Analysis of Teacher Competence Using ICT in Learning After Pembatik (Pembelajaran Berbasis TIK) Program Implementation

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Abstract. The aim of this study is to search the impact of the PembaTIK Program on the competence of teachers in the use of ICTs in learning after the implementation of the ICT-based Learning Program (PembaTik). The PembaTIK Program, which is run by the Badan Layanan Teknologi (BLPT) Ministry of Education, Culture, Research and Technology, aims to improve teacher competence in using ICT in learning. The research method used is a case study approach with research subjects consisting of 10 teachers who have completed the PembaTIK Program to level 3 and are passing level 4 by 2023 in the northern Sumatera province. Data is collected through interviews and analyzed using a thematic approach. The result of the research was that the PembaTIK Program improved the competence of teachers in the use of ICTs in learning. The improvement in the teacher's competence after following is that teachers have improved the skills of the tick in teaching. It can be seen from how teachers prepare to plan innovative and creative learning with the help of ICT. It is in the teaching that PembaTik can increase the learning interest of pupils; PembaTik also help teachers do good practice and share knowledge with teachers' peers and the teacher community by becoming a source, besides acting as a program that helps teachers continue learning and improve teacher competence. proves that all teachers who become sources continue to follow a PembaTik program every year because it can motivate teachers into learning and sharing good practices with other teachers.

Keywords: Teacher Competence, PembaTik Program, ICT, Learning

INTRODUCTION

Education in Indonesia today has long faced a worrying crisis. Data from the Programme for International Student Assessment (PISA) show that many students in Indonesia have difficulty understanding simple reading and applying basic concepts of mathematics. Over the past two decades, the international PISA tests that measure literacy, numeration, and science skills have shown stagnation in student achievement, even with 70% of 15-year-olds being below minimum reading and mathematical competence. With the COVID-19 pandemic, the educational crisis has been exacerbated by learning losses and growing learning gaps. Faced with these challenges, the Indonesian government has provided support through curriculum adjustments and improved technology adaptation, especially in the context of distance learning. (Mualana et al., 2023)The continued efforts of the government through the Ministry of Education, Culture, Research, and Technology introduced the Free Learning Policy, which refers to the inspiring idea of Ki Hajar Dewantara, affirming that the essence of education is the achievement of independence. It aims to free students and teachers to think and create, giving them the freedom to pursue their knowledge and self-development with a creative and unhindered spirit (Mualana et al., 2023). In the 21st century, it is becoming crucial for teachers to better understand how to use information and communication technology (ICT). The policy that integrates ICT subjects into all topics, especially in the 2013 curriculum and the Merdeka Curriculum, is increasingly emphasising that all teachers are not just skilled ICT teachers (Herliani & Wahyudin, 2019).

In accordance with this statement, (Permendiknas No.16 Tahun 2007) on the Standards of Academic Qualifications and the Competence of Teachers and Lecturers, which is updated mainly for the benefit of learning (pedagogical competence) and communicating and developing themselves (professional competence), teachers must have high competence in using technology, especially in the use of technology platforms in the context of education. It aims to ensure that

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383

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

teachers are able to maximise the facilitation of learning in the school environment. The ability to use information and communication technology (ICT) should be an integrated part of the learning process, with the hope of creating more proactive and self-reliant students in their educational journey.

In order to encourage teacher innovation in the use of technology in the learning process, the Technology Platform Service Room (BLPT), a Technical Implementing Unit (UPT) under the Data and Information Technology Centre (Pusdatin) of the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), has an important role in organising the ICT-based Learning Programme (PembaTIK).

The importance of improving teacher competence in the use of ICTs has become an urgent need for a professional teacher in the 21st century. The increased skills of ICT teachers enable more effective learning. Skilled teachers using technology can make classes more interactive and adaptive. This improves students' understanding and academic achievement (Ekantiningsih & Sukirman, 2023).

The rapid advances in digital technology marked the digital era of the twenty-first century. ICT advances also enable more people to get high-quality education. Distance learning is becoming more common, especially during pandemics. Even in difficult situations, teachers who are skilled in technology can ensure that education remains affordable. Teachers who master ICT show a high level of professionalism. They show their commitment to learning and growing to meet the demands of the ever-changing information age (Raja & Nagasubramani, 2018).

According to previous research by (Bagou & Suking, 2021) The use of information and communication technology by teachers for self-development was achieved at a percentage rate of 86.07%, which is well.

