



The Relationship among Attitudes toward ICT, Collegial Support and TPACK of EFL Teachers

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Abstract

Technological Pedagogical and Content Knowledge (TPACK) promotes real-world context, cultural awareness, a wide range of tools, teamwork and cooperation, and independent learning. It was crucial to understand the connection between TPACK, attitudes toward Information and Communications Technology (ICT), and collegial support. The purpose of this study was to determine teachers' levels of TPACK, attitudes toward ICT, and collegial support. Additionally, this study sought to determine whether attitudes toward ICT and collegial support were significantly related to TPACK. The questionnaire for this study was completed by 49 English as a Foreign Language (EFL) instructors in East Borneo. To examine the data from the survey, t and F tests were run. According to this study, TPACK level and attitudes toward ICT and peer support were significantly correlated. The study showed that the participants had a high category for TPACK level. Secondly, this study found positive results regarding ICT use for teaching and learning. Thirdly, this study showed participants had a high level of collegial support. ICT attitudes and TPACK levels were positively and significantly correlated. Support from peers was positively and significantly correlated with TPACK level. ICT attitudes and peer support were significantly correlated with TPACK level. To raise teachers' TPACK level, educators should have internal teacher development sessions more frequently and encourage teacher associations to share ideas.

Keywords: *Attitude; Collegial Support; EFL; ICT; TPACK*

INTRODUCTION

Nowadays, teachers may use Information and Communications Technology (ICT) to display content, make presentations, and complete administrative tasks. ICT can be used as an instrument for learning English as a Foreign Language (EFL). Integrating ICT into EFL instruction can guide EFL students to promote communicative competencies through interaction and collaboration provided by reliable language learning situations, meaningful learning materials, and multimedia. Furthermore, [Mishra and Koehler \(2006\)](#) recognized Technological Pedagogical and Content Knowledge (TPACK) as knowledge of how technology is integrated into education to share content in meaningful ways. [Nazari et al. \(2019\)](#) believe more studies are needed to assess the TPACK levels of EFL educators. In Indonesia, [Mahdum \(2015\)](#) found high TPACK levels among English teachers in Pekanbaru.

Teachers should be capable of applying technology. Previous studies found that there are several factors that affect TPACK levels ([Dong et al., 2020](#); [Durak, 2019](#)). A positive attitude towards technology integration will lead to an acceptance of technology for use in teaching. [Şen \(2020\)](#) asserted that further studies should investigate TPACK and teachers' attitudes since teachers' attitudes are a predictor of technology use. Teachers will be able to integrate technology if they have the opportunity to use it for teaching. Teachers are beginning to realize the advantages of technology use in classrooms and to improve instruction through technology. Teachers use workshop attendance, training, professional development, and peer mentoring to increase their knowledge. A study from [Nugroho and Mutiaraningrum \(2020\)](#) reveals that EFL teachers in Central Java, Indonesia are aware of the significance of technology for English teaching. They suggest future studies investigate teacher TPACK's level from other settings and other backgrounds.

Furthermore, [Durak \(2019\)](#) specified that there is a relationship between attitudes toward

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ICT and TPACK. Liu et al. (2017) found that EFL teachers have a positive attitude toward ICT. Dong et al. (2020) also considered collegial support to improve the level of TPACK. Previous studies have investigated TPACK levels from EFL teachers and teachers' attitudes toward technology. Previous researchers suggest further research investigating the relationship among TPACK, attitude towards ICT, and collegial support; therefore, the researcher would investigate the relationship among English teachers' TPACK levels, attitudes towards ICT, and collegial support.

LITERATURE REVIEW

This chapter presents some theories that are related to this study. They are the concepts and importance of TPACK, attitude toward ICT in teaching, attitude toward ICT and TPACK, and the relationship between collegial support and TPACK.

