Technology Pedagogical Content Knowledge (TPACK): An Analysis of Ability of Elementary School Teacher

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Abstract. TPACK is one of the approaches or frameworks that can integrate science, technology, and content. The study aims to analyze the ability of Technology Pedagogical Content Knowledge (TPACK) for State Elementary School Teachers. This research is descriptive research with a quantitative approach. The sampling technique used random sampling of research samples totaling 16 respondents from 8 State Elementary Schools, in Labuhan Ratu District. The research instrument is in the form of a questionnaire sheet from previous research that has high validity and reliability. The analysis of this study used the Analyze Descriptive Statistics technique with the help of the SPSS application. The measurement of the ability of State Primary School Teachers is divided into 7 TPACK frameworks. The results of a descriptive analysis of the TPACK ability of State Elementary School Teachers in Labuhan Ratu District showed that the Technological Pedagogical Knowledge (TPK) framework area was better with an average of 4.23.

Keywords: TPACK · Elementary School Teacher

1 Introduction

Technology provides several options in the learning development process, these options can be an option for educators to deliver learning materials online as well as offline. This is comparable to how the Industrial Revolution 4.0 is being used and developed. The Industrial Revolution 4.0 is the result of science and technology advancement, and it places a strong emphasis on digital technology and artificial intelligence, big data, and robots in all spheres of life. 2019 (Sintawati & Indriani).

Information technology advancements have altered a number of facets of human existence, including schooling (Wasitohadi, 2009); (Suyamto et al., 2020). Educators need to see many benefits from the delivery of material that is integrated with technology according to Nasution (2018: 14) in (Sintawati & Indriani, 2019) examining the advantages of technology in the learning process, including 1) students' increased focus,

R. Perdana et al. (Eds.): ICOPE 2022, ASSEHR 746, pp. 669–684, 2023.
https://doi.org/10.2991/978-2-38476-060-2_61

motivation, and independence, and 2) teachers' reduced use of material delivery time, creation of more enjoyable student learning experiences, design of more engaging materials, and encouragement of teachers to enhance their computer literacy. Teachers deliver more effective, efficient, communicative learning so that learning objectives can be met. The existing facilities in schools are quite helpful for teachers to strive for changes and improvements in learning, there is hardware that can help teachers to integrate technology. However, some teachers in providing learning only use conventional methods focused on the teacher and not the students.

Seeing the importance of teachers in developing learning is professionalism for teachers. For this reason, instructors must possess the four skills outlined in Law No. 14 of 2005. 1) Competence in teaching, 2) Competence in personality, 3) Competence in career, and 4) Competence in social interaction For instructors in the twenty-first century, developing technology-integrated learning is a problem. Computers and other instructional tools can also help pupils perform better (Margerum-Leys & Marx, 2002 in Sahin, 2011). Therefore, teachers must have knowledge in improving students' understanding.

- choosing the subjects to be studied using educational technology in a way that highlights the benefits of doing so,
- developing representations to explain context in a way that is simple to grasp but challenging to teach using conventional techniques,
- develop a teaching plan that addresses learners' needs,
- Pick the right educational technology tools to assist information transformation and instructional techniques., and
- incorporating lessons with educational technologies in the classroom, (2005) Angeli and Valanides; (Sahin, 2011)

One of the combinations of approaches that can be used is TPACK (Technology Pedagogical Content Knowledge). Technology, pedagogy, and content (TPACK) is a model that clarifies the relationships and difficulties between the three core components of knowledge (Koehler & Mishra, 2008; Mishra & Koehler, 2006). The TPACK framework introduces the relationship and complexity between the three core elements (technology, pedagogy, and content) (Koehler & Mishra, 2008; Mishra & Koehler, 2006). In (Schmidt et al., 2009.

TPACK is a theoretical framework for describing and investigating teachers' professional knowledge. 2017 (Valtonen and others) To describe how instructors' PCK and understanding of educational technology interact to produce successful technology-based teaching, TPACK expands on the explanation of PCK provided by Shulman (1987, 1986). Similar concepts have been presented by other writers, but frequently with different labeling methods. The idea of TPACK stated above has changed over time and via a number of publications, with Mishra and Koehler providing the most comprehensive definition of the framework (2006, 2008). (2013) Koehler et al.