However, in reality, as reported in the news by Coverage 6 and Merdeka.Com, the Ministry of Education and Culture (Kemendikbud) revealed that 60 percent of teachers in Indonesia still have limitations in mastering information and Communication Technology (ICT).

The trigger programmeme has been running for seven years, starting in 2017, but so far, no research has specifically explored the impact of the programmeme on teachers as participants. To fill this research gap, researchers are keen to undertake an in-depth investigation into the impact felt by teachers who are following the 2023 This will provide a clearer and more tangible picture of the effectiveness of the programmeme as well as how the teacher's ICT competence develops as they participate in the ram. With a deeper understanding of the impact of this programme on the improvement of teacher ICT competence, stakeholders, especially the Ministry of Education and teachers themselves, will have a strong foundation for taking better policies in order to enhance teacher teaching capabilities. Thus, this research is expected to make a positive contribution to advancing education in Indonesia by strengthening the role and competence of teachers in the use of information and communication technology (ICT).

METHOD

The research method applied in this research is a case study approach, a research framework used to provide a thorough and detailed understanding of the situation of the subject of research. This approach is consistent with (Priya, 2021) view that emphasises that case studies are perfectly suited to answering the "how" question, as such questions require in-depth data exploration. In the context of this research, the main focus is to analyse how the ICT-based learning programme affects teacher competence in the use of Information and Communication Technology (ICT) in the implementation of the learning process. The research subjects consist of 10 teachers who have completed the PembaTIK programme to level 4 by 2023. The data, the interview method, is used as the primary tool, which allows researchers to get direct insights from teachers. Next, data analysis is done with a thematic approach. In thematic analysis, emphasis is placed on the code-making process that refers to the research questions that have been previously defined. The result of this analysis is the preparation of themes that correspond to the research question, which are then used as a reference framework to explain the phenomena observed in the research (Heriyanto, 2018). Case study approaches and thematic analysis methods are used

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Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

384

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

to dig deeper into the impact of the PembaTIK Programme on teacher competence in the use of ICT in learning. A more detailed view of the study can be seen in Figure 1 below.
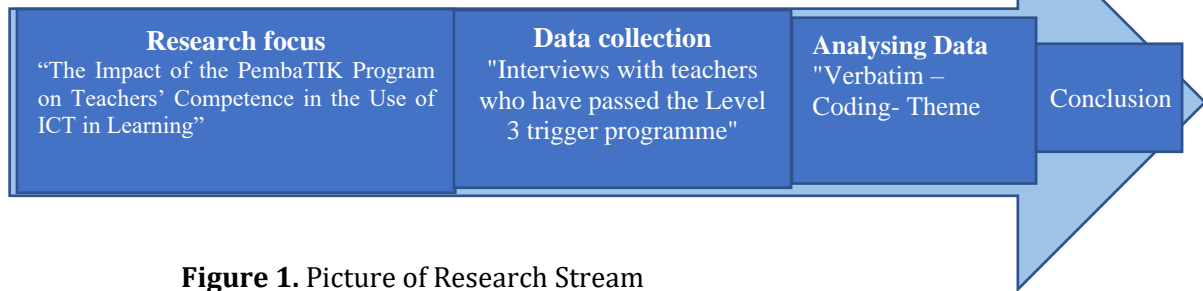

Figure 1. Picture of Research Stream

RESULTS

In general the use of technology, especially through the trigger programme, has a positive impact on teachers in several aspects:

1. **Increased ICT Knowledge**

Through the Trigger program, teachers experience increased knowledge and understanding of Information and Communication Technology (ICT). They become more familiar with new applications, online learning platforms, and the latest technologies that can be applied in the teaching process. as shown by one of the trigger participants as follows:

….*Through his participation in the trigger programme, I experienced a significant improvement in my knowledge of Information and Communication Technology*……as quoted in Mr. S.P interview

…*This programme gives me an opportunity to explore new aspects of the world of educational technology. successfully opened my insight into a variety of new technologies that can be applied in the context of learning, such as word walls and artificial intelligence (AI)….* as quoted in Mr. A.L interview

…*This introduction helped me to remain relevant and innovative in organising learning activities. The trigger programme not only became a source of new knowledge but also gave me an opportunity to enhance my ability to learn independently*……as quoted in Ms. D.T interview

….*Through the available modules, he can access learning materials flexibly, increasing independence in the personal learning process." In the context of preparing the material, I acknowledge that technology opens up access to a variety of more interesting material resources, including artificial intelligence (AI), and I also create lessons based on Augmented Reality…..* as quoted in Mr.R.S interview

…*This enables enrichment of learning material with a more innovative and interesting approach for students." I was actively involved in creating interactive learning videos using platforms like Canva….*as quoted in Ms. A.S interview

….. *I also took the opportunity to learn about simple website creation through a webinar. My strategy involves a commitment to continuous learning and upgrading IT skills",…..* as quoted in Mr. M.S interview.

