Teacher Adaptation in the Digital Era: Addressing Challenges and Opportunities in Cyber Pedagogy

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Abstract

This research aims to identify the issues faced by teachers when utilizing educational technology and to explore the existing opportunities to enhance online learning experiences. The study centers on the Cyber Pedagogy approach. The research method involves a survey of educators across various educational levels and in-depth interviews with respondents who possess significant experience in the use of technology for teaching. The research findings indicate that teachers tend to have a positive perception of the digital learning environment and the concept of Cyber Pedagogy. However, they encounter several challenges in adopting educational technology, such as limitations in their technological abilities, difficulties in motivating students, and a lack of technological facilities. To overcome these constraints, teachers engage in collaboration with peers, learn from external sources to enhance their technological skills, and employ a personalized approach in designing their teaching methods.

Keywords: *Teacher adaptation, Digital Era Cyber Pedagogy*

Abstrak

Penelitian ini bertujuan untuk mengidentifikasi masalah yang dihadapi oleh guru saat menggunakan teknologi pendidikan dan mengeksplorasi peluang yang ada untuk meningkatkan pengalaman belajar online. Penelitian ini berfokus pada pendekatan Cyber Pedagogy. Metode penelitian ini melibatkan survei terhadap guru dari berbagai jenjang pendidikan dan wawancara mendalam dengan responden yang memiliki pengalaman yang signifikan dalam penggunaan teknologi dalam pembelajaran. Hasil penelitian menunjukkan bahwa guru cenderung memiliki persepsi yang positif tentang lingkungan pembelajaran digital dan gagasan Cyber Pedagogy. Namun, mereka menghadapi beberapa

masalah dalam mengadopsi teknologi pendidikan, seperti keterbatasan kemampuan mereka, kesulitan untuk memotivasi siswa, dan kurangnya fasilitas teknologi. Untuk mengatasi kendala ini, guru melakukan kolaborasi dengan teman sejawat, belajar dengan sumber eksternal untuk meningkatkan kemampuan teknologi, dan menggunakan pendekatan personalisasi dalam meracang pembelajaran

Kata Kunci: Adaptasi guru, Era digital, Pedagogi Cyber

A. Introduction

The digital age makes it easy to access information and communicate with others. This convenience makes all work more practical, increasing human efficiency and productivity. In the world of education, the digital era provides easy access in finding and developing materials to learning models (Rahayu et al., 2022). Distance learning, which was once considered impossible, is now a superior alternative, especially during the Covid 19 pandemic, and is currently still being used and developed into hybrid learning. In addition to learning models, the digital era has also changed the education management system, from manual to all-digital (Gumelar & Dinnur, 2020). Digitalization is a demand for both schools and teachers with the aim of providing educational services that are not outdated and able to compete with other schools. In addition, the government considers that the digitalization transformation of education is a way to improve quality and achieve educational goals.

The digitalization transformation of education provides hope and a bright picture for education in Indonesia, but on the other hand it is also a tremendous pressure for schools, especially managers and teachers. Schools need to develop their education system management, ensure adequate technology infrastructure, and ensure that their human resources (teachers and staff) have the ability to use the technology that has been provided(Tugiah & Jamilus, 2022). On the other hand, teachers are required to be able to integrate technology in the learning process including evaluation and reporting. Judging from the implementation in the field, it shows that there are problems that arise and become obstacles in digitizing education. Problems that arise include inadequate infrastructure, lack of digital skills, poverty, and cultural barriers (Wulandari et al., 2021) . There are many schools that do not have adequate technological infrastructure, especially in villages and remote areas, and poverty makes learning facilities even more unequal. The quality of teachers, especially in digital mastery, is still lacking. The Ministry of Education and Culture says that 60% of teachers in Indonesia still have limited mastery of information and communication technology. Another barrier is cultural, as traditional teaching methods may not be compatible with digital tools and platforms (Makdori Yopi, 2021).