Shulman (1986; 1987) asserts that understanding of the subject's substance (also known as "content knowledge," or "CK"), as well as of effective teaching techniques, is "teacher knowledge" PK stands for pedagogical knowledge. Understanding how to instruct a certain topic to a particular group of pupils in a particular environment is referred to as (pedagogical content knowledge - PCK). Technology development resulted

in a reworking of this tale. Three types of teacher knowledge exist: pedagogical, technical, and content-related. The model places equal weight on the interactions between and among these bodies of knowledge, which are represented by the acronyms PCK (Pedagogical Content Knowledge), TCK (Technological Content Knowledge), TPK (Technological Pedagogical Knowledge), and TPACK. (Koehler et al., 2013). A teacher's ability to combine knowledge, content, and technology becomes a specific skill that must be mastered given the development of generations over generations, (see Fig. 1). The basic concept of TPACK has seven elements that have been developed indirectly this describes the seven basic knowledge f TPACK that teachers must master. Mishra and Koehler explain the seven concepts as follows (Santos & Castro, 2021):

2 Ease of Use

1. Knowledge of rpp development, evaluation, and classroom management are all examples of pedagogical knowledge (PK), which is knowledge related to teaching approaches and practices.
2. Technical expertise (TE) Understanding many technologies, from low-tech to digital, such as desktop computers, internet connections, laptops, projector and television displays, printers, scanners, speakers, and tablets constitutes technological knowledge (TK).
3. Content Knowledge (CK): The term "content knowledge" refers to "knowledge of the actual subject matter to be studied or taught." Teachers need to understand both the subject matter they will be teaching and how various subjects call for various forms of knowledge.

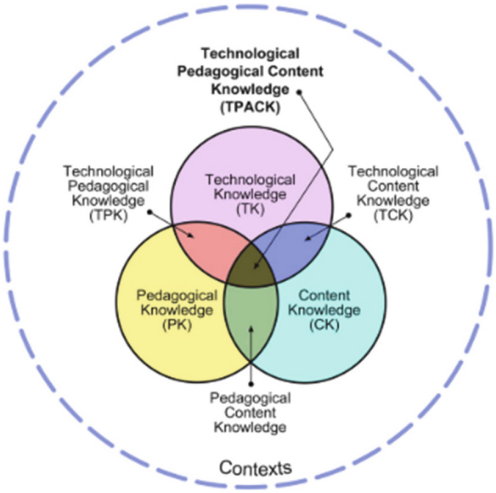

Fig. 1. The TPACK framework and its knowledge components.

4. Knowledge of pedagogical content (PCK) Pedagogical content is knowledge related to the teaching procedure. Knowledge of pedagogical content differs for different areas of content since it mixes content and pedagogy with the goal of enhancing teaching techniques in the issue area.
5. Technological pedagogical knowledge (TPK) is the understanding of how different technologies may be used in education, as well as the knowledge of how their usage may change how teachers instruct.
6. Technological content knowledge (TCK): TCK is the comprehension of how technology may deliver certain information in novel ways. This demonstrates that instructors are conscious of the possible impact that some technologies may have on how pupils learn and retain particular subject-specific material.
7. Technological Pedagogical Content Information (TPACK): Also known as TPACK, this is the information that educators require to integrate technology into their classroom in any subject area (TPACK). Teachers have an innate understanding of the complex links between the three essential components of knowledge because they use pedagogically sound strategies and technology for their lesson plans (CK, PK, and TK). Schmidt ET AL, 2009).