Relationship between Attitude toward ICT and TPACK

Attitudes toward technology integration affect the intention to use technology (Daya & Laher, 2020; Liu et al., 2017; Sun, 2020). The function of technology, its simplicity, and opportunities to use ICT affect teachers' perceptions of attitudes toward ICT. Then, their attitudes toward ICT will influence the purpose of technology integration for education (Giles, 2019; Liu et al., 2017). Durak (2019) reported TPACK level directly affects teachers' attitudes toward integrating technology into education. Martín et al. (2020) noticed that in designing a learning environment with ICT, ICT attitudes would not affect pre-service teachers' competencies. Digital competence includes the ability to manage tools and devices, use the internet, publish or share presentations, and manage blogs or websites. Giles (2019) found that if teachers have negative attitudes toward technology, they have no motivation to integrate technology into their classrooms. Giles (2019) also concluded that knowledge and proficiency in technology do not correlate with attitudes toward technology. Knowledge of digital competence does not correlate with the attitude towards ICT.

Furthermore, pedagogical belief can be the cause of obstacles to the successful integration of technology, even if there is an improvement in the diminished availability of technical assistance and resources (Liu et al., 2017). The obstacles to technology integration include beliefs about learning, technology, self-efficacy, and teachers' knowledge (Bustamante, 2020). TPACK influences technology integration. Teachers should know about technology. The lack of TPACK caused barriers to integrate the usage of ICT for learning. The previous study finds that there is a relationship between TPACK, self-efficacy, school support, and techno-stress (Dong et al., 2020). A teacher should have good TPACK to explore activities that are suitable and support 21st-century skills. Two previous studies reveal that there is a relationship between attitude toward ICT and TPACK (González-Sanmamed et al., 2017; Durak, 2019).

The researchers mostly investigate teachers, pre-service teachers, and lecturers from all levels of education and all subjects (Kolikant, 2019; Blayone et al., 2018; McGarr & Ó Gallchóir, 2020). Studies that investigate the TPACK framework for English teaching are needed. It is crucial to understand the relationship between attitudes toward ICT and collegial support on TPACK.

The Relationship between Collegial Support and TPACK

Teachers will develop TPACK levels if they have the opportunity and observation related to technology integration (Gill & Dalgarno, 2017). Furthermore, Suherdi (2019) observed that engagement leads to a good result. Teacher trainers introduced web conferencing teaching to teachers so that teachers develop TPK. The training includes social presence, encouraging interaction, and engagement (Tseng et al., 2019). Drossel et al. (2017) analyzed that teacher collaboration is an admissible part of many countries in the expansion of ICT use in education. Working together with coworkers to advance ICT use is an indication of how frequently teachers

utilize computers in the classroom. Teacher collaboration supports the use of existing and advancing technologies in instructional strategies and is a powerful professional development tool.

Rohatgi et al. (2020) also discovered that teacher collaboration could predict ICT use and support for educators. Teamwork and paired grouping will increase teachers' positive attitude toward technology use besides training and teamwork. Teachers who use ICT frequently have positive about teacher collaboration (Rohatgi et al., 2020). The collaboration allows teachers to develop their ICT-related skills for their professional development. Professional development should ensure teachers will have good self-efficacy and well-preparedness for abilities to integrate technology into teaching. Cooperation among instructors is crucial because it fosters the emergence and development of innovative methods. Teachers can collaborate to acquire skills related to ICT, which are crucial for their professional progress.

The Relationship among Attitudes toward ICT, Collegial Support and TPACK

According to Durak (2019), the level of TPACK has a direct impact on teachers' attitudes toward integrating technology into the classroom. Teachers with negative attitudes about technology have no enthusiasm to integrate technology into their courses (Giles, 2019). As stated by Drossel et al. (2017), teacher collaboration is a significant component in the development of teaching-related ICT use in most countries. The use of technology in the classroom is predicted by collaboration with coworkers to increase ICT use. Teacher collaboration can help teachers make better use of existing and new technology in the classroom, and it can also help with professional development. Similarly, Roussinos and Jimoyiannis (2019) find that peer discussion and professional development programs assist teachers in improving TPACK levels. The previous study finds that there is a relationship between TPACK, self-efficacy, school support, and techno-stress (Dong et al., 2020).