PembaTIK 2023, presented by Kemdikbud, is an initiative held online, especially at level 1. Online maintenance allows participants to attend the programme without having to gather physically at a specific location. The available modules are easily accessible and are always updated whenever the programme takes place, ensuring that participants get updated and relevant information throughout the course (Mualana et al., 2023)

The PembaTIK programme consists of four stages, namely: stage 1 - Literacy; stage 2 - Implementation; stage 3 - ICT creation); and stage 4 (sharing and Collaborating. This phase is an adaptation of the ICT competence framework proposed by UNESCO as a standard for improving teachers' ICT competence at the national level. There is the addition of an additional stage, namely

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

385

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

shared competence, which is a continuation of the result of knowledge creation. The existence of shared competence is expected to make teachers not only able to apply technology in the learning-teaching process but also share the learning innovation that has been created (Mualana et al., 2023)

Participants of the PembaTIK programme start with self-learning online at phase 1, and then continue with the guidance of a tutor or facilitator from phase 2 to phase 4. During these phases, they are also invited to share good practices in the use of technology platforms in learning. Each stage will involve a selection process in the form of a test to evaluate the participants who can proceed to the next level. Participants who successfully complete the entire PembaTIK programme to reach level 4 are expected to become partners of the Department of Education in their respective regions and help promote the use of technology platforms in the learning process. They are also expected to be a source of inspiration for fellow teachers in applying best practices. At the end of the PembaTIK programme, some teachers will be selected as technology ambassadors who will represent their respective provinces as the Education Technology Jangkar of Indonesia (Mualana et al., 2023).

2. Increased Creativity in Learning

Teachers' competence in preparing lessons is becoming more creative and innovative. The use of a variety of applications and platforms, such as Canva, Quiziz, and Google Classroom, stimulates the creativity of teachers in developing learning materials. Teachers are able to produce interesting presentations and animations to enhance the attractiveness of learning, this forming a more attractive and effective learning environment. Things as expressed by the interviewer

…"*Through the addition of knowledge about learning technologies, I utilised a variety of applications and platforms, such as Canva, Quiziz, and Google Classroom, and it made me more creative and innovative in developing learning materials because of the diverse information sources as well as the help of AI technology. These ICT users in learning will stimulate the creativity of teachers in developing the material*"… Quote from D.T interview

…"*I'm using technology, using a platform from the government, that is, the Merdeka Mengajar Platform. So there, I'm looking for a tool or a learning resource that I can use in learning. Likewise, I use it for judgement; for example, I'm using applications like Quiziz. But because in our school, the internet is often interrupted, especially when the electricity is off, and my pupils at this school are not currently allowed to carry mobile phones unless permission from the teacher and parental consent So, at the time of using the quiz app, I chose the paper mode, that is, the papers mode, so you don't have to use a smartphone.....* Quote from Mr. DS interview

3. Self-learning and Student Independence

The trigger programme provides an opportunity for teachers and students to learn independently through the modules provided. In addition, the use of technology supports students' independence in working on tasks and projects independently, providing a more personal and interactive learning experience. This is in line with what was revealed by the source;

.....*"I use video learning for a particular material, and students can show a good level of independence. They can watch the video without a detailed explanation from me. I just give instructions to watch and then give LKPD. The results show that students are able to work independently, considering the information from the learning video… "*as quoted in Ms. A.S interview

.....*"I used to create interactive learning media using the Canva platform. The advantage of using Canva is that students can learn independently because the material can be accessed through links without the need for additional applications. Especially after teachers are given learning ID accounts, everything becomes more efficient because it can be directly accessed without any barriers....."* as quoted in Ms. T.S interview

.....*Students are very engaged and active in the use of technology. Of course, we have to make sure that all students have access to it. If there are students who don't have a*

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386

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*Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0*

smartphone or a tablet, we can facilitate it using a computer or a Chromebook. Besides, we also keep considering students who prefer manual learning methods by making mind maps on cardboard. So, we provide a variety of facilities according to the conditions and interests of the students. I provided the facilities in advance, directed them on how to use them, and gave them a study account. After that, they were released to independently explore whatever they wanted to learn…. as quoted in Mr. M.S interview

