

## Technology Use and Technology-Related Learning Experiences as Perceived by Indonesian Tertiary EFL Students

Sofendi, Rita Inderawati, Machdalena Vianty\*

Faculty of Teacher Training and Education, Sriwijaya University, Jalan Raya Palembang-Prabumulih, Ogan Ilir, South Sumatera, Indonesia

**Corresponding Author:** Machdalena Vianty, E-mail: machdalenavianty@unsri.edu.au

### ARTICLE INFO

#### Article history

Received: January 26, 2021

Accepted: March 11, 2021

Published: May 31, 2021

Volume: 10 Issue: 3

Advance access: May 2021

The research is financed by

Sriwijaya University

Conflicts of interest: None

Funding: None

### ABSTRACT

Research aiming at investigating Technological Pedagogical Content Knowledge (TPACK) has been extensively conducted and measured by TPACK instruments developed in the context of ESL (English as a Second Language). Therefore, research within the context of EFL (English as a Foreign Language) and which applies a TPACK instrument specifically designed for the EFL context can give a significant contribution to the field of study. This study was conducted to map the TPACK of thirty-three EFL students at a teacher training institution in South Sumatera (Indonesia) by using a TPACK questionnaire specifically designed to map ICT-related learning experiences of Indonesian EFL students. The result of the analysis was presented in terms of the students' TPACK perceptions concerning five domains: Technological Knowledge (TK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Technological Pedagogical Content Knowledge (TPCK), and Technology-Related Learning Experience (TLE).

**Key words:** TPACK, ICT-related Learning Experiences, English as a Foreign Language (EFL), Indonesian Tertiary Institution

### INTRODUCTION

Information and Communication Technologies (ICT) have been developing rapidly in recent years. ICT tools such as a smartphone are now equipped with the application *Play Store* which helps students to download educational software applications they need for their study. Many educational software applications are also available online and free to use. For English as Foreign Language (EFL) students, such educational software applications as an on-line dictionary, translation tool, and grammar checker can be a great help for them to support their learning.

In the Education Transformation and 21st Century Learning Seminar organized by the Indonesian Ministry of Education and Culture in collaboration with Intel Corporation and Analytical on Capacity Development Partnership (ACDP) in Jakarta on January 20-21, 2016, the Indonesian Minister of Education highlighted knowledge as the main source of strength, while technology which is the product of knowledge has become the way to reach all parties in providing information (Indonesian Ministry of National Education, 2016). For example, through the use of technology, students gain the academic information they need for their research projects from the internet. The use of *WhatsApp* helps students keep in touch with their academic advisors while their academic advisors are overseas attending an international

conference. Next, *Google form* allows students to administer an online survey to collect data for their study. The use of technology has also helped teachers improve their students' academic performance. For example, a literature-based approach with the application of *Tales with Gigi*, a mobile storytelling application with over 30 professionally narrated fairy tales, has helped improve the students' literacy achievement (Wardhani, Inderawati & Vianty, 2019). It is worth saying that nowadays, the academic lives of many students are attached to technology.

Indonesian government through the Ministry of Education has urged teachers to integrate ICT in the learning and teaching process (Ministry of National Education, 2007a; Ministry of National Education, 2007b; Ministry of National Education, 2009). This suggests the fact that teachers' role in technology integration is very important. Referring to what Covell suggests (2000, as cited in Gibson, 2001, p. 56), "every tool has a place, and that it is the teacher's professional responsibility to find that place". The challenge for teachers is to use technology appropriately so that students learn with it, not just from it (Gibson (2001, p. 56). Besides, teachers who are knowledgeable about both the technology itself and its implementation to meet educational goals play a very important role to make technology effective in the classroom (DeCoito & Richardson, 2018).

Successful ICT integration in learning and teaching considers technology, not as an end in itself; it needs to be related to the content of school subject, good pedagogy, and classroom context (Mishra & Koehler, 2006). Teachers need knowledge for technology integration that is, as referred by Mishra and Koehler (2006), conceptualized as TPACK (Technological Pedagogical Content Knowledge). TPACK has become the framework for restructuring teacher education programs in preparing teachers to teach with technology (Ciptaningrum, 2017). As the future teacher of English, the students of the English Education Study Program within Faculty of Teacher Training and Education of Sriwijaya University, who participated in this present study, are also expected to be able to use and integrate technology which can support them in their learning as a student as well as in their teaching later as an English teacher. Concerning this, it is important to gain information about EFL pre-service teachers' knowledge on pedagogical content knowledge and technology integration. This present study was designed, with the following research objective: to describe ICT-related learning experiences of Indonesian EFL students in terms of the five domains or constructs of Technological Pedagogical Content Knowledge (TPACK): Technology Knowledge (TK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Technological Pedagogical Content Knowledge (TPCK) and Technology-Related Learning Experience (TLE).