Attitude and TPACK are internal factors from a teacher that affects technology integration. A study that investigates an external factor that affects TPACK is also needed. This study will investigate the relationship among TPACK, attitude toward technology, and an external factor called collegial support. It is important to know how TPACK, attitude toward technology, and collegial support are intertwined and how the contribution of attitude to ICT and collegial support will relate to the TPACK level.

The proposed hypotheses related to these research questions are as follows:

H_{a1}: Attitudes toward ICT had a significant relationship with teachers' TPACK level.

H₀₁: Attitudes toward ICT had no significant relationship with teachers' TPACK level

H_{a2}: Collegial support had a significant relationship with teachers' TPACK level.

H₀₂: Collegial support had no significant relationship with teachers' TPACK level.

H_{a3}: Attitudes toward ICT and collegial support had a significant relationship with teachers' TPACK level.

H₀₃: Attitudes toward ICT and collegial support had no significant relationship with teachers' TPACK level.

RESEARCH METHOD

This chapter presents the description of the research methods applied in this study. It consists of research design, research participants, research instruments, data collection technique, and data analysis technique.

Research Design

The research used the quantitative method, particularly correlational study. The main characteristic of correlational research is seeking out associations among variables. Correlational studies explain important human behaviors or predict likely outcomes. (Fraenkel et al., 2012). The minimum sample size for the correlational study is 30 participants (Fraenkel et al., 2012). There are dependent and independent variables in a correlational study. In this study, the independent variables were attitude toward ICT and collegial support. The dependent variable was TPACK. The independent variable is the one that the researcher alters or manipulates, and the dependent variable is the variable that is being measured. It varies in reaction to or depending on the independent variable (Fraenkel et al., 2012). The following figure shows the proposed research model in this research.

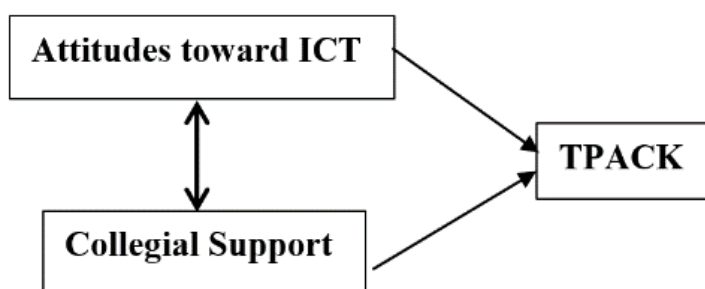


Figure 1. Proposed Research Model

Research Participants

Research participants are the group to which the researcher would like to generalize the result of the study (Fraenkel et al., 2012). The participants in this study were EFL teachers who were willing to complete the survey in this study. They were from primary school, middle school, and secondary school. Firstly, the researcher prepared the link and text for sharing the information about the questionnaire. There was information about the aim of this study and a link to the questionnaire for participating in the study. Secondly, the researcher sent the information to her colleagues, who were EFL teachers in East Borneo. The researcher also sent the questionnaire to representatives of the EFL teacher association in Samarinda. All EFL teachers in East Borneo who were willing to participate in this study were the participants. They taught in Samarinda, Balikpapan, Kutai Kartanegara, Kutai Timur, Kutai Barat and Berau. The participants' names in this study were anonymous. Table 1 shows information about the participants.