…..In the development of learning materials, I often advocate collaborative projects using the Canva platform. The projects are designed to work asynchronously, giving students the freedom to complete project tasks at any time according to the time they have. It aims to facilitate more flexible learning and provide room for students to contribute in a way that fits their own learning rhythms…. as quoted in Mr. A.L interview

…..In student involvement, I involve them in creating technology-based projects. For example, in differential learning, I give students the freedom to choose the way they complete tasks, either with videos, pictures, or live footage on a board. They can express their own creative ideas, and this has proven to boost their motivation and creativity…. as quoted in Ms. S.A interview

…I made Google slides on each of their gadgets independently because they were given responsibility for each of them, for example, the matter of the reproductive system. So they divided the sub-topics of each individual into one group so that they were responsible for filling out their slides"….. as quoted in Ms. T.S interview

4. **Participation in the Teacher Community**

Teachers are actively involved in the teacher community, such as Kelompok Kerja Guru (KKG), Musyawarah guru mata pelajaran (MGMP) and the Trigger community and learning community in the Education Unit. This participation creates a platform for sharing experiences and science among teachers, enriching learning experiences, and enhancing collaboration among them.

*….I'm an active source of learning community activities, learning community, sharing knowledge about technology, about pedagogy, and about teacher development"…….*as quoted in Mr. A.L interview

…..I actively share technology knowledge with peers, being a source for activities involving the use of technology in the classroom. Although I do not claim to know all, I collaborate and discuss with fellow teachers as well as engage in community activities such as joint learning and collaboratively making learning videos"………. as quoted in Ms. S.A interview

….Besides in the learning community at my school, I've also been active as a source in the training community and the Guru Penggerak community in various places, such as learning communities and in self-training on the Platform Merdeka Mengajar. I share my knowledge and experience, and this kind of collaboration makes me more motivated to keep learning…. as quoted in Mr. M.S interview

………I was actively engaged in scanning with teachers and colleagues in support of the learning community. I attended a lot of teacher certification training, so I had the opportunity to also become a source like Google Master Trainer. I formed a Learning Community and invited other learning communities to collaborate in sharing practices in both online and offline learning, so I was invited to the Office of the Ministry of Culture for Research and Technology for having had an impact on learning…… as quoted in Ms. C.S interview

5. **Improving Learning Quality**

The integration of technology through the trigger programme involves innovation in the presentation of material, evaluation, and utilisation of various features of technology to improve the effectiveness of teaching and learning processes. Teachers report improved learning quality that is reflected in student engagement and better learning outcomes.

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

387

*...collaboration and integrated application of technology, I believe that learning becomes more dynamic and motivates students to continue to explore and be creative.....*as quoted in Ms. S.A interview

*..."I found that the integration of ICTs in learning does not always result in an improvement in the quality of learning in person, but it turns out to stimulate the interest of learners in learning. Although it does not automatically improve academic achievement, the application of technology can give a positive boost to the student's learning spirit."...*as quoted in Mr. M.S interview

......."I encourage the active participation of students in the creation of technological content, such as video learning, in the hope that they can appreciate and be proud of the results of their own work. I believe that integrating ICT into learning can stimulate students' interest, motivation, and interest in the learning process. As an implementation of this concept, I have created learning media, teaching materials, and evaluation using technology platforms like Canva, Edu games, and Quizizz with hyperlinks to enrich their learning experience."...... as quoted in Mr. A.L interview

6. **Challenges in Technological Integration**

Teachers face the challenge of trying to use technology in learning. They need to adapt to technical problems, such as limited devices The time of the teacher's sharing of science is limited because the teacher has to do his teaching duty. This is in line with what was revealed by the source;

......In the process of sharing knowledge, it may initially feel like a burden, especially when being a source for the first time. However, as time went by, it felt more motivated by getting appreciation and positive feedback from the participants. Things like that make me more enthusiastic and motivated to keep sharing knowledge....... as quoted in Mr. S.P interview

*......."There's an obstacle in adjusting the time when making a visit to the school, so sometimes my schedule of teaching in class is a little interrupted."......*as quoted in Ms. S.A interview

......I face challenges with a tight schedule, so sometimes I get tired, but I am still motivated to keep learning and sharing experiences........ as quoted in Ms. S.A interview

7. **Focus on Self-Development**

Teachers are focused on self-development, both in terms of digital skills improvement and overall self-capacity development. They recognise the importance of continuing to learn and develop themselves to remain relevant in an era of rapid technological change.