Several studies have been conducted related to the theme of digitization of education. Some of the themes raised are the urgency of digitizing education, the benefits of digitizing education, and case studies of the implementation of digitizing education. The urgency of digitizing education is to increase knowledge needs, improve the quality of education, and equip students with 21st century skills (Haris, 2023; Isma et al., 2022). The digitization of education is widely used to develop learning models and systems, learning resources, and learning media (., 2021; Anis & Mardiani, 2022; Sardiana & Moekti, 2022; Trisiana, 2020) Digitalization of education has been carried out at every level of education from early childhood, primary and secondary education to higher education (Anita & Astuti, 2022; Ishaac, 2021; Iskandar et al., 2022; Lalay & Long, 2022; Maadi, 2018). Studies on the obstacles experienced, especially by educators, are still not widely done, including the efforts made to overcome these obstacles. Thus, this article aims to find out the challenges and efforts made by educators in facing the digitalization of education. The formulation of the problem proposed in this article is about teachers' perceptions of digital learning, what challenges are faced in digital learning, and efforts to overcome problems in digital learning. By knowing the perceptions, challenges, and efforts that have been made, it will make it easier to take policies and solutions that will be taken by the leaders of educational institutions.

B. Methods

This research uses a qualitative approach, the object studied in this research is digital learning conducted by teachers at the primary and secondary education levels. There are 32 respondents in this study. Data collection techniques used a combination of in-depth interviews and surveys with closed-ended and open-ended question models. The survey is directed at teachers from different levels of education to collect data on their teaching approaches in a digital environment. In-depth interviews will be conducted with teachers who have successful experiences in integrating technology in learning. Data analysis uses Creswell's qualitative data analysis, the steps are as follows; 1) Organizing data, 2) Reading and looking at all the data, 3) Making coding, 4) Using coding as material for making descriptions, 5) Connecting between themes, 6) Providing interpretation and meaning about themes (Sugiyono, 2018)

C. Results

1. The Perception Of Teachers Towards The Digital Learning Environment

The concept of Cyber Pedagogy refers to an approach to learning that focuses on using technology and the digital environment to improve the quality and effectiveness of the educational process. It includes ways in which information and communication technology (ICT) is integrated into teaching and learning to achieve better educational goals. Teachers' understanding of Cyber Pedagogy is quite good, this can be seen from the development of teaching that is done, which focuses on technology. The selection of learning methods that fit the learning objectives and context is an important step to ensure digital learning works well. Teachers also show readiness to adjust learning strategies to meet the unique potential of each student. They recognize that technology can enrich learning by providing immersive benefits, increasing the attractiveness of learning, helping students acquire technology skills, and opening up new opportunities for effective learning. They also realize that providing meaningful learning experiences is an important part of teachers' efforts to make learning relevant and significant for their students in the digital era.