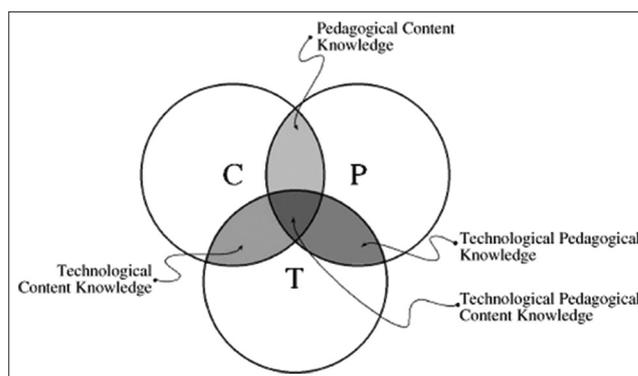
## LITERATURE REVIEW

A teacher's knowledge consists of "content knowledge, general pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners and their characteristics, knowledge of educational contexts and knowledge of educational ends, purposes, and values, and their philosophical and historical grounds" (Shulman, 1987, as cited in Mishra & Koehler, 2006, p. 8). Shulman further states that content knowledge and pedagogical knowledge intersection the minds of teachers and that makes the pedagogical content knowledge central in the body of knowledge of teaching. By including the integration of technological knowledge into the pedagogical content knowledge, a framework is proposed by Mishra and Koehler (2006) who argue that to realize the potential of ICT in the teaching and learning process, it is important for teachers to develop a knowledge that shows a connection and interaction among technological knowledge, content knowledge and pedagogical knowledge (Figure 1).

Mishra and Kohler (2006, p.1025) describe the framework as follows.

Our framework emphasizes the connections, interactions, affordances, and constraints between and among content, pedagogy, and technology. In this model, knowledge about the content (C), pedagogy (P), and technology (T) are central for developing good teaching. However, rather than treating these as separate bodies of knowledge, this model additionally emphasizes the complex interplay of these three bodies of knowledge.

A complex interaction exists among knowledge about content, pedagogy, and technology, therefore, it is important



**Figure 1.** Pedagogical Technological Content Knowledge (Mishra & Kohler, 2006, p. 1025)

to see them in pairs: Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Pedagogical Content Knowledge (TPCK) (Mishra & Kohler, 2006, p.1025).

In the context of education in Indonesia, Content Knowledge and Pedagogical Knowledge refer to what is outlined in Article 8 (Chapter 4) of the Indonesian Act No. 14/2005 concerning Teachers and Lecturers (Indonesian Directorate General of IT and Higher Education, 2016). It is stated that Indonesian teachers must have the academic qualification, competence, and teacher certificate; besides, they are physically and mentally healthy and can actualize the objectives of national education. Content Knowledge and Pedagogical Knowledge focus on the point about *competence*. There are four competencies that Indonesian teachers must have and the one that is concerned with Content Knowledge and Pedagogical Knowledge is *pedagogic competence*. This pedagogic competence is further governed in Government Regulation of Republic Indonesia No. 74/2008 concerning Teachers. Specifically, as stated in Point 1 of Article 3 (Chapter 2), the competence comprises of a set of knowledge, skills, and attitudes which teachers must have, apprehend, master, and actualize in performing their professional role (Regulation Database of Indonesian Financial Audit Board, 2017).

For an English teacher, *Content Knowledge* is about his/her understanding of linguistic components (phonetics, phonology, morphology, semantics, syntax, sociolinguistics, pragmatics), second language acquisition, cross-cultural awareness, and four language skills (reading, writing, speaking, and listening) (Richards, 1998 as cited in van Olphen, 2008). *Pedagogical Knowledge* is concerned with the English teacher's specific knowledge in creating an effective learning and teaching atmosphere for all students (Guerrero, 2014). Referring to what Mishra and Koehler (2006, p. 1027) explain, *Pedagogical Content Knowledge* (PCK) of an English teacher includes his/her knowledge regarding teaching approaches that are in accordance with teaching materials; representation and formulation of teaching concepts, pedagogical techniques, knowledge of what makes concepts difficult or easy for students to learn; information about prior knowledge of students or what students have known; knowledge of teaching strategies that combine appropriate conceptual representation to help students overcome difficulties

and misunderstandings so that they can gain meaningful understanding.