..........I love learning and sharing science because I'm a teacher. Of course, it's a soul that always exists for me, so if I say tired of learning, of course there is, but I feel the impact of the activities that follow the teacher's training. Through the training-training activities with the learning community, I have more and more connections and contacts that give me the incentive to continue learning. I am very enthusiastic about giving good practice to all teachers and motivated to change the mindset of teachers, but sometimes there are obstacles from educational officials....... as quoted in Ms. C.S interview

*......So far, I've been through this learning process and haven't encountered any significant obstacles. If I feel the need to repeat next year, my strategy will remain focused on the desire to continue learning and improving self-capacity, rather than just reaching a certain level or becoming an Ambassador. In sharing technology, I remain active in the community and collaborate with my fellow teachers. For me, being a source and sharing knowledge is a positive and beneficial step, and I will continue to do so as part of my journey of learning and self-development.......*as quoted in Ms. S.A interview

.....I'm still lacking in certain technologies, like a new Google feature. I'm also taking a microcredential scholarship at Harvard University to improve my digital skills, especially in coding and application programming. So, I keep looking for opportunities to learn and train to correct my shortcomings........ as quoted in Mr. M.S interview

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

388

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

DISCUSSION

The integration of technology, particularly through the PembaTIK program, has profoundly impacted teachers across various dimensions. Firstly, there is a notable increase in teachers' Information and Communication Technology (ICT) knowledge due to the PembaTIK program. This initiative exposes educators to cutting-edge technologies such as artificial intelligence (AI), enhancing their insight and relevance in organizing effective learning activities. Teachers highlight how the program helps students learn independently by providing easy access to modules, making teaching more knowledgeable and empowering. Teachers improve independent learning by providing easy access to modules, fostering knowledge, and empowerment.(Blackorby et al., n.d.)

Secondly, teachers showcase heightened creativity and innovation in lesson preparation by utilizing applications like Canva, Quiziz, and Google Classroom. The incorporation of diverse information sources and AI technology stimulates teachers' creativity in crafting engaging and effective learning materials. Teachers today demonstrate elevated creativity and innovation in lesson planning through the strategic use of applications such as Canva, Quiziz, and Google Classroom. These tools empower educators to craft engaging and effective learning materials by incorporating diverse information sources and leveraging AI technology(Antony, 2023). Canva, in particular, has been recognized for its role in promoting creativity in language teaching, with studies simulating its use for English Language Teaching (ELT) to enhance students' creativity (Fitria, 2022) This reflects a broader trend in education where teachers, acting as instructional designers, integrate technology into their curriculum, fostering an environment conducive to creativity and innovation (Putri & Jumardi, 2023).

Thirdly, the PembaTIK program promotes self-learning and independence, offering both teachers and students opportunities to pursue education independently through accessible modules. This dynamic fosters a more personalized and interactive learning experience for all participants. The concept of self-based learning reflects the goal of promoting the independence of learners, as demonstrated in projects such as the blogging initiative for university students. In this context, self-based learning refers to an approach where students have greater control over their own learning process. They not only follow the instructions of teachers or the strict curriculum structure, but also have the freedom to determine the course of their learning (Inayah & Cahyati, 2023).

The blogging initiative project for university students provides a real example of the application of this concept. In the project, students are invited to develop and manage their own blogs as a tool to express their ideas, thoughts, and personal reflections. Thus, they have full control over the subject they choose, the style of writing, and the way to convey information. Through this initiative, students become not only recipients of information but also creators and managers of their own content. They learn not only from the materials they are taught but also from their personal experience in planning, writing, and managing their blogs. It creates an environment in which learning is not limited by formal instructional constraints but allows for exploration and creative expression (Radjuni, 2022).

Fourthly, teachers actively engage in teacher communities, fostering knowledge sharing, leveraging technology, and participating in collaborative practices. This community involvement enriches the overall teaching experience and promotes a culture of continuous improvement. Teachers who actively participate in teacher communities, utilize technology, and engage in collaborative practices contribute to an enriched teaching experience and cultivate a culture of continuous improvement (Yu & Chao, 2023). Collaboration in Online platforms, exemplified by thriving K-12 educator communities, offer environments conducive to sharing knowledge and fostering trust, thereby enhancing professional development (Booth, 2012).Collaborative teaching strategies, supported by innovative learning environments, further emphasize the importance of teacher collaboration in fostering effective education practices. Communities of practice established by teachers enable the sharing of ideas and experiences, creating a supportive learning environment that benefits professional development (Akinyemi et al., 2019).

