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The Implementation TPACK in Elementary School

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ABSTRAK

Revolusi Industri 4.0 menuntut guru agar menguasai teknologi untuk diintegrasikan ke dalam proses pembelajaran. Tujuan penelitian ini untuk menganalisis penerapan Teknologi, Pedagogi dan Pengetahuan Konten (TPACK) dalam proses pembelajaran pasca daring. Penelitian ini tergolong ke dalam jenis penelitian kualitatif deskriptif menggunakan mixed methods dengan strategi eksploratoris sekuensial. Subjek yang terlibat dalam penelitian ini adalah guru kelas yang berjumlah 20 orang. Pengumpulan data yang digunakan dalam penelitian ini adalah pengumpulan data melalui wawancara, observasi, dan dokumentasi. Instrument yang digunakan untuk mengumpulkan data penelitian ini berupa angket. Data yang diperoleh dari penelitian ini akan dianalisis menggunakan teknik analisis model induktif. Hasil penelitian menunjukkan bahwa dalam implementasi TPACK, masih banyak guru yang belum dapat mengoperasikan teknologi dengan baik terutama guru yang berusia lanjut. Selain itu guru belum mampu memanfaatkan teknologi untuk menciptakan representasi baru. Guru hanya memberikan konten pembelajaran berdasarkan buku siswa dan beberapa contoh pembelajaran yang diambil dari google dan youtube. Maka dari itu, dapat disimpulkan bahwa guru perlu untuk memahami aspek-aspek TPACK. Implikasi penelitian inni diharapkan seluruh stakeholder mampu menyadari pentingnya TIK karena penggunaan media pembelajaran menggunakan teknologi bertujuan untuk mengembangkan kurikulum di sekolah yang arahnya menuju peningkatan kualitas pendidikan.

ABSTRACT

Industrial Revolution 4.0 requires teachers to master technology to be integrated into learning. This research aims to analyze the application of Technology, Pedagogy, and Content Knowledge (TPACK) in the post-online learning process. This research is classified as descriptive qualitative research using mixed methods with a sequential exploratory strategy. The subjects involved in this research were 20 class teachers. The data collection used in this research is data collection through interviews, observation, and documentation. The instrument used to collect data for this research is a questionnaire. The data obtained from this research will be analyzed using inductive model analysis techniques. The research results show that in implementing TPACK, many teachers, especially older ones, still need help operating technology well. Apart from that, teachers have yet to be able to utilize technology to create new representations. The teacher only provides learning content based on students' books and several examples from Google and YouTube. Therefore, teachers need to understand aspects of TPACK. This research implies that all stakeholders will be able to realize the importance of ICT because using learning media using technology aims to develop a curriculum in schools to improve the quality of education.

1. INTRODUCTION

Education 4.0 requires teachers to master technology so that it can be integrated into the learning process. Competence in Information and Communication Technology serves to develop themselves and support the learning process. This statement is reinforced by the regulation of the minister of education and culture no 22 of 2016 concerning process standards, namely that the learning principle used is that teachers must be able to utilize information and communication technology to improve the efficiency and effectiveness of learning (Dabbagh et al., 2019; Sintawati & Indriani, 2019). Teachers, including curriculum developers and other important policymakers in education, must increase awareness of information and communication technology to improve the quality of learning. Information technology services in the learning environment are intended to be the result of careful innovation in the learning integration process. In addition, technology changes the design of teachers' work and the activities to be carried out in the classroom (Khlaif et al., 2019; Lachner et al., 2021). With learning design, teachers can understand the characteristics of digital teaching materials that will be taught to students (Incedayı, 2018; Önal & Alemdağ, 2018). When integrating educational technology, there are four main things to consider, namely aspects of knowledge, content, pedagogy, and technology. Based on this, there is a framework that

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can be used to integrate these four aspects, namely TPACK (Technological, Pedagogical Content Knowledge).