TPACK is one of the approaches or frameworks that can connect science, technology, and content. This is a demand for skills that must be mastered by teachers in delivering learning materials. Improving and improving teacher abilities is an integrated effort, namely, through the TPACK approach, teachers are able to master and combine pedagogic competencies, knowledge, and technology so that learning is effective, innovative and can improve student learning outcomes (Online & Hayani, 2022). According to Law No. 14 of Th. 2005, instructors are required to possess four skills: Competencies in pedagogy, personality, career, and social interaction. Improving teachers' capacity to employ the TPACK method in learning is based on these qualities. Elementary school teachers must be able to teach all subjects, making TPACK proficiency crucial. Teachers with TPACK proficiency can incorporate technology into the learning process in accordance with the appropriate learning materials and learning strategies in accordance with student characteristics (Sintawati & Indriani, 2019). The difficulties with the TPACK framework may result from a number of assumptions. The TPACK framework may be interpreted, understood, and conceptualized via a variety of lenses to guide research planning, design, and execution (Graham, 2011; Voogt et al., 2013). (Jaikaran-Doe & Edward Doe, 2015). The emergence of various assumptions of understanding the TPACK framework n to be based on a teacher's experience and understanding of the concept. of course, this is the basis for measuring the teacher's ability to approach TPACK.

This study analyzed and mapped the ability of primary school teachers in the Labuan ratu sub-district to integrate the TPACK approach. The purpose of this article is to try to analyze the ability of TPACK in elementary school teachers in the Labuhan Ratu sub-district as a basis for learning needs that are adapted to developments and increased knowledge of TPACK components for teachers. This ability analysis is expected to be a motivation for teachers in providing new learning experiences for students as an effort to change and develop in the face of the 21st century.

3 Research Method

Type of Research

This type of research uses quantitative description. Researchers did not give treatment to samples. The study sample used random sampling, namely 2 class teachers taken in 8 public elementary schools in Labuhan Ratu District in each elementary school, with a total number of respondents, namely 16 samples. The research instrument uses the instrument adopted by Jaikaran-Doe & Edward Doe (2015). This instrument is designed to measure the TPACK ability of teachers. The instrument has been widely used by previous researchers and has a high value of validity and reliability.

The techniques and tools used to collect research data are questionnaires/questionnaires. The research data obtained will be analyzed using Analyze Descriptive Statistics with the help of the SPSS application. The data is retrieved using Google Forms using a Likert scale. The questionnaire instrument totaled 26 questions. How sure are you that you have the knowledge, skills, and abilities to support the use of ICT by students for what? is the first portion of the TPACK survey question that this question borrows from. (2012) Jamieson-Proctor et al. TTF is a design of the survey instrument on which the teaching instrument of future teachers, Albion (2014);(Jaikaran-Doe & Edward Doe, 2015), is classified according to the 7 TPACK frameworks. The average is used to determine the TPACK ability level o elementary school teachers.

4 Result and Discussion

Research has been done to learn more about the TPACK proficiency of the district's public elementary school teachers in Lathe Labuan Ratu. TPACK is made up of seven components, the first three of which are Pedagogical Knowledge (PK), Content Knowledge (CK), Technological Pedagogical Knowledge (TPK), Pedagogical Content Knowledge (PCK), and Technological Pedagogical Content Knowledge (TPACK) (Koehler et al., 2013). Data were obtained using questionnaire sheets/questionnaires for public elementary school teachers in Labuhan Ratu District with a total of 16 respondents selected from 8 public elementary schools about the ability of teachers to understand the Technological Pedagogical Content Knowledge (TPACK) framework.

In order to describe how instructors' knowledge of educational technology and PCK interact with one another to enable successful teaching using technology, the TPACK framework builds on Shulman's (1987, 1986) description of PCK. Similar concepts have been presented by other writers, but frequently with different labeling methods. The idea behind TPACK as it is presented below has changed over time and via a number of publications, with the most thorough explanation of the framework being in Mishra and Koehler (2006) and Koehler and Mishra (2008); (Koehler et al., 2013). A framework called TPACK may link content, technology, and science. Through the TPACK framework approach, teachers can provide teaching that is integrated with technology, pedagogics, and content. This TPACK approach is complex enough to be understood from theory to practice. To measure teacher abilities based on the TPACK component framework, category giving follows the Likert scale that has been compiled by Widoyoko

Table 1. TPACK Ability Criteria

Variable	interval	Category
TPACK	1 - 1.80	Not good
	> 1.80 - 2.60	Not good
	> 2.60 - 3.40	Enough
	> 3.40 - 4.20	Well
	> 4.20 - 5.00	Very good

(Purnomo & Palupi, 2016). The survey items were answered using a Likert scale with 5 response options, "1 = very unsure", "2 = unsure", "3 = unsure", "4 = sure", and "5 = very sure.". Criterion 5 of the interval scale is used to categorize the capabilities of each TPACK component.