This collaborative approach aligns with the evolving landscape of student-centered classrooms, where teachers play crucial roles in shaping identities and approaches to teaching

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

389

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

(Keiler, 2018). Leveraging diverse experiences within the classroom promotes cross-cultural understanding and empathy, preparing students for a globally connected world(Booth, 2012).

Fifthly, technology integration through the PembaTik program results in dynamic and motivating learning experiences, boosting student exploration and creativity. Although not consistently linked to improved academic achievements, technology significantly influences students' enthusiasm for learning. Technology Integration enhances learning experiences, fostering dynamic and motivating learning environments for student. While academic improvement isn't consistently linked to technology integration, it significantly boosts students' enthusiasm for learning (Rahim et al., 2016).

Creativity Boost through Emerging Technologies, Emerging technologies, as reviewed, promote creativity in education, offering new avenues for student exploration and creativity (Li et al., 2022). Classroom technology, when integrated effectively, plays a role in motivating students, impacting engagement and success (Ahmed et al., 2020). Augmented reality and gamification positively influence education, enhancing student engagement and offering benefits in the educational process (Rahim et al., 2016). Participation in STEM learning projects fosters interdisciplinary skills and contributes to dynamic learning experiences (Setiawaty et al., 2018)

Sixthly, teachers acknowledge the challenges posed by technological integration, including adapting to technical issues such as limited device availability. Effective time management amidst teaching duties is identified as a crucial factor in overcoming these challenges. Teachers recognize the challenges associated with incorporating technology in education, such as addressing issues like limited device availability. Effective time management is crucial for overcoming these challenges(Qazi et al., 2023) and (Christopoulos & Sprangers, 2021). Online classes present challenges, and teachers must address drawbacks, emphasizing the importance of a stable internet connection and effective online teaching (Clarin & Baluyos, 2022) and (Nartiningrum & Nugroho, 2020)

Lastly, teachers place a strong emphasis on self-development, recognizing the need to enhance digital skills and overall capacity to remain relevant in a rapidly changing technological era. Teachers today recognize the imperative of self-development, emphasizing the enhancement of digital skills to stay pertinent in a swiftly evolving technological era (Ng et al., 2023). The profound influence of technology is evident in knowledge acquisition, innovative teaching methods, collaboration, and the overall learning experience (Haleem et al., 2022).

The transformative impact of technology on knowledge acquisition, creative teaching approaches, collaboration, and the learning experience is evident throughout these dimensions. Teachers, while acknowledging challenges, express a dedicated commitment to continuous self-improvement. (Hämäläinen et al., 2021). Digital competence is pivotal, encompassing skills, knowledge, and attitudes for effective use of digital technologies in education (Grassini, 2023). As technology evolves, artificial intelligence (AI) significantly transforms educational practices, shaping the future of education (Almusaed et al., 2023). The identified 21st-century digital skills include technical, information, communication, collaboration, creativity, critical thinking, and problem-solving (van Laar et al., 2020).

CONCLUSION

The integration of technology through the PembaTIK program has brought about significant transformations for teachers across diverse dimensions. Primarily, there is a noteworthy augmentation in Information and Communication Technology (ICT) knowledge among educators, exposing them to cutting-edge technologies. This heightened insight contributes to the effective organization of learning activities, marking a pivotal shift in the educational landscape.

Additionally, teachers demonstrate heightened creativity and innovation in lesson preparation through the adoption of applications such as Canva, Quiziz, and Google Classroom and any more. These tools empower educators to design engaging and effective learning materials, aligning with the broader trend of technology integration in education. This integration fosters an environment conducive to creativity and innovation, enhancing the overall quality of teaching and learning.

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

390

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Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

Furthermore, the PembaTIK program actively promotes self-learning and independence, creating opportunities for both teachers and students to pursue education autonomously through accessible modules. This approach fosters a personalized and interactive learning experience, showcasing a departure from traditional teaching methods. The concept of self-based learning finds expression in projects like the blogging initiative for university students, allowing learners greater control over their educational journey and providing a platform for personal expression.