The application of TPACK in teachers' learning shows a positive attitude towards learning conducted in accordance with TPACK. TPACK practices attract teachers' attention to actively participate in learning by using TPACK learning (Çam & Erdamar Koç, 2021; Hanik et al., 2022). This shows that there are two applications of TPACK in learning that contribute to students and teachers. The role of TPACK from a constructivist perspective emphasizes building collaborative communication networks by utilizing media both asynchronously and synchronously, providing virtual places and spaces to utilize the latest technology to construct meaning based on experience (Hanik et al., 2022; Yaumi et al., 2018). However, other researchers state that, the implementation of TPACK in teachers indirectly has a positive effect on the ease and benefits of using technology in the classroom (Joo et al., 2018; Reyes et al., 2017). Not all teachers can effectively deliver lessons with technology integration, so ongoing training for education faculty and students is highly recommended . It should be noted that, schools in Indonesia still have problems, including teacher standards, mastery of materials, and most importantly, low media and technology and low technological knowledge of both et teachers and students in elementary schools. The sad thing is, there is no difference in the quality of education in Indonesia before and after the implementation of teacher certification due to the lack of knowledge about the use of technology, which is one of the triggers that can limit the integration of technology in learning so that it cannot realize the desire for 21st century learning (Churchill, 2020; Su, 2023). Seeing these problems, alternative solutions are needed, such as the fact that both teachers and students of the 21st century primary school generation are required to apply technology in learning and are required to become independent, highly capable, and progressive individuals so that they can realize the ideals of the nation. Teacher expertise can be nurtured and developed through various types of activities, including courses and workshops, degree programs, mentoring and coaching, and informal dialogue between teachers (Jung & Ottenbreit-Leftwich, 2019).

Technology Pedagogy and Content Knowledge is a body of knowledge and a framework used to analyze teachers' ability to use technology in appropriate pedagogy (Churchill, 2020; Shafie et al., 2019). TPACK is a learning center that consists of three components, namely: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) (Joo et al., 2018; Mutiani et al., 2021; Reyes et al., 2017). The interaction of the three forms of knowledge will develop secondary forms of knowledge, which include pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK) and finally the synthesis of the three secondary forms of knowledge will form TPACK. The emphasis on the application of TPACK competencies is how Technological Knowledge, Pedagogical Knowledge, and Content Knowledge can be integrated into learning which will make learning effective and successful in the learning context (Koehler et al., 2013; Santos & Castro, 2021; Surayya & Asrobi, 2020). The analysis of the TPACK application in this study is adjusted to the learning objectives to be achieved. Not only that, the use of technology as a medium has met the requirements as a learning medium that is easily understood by students, simple, and structured so that it attracts students' attention. This can influence and foster student learning motivation. This research is important to study as an educator's effort to improve technological knowledge by paying attention to learning design and student characteristics, as well as digital teaching materials to be taught to improve quality learning. In addition, the purpose of this research is that teachers in 21st century learning are expected to master technological knowledge, pedagogy, and content in delivering learning. This is due to the very important role of technology for teachers in improving the quality of learning through TPACK, so teachers are required to have good ICT literacy.

Technology Pedagogy and Content Knowledge is part of the knowledge and framework used to analyze teachers' ability to use technology in appropriate pedagogy (Rohmitawati, 2018; Shafie et al., 2019). The emphasis on the application of TPACK competencies is how Technology Knowledge, Pedagogy Knowledge, and Content Knowledge can be integrated into learning that will make learning effective and successful in the learning context. TPACK is a new type of knowledge that must be mastered by teachers to be able to integrate technology well into learning (Absari et al., 2020; Rahmadi et al., 2020). Technology, pedagogy, content, and knowledge are more structured alternatives that should be designed to assist teachers in public schools in implementing 21st century learning with the integration of technology, pedagogy, content, and knowledge that is able to integrate these elements into learning (Santos & Castro, 2021; Zha et al., 2022). Technology, pedagogy, content, and knowledge have a significant effect on teacher self-efficacy. The application of technology, pedagogy, content, and knowledge by teachers indirectly has a positive effect on the ease and benefits of using technology in the classroom (Joo et al., 2018). Therefore, this study aims to analyze the application of technology, pedagogy, and content knowledge (TPACK) in post-online learning, constraints, and solutions. The results of this study will help teacher education to rethink the instructions and scaffolding needed to meet the learning needs of different individuals. In

addition, this research can also inspire teachers of education programs to re-examine the structure and organization of their curriculum. Thus, this study can provide new insights into teachers' TPACK development by investigating knowledge gaps in TPACK development after training.