The Indonesian Ministry of National Education emphasizes the importance of all teachers to integrate Information and Communication Technology (ICT) in the teaching and learning process. In regards to the English subject, Ciptaningrum (2017, p.12) highlights the potentiality of ICT in contributing to the improvement of Indonesian students' English language proficiency; for example, she notes that the Internet has made it easier for the students to access the authentic materials, vast linguistic resources and an exhaustive range of materials. Inderawati (2017) has also reported that the use of technology through social media *Facebook* could serve as an innovative alternative in improving students' English writing skills. This present study had a closer look at the content knowledge, pedagogical knowledge and use of technology of pre-service English language teachers at a tertiary institution in South Sumatera (Indonesia) as measured by the *Survey of Technology Use, Teaching, and Technology-Related Learning Experiences among Pre-Service English Language Teachers* (Ciptaningrum, 2017).

## METHODOLOGY

This study was quantitative in nature with a survey design and the purpose was to map the ICT-related learning experiences of the EFL students in terms of the five domains or constructs of Technological Pedagogical Content Knowledge (TPACK): *Technology Knowledge (TK)*, *Technological Content Knowledge (TCK)*, *Technological Pedagogical Knowledge (TPK)*, *Technological Pedagogical Content Knowledge (TPCK)* and *Technology-Related Learning Experience (TLE)*.

A total population sampling technique was applied to select the participants of the study. They were thirty-three of the 3<sup>rd</sup>-semester students (Academic Year 2017/2018) of the English Education Study Program within the Faculty of Teacher Training and Education of a state university in Indonesia. Specifically, there were thirty female and three male students who completed the *Survey of Technology Use, Teaching, and Technology-Related Learning Experiences among Pre-Service English Language Teachers* (Ciptaningrum, 2017). This questionnaire was selected as the research instrument because as Ciptaningrum (2017, p. 11) claims, "(it) meets the general requirements to be used in a larger scale of work in investigating the role of pre-service teachers' experiences in learning to use ICT in their pedagogical practice in influencing the development of their TPACK". The questionnaire has been developed under the context of English as a Foreign Language in Indonesia and the context of pre-service English teachers. It measures five domains: Technology Knowledge (TK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Technological Pedagogical Content Knowledge (TPCK), and Technology-Related Learning Experience (TLE). It consists of 29 items on a 5-point Likert scale (Strongly Disagree; Disagree; Neutral-Neither Agree/Disagree-; Agree; Strongly Agree). The internal consistency was examined using Cronbach's alpha for five components as well as the whole. Cronbach's alpha co-

efficients of the scale with five factors (i.e., TK, TCK, TPK, TPCK, and TLE) ranged from .72 to .88, and the reliability estimate of the whole scale was  $\alpha=.93$  (Table1).

The collected data from the questionnaire were analyzed statistically (frequency analysis) to provide the descriptions of the five domains measured by the questionnaire.

## RESULTS

The results of data analysis were presented accordingly based on the students' responses for each domain. The students' perceptions of the five domains of TPACK were first described. Following this, the students' perception of each domain was presented.

### Five Domains of Technological Pedagogical Content Knowledge

The results of the quantitative analysis for five TPACK factors (Table 2) showed that the students had highly developed knowledge of TPACK, with a mean score of 4.15 (SD = .33224). The highest mean score was received for Technological Pedagogical Knowledge (TPK) dimension (M = 4.45, SD = .37563), whereas the lowest mean score was ascribed to Technological Knowledge (TK) dimension (M = 3.69, SD = .41969).

