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FRAMEWORK OF *TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE* (TPACK) ON TEACHERS' BACKGROUNDS IN GEOGRAPHY LEARNING IN MUNA DISTRICT

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ABSTRACT

Education has a big influence in the world of education, one of which is the role of the teacher who is no longer a source of learning, but the teacher is only a facilitator. Advances in Information, Knowledge and Technology pose challenges to teachers in finding relevant roles in order to measure student learning progress in order to face challenges in the 21st century. This study aims to determine the Technological Pedagogical Content Knowledge (TPACK) Competencies of Geography teachers in Muna Regency, (Research This study uses a survey method with quantitative descriptive analysis. With the results of the study showing that: The quality of the TPACK framework for geography teachers in Muna Regency is in the very good category (1) In the Technological Knowledge (TK) subdomain, geography teachers in Muna Regency are in Good criteria, (2) Pedagogical Knowledge (PK) of geography teachers in Muna Regency is in very good criteria and masters pedagogy very well, (3) Content Knowledge (CK) of geography teachers in Muna Regency is also in very good criteria which includes mastery of good content. very good, (4) Technological Content Knowledge (TCK) geography teachers in Muna Regency are in good criteria, (5) Pedagogical Content Knowledge (PCK) for geography teachers are in very good criteria, (6) Technological Pedagogical Knowledge (TPK) is in good category, and (7) Technological Pedagogical Content Knowledge (TPACK) of geography teachers in Muna Regency is in the very good category.

Keywords*: TPACK Framework, Teacher's Background, Learning Geography*

INTRODUCTION

Global demand on the task of teachers entering the 21st century is progressively challenging (Daryanto & Karim, 2017, p.6). Teachers are obliged to improve their professional competencies. With the professional competencies that must be possessed, several studies on the professional competencies of teachers show different abilities in each indicator (Hayati, 2015).

Advances in science and technology have had a major impact on the fields of human life, from the fields of politics, economy, ideology, culture and education. This has a great influence on the role of the teacher. Currently the teacher is the only source of information and learning resources, it can no longer be maintained (Payong, 2011). The 21st century challenges teachers to find new roles that are more contextual and relevant in learning, for example, teachers act as mentors, directing discussions and measuring students' learning progress so that the younger generation is able to face challenges in the 21st century (Zubaidah, 2017).

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The emergence of digital technology has dramatically changed the routines and practices in human daily life, including in the field of education. The use of technology in learning is defined as interaction and collaboration between technology, ideas and science. Thus making technology an important component in its application in the learning process (Mishra & Koehler, 2006).

The ability to use information and communication technology mixed with good teacher pedagogical knowledge is one of the factors that can help teachers meet the challenges of preparing students to improve the skills needed in the 21st century (Hennessy, Ruthven & Brindley 2005; Schoen & Fusarelli, 2008 ; Tay, Lim & Koh, 2012).

Then Ibda (2018, p.7) states that there are challenges in the current era of globalization, namely: (1) information technology that targets the world of education, (2) constraints and stability of production machines, (3) inadequate skills, (4) the loss of many jobs due to automation, (5) stagnation in the use of information and communication technology, (6) uneven changes in curriculum, models, strategies, approaches, and teachers in learning that strengthen new literacy.

Therefore, teachers as educators who will deliver students in the future need to master content, pedagogy and technology as learning resources and media (Maryani, 2017, p.20). There are many skills that must be possessed by geography teachers, but there are still many obstacles faced in mastering pedagogical knowledge, including the use of media, finding interesting methods, evaluation and classroom management (Maryani, et al, 2016, p. 9). Content knowledge is knowledge of concepts, theories, ideas, frameworks, knowledge of evidence, as well as practices and approaches to develop that knowledge (Shulman, 1986; Suryawati et al., 2014; Tian, et al., 2012).

Shulman has put forward the definition of the subject of content learning knowledge which is then known as pedagogical content knowledge (PCK). Shulman (1986) explains that a teacher in addition to mastering content knowledge, teachers must also master pedagogic knowledge, because knowledge of pedagogic content can be a special part of knowledge in teaching. Knowledge of pedagogic content includes understanding what makes learning a particular topic easy or difficult, so that it can be transformed into a particular topic.