Table 1. Information about Participants

No.	School Level	District	Number of participating teachers
1.	Primary school	Samarinda	6
2.	Middle School	Balikpapan	1
		Kutai Timur	1
		Samarinda	17
3.	Secondary School	Balikpapan	1
		Berau	1
		Kutai Kartanegara	1
		Samarinda	20
		Paser	1

Two participants graduated from master degree programs; others graduated from undergraduate programs. Twenty-four participants from forty-nine had attended webinars, workshops, and professional development related to technological knowledge for teaching. Four participants had attended more webinars or professional development programs that related to content knowledge. Other participants had rarely attended a webinar or professional development related to TPACK.

Research Instrument

There were three instruments that were used for this study. They were attitudes toward ICT, collegial support, and TPACK.

To collect the data for attitude toward ICT, the questionnaire from [Liu et al. \(2017\)](#) was used (See Table 2). This study was cited by seventy-five studies in 2021. [Liu et al. \(2017\)](#) examined internal consistency reliability for the questionnaire. The questionnaire was constructed for English-as-a-foreign language (EFL) teachers. The questionnaire was about the attitude towards ICT. It had 4 items with the statements on a five-point Likert scale, where 1 was strongly disagree and 5 was strongly agree. Cronbach's alpha results for attitudes toward ICT was .787 which indicated acceptable consistency reliability. There were seventy-five studies cited by [Liu et al. \(2017\)](#).

Table 2. Description of Attitudes toward ICT Questionnaire

Variable	Description	Item
Attitudes toward ICT	Attitudes toward technology integration reflect individuals' opinions of technology. Attitudes toward ICT can be positive or negative attitude (Liu et al., 2017).	ICT makes language teaching more interesting
		Working with ICT in language teaching is fun.
		I like using ICT in language teaching.
		I look forward to using ICT in language teaching

To collect the data for collegial support, items from [Dong et al., 2020](#) were used (See Table 3). The questionnaire was collegial support. In 2021, there are thirty-two studies cited the finding from [Dong et al., 2020](#). They ensured the validity and appropriateness of the items. They also examined internal reliability and construct validity. The items were related to collegial support for teacher ICT integration for teaching. The questionnaire had 3 items with the statements on a five-point Likert scale, where 1 was strongly disagree and 5 was strongly agree. The following table shows the description and items for Collegial Support.

Table 3. Description of Collegial Support Questionnaire

Variable	Description	Item
Collegial Support	Collegial support refers to encouragement from colleagues to overcome obstacles to ICT integration in the classroom, sharing useful resources and experiences about integrating ICT in teaching, and collaborative efforts to integrate ICT in teaching (Dong et al., 2020).	I got encouragement from my colleagues when I faced difficulties in integrating ICT into teaching.
		Many colleagues shared helpful sources and experience with me about utilizing ICT in teaching.
		My colleagues and I made a planned effort to integrate ICT into teaching.

To collect the data for teachers' TPACK level, the questionnaire from [Bostancıoğlu and](#)

Handley (2018) was used (See Table 4). The questionnaire consisted of TPCK 6 items, PCK 7 items, TK 6 items, TCK 5 items, CK 4 items, and TPK 6 items. The statements in the questionnaire had a five-point Likert scale, where 1 was strongly disagree and 5 was strongly agree. Bostancioğlu and Handley (2018) tested content validation, construct validation, and validity and reliability consistency. The questionnaire for the assessment of TPACK for English language teaching is not influenced by a particular approach to language teaching or the use of specific technologies. Bostancioğlu and Handley (2018) was cited by forty-five studies in 2021. The following table shows descriptions and items for attitudes toward ICT. The following table shows the items and components of TPACK.

Table 4. Description of TPACK Questionnaire

Total of Items	Component of TPACK	Sample Items
6	TPCK No.1-6	I can use technology effectively to communicate relevant information to students and peers.
7	PCK No. 7-13	I can assess student learning in multiple ways
6	TK No.14-19	I know how to save data into/from a digital device (i.e., flash disk, USB stick, CD)
5	TCK No.20-25	I know about technologies that I can use to teach English language grammar
4	CK No.26-30	I can monitor my own writing for accuracy
5	TPK No.31-36	I can choose technologies that enhance students' learning for a lesson

Data Collection Technique

Data are the kinds of information researchers attain on the subjects of their research (Fraenkel et al., 2012). The data in this study were scores from an instrument that was used for collecting the data.