Teachers also actively participate in teacher communities, engaging in knowledge-sharing, leveraging technology, and participating in collaborative practices. Despite encountering challenges, teachers express a dedicated commitment to continuous self-improvement, acknowledging the transformative impact of technology on knowledge acquisition, creative teaching approaches, collaboration, and the overall learning experience.

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REFERENCES

Ahmed, J. Y., Ismail, A. I., Mokh, A. J. A., & Hamarsha, M. (2020). Exploring the effectiveness of technology integration on students' motivation and engagement during Covid-19 from teachers' perspectives: A case study. *Elementary Education Online (EEO)*, *19*(04).

Akinyemi, A. F., Rembe, S., Shumba, J., & Adewumi, T. M. (2019). Collaboration and mutual support as processes established by communities of practice to improve continuing professional teachers' development in high schools. *Cogent Education*, *6*(1), 1685446. https://doi.org/10.1080/2331186X.2019.1685446

Almusaed, A., Almssad, A., Yitmen, I., & Homod, R. Z. (2023). Enhancing Student Engagement: Harnessing "AIED"'s Power in Hybrid Education—A Review Analysis. *Education Sciences*, *13*(7), 632. https://doi.org/10.3390/educsci13070632

Antony, S. (2023). A Phenomenalogical Exploration Of Student' Perception of AI Charbots in Higher Education. *IAFOR Journal of Education*, *11*(22).

Bagou, D. , Y. , & Suking, A. (2021). Analisis Kompetensi Profesional Guru. *Jambura Journal of Educational Management*, *1*(2), 122–130.

Blackorby, J., Borup, J., Burch, L., & Deane, J. (n.d.). *Teacher Digital Learning Guide*. Department of Education, Office of Educational Technology.

Booth, S. E. (2012). Cultivating Knowledge Sharing and Trust in Online Communities for Educators. *Journal of Educational Computing Research*, *47*(1), 1–31. https://doi.org/10.2190/EC.47.1.a

Christopoulos, A., & Sprangers, P. (2021). Integration of educational technology during the Covid-19 pandemic: An analysis of teacher and student receptions. *Cogent Education*, *8*(1). https://doi.org/10.1080/2331186X.2021.1964690

Clarin, A. S., & Baluyos, E. L. (2022). Challenges Encountered in the Implementation of Online Distance Learning. *EduLine: Journal of Education and Learning Innovation*, *2*(1), 33–46. https://doi.org/10.35877/454RI.eduline591

Ekantiningsih, P. D. , & Sukirman, D. (2023). Trends of education and training teacher competency in information and communication technology. *Jurnal Inovasi Teknologi Pendidikan*, *10*(1), 87–105.

Fitria, T. N. (2022). USING CANVA AS MEDIA FOR ENGLISH LANGUAGE TEACHING (ELT) IN DEVELOPING CREATIVITY FOR INFORMATICS STUDENTS'. *ELT Echo : The Journal of English Language Teaching in Foreign Language Context*, *7*(1), 58. https://doi.org/10.24235/eltecho.v7i1.10789

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

391

e-ISSN: 2808-8263
p-ISSN: 2829-0976

Improving Quality of Education in Elementary School:
Overcoming Any Issues of Elementary Education in Smart Society 5.0

Grassini, S. (2023). Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. *Education Sciences*, *13*(7), 692. https://doi.org/10.3390/educsci13070692

Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. *Sustainable Operations and Computers*, *3*, 275–285. https://doi.org/10.1016/j.susoc.2022.05.004

Hämäläinen, R., Nissinen, K., Mannonen, J., Lämsä, J., Leino, K., & Taajamo, M. (2021). Understanding teaching professionals' digital competence: What do PIAAC and TALIS reveal about technology-related skills, attitudes, and knowledge? *Computers in Human Behavior*, *117*, 106672. https://doi.org/10.1016/j.chb.2020.106672

Heriyanto, H. (2018). Thematic Analysis sebagai Metode Menganalisa Data untuk Penelitian Kualitatif. *Anuva*, *2*(3), 317. https://doi.org/10.14710/anuva.2.3.317-324

Herliani, A. an, & Wahyudin, D. (2019). Pemetaan kompetensi teknologi informasi dan komunikasi (TIK) guru pada dimensi pedagogik. *Jurnal Penelitian Ilmu Pendidikan*, *11*(2), 134–148. https://doi.org/10.21831/jpipfip.v11i2.19825