Technological Pedagogical Content Knowledge (TPACK**)** is teacher knowledge about how to facilitate student learning of certain content through pedagogic and technological approaches (Cox & Graham, 2009: 63). According to Shulman (1986), TPACK is known in the field of educational research as *a framework* for designing learning models by integrating three main aspects, namely technology, pedagogy, and content.

TPACK describes the basics of effective teaching using technology, understanding the concept of repentance in applying technology, applying pedagogical techniques using technology constructively to teach content, knowledge of what makes concepts difficult or easy to learn and how technology can help some of the problems faced by students. understanding about how technology can be used to build on existing knowledge to develop new epistemologies or to strengthen old ones (2016: 451).

According to Koeher & Mishra (2008: 3), the TPACK framework was built in 1986-1987 to describe how teachers' understanding of educational technology and content knowledge interact with each other to produce effective teaching with technology. The description of the TPACK framework described by Koehler & Mishra (2008: 12-18) consists of 7 domains. Figure 1 below provides an illustration of the material (C). pedagogy (P) and technology (T) which then becomes C (CK). P becomes (PK) and T becomes (TK).

RESEARCH METHOD

The method used in this research is a survey method. Survey research is research that takes a sample from one population and uses a questionnaire as the main data collection tool. Survey research can be used for the following purposes: colonization (*explorative*), descriptive *exploratory* or *confirmatory*, namely explaining causal relationships and hypothesis testing, evaluation, prediction, operational research and development of social indicators

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(Singarimbun, 1989). This study uses a quantitative approach with the analysis used in descriptive analysis.framework for *Technological Pedagogical Content Knowledge* Geography teachers of SMA/MA in Muna Regency. Descriptive research is a research method that aims to describe phenomena in real conditions and can occur both now and in the past. The process of describing the results of the study used a quantitative approach, this was done because the data obtained in the field used a questionnaire/questionnaire with a numerical value.

RESULTS AND DISCUSSION

The description of the Geography Teacher Technological Pedagogical Content Knowledge (TPACK) Framework is as follows.

1. Technological Knowledge (TK)

Technological knowledge is one of the types of knowledge that continues to experience changes and developments which includes technological knowledge in managing information, communication and problem solving and focuses on the productive application of technology in work and daily life. Technological advances are expected to help and make it easier for students to understand a material. Geography teachers' knowledge of technology in Muna Regency in learning is one of the dimensions in this study, this is related to the TPACK mastery of geography teachers in Muna Regency. The average score of technology knowledge for geography teachers in Muna Regency can be seen in table 1.

Table 1. Geography Teacher Technological Knowledge (TK) Score

No	Item Statement	Average	Criteria
1	Ability to operate computer equipment	4.26	Very Good
2	Use of technology in learning	4.17	Good
3	Can teach students using the web (eg blogs, facebook, wikipedia) effectively.	3.30	Currently
4	Easily adaptable to the latest technological developments (eg Zoom meeting application, Google meet and others).	3.57	Good
	Cumulative	15.30	Good

Source: Data Analysis (2022)

Cumulatively from the average TK score for geography teachers of 15.30, which is shown in table 1 is in the Good category, this illustrates that geography teachers in Muna Regency already have knowledge of good technology and have been able to apply it in the geography learning process. The highest score was on the statement item that the geography teacher was able to operate computer equipment at 4.26 which was included in the Good category. The lowest average score is on the statement item Can teach students using the web (eg blog, facebook, wikipedia) effectively at 3.30 with the Medium category.

The frequency distribution of teachers' TK scores can be seen in the SPSS 4.4 output table.

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Table 2. *Output* Geography Teacher Technological Knowledge (TK) Score

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Bad	1	4.3	4.3	4.3
	Currently	4	17.4	17.4	21.7
	Good	15	65.2	65.2	87.0
	Very Good	3	13.0	13.0	100
	Total	23	100	100	

Source: Data Analysis (2022)

Table 2 shows that as many as 3 respondents or 13% of geography teachers have very good TK skills, and more than half of the geography teacher respondents, namely 15 people or 65.2% have good TK. Then the geography teacher respondents as many as 4 people or 17.4% have moderate TK abilities, and only a small number of geography teachers as much as 1 person or 4.3% have poor TK.