2. METHOD

This research used descriptive qualitative research. The research was conducted at Cemara II State Elementary School No.13, Surakarta, Central Java. The subjects of this study were class teachers totaling 20 teachers. Determination of the sample location using purposive sampling, namely by considering the reasons that are already known (Ayu et al., 2023). The basis for choosing SD Negeri Cemara II No.13 is because this school is a favorite school in the city of Surakarta. The research subjects were aged 23-55 years. Data collection in this study was obtained by conducting observations and then structured interviews conducted with educators. After the data were collected, data verification was carried out with students and school principals which were then analyzed using an inductive model. The use of this model is intended to clarify the data reduction process to create meaning from the raw data that has been collected. Interview activities are carried out to find out the problems that occur in the field. In order for the data obtained to be truly valid, the researcher made observations as an important source of data triangulation. Data validity was done by triangulation of content, technique, and reference. Data analysis in this study consists of several stages, including; 1) data reduction (selection and focusing) and transforming data obtained from field notes. In this study, the data is in the form of structured interviews and observations distributed to respondents. Then, the summary is made more accessible to analyze the data and proceed to the next step; 2) data presentation (displaying arranged data arranged from a set of information so that it allows conclusions to be drawn later. In this step, researchers show or display data in accordance with the data that has been compiled). Sequentially obtained and presented; 3) conclusion drawing (after completing data reduction and displaying the data obtained, the researcher concludes the findings in the field based on the research problem (Miles, M.B., Huberman, A.M., 2018). The instrument used in this research is an instrument in the form of a questionnaire sheet.

TPACK has six indicators adapted from (Mutiani et al., 2021). a) Technological Knowledge (TK) knowledge of hardware and software technology; b) Content Knowledge (CK), teachers' knowledge of the subject matter to be taught; c) Pedagogical Knowledge (PK), knowledge of theories and practices in planning, processing, and evaluating learning d); technological Pedagogical Knowledge (TPK), teachers' mutual identification in implementing learning by integrating learning strategies with technology; e) Technological Content Knowledge (TCK) teachers' ability to use technology to deliver material to students; f) Pedagogical Content Knowledge (PCK), learning activities related to material based on the curriculum. TPACK indicators can be seen in Table 1.

Table. 1 Indicator Implementation Technological, Pedagogy and Content Knowledge

Competence	Definition
Technological Knowledge (TK)	Respondents' knowledge of software and hardware
Pedagogical Knowledge (PK)	Respondents' knowledge of the characteristics of students Mastering Learning Theory Curriculum Development Educational Learning Activities Understanding the Potential of Learners Intense Communication With Students Conduct an Assessment
Content Knowledge (CK)	Respondents' knowledge of teaching materials .
Technological Pedagogical Knowledge (TPK)	Understanding of change learning methods and processes as a result of use technology in learning
Technological Content Knowledge (TCK)	Utilization of technology in creating a new picture in certain materials
Pedagogical Content Knowledge (PCK)	Integration of technological knowledge, pedagogic and learning content

Table 2 shows the categorization of TPACK implementation by State Elementary School teachers in Surakarta City. Interval and categorization criteria are adopted from categorization by (Lestari et al., 2020).

Table 2. Categorization of Teacher TPACK Implementation at Cemara II Public Elementary School No.13 Surakarta

	Range	Criteria
1	76%-100%	Very good
2	51%-75%	Good
3	26%-50%	Pretty good
4	<50	Weak

3. RESULT AND DISCUSSION

Result

In this section, the researcher wants to present the results of the research which originate from the interpretation of the raw data based on the results of calculating the questionnaire as a data collection tool; observations and interviews with teachers regarding the findings obtained for more in-depth analysis. TPACK implementation consists of six components, namely: 1) Technology Knowledge (TK), 2) Pedagogic Knowledge (PK), 3) Content Knowledge (CK), 4) Pedagogic Technology Knowledge (TPK), 5) Content Technology Knowledge (TCK) and 6) pedagogic content knowledge (PCK). The presentation of the TPACK knowledge analysis results in Table 3.

Table 3. Presentation of The Results of The Analysis of Technology, Pedagogy and Content Knowledge (TPACK)

Aspect	Presentation	Category
Technological Knowledge (TK)	66.11%	Good
Pedagogical Knowledge (PK)	67.05 %	Good
Content Knowledge (CK)	74.50%	Good
Pedagogical Technology Knowledge (TPK)	72.35%	Good
Technology Content Knowledge (TCK)	52.15%	Pretty good
Pedagogical Content Knowledge (PCK)	68.30%	Good

Based on Table 3, after conducting the research it was concluded that overall 17 teachers (67%) fulfilled the TPACK aspect in terms of six aspects, namely technological knowledge (TK), pedagogical knowledge (PK), content knowledge (PK), pedagogical technology knowledge (TPK), content technology knowledge (TCK) and pedagogical content knowledge (TPK). Based on the results of interviews with teachers, teachers have not been able to utilize technology in making new representations of certain materials, the contents of the material are only copies from student books and the internet. PPTs made by teachers tend to be monotonous, only in the form of writing summarized from student books, this is due to the teacher's lack of knowledge regarding procedures for designing interesting teaching materials with certain applications. This is in line with the results of interviews with students that students prefer when the teacher shows teaching material from YouTube rather than learning through teacher-made PPT because it only contains writing that contains a summary of teaching material, students admit this will make lessons more boring.