Digital learning environments are transforming teacher-student interactions. Digital learning has tremendous potential in facilitating interaction between teachers and students. With technology that can remove time and space barriers, it can expand accessibility and flexibility of interaction, and improve communication between teachers and students. A survey of teachers regarding the use of technology in learning showed a positive response, with the majority of teachers agreeing that digital learning environments help improve interactions between teachers and students. In addition, the use of technology in learning also helps students get more learning experiences.
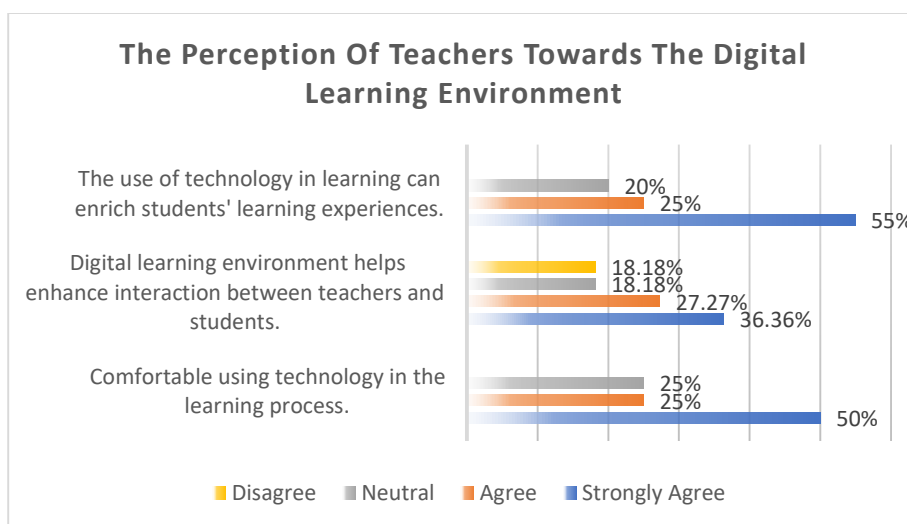
However, many teachers need to raise awareness of the benefits of digital learning. Although it offers positive potential, its success depends on the extent to
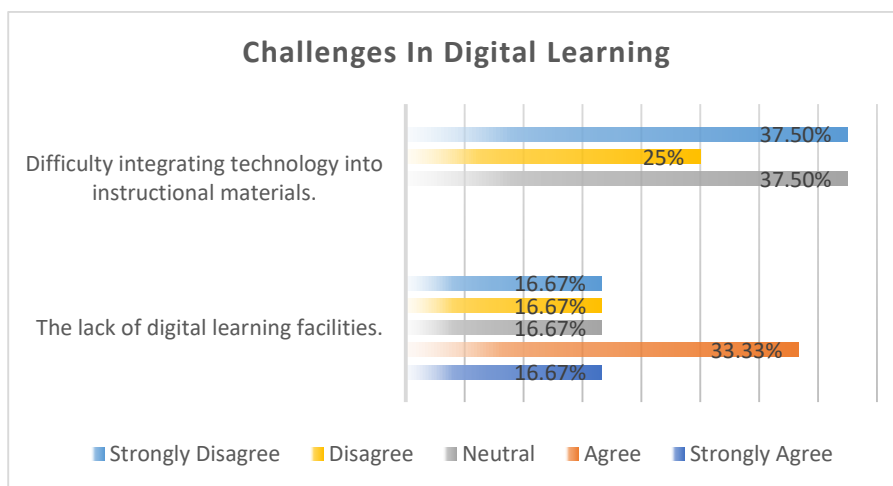
which teachers and students understand the value offered by digital learning. Given this condition, there is a need for adequate education on the potential advantages of technology in the context of learning. In addition to understanding, another thing that is equally important is good collaboration between teachers and students in the use and interaction of learning through digital learning platforms. The implementation of digital learning requires the application of cooperative methods, where students actively participate in the learning process and teachers act as knowledge facilitators. This active engagement can lead to deeper conversations, stronger exchange of ideas and broader understanding.

Many teachers are still comfortable with traditional learning rather than using digital learning, often associated with the concern that important values will be lost during the online learning process. This is a complicated and understandable perspective as values are often associated with the human interaction that exists in face-to-face teaching. It is important to understand that digital learning is not a replacement, but an additional tool for learning strategies. Values do not have to be lost despite different interactions. Instead, with the right approach, they can remain in a digital learning environment. One method of using digital learning platforms to facilitate social interaction is through group discussions, online forums, or direct question and answer between teachers and students. In addition, technologies such as video conferencing allow students and educators to interact with each other in real-time, which is an important part of personal relationships in learning. Teachers were of the view that the use of technology as part of the digital learning environment in schools can provide a more diverse learning experience. Some teachers highlighted that technology allows students to interact with various sources of knowledge and information, which makes the learning process more in-depth and informed. In addition, technology allows students to better understand the development of the world, which makes wider access to information easier. All teachers agree that, although there are several ways, the use of technology in education can help students learn better. Thus, this perspective recognizes the importance of technology as a tool that can help students develop a well-rounded understanding, ability and knowledge.