2. Pedagogical Knowledge (PK)

Pedagogical knowledge or commonly referred to as teacher knowledge about how to implement, strategies and modes to support the learning of geography teacher students in Muna Regency is shown in table 3 below. The pedagogic knowledge of geography teachers in Muna Regency is in the very good category, indicated by the cumulative average score of the geography teacher PK of 26.74, this shows that geography teachers in Muna Regency have very good Pedagogic Knowledge and have been able to apply it in the implementation of learning geography. The highest average score is on the statement item that the geography teacher is able to understand the learning objectives to be achieved at 4.65 which is included in the very good criteria. and the lowest average score was on the statement item understanding the development of learning media at 4.26, but it was still in the very good category.

Table 3. Geography Teacher Pedagogical Knowledge (PK) Score

No	Item Statement	Average	Criteria
1	Guiding students to learn independently	4.39	Very Good
2	Learning objectives to be achieved	4.65	Very Good
3	Variations of learning methods	4.35	Very Good
4	student learning ability	4.48	Very Good
5	Preparation of syllabus and lesson plans (RPP)	4.61	Very Good
6	Development of learning media	4.26	Very Good
	Cumulative	26.74	Very Good

Source: Data Analysis (2022)

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The frequency distribution of respondents' PK acquisition can be seen in the SPSS PK output table in table 4. Table 4 shows that more than half, namely 52% or as many as 12 geography teacher respondents have very good PK abilities and the remaining 47.8% or 11 geography teacher respondents have good PK abilities.

Table 4. Output Pedagogical Knowledge (PK)

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Good	11	47.8	47.8	47,8
	Very Good	12	52.2	52.2	100,0
	Total	23	100	100	

Source: Data Analysis (2022)

3. Content Knowledge (CK)

If a teacher is not able to master the material when carrying out learning, then it is not impossible that the teacher will direct the teacher in the wrong direction so that it distorts the students' perspective regarding a concept in learning. The material is a very absolute knowledge that must be understood by a geography teacher, content knowledge covering various dimensions must be mastered by a geography teacher. To find out a general description of the content knowledge of geography teachers in Muna Regency, see table 5 below.

Table 5. Geography Teacher Content Knowledge (CK) Score

No	Item Statement	Average	Criteria
1	Learning materials	4.65	Very Good
2	can provide examples for students to understand material that is difficult to understand becomes easy.	4.35	Very Good
3	can provide relevant answers according to student questions.	4.57	Very Good
4	Draw conclusions from each material taught.	4.65	Very Good
	Cumulative	18.22	Very Good

Source: Data Analysis (2022)

From the average CK score for geography teachers of 18.22, it is in very good criteria, this shows that teachers have very good confidence in geography knowledge. The highest average score is on the statement item understanding the learning material and being able to draw conclusions from each material being taught at 4.65 which is in very good criteria. The lowest average score is on the statement item that the geography teacher can provide examples for students to understand difficult-to-understand material easily, at 4.35 but still in very good criteria.

The frequency distribution of geography teachers' CK scores can be seen in the SPSS 4.8 output table below.

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Table 6. Output Content Knowledge

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Good	6	26.1	26.1	26.1
	Very Good	17	73.9	73.9	100
	Total	23	100	100	

Source: Data Analysis (2022)

Table 6 shows that more than half of 73.9% or as many as 17 people from 23 geography teacher respondents have very good CK abilities and the rest are 26.1% or 6 Geography teacher respondents have good CK ability.

4. Technological Content Knowledge (TCK)

TCK is an ability to understand how to link technology and the influence of related content. The following is a description of the TCK ability of geography teachers in Muna Regency which is presented in table 7 below.

Table 7. Geography Teacher Technological Content Knowledge (TCK) Score

No	Item Statement	Average	Criteria
1	Can use appropriate technology in every learning material.	3.52	Good
2	Using maps to assist students in developing student insight.	4.17	Good
3	Utilize technology (eg audio, animation, text, video) according to the topic of the subject matter.	4.39	Very Good
Kumulatif		12.09	Good

Source: Data Analysis (2022)

Cumulatively, the average TCK score for geography teachers is 12.09 and is in good criteria, this shows that geography teachers have knowledge about the use of technology and related content . The highest average score is on the statement item that Utilizes technology (e.g. audio, animation, text, video) according to the topic of the subject matter of 4.39 with very good criteria. The lowest average score is on the statement item can use appropriate technology in each learning material, amounting to 3.52 which is in good criteria.

