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Technological Pedagogical Content Knowledge (TPACK): An Overview Through Self-Efficacy and Motivation to Become a Professional Teacher

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Abstrak

Penelitian ini dilatarbelakangi oleh pentingnya Technological Pedagogical Content Knowledge (TPACK) untuk Menjadi Guru Profesional. Tujuan penelitian ini adalah untuk menguji dan menganalisis pengaruh efikasi diri dan motivasi terhadap TPACK untuk menjadi guru profesional. Penelitian ini menggunakan pendekatan kuantitatif dengan metode survey. Teknik pengambilan sample menggunakan purporsive sampling sebanyak 100 orang guru. Instrumen yang digunakan adalah observasi, kuesioner dan angket. Teknik análisis data yang digunakan adalah asumsi klasik, analisis korelasi, dan analisis regresi linear berganda meliputi pengujian hipotesis Uji T, Uji F dan Uji R^2. Hasil penelitian ini menunjukan : 1) Efikasi diri berpengaruh secara positif dan signifikan terhadap Technological Pedagogical Content Knowledge (TPACK), 2) Motivasi berpengaruh secara positif dan signifikan terhadap Technological Pedagogical Content Knowledge (TPACK), dan 3) Efikasi diri dan motivasi berpengaruh secara positif dan signifikan terhadap Technological Pedagogical Content Knowledge (TPACK). Temuan penelitian ini mengisyaratkan pentingnya efikasi diri dan motivasi dalam meningkatkan Technological Pedagogical Content Knowledge (TPACK) untuk menjadi guru profesional.

Kata Kunci: *Efikasi Diri, Motivasi, Technological Pedagogical Content Knowledge (TPACK), Guru Profesional*

Technological Pedagogical Content Knowledge (TPACK): An Overview Through Self-Efficacy and Motivation to Become a Professional Teacher

Abstract

This research is motivated by the importance of Technological Pedagogical Content Knowledge (TPACK) for Becoming a Professional Teacher. The purpose of this study was to examine and analyze the effect of self-efficacy and motivation on TPACK to become professional teachers.

This research uses a quantitative approach with a survey method. The sampling technique used purposive sampling of 100 teachers. The instruments used were observation, questionnaires and questionnaires. The data analysis technique used is the classical assumption, correlation analysis, and multiple linear regression analysis including hypothesis testing T test, F test and R2 test. The results of this study indicate: 1) Self-efficacy has a positive and significant effect on Technological Pedagogical Content Knowledge (TPACK), 2) Motivation has a positive and significant effect on Technological Pedagogical Content Knowledge (TPACK), and 3) Self-efficacy and motivation have a positive effect and significant to Technological Pedagogical Content Knowledge (TPACK). The findings of this study indicate the importance of self-efficacy and motivation in improving Technological Pedagogical Content Knowledge (TPACK) to become professional teachers.

***Keywords** : Self-Efficacy, Motivation, Technological Pedagogical Content Knowledge (TPACK), Professional Teachers*

Introduction

Every job will require the ability to work professionally, including teachers. In an effort to improve the quality of education, teachers are required to become professionals in their fields. Professional teachers are people who have special abilities and expertise in the field of teacher training so that they are able to carry out their duties and functions as teachers with maximum abilities (Rusman, 2011). In the world of education in the 21st century and this is completely integrated, there are several abilities that must be possessed by teachers to support the quality of education in Indonesia. Among them is Technological Pedagogical Content Knowledge (TPACK). Technological Pedagogical Content Knowledge (TPACK) is a framework that introduces the relationships and complexities between the three basic components of knowledge. These three types of knowledge are intuitive understanding of teaching content with appropriate pedagogical methods and technologies. There are two factors that can review TPACK, namely Self-Efficacy Factors and Motivation to Become a Professional Teacher.