Discussion

TPACK (Technology Pedagogy, and Content Knowledge) is part of the knowledge and framework used to analyze teachers' abilities to use technology in appropriate pedagogy. TPACK has been considered one of the most popular frameworks for representing teacher knowledge in the digital technology era (Rochaendi et al., 2021; Sulistyarini & Fatonah, 2022). TPACK has been considered one of the most popular frameworks for representing teacher knowledge in the digital technology era (Juanda et al., 2021; Yeh et al., 2021). This study aims to analyze the application of technology, pedagogy, and content knowledge (TPACK) in post-online learning, what obstacles are experienced, and what solutions are. The results from this line of research will help teacher education rethink necessary instruction and scaffolding for addressing the learning needs of different individuals. In addition, it can inspire teachers of educational programs to re-examine the structure and structure of their curricula. Thus, this research can provide new insights about teacher TPACK development by investigating the knowledge gap in TPACK development after training. TPACK (Technology Pedagogy, and Content Knowledge) is part of the

knowledge and framework used to analyze teachers' abilities to use technology in appropriate pedagogy. TPACK has been considered one of the most popular frameworks for representing teacher knowledge in the digital technology era TPACK (Technology Pedagogy, and Content Knowledge) is part of the knowledge and framework used to analyze teachers' abilities to use technology in appropriate pedagogy.

Based on the results of the observations in Table 1. The presentation of the teacher's technology knowledge as a whole shows 66.11% fulfilling the two aspects of technological knowledge. Software implementation is shown by teachers being able to apply laptops and LCD projectors, while software implementation is shown by teachers being able to apply the Quizziz and Google Classroom applications as the main media in learning. This shows that teachers have the basic capital to follow developments in the digital learning era. Meanwhile, 33.89% of teachers, especially older teachers, admitted that they could not operate technology properly. Many factors are experienced by senior teachers, such as the age factor. The rapid progress of digital technology is, of course, not easy to do, it takes time for educators to adapt. There are still many teachers who cannot operate online learning media, especially elderly teachers, so that the learning process becomes less than optimal (Sabella et al., 2022; Winda & Dafit, 2021). The factor that causes teachers to have difficulty operating IT-based media is the teacher's lack of knowledge about IT (laptop/computer, infocus, printer, and the internet), which is caused by age and difficulty in finding files (Lian, 2020; Ridha et al., 2021). To avoid this, there is a need for government efforts to improve the ability of pre-service teachers to integrate technology. Preservice teachers prepared to integrate technology to enhance instruction in self-contained technology courses, technology instruction embedded in methodological preparation, and more integrated approaches that span the entire program indicate that the characteristics of the program's technology integration teaching approach have a positive impact on prospective teachers (Nelson & Voithofer, 2022). In the implementation of technological knowledge, previous researchers also emphasized that the majority of teachers did not have a CS background. Then implemented technology implementation by developing a Computational Thinking (CT) course-based program with a mixed programming environment and embedding programming into the educational curriculum, which effectively developed teacher abilities (Kong et al., 2023; Schweisfurth, 2023). Governments could also develop teacher-educator technology competency sets to help teacher education programs guide their technology integration instruction (Schweisfurth, 2023). Therefore, teachers must acquire the skills and knowledge of educational technology to ensure successful teaching with technology (Liu,. et al, 2018).