The results of a descriptive analysis based on seven components of the framework—technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), technological pedagogical knowledge (TPK), pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical content knowledge—of public elementary school teachers in Labuhan Ratu District are presented (TPACK).

1. ***Technological Knowledge (TK)***

Technology Knowledge is knowledge of the use of more advanced technology. Technical knowledge (TK) is the understanding of both basic and more complex technologies, such as books, chalk, and whiteboards. It involves the abilities needed to choose and use ICT tools including document/digital cameras, video projectors, interactive whiteboards, and laptop computers. It involves understanding computer hardware and operating systems as well as having the technical know-how to implement and manage applications including word processors, spreadsheets, browsers, emails, and web-based resources in the classroom (Jaikaran-Doe & Edward Doe, 2015). The table below shows the conclusions on the framework (TK).

Based on the findings of research on the Knowledge Technology framework, the 2 questions asked are based on the instruments adopted by Jaikaran Doe (2015). Item TK1 gets an average of 4.19 with a TCR of 84% can be interpreted well. In the TK2 item, it gets an average of 3.94 with a TCR of 79% in sufficient interpretation. The final average on the technological knowledge framework averaged 4.06 with a TCR of 81% and was well interpreted. These results show that the ability of technological knowledge in public elementary school teachers in Labuhan Ratu District is included in the interpretation of good. Teachers' ability to provide learning allows them to use it in the classroom.

2. ***Pedagogical Knowledge (PK)***

The depth of the teacher's grasp of the process, application, or manner of education is known as pedagogic knowledge (PK). They include, among other things, the overarching ideals, values, and objectives of education. This broad area of knowledge includes an

Table 2. Pedagogical Knowledge (PK) findings

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
PK	PK1	How certain are you that you are knowledgeable about instructional techniques?	16	58	3.63	73%	Well
	PK2	How confident are you in organizing your lessons to attract students of all abilities to your class?	16	58	3.63	73%	Well
				116	3.63	73%	Well

understanding of the learning process, a wide range of classroom management skills, lesson planning, and student evaluation. This entails being aware of the instructional techniques or methods used in the classroom, the demographics of the target audience, and the methods for evaluating the knowledge of the pupils. (Koehler et al, 2013). The findings on the framework (PK) are as follows.

Based on the results of research findings on the Pedagogic Knowledge framework, item PK1 got an average of 3.63 with Tcr 73% can be interpreted well. In item, PK2 gets an average of 3.63 with a TCR of 73% in good interpretation. The final mean on the pedagogic knowledge framework averaged 3.63 with a TCR of 73% and was well interpreted. These results show that the ability of pedagogic knowledge in public elementary school teachers in Labuhan Ratu District is included in the interpretation of good. The ability of teachers to pedpedagogical knowledge in providing learning allows them to understand enough, among others, the objectives, values, educational objectives, learning strategies and learning evaluations, learning methods, and models that are adapted to the Basic Competencies (KD) to be achieved.

3. ***Content Knowledge (CK)***

Knowledge of the topic area is referred to as content knowledge. The teacher's familiarity with the material to be taught or acquired is referred to as their content knowledge (CK). (Koehler et al., 2013). The findings on the framework (CK) are as follows.

Based on the findings of research on the content knowledge framework, item CK1 got an average of 3.81 with a Tcr of 76% can be interpreted well. In the CK2 grain, it gets an average of 3.88 with a TCR of 78% in good interpretation. The final average on the content knowledge framework averaged 3.84 with a TCR of 73% and was well interpreted. These results show that the ability of content knowledge in public elementary school teachers in Labuhan Ratu District is included in the interpretation of good. For the learning objectives to be successfully met, this competence gives the instructor

Table 3. Content Knowledge (CK) findings

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
CK	CK1	How certain are you that you are knowledgeable about and comprehend the subject you are teaching?	16	61	3.81	76%	Well
	CK2	How certain are you that you can effectively respond to any inquiries from students on the topic you are teaching?	16	62	3.88	78%	Well
				123	3.84	77%	Well

understanding of the content to teach. In order to adapt to particular classroom demands, it is crucial to be familiar with the teacher's topic, recognize struggling students and change the way information is presented to make it easier to understand (Santos & Castro, 2021).