**Table 1.** Five domains and their reliabilities

Domains	Number of items (5-point Likert Scale)	Cronbach's alpha
Technology Knowledge	3	0.72
Technological Content Knowledge (TCK)	10	0.83
Technological Pedagogical Knowledge (TPK)	6	0.77
Technological Pedagogical Content Knowledge (TPCK)	6	0.88
Technology-Related Learning Experience (TLE)	4	0.84

**Table 2.** Perception of TPACK with respect to all domains

Domains	N	Mean	SD
Technological Knowledge (TK)	33	3.69	0.41969
Technological Content Knowledge (TCK)	33	4.33	0.44698
Technological Pedagogical Knowledge (TPK)	33	4.45	0.37563
Technological Pedagogical Content Knowledge (TPCK)	33	4.06	0.56951
Technology-Related Learning Experience (TLE)	33	4.23	0.47161
Total	33	4.15	0.33224

**Table 3.** Perception of TPACK concerning technology knowledge (TK) domain

Item statements	N	Mean	SD
I play around with different technologies.	33	4.45	0.666
I do not know how to solve my own technical problems.	33	2.45	0.971
Opportunities to work with different technologies are available for me.	33	4.18	0.584

**Table 4.** Perception of TPACK with respect to technological content knowledge (TCK) domain

Item statements	N	Mean	SD
I can use technologies to help me understand the linguistics topics I take in the English language and education study program.	33	4.33	0.479
I can use technologies to help me understand how people acquire a second language.	33	4.21	0.696
I can use technologies to help me understand learning theories.	33	4.27	0.452
I can use technologies to help me understand the culture of the native speakers of English.	33	4.48	0.508
I can use technologies to find language learning material that I can use for teaching.	33	4.45	0.506
I know how to use technology to help me develop lesson plans.	33	4.21	0.600
I know how to use technology to help me improve my English language skills	33	4.64	0.489
I know how to use technology to help me understand the Indonesian government policies concerning educational issues	33	4.09	0.879
I know how to use technology to develop language learning material that I can use for teaching.	33	4.45	0.506
I can make wise and critical choices of the information I found in the Internet.	33	4.18	0.917

### Students' Technological Knowledge (TK)

The result of the descriptive statistic analysis for students' Technological Knowledge (TK) showed that the item with the highest mean score for TK was about the students' ability to use different technologies ( $M=4.45$ ,  $SD=.666$ ), followed by the item referring to the students' statement about having the availability of the opportunities to work with different technologies ( $M=4.18$ ,  $SD=.584$ ).

However, although the students' responses showed that they can use different technologies and there are opportunities for them to work with different technologies, their response to the item "I do not know how to solve my own technical problems" had the lowest mean score ( $M=2.45$ ,  $SD=.971$ ), suggesting that they know how to use the technology, but they do not have sufficient knowledge when it comes to solving or fixing problems related to the technology they use.

**Table 5.** Perception of TPACK concerning technological pedagogical knowledge (TPK) domain

Item statements	N	Mean	SD
I know how to use technology for organizing my school work	33	4.52	0.508
When I teach later, I will know how to use technologies to assess students' performance.	33	4.67	0.479
When I teach later, I will know how to use technologies to help students understand the difficult concepts of the English language (e.g. the concept of tenses).	33	4.52	0.508
I know how to use technologies to help me understand instructional strategies in teaching the English language.	33	4.21	0.545
I can use technologies to make students active in the classroom.	33	4.55	0.506
I can use technologies to have collaboration with other people on a project.	33	4.27	0.801

### Students' Technological Content Knowledge (TCK)

The students' responses regarding Technological Content Knowledge (TCK) showed that all the students agreed with the items measuring their technological content knowledge. All items related to TCK were rated positively ( $M > 4$ ). The highest mean score ( $M = 4.64$ ,  $SD = .489$ ) was ascribed to the students' knowledge of using technologies to help them improve their English language skills.

### Students' Technological Pedagogical Knowledge (TPK)

The items in this domain required the students to describe the relationship between their knowledge on how to use technology and their knowledge on teaching topics they study at university. The students' responses showed that the mean scores for all items measuring Technological Pedagogical Knowledge (TPK) were above 4, suggesting that the students' had a positive attitude toward technology and its use both in their study and their teaching later.

### Students' Technological Pedagogical Content Knowledge (TPCK)

Table 6 presents the result of the students' responses for the items in the Technological Pedagogical Content Knowledge or TPCK domain which focuses on the students' knowledge on the use of technology, specifically on what the students used the technology for. The students were requested to give their response to the statement *I use technologies for ...* by rating their options in the order of importance (6 for 'the most used' and 1 for 'the least used'). Table 6 presents the students' responses.