5. Pedagogical Content Knowledge (PCK)

The results of calculations using descriptive analysis using Microsoft Excel 2007 PCK for geography teachers in Muna Regency are presented in the following table 8.

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Table 8. Geography Teacher Pedagogical Content Knowledge (PCK) Score

No	Item Statement	Average	Criteria
1	Carry out learning in accordance with the lesson plans that have been made previously.	4.74	Very Good
2	Can organize classes to provide equal opportunities to all students.	4.74	Very Good
3	Can design fun learning activities for students.	4.57	Very Good
4	Delivering subject matter in accordance with learning objectives.	4.78	Very Good
5	Using learning media according to the situation and conditions in the classroom.	4.78	Very Good
	Cumulative	23.61	Very Good

Source: Data Analysis (2022)

Cumulatively, the average PCK score for geography teachers is 23.61 which is in the very good category, this shows that teachers already have knowledge that places more emphasis on how a teacher practices learning and the learning process in accordance with the material presented. taught.

The highest average score is on the statement item Delivering subject matter in accordance with the learning objectives and Using learning media according to the situation and conditions in the classroom, amounting to 4.78 which is in very good criteria.average score is on the statement item Can design fun learning activities for students, amounting to 4.57 which is also in the very good category.

6. Technological Pedagogical Knowledge (TPK)

The results of calculations using descriptive analysis using Microsoft Excel 2007 PCK for geography teachers in Muna Regency are presented in table 9 below.

Table 9. Geography Teacher Technological Pedagogical Knowledge (TPK) Score

No	Item Statement	Average	Criteria
1	I use technology in the classroom to support learning (eg internet, Infocus and laptops).	3.78	Good
2	I can use conference applications to discuss with students (e.g. Whatsapp and others).	3.57	Good
3	Directing students to use technology to explore and search for the material to be studied (eg internet).	4.57	Very Good
	Cumulative	11.91	Good

Source: Data Analysis (2022)

From the average TPK score for geography teachers of 11.91 which is a good criteria. This shows that teachers have good knowledge of technology in the learning process and design learning as well as possible based on constraints and obstacles in implementing strategies and pedagogic designs in learning. The highest average score is on the statement item Directing students to use technology to explore and search for the material to be studied (eg internet), which is 4.57 which is in the Very good criteria.applications *conference* to discuss with students (eg Whatsapp and others), amounting to 3.57 which is in good criteria.

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Tabel 10. Output Technological Pedagogical Knowledge (TPK)

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Average	3	13.0	13.0	13.0
	Good	17	73.9	73.9	87.0
	Very Good	3	13.0	13.0	100.0
	Total	23	100	100	

Source: Data Analysis (2022)

In table 10 Distribution of the frequency of obtaining TPK scores for geography teacher respondents, the TPK output shows that most of the 17 respondents from geography teachers or 73.9% of geography teachers have TPK abilities in the Good category, as many as 3 respondents from geography teachers or 13% of geography teachers have TPK abilities in the very good category, and as many as 3 respondents from geography teachers or 13% of geography teachers have TPK abilities in the very moderate category.

7. Technological Pedagogical Content Knowledge (TPACK)

The results of calculations using descriptive analysis using Microsoft Excel 2007 TPACK for geography teachers in Muna Regency are presented in table 11 below.

Table 11 Geography Teacher TPACK Score

No	Item Statement	Average	Criteria
1	I determine the appropriate learning method in using technology in the classroom.	4.13	Good
2	Using a strategy of combining content, technology and teaching approaches.	4.52	Very Good
3	Teach proper teaching by integrating lessons, technologies and methods.	4.52	Very Good
4	Teaching according to pedagogic competence, and using learning technology in teaching material to students.	4.52	Very Good
5	Helping others to coordinate the use of content, technology, and teaching approaches in schools.	4.17	Good
	Cumulative	21.87	Very Good

Source: Data Analysis (2022)

Cumulatively, the average TPACK score for geography teachers is 21.87, which is in the very good criteria. This shows that the teacher already has knowledge of the complex interactions between the domains of scientific principles (content, pedagogy, technology). The average score is on the question items Using strategies combining content, technology and teaching approaches, Teaching appropriate teaching by integrating lessons, technology and methods, and Teaching according to pedagogic competencies, and using learning technology in teaching materials to students, amounting to 4.52 which are in very good criteria. The lowest average score is on the statement item determining the appropriate learning method in using technology in the classroom, with a score of 4.13 which is in good criteria. The distribution of the frequency of the geography teacher's TPACK score can be seen in the following SPSS 4.16 output