4. ***Technological Pedagogical Knowledge (TPK)***

Understanding TPK is knowing how particular technologies utilized in certain ways may alter teaching and learning (Koehler et al., 2013). For learning to take place effectively, pedagogic technology knowledge necessitates a thorough and precise grasp of the functions of the devices to be utilized, as well as knowledge of the necessary abilities. The following table displays the TPK's results.

Based on the findings of research on the framework of technological pedagogical knowledge, of the 4 questions asked based on the adopted instrument from Jaikaran Doe (2015). On item TK1. PK1 gets an average of 3.81 with a Tcr of 76% can be interpreted well. On item TK1. PK2 gets an average of 3.81 with a Tcr of 76% in good interpretation. On item TK2. PK1 gets an average of 4.69 with a Tcr of 94% which can be interpreted very well. On item TK2. PK2 gets an average of 4.63 with a Tcr of 93% can be interpreted very well. The final average on the technological pedagogical knowledge framework averaged 4.23 with a Tcr of 85% and was well interpreted. The results understand that the ability of technological pedagogical knowledge in public elementary school teachers in Labuhan Ratu District is good. Teachers are better able to comprehend the nature of teaching and learning with technology and the advantages that are altered in the context of learning when they combine the frameworks (TK) and (PK) for learning. Preferred terminology for this information is "pedagogical knowledge of technology." It includes understanding of the nature of teaching and learning with

Table 4. Technological Pedagogical Knowledge (TPK) findings

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
TPK	TK1.PK1	1. How confident are you in your ability to regularly offer instruction utilizing ICT like PowerPoint, a video projector, and an interactive whiteboard while integrating your understanding of teaching and learning strategies?	16	61	3.81	76%	Well
	TK1.PK2	2. How sure are you that you can integrate? ICTs like PowerPoint and Excel may be used in the classroom to engage and motivate students of all skill levels?	16	61	3.81	76%	Well
	TK2.PK1	3. How confident are you that you can use online tools and teaching resources like YouTube, Google, WebQuest, and Google Scholarship to incorporate your understanding of teaching and learning strategies?	16	75	4.69	94%	Very good
	TK2.PK2	4. How confident are you that you will regularly apply your understanding of teaching and learning techniques utilizing ICT, such as PowerPoint, Excel, projectors, and interactive whiteboards?	16	74	4.63	93%	Very good
				271	4.23	85%	Well

technology as well as the benefits and downsides of various technologies for a particular pedagogical practice (TPK). (Valtonen et al, 2017)

5. **Pedagogical Content Knowledge (PCK)**

The knowledge foundation required for teaching, which calls for a combination of content and pedagogical knowledge, is referred to as knowledge of pedagogical content.

(1987) Shulman; (Valtonen et al., 2017). This framework provides an understanding of learning skills with the content that will be taught by students. The findings (PCK) can be seen in the following table.

Based on the results of research findings on the framework of knowledge of pedagogical content. On item PK1. CK1 gets an average of 4.13 with a Tcr of 83% can be interpreted well. On item PK1. CK2 gets an average of 3.88 with a Tcr of 78% in good interpretation. On item PK2. CK1 gets an average of 3.69 with a Tcr of 74% well interpreted. On item PK2. CK2 gets an average of 3.75 with a Tcr of 75% well interpreted. The final mean on the knowledge framework of pedagogical content got an average of 3.86 with a Tcr of 77% and was well interpreted. The findings explain that teachers have a good ability to understand good content and pedagogical. This framework works for teachers in providing appropriate learning in terms of the material or content of the lesson and skills that fit the context of the material or specific objectives. Knowledge of pedagogical content includes appropriate teaching methods for delivering certain content. The teacher in this instance is knowledgeable about the material and presents it in a variety of ways. (Goradia, 2018)

6. ***Technological Content Knowledge (TCK)***

Knowledge of the link between content and technology, as well as how each influences and is constrained by the other, is referred to as technology content knowledge (TCK). The term "TCK" stands for "technological content knowledge" (e.g. biology, mathematics, etc.). (Valtonen and others, 2017) The following are examples of the TCK results.