In Table 2, the presentation of teachers' pedagogical knowledge shows that 67.05% or 17 teachers were able to master aspects of pedagogical knowledge. Of the seven indicators of pedagogical knowledge, 32.95% of novice teachers admitted that they had difficulty in understanding the various characteristics of students, thus affecting the selection of learning methods and models. In accordance with previous researchers' statements that novice teachers tend to have pedagogical knowledge, namely lack of variety in the use of learning strategies, asking monotonous questions, not exploiting student potential, not providing illustrations, and explaining procedurally (Nur'aini & Pagiling, 2020; Wijayanto, et al., 2018). Not all teachers have good pedagogical skills, there are still teachers who have not been able to choose good learning strategies and methods, media, or implementation models for students (Wijayanto., et al 2018). Even though Ideally, in the learning process, teachers must know and understand student characteristics. One of the benefits of understanding student characteristics is that the teaching and learning process runs better, so that learning objectives can be achieved (Antony & Paidi, 2019; Nur'aini & Pagiling, 2020). Therefore, it is necessary to increase teacher competence activities that lead to self-reflection as implementing agents of educational institutions (de Pietri et al., 2019). Training is one way that can help improve pedagogical competence (Urban et al., 2018). Meanwhile, according to other researchers in their pedagogical implementation, guided inquiry-based learning approaches offer potential as a pedagogy to facilitate more intense teacher-student interactions, so choosing the right instructional pedagogy and gaining further insight into the complexity of student learning experiences is very important in designing learning contexts (Antony & Paidi, 2019; Krieglstein et al., 2023). Whereas further researchers conducted programs that specifically targeted socio-emotional learning leading to an increase in students' ability to manage stress and depression, as well as having better attitudes about themselves and others, among other things. positive feelings about school and increased capacity to learn, as one of the main challenges in improving students' learning outcomes is to engage them in deep learning approaches (Schweisfurth, 2023).

Table 3. In the presentation of teacher content knowledge, it shows that 74.50% or 19 teachers are able to master aspects of content knowledge by combining several relevant sources from books, articles, and e-learning applications so that they become learning content presented in the form of PowerPoint. The use of this strategy can be fostered, as well as highlighting students to information that supports evaluation, namely, sources of information, statistical evidence and accessing references during

reading is predictive of understanding and integration of several texts. It is also a formidable challenge as it requires students to manage and coordinate a large amount of information from multiple sources (List & Lin, 2023; Schmid et al., 2021). It was further explained that 25.50% or 6 other teachers experienced barriers especially in teaching learning facts. This is because teachers tend to provide learning content through photos or videos without representing it directly. This makes learning boring. Such learning will raise many concerns in terms of quality and effectiveness. It certainly faces significant challenges in overcoming the lack of human connection in generating opportunities for collaborative learning (Fikri et al., 2021). It should be noted that, ideally, learning is done in innovative ways such as blended learning, social and collaborative learning (using social media), simulation and game-based learning (Wati & Yuniawatika, 2020). Other researchers, revealed that the content developed by educators is only limited to concepts that inform the material only from how to observe and measure the concept of the material (Rahmadini & Rahmi, 2022; Schmid et al., 2021). Contextual learning is needed to make students more active conceptually and contextually through the presentation of case studies that can encourage active engagement, participation, and critical thinking among students (Ramadansur et al., 2023).

In the pedagogical technology knowledge aspect, 72.35%, or as many as 18 teachers, mastered the pedagogical technology knowledge aspect. Teachers use the Quiz online game application as the main media for taking student assessments every week. One of the researchers in his research also found that integrated games for learning can be done in various forms, ranging from computer games played in one class period to role-playing games for one semester covering the entire curriculum. This is commonly referred to as game-based learning. Game-based Based Learning can keep students engaged and motivated and lead to deeper learning through an immersive environment where students can explore concepts, reflect on personal experiences and solve problems (Nadolny et al., 2020). In addition to game-based learning, there is the term computing education that can lead students to have the functional skills and knowledge needed to use digital technology (Polizzi, 2020; Tokarieva et al., 2019). This will create a consistent movement from skill-based, self-paced courses to preparation that integrates technological knowledge with pedagogical knowledge (Alsawaier, 2018; Flegr et al., 2023). Other researchers have also presented playful learning models that utilize "how" children learn to support other skills needed for 21st century success. Contextualizing innovative "what" and "how" learning models within value systems and discussing successful adaptations of playful learning (Lee et al., 2023). This is also supported by the opinion of other researchers that games can help students to acquire knowledge and develop their skills in game activities that involve participation in problem-solving tasks and challenge students with a sense of achievement (Liu et al, 2018).

The use of learning tools such as Quizlet media or a learning application with various educational features that can be used to support learning is also proven to be able to guide students to carry out learning and playing activities (Sari, 2019). With recent advances in information and communication technology (ICT) and greater access to ICT in the 21st century, technology is increasingly being used to increase student engagement in learning and to increase student motivation (Cheng et al., 2020; Hung et al., 2014). It is further explained that 27.65%, or 7 teachers, have not mastered aspects of TPK, LCD hardware and laptops as the main media for learning. However, with the available media, the learning process still looks boring because the teacher has not been able to change the learning method. The lecture method is used excessively without paying attention to students' characteristics and learning styles. The weakness of the lecture method is that the teacher cannot know for sure the extent to which students have mastered the subject matter, the teacher is more active while students are passive (Hatmiah, 2023). Students become inactive and learning objectives cannot be achieved effectively (Barzilai et al., 2023; Cheng et al., 2020; Hung et al., 2014). In implementing pedagogical technological knowledge, teachers need to pay attention to students' systematic and psychological views of learning principles and use digital and communication technology because it is important and part of the pedagogical abilities that teachers must have (Nurlaila, 2022; Pal & Vanijja, 2020).