2. Challenges In Digital Learning

Adaptation brings its own challenges and barriers, and digital learning is no exception. Half of the respondents who indicated a combination of "Strongly Agree" and "Agree" stated that digital learning facilities are a significant issue. They believe that there is a lack of facilities that support digital learning. Meanwhile, 33.33% of respondents felt neutral towards this statement, which may indicate that they do not yet
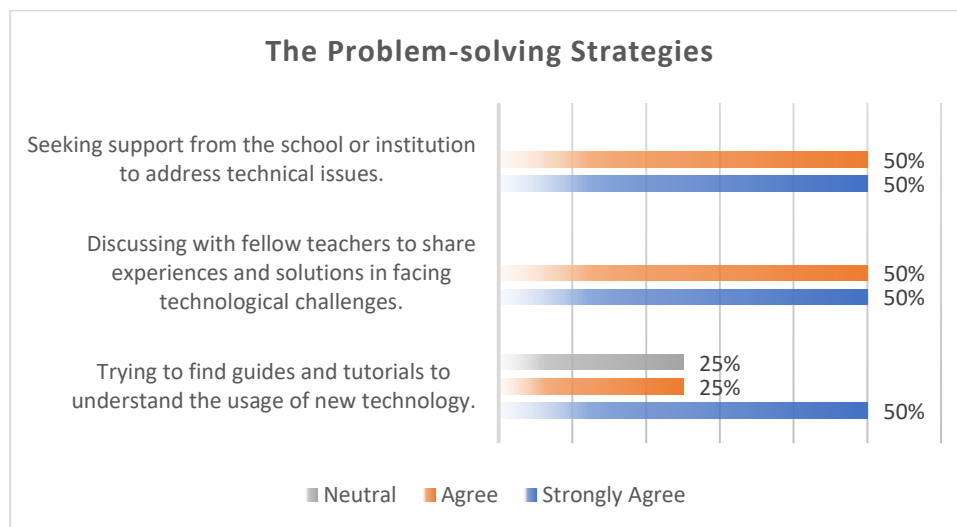
have a strong view on the presence or absence of digital learning facilities. Although 33.33% of respondents who said "disagree" or "strongly disagree", this number is not dominant, and there is still room for improvement and enhancement of digital learning facilities. In addition, on the aspect of integrating technology in learning materials, 37.5% of the respondents agreed that they face difficulties in integrating technology into learning materials, which indicates that most respondents face difficulties in adopting and integrating technology into their teaching methods. 25% of the respondents showed a neutral attitude, which could indicate that they have mixed experiences regarding technology integration. In addition, 37.5% of the respondents disagreed, which could indicate that they are comfortable with the integration of technology and learning and consider it not a problem.

Challenges In Digital Learning

Difficulty integrating technology into instructional materials.
- Strongly Disagree: 37.50%
- Disagree: 25%
- Neutral: 37.50%

The lack of digital learning facilities.
- Strongly Disagree: 16.67%
- Disagree: 16.67%
- Neutral: 16.67%
- Agree: 33.33%
- Strongly Agree: 16.67%

Legend: Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

Another challenge that teachers face when implementing digital learning is the limitations of teachers in managing digital technology including technical mastery and use of devices, to student learning motivation. Not a few teachers face difficulties in using learning technology. In addition, to participate effectively in technology-based learning, not only teachers, but also students must understand digital technology. Another challenge is understanding the technical aspects and using the devices. To achieve learning objectives, teachers and students must have technical expertise in the use of technology. From the students' side, teachers also need to motivate students to participate and be actively involved in learning. This is because the difficulties faced by teachers are also faced by students. Not all students have skills in using digital media. Support and training for both teachers and students are needed to help them cope with the changing digital environment.

3. The Problem-solving Strategies

There are many innovative and adaptive ways to address technology issues in teaching. The survey results show that respondents responded positively to three statements. 50% of respondents strongly agreed with the statement "Try to find guides and tutorials to understand the use of new technology", while 25% agreed. This shows that the majority of people who responded probably actively seek additional information on the use of new technologies. This shows their efforts to overcome technological obstacles by learning on their own. Furthermore, 50% of respondents strongly agreed with the aspect of "Discussing with fellow teachers to share experiences and solutions in dealing with technological constraints", and 50% agreed. This result shows that working together and sharing experiences with fellow teachers is considered important when facing technological challenges. This shows how useful it is to exchange ideas and find solutions to improve the ability to overcome technological problems. Finally, 50% of respondents agreed with the question "Seek support from the school or institution in overcoming technical problems", which shows that many respondents expect support from the school or institution when they face technical problems. This shows how important it is to have adequate infrastructure and technical assistance to support technology in learning.