Based on the results of research findings on the framework of knowledge of technological content. On item TK1. CK1 gets an average of 4.19 with a Tcr of 84% well interpretable. On item TK1. CK2 gets an average of 4.25 with a Tcr of 85% in excellent interpretation. On item TK2. CK1 gets an average of 4.00 with a Tcr of 80% can be interpreted well. On item TK2. CK2 gets an average of 3.81 with a Tcr of 76% well interpretable. The final average on the technology content knowledge framework averaged 4.06 with a Tcr of 81% and was well interpreted. The findings explain that teachers can integrate learning content with technology effectively and efficiently. This framework describes the teacher's ability to choose technology that suits students' needs, as well as providing students with a new learning experience tailored to the content or content of the subject matter. Technology content knowledge refers to the teacher's knowledge of the use of appropriate technology to communicate content. Material in a particular discipline. (Goradia, 2018).

7. ***Technological Pedagogical Content Knowledge (TPACK)***

The three "core" pieces are only one new category of knowledge called TPACK (content, pedagogy, and technology). Technology pedagogical content knowledge is the understanding that arises from the interaction of content, pedagogy, and technological knowledge. Koehler et al, 2013) Instructors must understand the TPACK framework, which acts as the cornerstone for achieving both educational and learning goals, in order to give students with the best learning experience possible. Technical pedagogical content knowledge (TPACK) the most important and integrated kind of teacher knowledge.

Table 5. Technological Content Knowledge (TCK) findings

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
TCK	TK1.CK1	1. How confident are you utilizing ICT to support your subject-matter knowledge?	16	67	4.19	84%	Well
	TK1.CK2	2. How comfortable are you utilizing ICT to deliver thorough responses to all of the students' inquiries concerning the subjects you teach?	16	68	4.25	85%	Very good
	TK2.CK1	3. How confident are you utilizing online resources to boost your teaching-related knowledge?	16	64	4.00	80%	Well
	TK2.CK2	4. How confident are you in your ability to use online resources to effectively respond to all student inquiries concerning the content you teach?	16	61	3.81	76%	Well
				260	4.06	81%	Well

(McGrath et al, 2011) The outcomes of technological pedagogical content knowledge are as follows: (TPACK).

Based on the results of research findings on the framework of knowledge of pedagogic content of technology. From 8 questions, the results were obtained in item TK1. PK1. CK1 gets an average of 4.50 with a Tcr of 90% which is very well interpreted. On item TK1. PK1. CK2 gets an average of 3.50 with a Tcr of 70% in good interpretation. On item TK1. PK2. CK1 gets an average of 3.88 with a Tcr of 78% well interpretable. On item TK1. PK2. CK2 gets an average of 3.31 with a Tcr of 66% can be interpreted well. On item TK2. PK1. CK1 gets an average of 3.50 with a Tcr of 70% good interpretation. On item TK2. PK1. CK2 gets an average of 3.50 with a Tcr of 70% good interpretation.

Table 6. The findings of the Technological Pedagogical Content Knowledge framework‖ or TPACK

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
TPACK		How confident are you…..					
	TK1. PK1. CK1	you are knowledgeable about teaching and learning techniques, have a thorough understanding of the subjects you are teaching, and are able to use ICT in your instruction, such as PowerPoint and Excel?	16	72	4.50	90%	Very good
	TK1. PK1. CK2	you are knowledgeable about instructional techniques for teaching and learning, and you are able to use ICT tools like PowerPoint and Excel to address all student inquiries and give clear explanations?	16	56	3.50	70%	Well
	TK1. PK2. CK1	demonstrate you are knowledgeable about the subjects you instruct, that you can plan your lectures and effectively use ICTs like PowerPoint and Excel to draw in students of all academic levels to your class?	16	62	3.88	78%	Well

(*continued*)

Table 6. (*continued*)