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Table 12. Output TPACK

		Frequency	*Percent*	*Valid Percent*	*Cumulative Percent*
Valid	Average	1	4,3	4,3	4,3
	Good	11	47,8	47,8	52,2
	Very Good	11	47,8	47,8	100,0
	Total	23	100,0	100,0	

Source: Data Analysis (2022)

The distribution table for the frequency of obtaining TPACK scores for geography teachers can be seen in the SPSS 4.16 output table, showing that less than half of the 11 respondents for geography teachers or 47.8% of respondents for geography teachers have TPACK abilities with very good and good. And a small part of the geography teacher respondents, namely 4.3% or 1 geography teacher respondent has moderate TPACK ability.

An illustration of the TPACK ability of teachers in Muna Regency in applying TPACK is presented in the following chart 1.

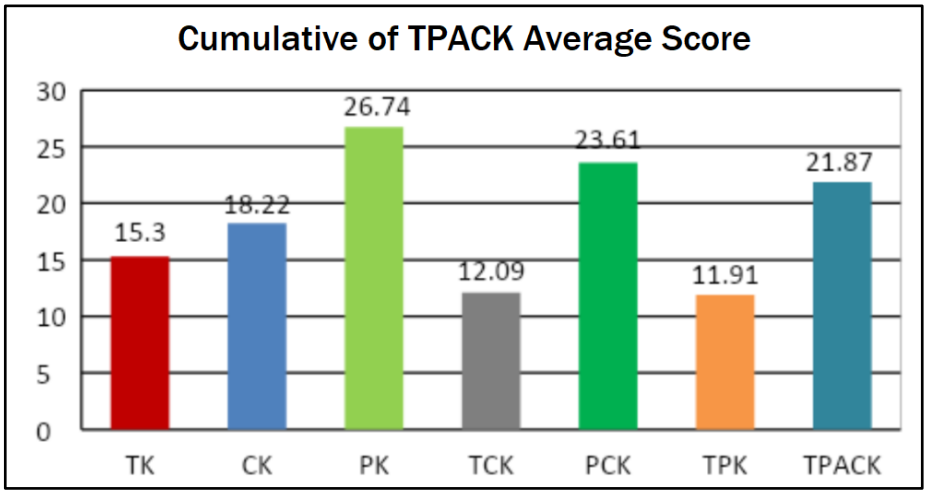

Figure 1. Average Score of Geography Teachers' TPACK Subdomains in Muna Regency

Figure 1 shows there are differences in competence in each geography teacher's TPACK subdomain, while the cumulative average score for the highest score is in the PK subdomain, which is 26.74, while the lowest average score is in the TPK subdomain. , which is 11.91.

Based on the results of the analysis and discussion that has been carried out, it can be concluded that the quality of the TPACK framework for geography teachers in Muna Regency is in the very good category. This is very interesting, when viewed from the general description of each TPACK sub domain which shows various results.subdomain *Technological Knowledge* (TK) *Pedagogical Knowledge* (PK) geography teachers in Muna Regency are in very good criteria and master pedagogy very well, *Content Knowledge* (CK) geography teachers in Muna Regency also is in very good criteria which includes excellent content mastery, *Technological Content Knowledge* (TCK) for geography teachers in Muna Regency is in good criteria, *Pedagogical Content Knowledge* (PCK) for geography teachers is in very good criteria, Technological Pedagogical Knowledge (TPK) are in the good category, and Technological Pedagogical Content Knowledge (TPACK) geography teachers in Muna Regency are in the very good category.

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RECOMMENDATIONS

The TPACK framework for geography teachers in Muna Regency is generally in the good category, but if you look at the TK subdomain there are still subdomains that are in moderate criteria, therefore there is a need for training on the use of technology, especially the use of technology in learning, so that it can improve the ability of geography teachers in Kindergarten in Muna Regency. It is necessary to provide guidance and training to geography teachers on the development of geography learning tools/media so that various innovative ideas from teachers will emerge. The government provides an innovation fund scheme that is provided with a scheme and innovation that is provided regularly as part of the teacher achievement award

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