The Problem-solving Strategies

Seeking support from the school or institution to address technical issues. — 50% (Agree), 50% (Strongly Agree)

Discussing with fellow teachers to share experiences and solutions in facing technological challenges. — 50% (Agree), 50% (Strongly Agree)

Trying to find guides and tutorials to understand the usage of new technology. — 25% (Neutral), 25% (Agree), 50% (Strongly Agree)

■ Neutral ■ Agree ■ Strongly Agree

There are many efforts made to adjust to online learning. One is to thoroughly analyze the problems encountered and actively seek solutions from various sources. This includes attending trainings, discussing with more advanced peers, and self-study through online resources. Proactive actions such as these demonstrate a commitment to overcoming challenges and embracing the digital learning environment. Individuals can demonstrate their commitment to the digital world by discovering problems, seeking

help from more experienced colleagues, attending training and self-learning through online platforms. Overall, the efforts demonstrate different types of adaptability, initiative and creativity in overcoming technological learning challenges. Whether it is by solving problems independently, collaborating with others, or even learning new skills, the desire to learn continues to increase despite the challenges.

D. Discussion

Teachers' views on the use of technology in digital learning environments reflect the principles of constructivism theory and technology-based learning approaches in education. In the context of constructivism, the use of technology enables students to actively construct their own knowledge by interacting with various sources of information and digital resources, deepen their understanding, and integrate it into personal understanding. In addition, technology-based learning approaches emphasize the use of technology to enhance the learning experience, enable project-based and collaborative learning, and bring wider access to information (Syamsuar & Reflianto, 2019). Thus, teachers' views recognize the important role of technology as a tool that supports students in developing their understanding, abilities and knowledge deeply and thoroughly through active interaction with digital learning environments.

Resource gaps in hardware accessibility and internet connectivity can impact on gaps in student motivation in digital learning. Students who are underprivileged and have limited access to digital technologies may face significant barriers to online learning, such as difficulty accessing devices or unstable connections. This can reduce their confidence in their ability to succeed in a digital learning context, creating low expectations of the learning experience (Tetep & Arista, 2022). This inequality of accessibility may also reduce the value students place on digital learning as they feel they cannot take maximum advantage of the resources. As a result, such students may be less motivated to actively participate in digital learning and may tend to be inactive or even absent in online learning sessions. Thus, resource gaps and student motivation gaps are interrelated and may impact on uneven academic achievement (Andriani & Rasto, 2019). Efforts to address the technology accessibility gap need to be integrated with approaches that consider students' expectations and values, and design digital learning experiences that are more inclusive and relevant to students' lives, which can then increase their motivation to actively participate in digital learning.

Teachers and students need to have digital competencies that include technological understanding, technical skills, and critical and ethical abilities in the use of technology (Syahid et al., 2022). Gaps in teachers' digital competencies can be caused by a lack of training and professional development in the use of technology in

education, resulting in a lack of utilization of the full potential of technology in teaching. Acceptance and use of technology in an educational context is influenced by individual perceptions of the usefulness and ease of use of the technology (Park & Park, 2020). Gaps in teachers' and students' understanding and use of technology can reduce perceptions of usefulness and ease of use, so they may tend to be resistant to the use of technology in learning. The impact of these two gaps is the lack of effectiveness in the use of technology in the learning process. Teachers who lack technical skills and understanding of technology may have difficulties in designing adequate learning experiences and integrating digital resources well. Students may also find it difficult to understand and use digital resources provided by teachers.