Recruiting research participants

Recruiting participants through social media for research purposes is a promising way that offers numerous advantages (Rife et al., 2016). The researcher shared the information via WhatsApp chat. Firstly, the researcher prepared the information about the questionnaire. It included the aim of the study, information about voluntary and anonymous participation for participants, and a link to the questionnaire. The researcher sent the information to her colleagues, who were EFL teachers in East Borneo. The teachers taught in several districts in East Borneo. The researcher also shared the information with the EFL teacher association in Samarinda.

Distributing the Questionnaires

Firstly, the researcher sent the information to her colleagues who were EFL teachers in East Borneo. She sent the information about the questionnaire via WhatsApp to groups of EFL teachers who were alumni of Mulawarman University and also sent it to the representative of the EFL teacher association in Samarinda. The researcher asked the representative of the EFL teacher association to share the information with other EFL teachers in East Borneo.

Data Analysis Technique

The descriptive statistics included the result of and attitude toward technology, collegial support, the teachers' TPACK level, standard deviation, minimum and maximum values, and the mean score for each variable. The categorization of participants' response scores had a range of

maximum and minimum scores. Participants' responses to each statement item were categorized into 5 categories of very low (0-20), low (20-40), medium (40-60), high (60 – 80), and very high (80– 100). For inferential statistics, F test statistic was conducted to prove whether attitudes towards ICT and collegial support have a significant relationship with TPACK. A statistical T-test was used to test each Independent variable.

FINDINGS AND DISCUSSION

A descriptive analysis of TPACK level, attitudes toward ICT, and collegial support is shown in the tables and following parts. A descriptive analysis was conducted in order to obtain an overview of participants' answers to the study's variables. The variables in this study were TPACK, attitudes toward ICT, and collegial support. The results of the calculations were from 49 participants.

Descriptive Statistics for Attitude toward ICT

The following table shows descriptive statistics for attitudes toward ICT.

Table 5. Descriptive Statistics for Attitude toward ICT

Attitudes towards ICT		Frequency	Percentage (%)
Interval	Category		
80 < X ≤ 100	Very High	22	44.90%
60 < X ≤ 80	High	23	46.94%
40 < X ≤ 60	Medium	4	8.16%
20 < X ≤ 40	Low	0	0.00%
0 < X ≤ 20	Very Low	0	0.00%
Total		49	100.00%
Maximum Score		20	
Minimum Score		10	
Average		16.35	
Standard Deviation		2.55	
Variance		6.48	

Table 5 shows that there are 44.90% of participants had high scores for attitude toward ICT. In addition, there were also 8.16% of participants reached a medium level of the score for attitude toward ICT. No one was categorized as having a low or very low score. Furthermore, as shown in Table 6, the total score for the Attitudes Toward the ICT variable was 846, with a mean score of 4.32. Most of the participants agreed that ICT makes language teaching more interesting. The following table shows a detail description of Attitudes Towards ICT.

Table 6. The score for Attitudes Toward ICT

No	Statement	Options					Total	Mean	Category
		SD	D	N	A	SA			
1	ICT makes language teaching more interesting	0	0	23	20	20	249	5.08	Very high
		0%	0%	47%	41%	41%			
2	Working with ICT in language teaching is fun	0	3	23	18	18	237	4.84	Very high
		0%	6%	47%	37%	37%			
3	I like using ICT in language teaching.	0	3	25	12	12	189	3.86	High
		0%	6%	51%	24%	24%			

No	Statement	Options					Total	Mean	Category
		SD	D	N	A	SA			
4	I look forward to using ICT in language teaching	0	0	30	9	9	171	3.49	High
		0%	0%	61%	18%	18%	70%		
Attitudes Towards ICT							846	4.32	Very high

Descriptive Statistics for Collegial Support

The following table shows descriptive statistics for Collegial Support.