As shown in Table 6, the students' responses were varied, suggesting that they used technology for the activities as listed in the TPCK domain. However, the analysis of the students' responses revealed that the students mostly used technology for *communication with friends*. On the other hand,

**Table 6.** TPCK domain: *I use technology for...*

Item statement	Options	Students' responses (the least to most used)											
		1		2		3		4		5		6	
		N	%	N	%	N	%	N	%	N	%	N	%
<i>I use technologies for ...</i>	Communication with friends	-	-	-	-	-	-	-	-	6	18.2	27	81.8
	Entertainment	-	-	-	-	7	21.2	4	12.1	18	54.5	4	12.1
	Collaboration with friends/other people for my school assignments	2	6.1	2	6.1	11	33.3	16	48.5	16	48.5	-	-
	Publishing my ideas (e.g., writing blogs, contributing to discussion in mailing lists)	6	18.2	16	48.2	7	21.2	-	-	4	12.1	-	-
	Collecting information for my teaching purposes	6	18.2	2	6.1	6	18.2	12	36.4	5	15.2	2	6.1
	Collecting information for my learning purposes	6	18.2	2	6.1	6	18.2	12	36.4	5	15.2	2	6.1

the technology less used by the students for such activity as publishing their ideas in the form of writing (*publishing my ideas*) which was shown by the high percentages of both options 1 ('the least used') and 2 ('less used').

In addition to the item presented in Table 6 (*I use technology for ...*), there were other six items in TPCK domain. The items focus on the relationship between the students' knowledge of how to use technology and their knowledge on English language topics (both teaching and non-teaching topics).

The result of the analysis of the students' responses presented in Table 7 shows that three items had mean scores above 4, while the mean scores of the other three items were 3.82, 3.91, and 3.94. The highest mean score ( $M=4.36$ ,  $SD=.489$ ) was about their knowledge on how to use technologies to help students improve their English language skills.

### Students' Technology-Related Learning Experience (TLE)

This domain focuses on the quality of learning experiences that influence the students' development of TPACK. The students' responses as presented in Table 8 show that the mean scores for three items were ranging from 4.24 to 4.48 and one item was almost 4 ( $M=3.91$ ), suggesting that the students viewed positively the use of technologies by their lecturers in the classroom.

In addition to the four items presented in Table 8, the other two items in the TLE domain asked the students about their technology-related learning experience. Specifically, they asked about from where or whom the students learn about technology (see Table 9) and about the use of technology to teach English language. The students could select more than one option.

The finding showed that 84.8% (24 students) learned about technology from their friends. They also acknowledged they learned about the use of technology to teach English language from observing the way their lecturers taught in class by using technology. These findings can be considered as a confirmation that technology was integrated in the teaching and learning activities within the students' tertiary study.

The last item in the TLE domain asked the students' response to the statement presented in Table 10 and the students could select more than one option.

**Table 7.** Perception of TPACK with respect to TPCK domain

Item statements	N	Mean	SD
I know what to consider before using technologies to teach English language in the classroom	33	4.15	0.442
I can teach English language with different instructional strategies by using technologies that suits the context of my students.	33	3.82	0.917
I know how to help students use technologies to improve their English language skills.	33	4.36	0.489
I know how to use technologies to help students develop critical thinking skills.	33	3.94	0.933
I know how to use technologies to develop students' skills in collaboration.	33	3.91	0.879
I know how to help friends/colleagues integrate the teaching of English language with technologies.	33	4.18	0.465

**Table 8.** Perception of TPACK with respect to technology-related learning experience (TLE) domain

Item statements	N	Mean	SD
My lecturers use technologies in the classrooms.	33	4.48	.667
The ways technologies are used in my classrooms have helped me learn better.	33	4.24	.663
My lecturers have demonstrated the use of technologies that can enhance student learning.	33	4.30	.684
When technologies are used in my classroom, it is the students who use it most of the time.	33	3.91	.879

The highest percentage of the students' responses (81.8%) indicated that the students liked it better if they learned how to use technology for English language teaching in programs that were related to their personal needs. The second item that also received a higher response

**Table 9.** TLE domain

Item statements	Options	N	%
<i>I learn about technology from...</i>	Friends	28	84.8
	Enrolling in a technology course inside university	9	27.3
	Enrolling in a technology course outside university	7	21.2
	Reading books/magazines on technology	22	66.7
	Attending workshops/seminars/conference on technology	8	24.2
	Other	0	0
<i>I learn about the use of technology to teach English language from...</i>	Friends	22	66.7
	Enrolling in a technology course inside university	15	45.5
	Enrolling in a technology course outside university	7	21.2
	Reading books/magazines on technology	20	60.4
	Attending workshops/seminars/conference on technology	6	18.2
	Observing the way my lecturers teach in class using technology	28	84.8
	Joining mailing-lists on educational technology	2	6.1
	My teaching practicum	3	9.1
	Other	0	0