Technological Pedagogical Content Knowledge (TPACK) is a framework that introduces the relationships and complexities between the three basic components of knowledge. These three types of knowledge are intuitive understanding of teaching content with appropriate pedagogical methods and technologies (Schmidt 2009). Schmidt also explains that technological pedagogical content refers to the knowledge needed by teachers to integrate technology into their teaching in any content area. Teachers have an intuitive understanding of the complex interactions between the three basic components of knowledge Content Knowledge (CK), Pedagogical Knowledge (PK), and Technology Knowledge (TK) by teaching content using appropriate pedagogical methods and technologies.

In research conducted by (Sintawati 2019) stated that to be able to integrate technology in learning, a teacher or prospective teacher must have Technological Pedagogical Content Knowledge (TPACK) skills. Furthermore, in research conducted by (Hanik 2022) stated that TPACK can support effective learning at SIKL, besides that it can create a positive learning environment so that there is interaction between educators and

students, and students and other students without any limitations by space and time.

In his research (Wuryaningtyas 2020) found that teachers' ability to integrate technology is still limited to using PowerPoint, learning resources used by teachers are still limited to conventional textbooks, have not used technology-based online resources, integrating technology by teachers in preparing lesson plans is still not optimal , and teachers are already using technology, but still limited to CAI (Computer Assisted Instruction). From the results of this study it can be concluded that TPACK is important to develop and improve.

There are two factors that can review TPACK, namely Self-Efficacy Factors and Motivation to Become a Professional Teacher. According to (Bandura 1994) self-efficacy is defined as people's beliefs about their ability to produce a certain level of performance that influences events that affect their lives. According to (Wati 2022) teacher self-efficacy is the belief in the teacher that he has the ability to achieve success in completing work. Besides that, according to (Dewi 2022) Teacher efficacy is the belief or belief that a teacher can invite students to participate in teaching and learning activities even though students have limitations or lack motivation to learn. From this definition it can be concluded that teacher self-efficacy is the teacher's confidence in instilling an understanding of the material in students under any conditions. However, in writing (Tafano & Saputra, 2021) it is found that there are still many teachers who do not understand using online media that support the implementation of teaching and learning activities, both hardware (laptops/computers, cellphones/tablets) and software such as Quipper School, Ruangguru , Google for Education, Zenius, Google classroom, Google form, Zoom, and many more. This illustrates that teacher self-efficacy is currently quite low, because teachers are not ready and able to optimize the use of technology so that it will have an impact on students' weak ability to understand learning material.

Apart from that the motivation to become a professional teacher is also a factor that can review TPACK. According to Uno, HB (2023), motivation is the basic drive that moves a person to behave. Motivation can also be interpreted as a person's mental drive to achieve a goal. While professional teachers are educators who have special abilities that can maximize the output of their functions and duties in educating. Safitri (2019) also explains that professional teacher competence refers to the ability to master subject matter broadly and in depth.

One of the professional demands in becoming a teacher is understanding the use of the latest technology that can be utilized in the field of education. In accordance with the opinion of Soedirman (2023) and Ermawati (2023) who said teachers need to leave conventional learning and think about more dynamic and interactive learning by using technological advances in managing their learning. Apart from that, Maulana (2023) also said that technology plays an important role in contributing to innovation in the field of education so it is important for teachers to understand technology in order to become professional teachers. Therefore professional teachers must be able to understand Technological Pedagogical Content Knowledge (TPACK) well.

Motivation to become a professional teacher also means a person's mental drive to learn and understand TPACK. In other words, TPACK in teachers can be viewed as influenced by how much motivation is to become a professional teacher. However, there is still the application and use of technology that is considered ineffective and

not feasible due to several obstacles (Hasyim 2021). This has an impact on the motivation of professional teachers in Indonesia. From this elaboration, it is important to review TPACK through self-efficacy and motivation to become a professional teacher to improve the quality of education in Indonesia.

Based on the background and previous studies that have been described by the author, the writer is interested in researching "Technological Pedagogical Content Knowledge (TPACK): An Overview Through Self-Efficacy and Motivation to Become a Professional Teacher". This study aims to examine and analyze the effect of self-efficacy and motivation towards TPACK to become a professional teacher . The findings of this study are expected to be able to contribute to knowledge about the influence of self-efficacy and motivation towards TPACK to become a professional teacher .