Inayah, R., & Cahyati, S. S. (2023). PROMOTING STUDENTS' INDEPENDENT LEARNING STRATEGIES IN FACING ONLINE LEARNING: STUDENTS' VOICES. *English Journal Literacy Utama*, *7*(2), 702–709. https://doi.org/10.33197/ejlutama.v7i2.200

Keiler, L. S. (2018). Teachers' roles and identities in student-centered classrooms. *International Journal of STEM Education*, *5*(1), 34. https://doi.org/10.1186/s40594-018-0131-6

Li, Y., Kim, M., & Palkar, J. (2022). Using emerging technologies to promote creativity in education: A systematic review. *International Journal of Educational Research Open*, *3*, 100177. https://doi.org/10.1016/j.ijedro.2022.100177

Mualana, N. M., Faizanti, A., Widiatmoko, & Saputra. Feriza. (2023). *Pedoman Penyelenggaraan Pembatik* (T. Alawiyah, Ed.; 1st ed.). BLPT KEMENDIKBUDRISTEK.

Nartiningrum, N., & Nugroho, A. (2020). Online Learning amidst Global Pandemic: EFL Students' Challenges, Suggestions, and Needed Materials. *ENGLISH FRANCA : Academic Journal of English Language and Education*, *4*(2), 115. https://doi.org/10.29240/ef.v4i2.1494

Ng, D. T. K., Leung, J. K. L., Su, J., Ng, R. C. W., & Chu, S. K. W. (2023). Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world. *Educational Technology Research and Development*, *71*(1), 137–161. https://doi.org/10.1007/s11423-023-10203-6

Permendiknas No.16 Tahun 2007. (2007). *Permendiknas No.16 Tahun 2007 tentang Standar Kualifikasi Akademik dan Kompetensi Guru.*

Priya, A. (2021). Case Study Methodology of Qualitative Research: Key Attributes and Navigating the Conundrums in Its Application. *Sociological Bulletin*, *70*(1), 94–110. https://doi.org/10.1177/0038022920970318

Putri, I., & Jumardi, J. (2023). Utilization of the Canva application on the Belajar.Id site as a learning media at SMK Bina Nusa Mandiri Jakarta. *Jurnal Inovasi Teknologi Pendidikan*, *10*(4), 344–352. https://doi.org/10.21831/jitp.v10i4.63299

Qazi, A. G., Mustafa, M. Y., Mtenzi, F. J., & Valcke, M. (2023). Mobile Technology as an Alternative Teaching Strategy Amidst COVID-19 Hiatus: Exploring Pedagogical Possibilities and Implications for Teacher Development. *Education Sciences*, *13*(4), 385. https://doi.org/10.3390/educsci13040385

Radjuni, M. (2022). Blogging to Write: Promoting Learner Independence in a 4.0 Learning Environment during the pandemic Covid-19. *ELS Journal on Interdisciplinary Studies in Humanities*, *5*(3), 586–592. https://doi.org/10.34050/elsjish.v5i3.23277

Rahim, M. I., Salija, K., & Weda, S. (2016). The Implementation of Integrated Technology in Motivating Students of an Accelerated Program at Senior Secondary School Makassar, Indonesia. *ELT Worldwide: Journal of English Language Teaching*, *3*(2), 122. https://doi.org/10.26858/eltww.v3i2.2253

Raja, R., & Nagasubramani, P. C. (2018). Impact of modern technology in education. *Journal of Applied and Advanced Research*, S33–S35. https://doi.org/10.21839/jaar.2018.v3iS1.165

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

392

Setiawaty, S., Fatmi, N., Rahmi, A., Unaida, R., Fakhrah, Hadiya, I., Muhammad, I., Mursalin, Muliana, Rohantizani, Alchalil, & Permana Sari, R. (2018). *Science, Technology, Engineering, and Mathematics (STEM) Learning on Student's Science Process Skills and Science Attitudes* (pp. 575–581). https://doi.org/10.1108/978-1-78756-793-1-00036

van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review. *SAGE Open*, *10*(1), 215824401990017. https://doi.org/10.1177/2158244019900176

Yu, T.-K., & Chao, C.-M. (2023). Encouraging teacher participation in Professional Learning Communities: exploring the Facilitating or restricting factors that Influence collaborative activities. *Education and Information Technologies*, *28*(5), 5779–5804. https://doi.org/10.1007/s10639-022-11376-y

The 6th International Conference on Elementary Education Volume 6 (1)
Elementary Education Study Program, School of Postgraduate Studies, Universitas Pendidikan Indonesia

393