Table 7. Descriptive Statistics for Collegial Support

Interval	Category	Frequency	Percentage (%)
80 < X ≤ 100	Very High	17	34.69%
60 < X ≤ 80	High	24	48.98%
40 < X ≤ 60	Medium	8	16.33%
20 < X ≤ 40	Low	0	0.00%
0 < X ≤ 20	Very Low	0	0.00%
Total		49	100.00%
Maximum Score		15	
Minimum Score		7	
Average		11.84	
Standard Deviation		2.10	
Variance		4.39	

Table 7 shows that the most participants had high scores for collegial support. In addition, there were 16.33% of participants with medium scores, and 34.69% of participants had very high scores. Besides, the total score was 556 and the mean score was 3.78. Table 8 shows a detailed description of Collegial Support.

Table 8. The score for Collegial Support

No	Statement	Option					Total	Mean	Category
		SD	D	N	A	SA			
1	I got encouragement from my colleagues when I encountered difficulties in integrating ICT into teaching.	0	0	30	10	10	180	3.67	High
		0%	0%	61%	20%	20%	73%		
2	Many colleagues shared useful resources and experiences with me about integrating ICT into teaching.	0	1	22	13	13	185	3.78	High
		0%	2%	45%	27%	27%	76%		
3	My colleagues and I made a concerted effort to integrate ICT into teaching.	0	4	16	15	15	191	3.90	High
		0%	8%	33%	31%	31%	78%		
Collegial Support							556	3.78	High

Descriptive Statistics for TPACK Level

The following table shows descriptive statistics for TPACK Level.

Table 9. Descriptive Statistics for TPACK Level

TPACK Interval	Category	Frequency	Percentage (%)
80 < X ≤ 100	Very High	22	44.90%
60 < X ≤ 80	High	27	55.10%
40 < X ≤ 60	Medium	0	0.00%
20 < X ≤ 40	Low	0	0.00%
0 < X ≤ 20	Very Low	0	0.00%
Total		49	100.00%
Maximum Score		176	
Minimum Score		117	
Average		144.71	
Standard Deviation		13.95	
Variance		194.63	

Most of the participants had high scores for the TPACK level. There were also 44.90% of all participants who had very high scores for the TPACK level. No participant had a medium, low, or very low score for the TPACK level. Teachers had high category levels for TPACK, PCK, and TCK. The teacher had a very high category for TK and a fair category for TPK but had a weak category for CK (See Table 9). The total score of all participants was 7020, and the mean score was 3.98. It can be concluded that participants' responses to TPACK were in the high category. Furthermore, Figure 2 shows the mean score and descriptive statistics for TPACK Level.

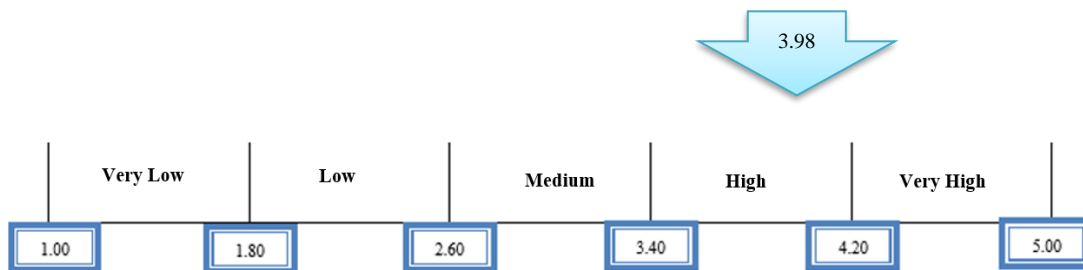


Figure 2. Continuum Line TPACK

Inferential Analysis

To answer questions four and five, there were two tests to answer the hypotheses in this study. Using the information gathered from the questionnaire, this section will show the effect of Attitudes toward ICT and collegial support on TPACK.