Method

This research uses a quantitative approach with a survey method. The study was conducted to examine the effect of self-efficacy (X1) and motivation (X2) on Technological Pedagogical Content Knowledge (Y). The sampling technique used purposive sampling of 100 teachers. The instruments used are tests and questionnaires. Indicators of self-efficacy variables are magnitude, strength and generality (Bandura in Lukmayanti, 2015). Indicators of motivational variables are responsibility, work performance, opportunities for advancement, recognition for performance, and challenging work (Mangkunegara, 2009). Technological Pedagogical Content Knowledge (TPACK) variable indicators are 1) Technology Knowledge, 2) Pedagogical Knowledge, 3) Content Knowledge, 4) Technology Pedagogical Knowledge, 5) Technology Content Knowledge, 6) Pedagogical Content Knowledge, and 7) Technology Pedagogical Content Knowledge (Shulman, 2006).

The data analysis technique used is the classical assumption with the aim of understanding the data used beforehand is in accordance with the requirements, correlation analysis is to find out how close the relationship between the independent variables and the dependent variable is. Furthermore, data analysis techniques to see the effect of independent learning and learning motivation on students' critical thinking skills using multiple linear regression analysis. Then using hypothesis testing T test, F test and R test ^{2} .

Results and Discussion

Research Result

Overview of Research Respondents

Respondents Based on Gender

Table 1. Respondents by Gender

No	Gender	Amount	Percentage
1	Man	30	30
2	Woman	70	70
	Total	100	100

Source: Data Processing Results, 2023

Respondents by Type of School

Table 2. Respondents by Age

No	School Type	Amount	Percentage
1	Country	70	70
2	Private	30	30
	Total	100	100

Source: Data Processing Results, 2023

Classic assumption test

Normality test

Table 3. Normality Test Results

	Unstandardized Residuals
asymp. Sig (2-tailed)	0.700

Source: Data Processing Results, 2023

From the results of the normality test, it is known that the sig results from the study are 0.700, which means that the sig value is > 0.05, indicating that the data is normally distributed.

Heteroscedasticity Test

Table 4. Heteroscedasticity Results

Free Variables	Sig
Self Efficacy (X1)	0.071
Motivation (X2)	0.091

Source: Data Processing Results, 2023

Based on Table 4 above, X1 shows that self-efficacy has a significant value of 0.071 where 0.071 > 0.05 where there is no heteroscedasticity for X2 namely Entrepreneurship Education obtains a significance value of 0.091, where 0.091 > 0.05 and there is no heteroscedasticity.

Autocorrelation Test

Table 5. Autocorrelation Test Results

Durbin Watson Values	Information
2.210	There is no autocorrelation

Source: Data Processing Results, 2023

Multicollinearity Test

Table 6. Multicollinearity Test Results

Variable	tolerance	VIF	Information
Self Efficacy (X1)	0.700	1.300	There is no multicollinearity
Motivation (X2)	0.600	1.300	There is no multicollinearity
TPACK (Y)	0.700	1.200	There is no multicollinearity

Source: Data Processing Results, 2023

Based on Table 6 above, it can be concluded that multicollinearity does not occur because the tolerance value is greater than 0.1 and the VIF value is not less than 0.10.

Multiple Regression Test

Table 7. Multiple Regression Test Results

Variable	Reg	Q	Sig
Constants	0.387	1.656	0.000
Self Efficacy (X1)	0.287	0.856	0.000
Motivation (X2)	0.687	1.256	0.000
Adjusted R square	0.697		

Source: Data Processing Results, 2023

Based on the results of the regression test in the table above, the following equation can be written:

TPACK = 0.387 + 0.287 (Self-Efficacy) + 0.680 (Motivation) +e

T test

Table 8. T test results

Variable	T_{count}	T_{Table}	Sig
Learning Independence (X1)	0.856	0.670	0.003
Intellectual Intelligence (X2)	1.256	0.670	0.030