**Table 10.** TLE domain

Item statement	Options	N	%
<i>I like it better if I learn how to use technology for English language teaching in programs that...</i>	Have longer contact hours	8	24.2
	Provide advices/tutorial after the activities/programs finish	16	48.5
	Are related to my personal needs	27	81.8
	Are related to real problems that I might encounter during my teaching practicum	15	45.5
	Give opportunities for me to actively use technology	25	75.8
	Provide a degree of freedom for me to design my own learning	8	24.2
	Promote collaboration with peers or other people	9	27.3
	Provide opportunities for me to reflect on my own learning and teaching practices	16	48.5
	Other	0	0

(75.8%) was the one related to the students' preference to learn how to use technology for English language teaching in programs that gave opportunities for them to actively use the technology.

## DISCUSSION

The students' responses to the two items in the *Technological Knowledge* (TK) domain suggested that they had the access to different technologies and they took the advantage of the development of technology by letting themselves play around with the technology. These findings are in accordance with what Corrin, Lockyer, and Bennet (2010) reported that there was "a wide diversity of usage of technologies" as reported by 470 first-year students across seven faculties of an Australian university participated in their study although a closer examination showed that the students' use of technology in everyday life was higher than in academic study.

As explained in the previous paragraph, the students' responses to the two items in the *Technological Knowledge* (TK) domain showed that they could use different technologies and there were opportunities for them to work with different technologies. However, their responses to the third item in this domain revealed that they did not have sufficient knowledge when it came to solving or fixing problems related to the technology they used. As the students of the English Education Study Program who are trained to be English teachers, it is worth noting that the students' concern is probably more on how to use the technology and not on how to fix the technology tools when the technology gives them problems. The students might think it was for the other people who had the expertise when it came to fixing or solving problems related to technology use. In other words, engaging in the use of technology is more important for the students. As Lisenbee (2016, p.102) states, "A student-centered classroom in the 21st century is one in which students are engaged in using technological tools to assist them in constructing a deeper understanding of concepts".

Next, the students' responses to the items in *Technological Content Knowledge* (TCK) confirmed that they agreed with the statements in this domain; the mean score for each statement in this domain was above 4. Since TCK in this context of the study was concerned with what the students could do with the technology to support their learning, therefore, based on the finding it can be concluded that a vast majority of the students had the knowledge and ability to use technologies for supporting their English learning and their future teaching. For example, the students acknowledged that they could use technologies to help them understand learning theories and how people acquire a second language. In the past, hardcover textbooks might be the main source that students had as their academic references. With the development of technology, students now can take the advantage of the availability of the internet by searching for other references such as on-line materials and educational websites of the scholars in English language teaching. Through the use of technology, it is now also possible, for example, for a student to contact a professor teaching at a university overseas to request further information about the research conducted by the professor. As reported in this study, the highest mean score for the item in this domain was ascribed to the students' knowledge of using technologies to help them improve their English language skills. This suggests that the

students know the technology tools that can help them improve their expertise in English. Research has also shown that the use of technology could help students learn English better. For example, using *Podcast* in teaching English could help the students significantly improve their listening, speaking, and writing skills (Fitria, Vianty, & Petrus, 2015; Sani, Inderawati, & Vianty, 2016).

The next domain is *Technological Pedagogical Knowledge* (TPK) which is the interaction between one's knowledge of technology and pedagogy. In this present study, it refers to the students' knowledge on how to use technology to support their learning as a student and their teaching later when they become an English teacher. For example, as the students acknowledged, after completing their undergraduate study and being an English teacher, they would know how to use technologies to help their students understand the difficult concepts of English language (e.g. the concept of tenses) ( $M=4.52$ ). The mean scores for all items measuring TPK were above 4, suggesting that the students know how to use the technology for their study. They also see technology as a tool which can help them to perform their teaching later when they become an English teacher and this suggests the students' positive attitude toward technology. This is in line with what Spaulding (2013) reported that both pre-service and in-service teachers who had higher knowledge in the use of technology had better attitudes towards it. In addition, Carlson and Gadio (2003) have found that instructors' acceptance of the use of technology is very critical if they want to implement technology in their classrooms

The finding on the analysis of the students' responses on one item of the *Technological Pedagogical Content Knowledge* (TPCK) domain showed that the students used technology for the activities as listed in the TPCK domain. However, the students mostly used it for *communication with friends*, and technology was least used for publishing their ideas in the form of writing. However, there is no further information on whether or not the students' communication with their friends through the use of technology is concerned with academic or personal matters.