Hypotheses Testing

Furthermore, to prove attitudes towards ICT (X1) and collegial support (X2) have a significant relationship with TPACK (Y), then hypothesis testing was conducted.

1. Partial Hypothesis Test

Partial Hypothesis testing was conducted to prove whether attitudes towards ICT (X1) and collegial support (X2) had a significant relationship with TPACK level (Y). A statistical t-test was

used with a significance level 5%. Table 10 shows the relationship among attitudes towards ICT (X1) variable on TPACK (Y) that was analyzed by SPSS software.

Table 10. Result of t-test

Coefficients^a						
Model		Unstandardized Coefficients		Standardized	Sig.	
		B	Std. Error	Beta		t
1	(Constant)	.936	.179		5.238	.000
	Attitudes Towards ICT	.448	.051	.676	8.720	.000
	Collegial Support	.248	.049	.395	5.093	.000

a. Dependent Variable: TPACK

T-test was conducted to test the hypothesis. SPSS was used for the T-test. The calculated T value was 8,720, and the t critical value was 2.013 (df=n-k-1=49-2-1=46). The test criteria used are:

- a. If the calculated t value < t critical value, then H₀ was accepted.
- b. If the calculated t value > t critical value, then H₀ was rejected.

Table 11 shows the relationship among attitudes towards ICT (X1) variable on TPACK (Y) that was analyzed by SPSS software.

Table 11. The Relationship between Attitudes towards ICT (X1) and TPACK (Y)

		Standardized coefficient betta	Calculated T value	p-value	Label
Attitudes Towards ICT	→ TPACK	0.676	8.720	0.000	Significant

Hypothesis

H_{01=ρ=0} : There was no significant effect of attitudes towards ICT on teachers' TPACK level.

H_{a1=ρ≠0} : There was a significant effect of attitudes towards ICT on teachers' TPACK level.

Table 11 shows the calculated t value was 8,720, so that calculated t value > t critical value (2,013). It can be concluded that H₀₁ was rejected, and H_{a1} was accepted. There was a significant relationship between attitudes towards ICT on teachers' TPACK level. Thus, the hypothesis, which states that there was a significant relationship between attitudes towards ICT on teachers' TPACK level, can be accepted. Besides, the direction of the relationship between attitudes towards ICT (X1) to TPACK (Y) was positive. The coefficient value for TPACK was 0.676. It indicates when there is an increase in attitudes towards ICT (X1), it will increase TPACK (Y).

Table 12. Result of the T-test

Coefficients^a						
Model		Unstandardized Coefficients		Standardized	Sig.	
		B	Std. Error	Beta		t
1	(Constant)	.936	.179		5.238	.000
	Attitudes Towards ICT	.448	.051	.676	8.720	.000
	Collegial Support	.248	.049	.395	5.093	.000

a. Dependent Variable: TPACK

The test criteria used are:

- a. If the calculated t value < t critical value, then H_0 was accepted.
- b. If the calculated t value > t critical value, then H_0 was rejected.

Furthermore, the relationship between collegial support (X2) on TPACK (Y) was analyzed by SPSS software. T-test was conducted to test the hypothesis. The calculated T value was 5.093, and the t critical value was 2.013 ($df=n-k-1=49-2-1=46$). Table 12 shows the relationship between attitudes towards ICT (X1) variable on TPACK (Y) that was analyzed by SPSS software.

Table 13 shows the relationship between Collegial Support (X2) variable on TPACK (Y) that was analyzed by SPSS software.

