning systems where there is no face-to-face interaction between learners and educators, resulting in students being less active and achieving suboptimal results (Asmani, 2011:149).

Regarding the use of technology, Madrasah teachers in the Padalarang district mention that in the era of Industry 4.0, the learning process has become different and requires constantly updated technology. Teachers are expected to acquire the necessary skills to educate effectively, and there is a need for updates to ensure that students are not left behind in terms of information and skills required for the modern era. Traditional teaching methods are no longer relevant in the 21st century. Some Madrasah teachers in Padalarang only use technology sparingly or partially, as they believe that traditional teaching methods can still be implemented in certain subjects. Some teachers do not extensively use technology, while others use it very minimally.

Regarding the applications used by Madrasah teachers in Padalarang district, they include internet media, YouTube, applications such as Canva, Kinemaster, AI, PowerPoint, social media platforms (TikTok, Facebook, Instagram), video tools, Powtoon, Murotal, CapCut, Google Forms, Slidego, Google Forms, Examora, Zoom Meetings, and WhatsApp groups. Based on these results, it can be inferred that some teachers are technologically literate and utilize various social media platforms and applications for implementing technology in their teaching. However, Madrasah teachers in Padalarang district face several challenges in using technology in education. These challenges include poor network signals or limited data plans, resistance to change from monotonous teaching methods, difficulty finding engaging content, insufficient mastery of technology, limited signal coverage in certain areas, limited supporting devices, inadequate facilities, lack of knowledge and skills among teachers in utilizing technology, a shortage of devices such as laptops or computers, and a lack of understanding of how to use technological tools.

Educators in Padalarang district have several expectations from institutions and stakeholders. They emphasize the need for continuous learning opportunities for older

generation teachers (Gen X and Gen Y/Old). They call for IT training for teachers who are not yet tech-savvy, ensuring that each classroom is equipped with the necessary facilities and infrastructure for implementing IT-based teaching whenever necessary. They also desire freedom in using technology in teaching and learning and the provision of necessary technological resources for each learning session. They suggest improving and expanding facilities that support technology-based learning in every classroom and enhancing teachers' knowledge and skills in using and leveraging technology.

In connection with the above, Adibyo states that the positive impact of technology includes the emergence of new teaching methods that facilitate students and teachers in the learning process. Technological advancements have given rise to new methods that allow students to understand abstract subjects more easily, as technology can make abstract concepts more tangible and comprehensible. The learning process is no longer limited to face-to-face interaction. Previously, learning processes relied solely on direct face-to-face communication, but with technological advancements, learning can also take place through internet-based services and other means. Data processing for assessment results has become more efficient with the use of technology. In the past, data analysis and calculations were done manually, but with the development of technology, these tasks can be accomplished quickly using computer-based tools and programs.

IV. CONCLUSION AND SUGGESTION
A. Conclusion

Based on the results of research that educators in the district of Padalarang, provide a range of diverse views regarding the use of technology in 21st century learning. In general, they realize that technology is inevitable and is very helpful in finding learning resources that are accessible through the internet, YouTube, and a variety of other applications. Teachers recognize that technology can be used as a tool to create interesting and interactive learning methods by leveraging available applications. However, the use of technology also has positive and

negative sides. Some of the barriers faced by teachers in implementing technology in learning include networking and quota problems, resistance to changing monotonous learning methods, difficulty finding interesting content, limitations in teachers' knowledge and skills, as well as the limitations of devices and facilities.

Educators should be able to enhance their competence in the field of technology, so that they can balance the digital generation in their learning. The use of technology in learning has a positive impact, such as the emergence of new learning methods that facilitate students and teachers in the understanding of the material, flexibility in the learning process, more efficient processing of data results of assessments, and the fulfillment of the needs of faster educational facilities. Teachers need to be technologically skilled.

B. Suggestion

The discussion regarding this research is still very limited and requires a lot of input. The suggestion for future authors is to study it more deeply and comprehensively about Implementation of Creating Technology in 21st Century Learning.

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