In addition to the use of technology for communicating with friends, the students' responses on the other 6 items within *Technological Pedagogical Content Knowledge* (TPCK) domain also showed that they knew how to use the technology for both teaching and non-teaching topics they were studying at the university. As the students of the English Education Study Program who are expected to be English teachers, knowing non-teaching topics (for example, critical thinking and collaboration skills) is important. It because, as a teacher, they are required to demonstrate the four competencies: pedagogic, personal, social and professional as governed by the Indonesian government regulations. Therefore, it is not only about having the skill or ability to manage the teaching and learning process (pedagogic competence) that is expected from the students. but also having personalities which can be a good role model for students (personal competence), having skills to maintain a relationship with others (students, fellow teachers, parents) as part of the community (social competence), and having mastery of the learning materials which enable them to guide students in learning

(professional competence). Furthermore, as a future teacher of English in which technology has become part of the classroom teaching, knowing how to use the technology for both teaching and non-teaching topics, as acknowledged by the students who participated in this study can help them to better fulfill the requirement of teacher's four competencies.

The last domain reported in the finding was concerned with *Technology-Related Learning Experience* (TLE) that focuses on the quality of learning experiences that can influence the students' development of TPACK. As reported in the finding, the students viewed positively the use of technologies by their lecturers in the classroom. According to Ciptaningrum (2017, p.22), the literature around effective teacher professional learning confirms that teachers with positive or high-quality learning experiences will have a higher level of TPACK, and teachers with negative or poor learning experiences will have a lower level of TPACK. The other two items in the TLE domain asked the students about their technology-related learning experience. Specifically, the items asked the students about from where or whom they learn about technology showed that 84.8% of the students learned about technology from friends. Besides, they learned about the use of technology to teach the English language from observing the way their lecturers teach in class using technology. This has confirmed that technology has been integrated into the teaching and learning activities within the students' tertiary study and it has supported Leatham's statement (2007) about the need to provide adequate knowledge in the use of technology in teaching a concept in a classroom by teacher preparation colleges. The students also liked it better if they learned how to use technology for English language teaching in programs that were related to their personal needs and gave opportunities for them to actively use the technology.

## CONCLUSION

The findings of this study showed that the students perceived they had highly developed knowledge of TPACK: they were able to use different technologies to improve their study and teaching later. Generally, their responses showed that they positively viewed the use of technology by themselves and also by others (i.e., their lecturers). These findings are relevant with 21<sup>st</sup>-century learning in which students are required to have skills, knowledge, and abilities in the field of technology, media and information, learning skills, innovations, and life skills. The students' use of technology in their study shows the important role of technology in supporting learning activities. Teachers can serve as a role model for the students in using technology in teaching. Besides, the teachers can serve as the agent who can provide the students with the opportunity to use the technology in their learning activities. In other words, the teachers' use of technology in teaching can help encourage the students to positively view the existence and importance of technology in the classroom. This is important because technology has developed rapidly and it has entered the field of education. Living in this technological era and being a future teacher of English, the students should be ready to embrace technology and make the most of it to better perform their teaching for the benefit of their students.