The efforts made to adjust to online learning reflect the principles of self-directed learning which emphasize the importance of individual initiative in leading their own learning process. Efforts to analyze problems, seek solutions, attend training, and learn independently through online resources are steps that reflect self-learning initiatives. In addition, teachers also showed that they have an intrinsic drive to learn and improve, which is reflected in efforts to overcome technological learning challenges and continue learning new skills. In this case, the desire to learn and adapt to technological change illustrates strong internal motivation (Bamberg & Verkuyten, 2022). All of these illustrate a commitment to face the digital learning environment with creativity, initiative and adaptability, which corresponds to the principles of self-directed learning and self-motivation.

Overall, teachers' views on the use of technology in education, gaps in access to digital resources, and challenges and efforts in adjusting to online learning reflect the complexities of dealing with the changing digital environment. However, through a commitment to improving digital competencies, mobilizing self-directed learning initiatives and nurturing intrinsic motivation, teachers can create a more inclusive and effective learning environment. By doing so, education is able to provide more equitable and diverse opportunities for all students to develop their understanding, skills and knowledge in the digital age.

E. Conclusion

In the context of using technology in digital learning, teachers' views reflect the principles of constructivism theory and technology-based learning approaches, which recognize the important role of technology as a tool that supports students in developing their understanding, abilities and knowledge in depth and diversity. However, there are gaps in access to digital resources that may affect students' motivation in digital learning, especially for underprivileged students. These gaps create challenges in

achieving equity in educational opportunities. In addition, gaps in teachers' and students' digital competencies may hinder the effective use of technology in learning. Efforts to overcome these challenges reflect the importance of self-directed learning initiatives and internal motivation in dealing with the changing digital environment. Thus, to create an inclusive and effective learning environment, there needs to be collaborative efforts to address accessibility gaps, improve digital competencies and nurture motivation in digital learning.

References

. R. (2021). PEMANFAATAN DIGITALISASI DALAM PENDIDIKAN ISLAM DI MASA PEMBELAJARAN JARAK JAUH (PJJ). Jurnal PROGRESS: Wahana Kreativitas Dan Intelektualitas. https://doi.org/10.31942/pgrs.v9i1.4514

Andriani, R., & Rasto, R. (2019). Motivasi belajar sebagai determinan hasil belajar siswa. Jurnal Pendidikan Manajemen Perkantoran. https://doi.org/10.17509/jpm.v4i1.14958

Anis, A. M. Z., & Mardiani, F. (2022). Digitalisasi sumber belajar sejarah menyongsong pendidikan era 4.0. Prosiding Seminar Nasional Lingkungan Lahan Basah .

Anita, A., & Astuti, S. I. (2022). DIGITALISASI DAN KETIMPANGAN PENDIDIKAN: STUDI KASUS TERHADAP GURU SEKOLAH DASAR DI KECAMATAN BARAKA. Jurnal Pendidikan Dan Kebudayaan. https://doi.org/10.24832/jpnk.v7i1.2509

Bamberg, K., & Verkuyten, M. (2022). Internal and external motivation to respond without prejudice: a person-centered approach. Journal of Social Psychology. https://doi.org/10.1080/00224545.2021.1917498

Gumelar, D. R., & Dinnur, S. S. (2020). DIGITALISASI PENDIDIKAN HUKUM DAN PROSPEKNYA PASCA PANDEMI COVID-19. Al-Ahwal Al-Syakhsiyyah: Jurnal Hukum Keluarga Dan Peradilan Islam. https://doi.org/10.15575/as.v1i2.9909

Haris, M. A. (2023). Urgensi Digitalisasi Pendidikan Pesantren di Era Society 5.0 (Peluang dan Tantangannya di Pondok Pesantren Al-Amin Indramayu). Islamic Management: Jurnal Manajemen Pendidikan Islam.