Table 13. The Relationship between Collegial Support (X2) and TPACK (Y)

		Standardized coefficient betta	Calculated T value	Sig	Label
Collegial Support	→ TPACK	0.395	5.093	0.000	Significant

Hypothesis 2

$H_{02=\rho=0}$: There was no significant relationship between collegial support and teachers' TPACK level

$H_{a2=\rho\neq0}$: There was a significant relationship between collegial support to teachers' TPACK level

Table 13 shows that the calculated t-value was 5.093. Calculated t value > t critical value (2.013). It means that H_{01} was rejected, and H_{a1} was accepted. There was a significant relationship between collegial support on teachers' TPACK level. Thus, the hypothesis, which states that there was a significant relationship between collegial support on teachers' TPACK level, could be accepted. Based on the table above, the direction of the relationship between collegial support (X2) and TPACK (Y) was positive. The coefficient value for TPACK was 0.396. It indicates when there is an increase in Collegial Support (X2), it will increase TPACK (Y) value.

2. Simultaneous Test

Simultaneous testing was conducted to prove whether attitudes towards ICT and collegial support have a relationship with TPACK.

Hypothesis 3

$H_{03=\rho2=\rho n=0}$: attitudes towards ICT dan collegial support have no significant relationship with teachers' TPACK level simultaneously.

$H_{a3=\rho2\neq\rho n\neq0}$: attitudes towards ICT dan collegial support have a significant relationship with teachers' TPACK level simultaneously.

The hypothesis testing was conducted through the F test statistic with the following conditions:

- a. Rejecting H_0 if the calculated F value is higher than F critical value (calculated F value > F critical value)
- b. Accepting H_0 if calculated F value lower than / equal to F critical value (calculated F value \leq F critical value)

The formula for f test is as follows:

$$F = \frac{(n - k - 1)(R^2)}{k(1 - R^2)}$$

Table 14 shows the result for the Simultaneous Hypothesis Test. F critical value was 3.20. It was based on α value = 5%; $df_1=k=2$; $df_2=n-k-1=49-2-1=46$. Based on the results of the test, the calculated F value was 65.145, and F critical value was 3.20. The criteria of the test were, "rejecting H_{02} if calculated F value > F critical value". The result shows the value of the calculated F value was 65.145, then H_{a3} was accepted.

Table 14. Simultaneous Hypothesis Test

ANOVA						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	9.155	2	4.578	65.145	.000 ^b
	Residual	3.232	46	.070		
	Total	12.388	48			

a. Dependent Variable: TPACK

b. Independent Variable: (Constant), Collegial Support, Attitudes Towards ICT

CONCLUSIONS

Referring to the results of the analysis and discussion in the previous chapter, related to this study, there are several findings from the study. Firstly, attitudes toward ICT in this study were also in the very good category. Teachers agreed that ICT makes language teaching more interesting. Secondly, collegial support in this study was in a good category. Teachers and their colleagues made a planned effort to integrate ICT into teaching. TPACK level in this study was in the high category. Teachers had the highest score on technological knowledge, but they had the lowest score on content knowledge. Attitudes towards ICT had a positive and significant relation with TPACK. Collegial support had a positive and significant relation with TPACK. Attitudes towards ICT and collegial support also had a significant relationship with TPACK.

LIMITATION & FURTHER RESEARCH

This study revealed that there was significant relation among attitudes toward ICT, collegial support, and TPACK. Teachers and educational institutions may raise the frequency of development of teachers and teacher associations for contributing ideas for teaching because collegial support had significant relation with TPACK level. The teachers should have development sessions related to TPK and CK because the result of their scores was not in the good category. Schools should give information related to CK (Content Knowledge) development. Besides, teachers also should follow the development of ICT and discuss the strength and benefits of ICT for EFL teaching in their schools. Researchers and universities can provide workshops on how to improve teachers' TPACK levels. Future studies can use the proposed model in this research with other samples. Larger samples from different settings will be very useful. It will give more information if future studies investigate the comparison of TPACK levels from different districts, subjects, and levels of school. Furthermore, they may include interviews and observations for investigating teachers' TPACK level and other variables that may relate to TPACK.

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