In the content technology knowledge aspect, 52.25%, or only 13 teachers, fulfill the TCK aspect. This is because teachers have not utilized technology to creating new images on certain materials. Teachers have not been seen making new pictures, the content of the material is only copied from student books and the internet. This is in line with the research of other researchers who say that the TCK ability of teachers is only limited to presenting media, teachers have not been able to create new representations or different images using technology (Sintawati & Indriani, 2019). In line with the learning process, teachers are required to present material online, both in the form of videos, text, images and so on, but there are still many teachers who cannot design media-based media (Winda & Dafit, 2021). Most teachers only use what already exists, for example, such as materials on the YouTube site. The weakness in applying TCK is that teachers present media designed by others, teachers cannot modify the media themselves (Idrus, 2022). In contrast to the implementation of content technology knowledge, inquiry

learning is implemented with virtual experiments (interactive simulations) or a combination of real experiments and virtual reality experiments on the refraction of light through converging lenses (Flegr et al., 2023). AR supports approaches such as constructivism, learning by doing, and authentic learning, which serve to keep students active in the learning environment (Arici et al., 2019; Cheng et al., 2020). The collaborative design process during learning allows teachers to share knowledge through collaborative discourse so that they can learn and integrate knowledge from peers who have areas of expertise within the teacher community. Through the collaborative design process, teachers can also practice their knowledge in specific contexts around authentic design issues related to technology integration (Yeh et al., 2021). A teacher who is declared competent in a particular field is someone who has mastered work skills or expertise in accordance with the demands of the field of work concerned. Adoption and implementation of new technologies required to develop e-learning in schools takes time, requires training, and requires subjective norms and institutional willingness to accept new technologies (Pal & Vanijja, 2020). Innovative technology alone cannot produce the desired academic change; continuous human resource investment in training is also required (Gupta et al., 2020).

In Table 3, 68.30% of teachers mastered the aspects of PCK. Students' learning styles vary, namely visual, auditory and kinesthetic where in this type of learning, students will focus more on seeing things visually and rely more on their hearing and prefer to learn by doing hands-on practice. So that teachers more often use lecture, discussion and demonstration learning strategies (Idrus, 2022). While the application of Pedagogical Content Knowledge (PCK) uses several variations of teacher-centered and student-centered learning methods such as quiz game methods, ice breaking games, and group methods. This is in accordance with the characteristics of students who like to learn and play. However, in contrast to research on the application of Pedagogical Content Knowledge (PCK), teachers identify students' prior knowledge and misconceptions, consider learning strategies and conduct intensive assessments (Barzilai et al., 2023). However, in the application of pedagogical content, it should be noted that the learning content provided by teachers tends to be monotonous. Teachers rarely make learning media, this is due to a lack of time and energy to make media. Teachers as objects of supervision are preoccupied with administrative demands, while their main task as educators as well as "transfer of knowledge" to students gets a small portion that in the application of Pedagogical Content Knowledge (PCK) teachers identify prior knowledge and student misconceptions, consider learning strategies and carry out intensive assessments. However, in the implementation of pedagogic content, it should be noted that the learning content provided by the teacher tends to be monotonous . Teachers rarely make learning media, this is due to a lack of time and energy to make media. The teacher as the object of supervision is preoccupied with administrative demands, while his main task is as an educator as well as "transfer of knowledge" to students who get a small portion (Zhang et al., 2015). This study only focuses on analyzing the level of pedagogical skills of primary school teachers. This is so that researchers can delve specifically into the matter under study and then explore and evaluate the quality of teaching at the primary level.

4. CONCLUSION

In general, according to the research results, teachers still need to fulfill the six aspects of TPACK. Implementation of the use of software technology as content with due regard to this pedagogical competence must be followed up through training or technical guidance workshops. Because the competence and level of ICT literacy affect the effectiveness and efficiency of the teaching and learning process. Therefore, improvement and standardization of teachers and students in the mastery of information and communication technology must be pursued by all parties involved in the implementation of learning.

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