Source: Data Processing Results, 2023

Based on Table 8 T-test results it can be seen that:

1) The t test on the self-efficacy variable (X1) obtained a t count of 0.856 with a significance of 0.000. Because t count > t table (0.85 6 > 0.670) or a significance of less than 5% (0.000 <0.05) partially the self-efficacy variable (X1) has a significant effect on the TPACK variable (Y) then H1 is accepted.
2) The t test on the motivation variable (X2) obtained a t count of 1.256 with a significance of 0.000. Because t count > t table (1.256 > 0.670) or a significance of less than 5% (0.000 <0.05) partially the motivation variable

(X2) has a significant effect on the TPACK variable (Y) then H2 is accepted.

Determination Test

The value of the coefficient of determination or adjusted R square in this research model is 0.697 or 69.70% which means that learning independence and intellectual intelligence in influencing creative thinking ability is 69.70% while the remaining 30.30% is influenced by other variables not included in the this research.

Discussion

The Effect of Self-Efficacy on Technological Pedagogical Content Knowledge (TPACK)

The t test on the self-efficacy variable (X1) obtained a t count of 0.856 with a significance of 0.000. Because t count > t table (0.856 > 0.670) or a significance of less than 5% (0.000 <0.05) partially the self-efficacy variable (X1) has a significant effect on the TPACK variable (Y) then H1 is accepted. This means that the higher the self-efficacy, the higher the Technological Pedagogical Content Knowledge (TPACK), conversely the lower the self-efficacy, the lower the Technological Pedagogical Content Knowledge (TPACK).

Self-efficacy has a significant influence on Technological Pedagogical Content Knowledge (TPACK). High self-efficacy in the use of technology has a positive impact on the development of TPACK. Individuals with high self-efficacy feel confident in mastering technology and feel confident in applying technology effectively in learning contexts. They are more open to exploration and innovation in the use of technology to support teaching and learning (Saputra, 2019).

High self-efficacy encourages teachers to develop their ability to integrate technology well into their teaching. They feel confident in planning and carrying out learning that uses technology appropriately according to the desired content and learning objectives. This contributes to the development of a strong TPACK (Ariani, 2015).

High self-efficacy helps teachers overcome challenges and obstacles in developing TPACK. They are more likely to face difficulties with a positive attitude, seek solutions, and learn from experience. This allows them to continue to improve their competence in using technology in learning contexts (Sahidin, & Pradjono, R. (2022).

High self-efficacy can affect social interaction and collaboration between teachers. Teachers with high self-efficacy tend to share knowledge, experience, and best practices in using technology in learning. This creates a supportive and collaborative environment among colleagues that contributes to the development of TPACK collectively (Taufik, M., & Tadzkiroh, 2021).

It is important for teachers to develop and strengthen their self-efficacy in using technology in learning. Proper support, ongoing training, and opportunities to experience success in using technology can help increase self-efficacy and in turn enhance the development of TPACK (Khayati, N., & Bachelor, 2015).

The Effect of Motivation on Technological Pedagogical Content Knowledge (TPACK)

The t test on the motivation variable (X2) obtained a t count of 1.256 with a significance of 0.000. Because t count > t table (1.256 > 0.670) or a significance of less than 5% (0.000 <0.05) partially the motivation variable (X2) has a significant effect on the TPACK variable (Y) then H2 is accepted. This means that the higher the motivation, the higher the Technological Pedagogical Content Knowledge (TPACK),

conversely the lower the motivation, the lower the Technological Pedagogical Content Knowledge (TPACK).

High motivation encourages teachers to be actively involved in developing TPACK. They have a strong drive to master and use technology effectively in learning contexts. This motivation triggers interest and involvement in seeking new knowledge, updating skills, and increasing competence in the use of technology (Waluyo, & Sukatiman, 2021).

High motivation also influences teachers to take the initiative in developing their TPACK. They feel compelled to explore resources, attend training, and engage in professional activities that support the effective use of technology in learning. This motivation encourages teachers to be independent in developing and improving their TPACK (Sutiani, et al, 2022).