Ishaac, M. (2021). Digitalisasi Pendidikan Luar Biasa di Masa Pandemi Covid-19: Studi Kasus SLB Negeri 1 Palangka Raya. Muàṣarah: Jurnal Kajian Islam Kontemporer. https://doi.org/10.18592/msr.v3i2.6279

Iskandar, Y., Setiana, S., Darmayanti, D., Candra Destiyanti, I., Iman, I., & Nuryati, N. (2022). Digitalisasi Pendidikan di Pendidikan Anak Usia Dini. Journal of Innovation and Sustainable Empowerment. https://doi.org/10.25134/jise.v1i1.6

Isma, C. N., Rina Rahmi, & Hanifuddin Jamin. (2022). URGENSI DIGITALISASI PENDIDIKAN SEKOLAH. AT-TA'DIB: JURNAL ILMIAH PRODI PENDIDIKAN AGAMA ISLAM. https://doi.org/10.47498/tadib.v14i2.1317

Lalay, M. O., & Long, M. L. (2022). Perkembangan Pedagogi Berbasis Teknologi: Suatu Kajian model pembelajaran abad-21 di daerah 3T di Masa Pandemi Covid 19. Yupa: Historical Studies Journal. https://doi.org/10.30872/yupa.v5i2.783

Maadi, A. S. (2018). Digitalisasi Manajemen Pendidikan Islam dan Ekonomi Syariah di Perguruan Tinggi. FIKROTUNA. https://doi.org/10.32806/jf.v7i1.3185

Makdori Yopi. (2021). Kemendikbud Sebut 60 Persen Guru Masih Terbatas Menguasai Teknologi Informas. Liputan6.Com.

Park, E. S., & Park, M. S. (2020). Factors of the technology acceptance model for construction IT. Applied Sciences (Switzerland). https://doi.org/10.3390/app10228299

Rahayu, R., Iskandar, S., & Abidin, Y. (2022). Inovasi Pembelajaran Abad 21 dan Penerapannya di Indonesia. Jurnal Basicedu. https://doi.org/10.31004/basicedu.v6i2.2082

Sardiana, A., & Moekti, A. S. (2022). PERAN DIGITALISASI PENDIDIKAN TERHADAP PROSES PEMBELAJARAN SISWA DI MASA PANDEMI COVID-19. DEVOSI. https://doi.org/10.33558/devosi.v3i2.4581

Sugiyono. (2018). Mertode Penelitian Evaluasi. Alfabeta.

Syahid, A. A., Hernawan, A. H., & Dewi, L. (2022). Analisis Kompetensi Digital Guru Sekolah Dasar. Jurnal Basicedu. https://doi.org/10.31004/basicedu.v6i3.2909

Syamsuar, S., & Reflianto, R. (2019). PENDIDIKAN DAN TANTANGAN PEMBELAJARAN BERBASIS TEKNOLOGI INFORMASI DI ERA REVOLUSI INDUSTRI 4.0. E-Tech : Jurnal Ilmiah Teknologi Pendidikan. https://doi.org/10.24036/et.v2i2.101343

Tetep, T., & Arista, Y. (2022). Students' Perception towards Kahoot Learning Media and Its Influence towards Students' Motivation in Learning Social Studies and Civic Education amid Pandemic in SMKN 9 Garut. The Innovation of Social Studies Journal. https://doi.org/10.20527/iis.v4i1.5537

Trisiana, A. (2020). PENGUATAN PEMBELAJARAN PENDIDIKAN KEWARGANEGARAAN MELALUI DIGITALISASI MEDIA PEMBELAJARAN. Jurnal Pendidikan Kewarganegaraan. https://doi.org/10.20527/kewarganegaraan.v10i2.9304

Tugiah, T., & Jamilus, J. (2022). Pengembangan Pendidik sebagai Sumber Daya Manusia Untuk Mempersiakan Generasi Milenial Menghadapi Era Digital. Jurnal Sosial Teknologi. https://doi.org/10.36418/jurnalsostech.v2i6.350

Wulandari, R., Santoso, S., & Ardianti, S. D. (2021). Tantangan Digitalisasi Pendidikan

bagi Orang Tua dan Anak Di Tengah Pandemi Covid-19 di Desa Bendanpete. EDUKATIF : JURNAL ILMU PENDIDIKAN. https://doi.org/10.31004/edukatif.v3i6.1312