## REFERENCES

- Carlson, S., & Gadio, C.T. (2003). *Teacher professional development in the use of technology*. [Online]. Technologies for Education. Available at [www.TechKnowLogia.org](http://www.TechKnowLogia.org)
- Ciptaningrum, D.S. (2017). The development of the Survey of Technology Use, Teaching, and Technology-Related Learning Experiences among Pre-Service English Language Teachers in Indonesia. *Journal of Foreign Language Teaching and Learning*, 2(2), 11-26. <https://doi.org/10.18196/ftl.2220>
- Corrin, L., Lockyer, L. & Bennett, S. J. (2010). Technological diversity: An investigation of students' technology use in everyday life and academic study. *Learning, Media and Technology*, 35(4), 387-401.
- DeCoito, I., & Richardson, T. (2018). Teachers and technology: Present practice and future directions. *Contemporary Issues in Technology and Teacher Education*, 18(2). [Online]. Available at <https://www.citejournal.org/volume-18/issue-2-18/science/teachers-and-technology-present-practice-and-future-directions> (March 3<sup>rd</sup>, 2018)
- Fitria, U., Vianty, M., & Petrus, I. (2015). Using Podcast to improve students' Listening and Speaking achievements. *The Journal of English Literacy Education*, 2(1), 55-68. <http://dx.doi.org/10.36706/jele.v2i1.2218>
- Gibson, I.W. (2001). At the intersection of technology and pedagogy: considering styles of learning and teaching. *Journal of Information Technology for Teacher Education*, 10(1-2), 37-61, doi: 10.1080/14759390100200102, Available at <https://doi.org/10.1080/14759390100200102>
- Guerriero, S. (2014). *Teachers' Pedagogical Knowledge and the Teaching Profession*. [Online]. Available at [http://www.oecd.org/education/cei/Background\\_document\\_to\\_Symposium\\_ITEL-FINAL.pdf](http://www.oecd.org/education/cei/Background_document_to_Symposium_ITEL-FINAL.pdf)
- Inderawati, R. (2017). *The dynamics of EFL teaching in Indonesia: Be innovative teachers through social media*. [Online]. Available at <http://ejournal.unp.ac.id/index.php/eltar/article/view/8701>
- Indonesian Directorate General of IT and Higher Education. (2016). *Regulation on Teacher and Lecturer No. 14/2005*. Jakarta: Kemenristek Dikti. [Online]. Available at <http://kelembagaan.ristekdikti.go.id/wp-content/uploads/2016/08/UU14-2005GuruDosen.pdf>
- Indonesian Ministry of Education. (2016). *7 Provinces having the best results for Teacher Competence Test 2015*. [Online]. Available at <https://www.kemdikbud.go.id/main/blog/2016/01/7-provinsi-raih-nilai-terbaik-uji-kompetensi-guru-2015> (March 3<sup>rd</sup>, 2018).
- Indonesian Ministry of Education. (2007a). *Regulation of Indonesian Ministry of National Education No. 16/2007 about Teacher Competence and Academic Qualification Standard*. Jakarta: Indonesian Ministry of Education.
- Indonesian Ministry of Education. (2007b). *Regulation of Indonesian Ministry of National Education No. 41/2007 about Process Standard for Primary and Secondary Education*. Jakarta: Indonesian Ministry of Education.
- Indonesian Ministry of Education. (2009). *Regulation of Indonesian Ministry of National Education No. 78/2009 about Schools with International Standard at Primary and Secondary Level*. Jakarta: Indonesian Ministry of Education.
- Leatham, K. J. (2007). Mathematics teachers' beliefs about the nature of technology in the classroom. *Journal of Science, Mathematics, & Technology Education*, 7 (2/3), 183-207.
- Lisenbee, P. G. (2018). Generation gap between students' need and teachers' use of technology classroom. *Journal of Literacy and Technology*, 17(3), 101-125.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
- Regulation Database of Indonesian Financial Audit Board. (2017). *Government Regulation No. 74/2008*. [Online]. Available at <https://peraturan.bpk.go.id/Home/Details/4892/pp-no-74-tahun-2008>
- Sani, H., Inderawati, R., Vianty, M. (2016). Using podcast with dictogloss procedures to improve listening comprehension and writing achievements of tenth graders. *The Journal of English Literacy Education (JELE)*, 3(2), 164-178. <http://dx.doi.org/10.36706/jele.v3i2.3620>
- Spaulding, M. (2013). Preservice and In-Service Teachers' Perceptions toward Technology Benefits and Integration. *Journal of Learning in Higher Education*, 9(1), 67-78.
- Van Olphen, M. (2008). *TPCK an integrated framework for educating world language teachers*. In AACTE (Ed.), *The Handbook of Technological Pedagogical Content Knowledge (TPCK) for Educators*. New York: Routledge.
- Wardhani, O.K., Inderawati, R., & Vianty, M. (2019). *Using literature-based approach with Tales with Gigi application to improve literacy achievement of the eleventh graders of SMA Negeri 1 TanjungBatu*. Proceedings of the 28<sup>th</sup> International Conference on Literature: "Literature as a Source of Wisdom", July 11-13, 2019, UniversitasSyiah Kuala, Banda Aceh, Indonesia. [Online]. Available at <http://www.jurnal.unsyiah.ac.id/ICOL/article/view/14531/10947>