Strong motivation contributes to increased competence in the use of technology for learning purposes. Motivated teachers have a desire to continuously improve their knowledge, skills, and strategies in using technology. They are looking for opportunities to practice, experiment, and improve their use of technology in teaching (Ilahi, I., Rizal, F., & Irfan, 2021).

High motivation helps teachers to remain committed and survive the challenges of developing TPACK. They have a strong internal drive to overcome obstacles and difficulties that may arise in the use of technology in learning. This motivation allows teachers to see challenges as opportunities to learn and develop (Budiana, 2022).

High motivation encourages teachers to be innovative in the use of technology in teaching and learning. They feel motivated to find new and creative ways to use technology to deliver learning content, stimulate student engagement, and create more interesting and effective learning experiences (Zubaidah, 2016).

It is important for teachers to maintain and increase their motivation in developing TPACK. Building meaningful goals, providing positive feedback, creating a supportive environment, and strengthening the bond between technology use and student learning outcomes can help maintain high motivation (Amrina, Anwar, Alfino, & Sari, 2022).

Effect of Self-Efficacy and Motivation on Technological Pedagogical Content Knowledge (TPACK)

Research results simultaneously states that Self-Efficacy (X1) and Motivation to Become a Professional Teacher (X2) have a positive and significant effect on TPACK (Y). With an Fcount value of 0.697 with a Ftable value of 0.670, a significance value of 0.000 <0.05. This means that the higher the self-efficacy and motivation, the higher the Technological Pedagogical Content Knowledge (TPACK), conversely the lower the self-efficacy and motivation, the lower the Technological Pedagogical Content Knowledge (TPACK).

High self-efficacy and strong motivation help teachers develop the technology skills needed for their effective use in learning. Teachers who believe in their ability to master technology and are motivated to do so will be more likely to seek training, try new tools, and continually improve their competency in TPACK (Sa'pang, & Purbojo, 2020).

High self-efficacy and strong motivation in the development of TPACK have a positive impact on student learning

outcomes. Teachers who are confident in their abilities and motivated to improve learning will be more effective in using technology to support the achievement of learning objectives. This can contribute to increased student engagement, better understanding, and higher academic achievement (Sitompul, H., Setiawan, D., & Purba, 2017).

The combination of high self-efficacy and strong motivation contributes to improving the quality of learning supported by TPACK. Teachers who believe in their ability to use technology and are motivated to do so will be more engaged in effective and creative teaching. They will seek to integrate technology with relevant learning content and appropriate pedagogy (Windianingsih, 2022).

It is important for teachers to build and maintain high self-efficacy and strong motivation in developing TPACK. This can be done through support, training, opportunities for peer sharing and collaboration, and monitoring of progress and achievements.

Conclusion

Based on research problems, theoretical studies, research results, and discussion of Technological Pedagogical Content Knowledge (TPACK): An Overview Through Self-Efficacy and Motivation to Become a Professional Teacher, it can be concluded that 1) Self-efficacy has a positive and significant effect on Technological Pedagogical Content Knowledge (TPACK), 2) Motivation has a positive and significant effect on Technological Pedagogical Content Knowledge (TPACK), and 3) Self-efficacy and motivation have a positive and significant effect on Technological Pedagogical Content Knowledge (TPACK).

Based on the results and discussion and conclusions about Technological Pedagogical Content Knowledge (TPACK): An Overview Through Self-Efficacy and Motivation to Become a Professional Teacher, the author's recommendations are 1) For schools, it is better for schools to take part in professional training and development programs that focus on using technology in learning can help teachers increase their TPACK, 2) for schools, schools should be able to form TPACK teams consisting of teachers who are committed to developing and strengthening their knowledge and skills in TPACK, and 3) For future researchers, it is better to conduct research by adding other variables which is thought to have an effect on Technological Pedagogical Content Knowledge (TPACK) as well as adding mediating or moderating variables which are thought to strengthen or weaken this influence

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