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
	TK1. PK2. CK2	that you are able to include ICT tools like PowerPoint and Excel, design your courses to appeal to students of all levels, respond to all of the students' inquiries regarding the content you teach, and give clear explanations?	16	53	3.31	66%	Enough
	TK 2. PK 1. CK 1	ln your understanding of instructional techniques, and in your ability to draw in students of all skill levels using online teaching resources and technologies like YouTube, Google, and WebQuest?	16	56	3.50	70%	Well
	TK2. PK1. CK2	You are knowledgeable about teaching and learning techniques, and you are able to use online teaching resources like WebQuest, Google, and YouTube to address any queries students may have about the subjects you teach?	16	56	3.50	70%	Well

(*continued*)

Table 6. (*continued*)

Framework		Question	N	Score	mean	Tcr	Interpretation Verbal
	TK2. PK2. CK1	demonstrate you are knowledgeable about the things you teach and have experience using online tools like WebQuest, YouTube, and Google to draw in students of all academic levels to your class?	16	62	3.88	78%	Well
	TK2. PK2. CK2	that you are able to structure your lessons to appeal to students of all levels, respond to all questions students have about the content you teach, and give clear explanations using web-based teaching tools and resources like YouTube, Google, and WebQuest?	16	60	3.75	75%	Well
				477	3.73	75%	Well

TK2. PK2. CK1 gets an average of 3.88 with a Tcr of 78% good interpretation. TK2. PK2. CK2 gets an average of 3.75 with a Tcr of 75% good interpretation. The final mean on the knowledge framework of technological pedagogic content gets an average of 3.73 with a Tcr of 75% and is well interpreted. The findings can be interpreted to mean that the teacher's ability to integrate content, pedagogics, and technology in learning can be said to be good.

Understanding this framework for teachers certainly has their own achievement value in every learning in the classroom. This will have a positive learning impact when viewed from the total TPACK framework, the ability of teachers to understand reaches 75%. This means that in every learning activity takes place the teacher can integrate technology with content or learning materials that are associated together with pedagogical understanding in certain learning.

5 Discussion

This research clearly shows how the TPACK ability of Labuhan Ratu District Elementary School Teachers effectively understands this framework. The results show strong knowledge of each of the TPACK frameworks. The components of the framework that show the highest average are TPK (4.23), TCK, and TK (4.06) meaning that the basic TPACK framework can be understood for elementary school teachers, but there are several TPACK areas that show sufficient scores with an average of 3.19 in the aspects of TK.1, PK.2, CK.2 this area explains the teacher's ability to combine ICT with teacher skills in delivering material. The factor that causes the average gain is sufficient in the above aspect because there are still some teachers who have not been able to combine kindergarten, PK, and CK properly which is adjusted to the character and interests of students. Therefore, teachers need to improve their skills in the teacher's skill area in delivering material with the help of technology that can interest students, so that students get a new learning experience. So that learning can run well and in accordance with the 4 competencies of teachers.

Additionally, this study offers certain information that influences instructors' abilities. TPACK refers to the extensive collection of learning opportunities the government has amassed in an effort to raise the caliber of classroom instructors. Therefore, scholars support the government's equally distributed initiative for teacher quality improvement, since this will provide teachers the confidence and skills to integrate technology into the classroom. Consequently, traditional education will shift from being teacher-centered to being student-centered.

According to the study's findings, teachers would be able to better their abilities in the areas of kindergarten, primary school, and secondary school by taking part in training if it was known how well they understood the TPACK framework. The qualities of student-oriented technology must be adapted in the classroom in order for students to take part in the learning process. The results of this investigation might provide academics and scholars with knowledge and motivation.

6 Conclusion

This research explains that teachers' ability to understand the TPACK framework is quite good. This is the basis for the conclusion that Primary School Teachers have a strong scope of knowledge to apply in learning, although there are some coverage areas that are still categorized as sufficient. Therefore, this can certainly be a motivation for teachers to develop better learning in the future.

This research can be the basis for policies on how the government can meet facilities and infrastructure both materially and non-materially, especially at the elementary school level so that the learning process becomes better. In addition, researchers hope that this will be a motivation for teachers to be able to prepare all student-oriented learning tools.

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