INVESTIGATING ENGLISH LANGUAGE TEACHERS IN DEVELOPING TPACK AND MULTIMODAL LITERACY

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Abstract

Technology in every field is snowballing. Likewise, the use of technology in education requires knowledge and understanding of English teachers. The fact that most of the technology for enhanced language learning workshop did not continue into the classrooms. Another case is that teachers do not want to use technology at all in their classrooms because of lacking time and facilities. TPACK namely Technological Pedagogical Content Knowledge provides insight for pre-service teachers and in-service teachers of English to optimize three things for education; those are the aspect of technology, pedagogy, and content knowledge. With the use of this learning model, excellent technology, pedagogy, and knowledge will support and produce a comprehensive learning process. The purpose of this study was to examine the perception and implementation of pre-service teachers and in-service teachers about the literacy of the three above aspects. By using quantitative research, we get the data from questionnaires of 100 pre-service teachers and in-service teachers. The findings describe the demographic teacher with technology, pedagogy and content knowledge literacy (TPACK). The three points of the TPACK literacy are Pedagogical Content Knowledge for Multimodal Literacy, Technological Pedagogical Knowledge (21st C Learning), and Knowledge about digital media tools. The implications of this research give direction and the alternatives to the implementation of the TPACK model for English classroom. In future, it provides the advantages to developing the quality of English teachers' professional development.

Keywords: TPACK; Technology; Pedagogy; Content Knowledge; Multimodal Literacy; Learning Model; English Teachers' Professional Development

The rapid changes in technology have brought impacts in our daily routine and practices in most of the areas of our works. Therefore, the technology changes give alterations in the process of teaching and learning through fallen behind the imagination. There are some reasons behind the problems. Teachers only explore about technology and not how to implement it into teaching and learning process (Mishra & Koehler, 2006). The other reasons are fear of change and limited time and facilities supported frequently perceived as the facts that cannot be doubted (Koehler & Mishra, 2009). The emphasis should be on learning how to use technology in a classroom (Koehler & Mishra, 2009, Mishra & Koehler, 2006).

The process of learning for teachers has studied for the long time ago. Fifty years ago, Shulman (1986) with his research program "Knowledge Growth in Teaching" thought about the teachers' disparity. How teacher has new knowledge, how old knowledge retrieved, and both linked to form new information? What are the sources of teachers' information? What is a teacher information and how to get the information?

According to Shulman (1986), there are three categories of knowledge each teacher should flourish to grow in the minds: (a) subject matter content knowledge, (b) pedagogical content knowledge, and (c) curricular knowledge. Subject matter content knowledge involves knowledge of the realities and ideas. Pedagogical content knowledge is the substance of teaching and connected it with the ways in representing to make easier or more difficult to understand. Curricular knowledge related to the curriculum designed for a subject and pedagogy matter. These three notions of knowledge categories have been permeated in teacher education since 1987 (Shulman, 1986; Mishra & Koehler, 2006). This epistemology concept is well-known as PCK pedagogical content knowledge since 1987.

The rapid change of new technologies gives insight for teacher education to be the focus on the three variables associated with content, pedagogy, and technology for teacher professional

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development. This new framework gives new approach and paradigm for global teacher knowledge to create effective teaching with technology (Koehler & Mishra, 2009). The three core components: content, pedagogy, and technology boost new knowledge for students in learning new concepts in practical ways.

One of the reasons behind the above problem is due to the lack of teachers' multimodal literacy. The capacity to read and write traditionally was restrained the definition of literacy and the importance of literacy was on the reading and writing skill in printed texts (Tan, 2014). Nowadays, the wide-ranging definition of literacy includes to the literacy of information and communication technology related to prepare students for the 21st century learning (Tan, 2016).

TPACK is the new framework for teachers to teach the subject matter which integrates three essential aspects which are interrelated each other, they are technology, pedagogy, and content knowledge. Though teachers know and understand about pedagogy knowledge, content knowledge, and technology knowledge, there is still not well-understanding to integrate them in collaborative curriculum design (Boschman, McKenney, & Voogt, 2014).

The empirical reviews of TPACK in research fields have been yielded related to teacher professional development. Forssell (2011) reported in the dissertation that TPACK confidence related to student use of computers in the classroom. Although there was a small positive relationship between the frequencies of computer use, a stronger relationship was found to teachers' exploration of activities in class. Teachers with higher TPACK confidence were likely to have explored a greater breadth of activities related to 21st century skills with their students.

Technology, pedagogy and content knowledge for English teachers give an insight framework in teaching and learning process. Implementing technology in teaching and learning process is one of the challenges deal with teacher professional development. Preparing teachers to cope with 21st century quality learning requires teachers' skill in understanding and dealing with different tools, information, and work that integrate with computer-based within the context of the lessons (Niess, 2005).

There are some previous studies related to the topic about TPACK. Li and Xia (2016) found that only through persistent lifelong learning and attempt at new technology can college English teachers update their concept and technological equipment to improve their ability in selecting, controlling, and assessing information technology in their EFL teaching. In other case, Susannah and Ann (2016) found innovative strategies to enhance learning and technology. The authors use a variety of creative approaches that integrate interdisciplinary techniques. Such examples include integrating learning theory and technology, creative problem solving through technology, using technology to enhance teaching and learning methods, visualizing information through technology (with art and design), and additional technology tools for practical application.

TPACK is not a new model for teachers to integrate technology, pedagogy and content knowledge, yet it is a challenge for teachers as professionals to do the action. However, the three cores of knowledge for teachers are still problematic for teachers. In the other areas, pre-service teachers should know and understand about this teaching and learning model for future classroom. In Indonesia, a research study on TPACK was conducted by Mahdum (2015) who investigated the use of TPACK among Senior High School EFL teachers in Pekanbaru by using self-assessment questionnaire. Another study was conducted by Cahyono and Kurnianti (2016) showing that TPACK-oriented teaching practice course benefits Indonesian EFL teachers in improving the quality of their EFL instructional designs and teaching practices.

Though some previous studies about TPACK have been done by some researchers, there is not yet a research about the multimodal literacy for pre and in-service English teachers in Indonesia's context. This study set out to describe the demographic teacher with technology, pedagogy, and content knowledge literacy related to teacher professional development. To guide the exploration, we posed the following questions: (1) what is associated with knowledge of English teachers in TPACK for multimodal literacy? (2); what is the nature of the relationship between English teachers in TPACK and 21st century learning?; and (3) what kinds of technology media tools known by English teachers?

The benefits of this study give the demographic teacher with technology, pedagogy and content knowledge literacy (TPACK) related to the multimodal literacy, TPACK knowledge related to 21st century learning and technology media tools known by teachers. The implication of this research gives direction and the alternatives of the implementation of the TPACK model for English classroom future; it gives the advantages to developing the quality of English teachers' professional development.

METHOD

This study uses data from the online survey of technological, pedagogical and content knowledge related to multimodal literacy developed by the second author who adapted the TPACK items from Chai, Ng, Lee, Hong and Koh's (2013) study in Singapore (Tan & Ali, in press.)The online survey is for getting information about knowledge of English teachers in TPACK for multimodal literacy, the

nature of the relationship between English teachers in TPACK and 21st century learning and media tools known by English teachers. The online survey then followed by class observation and interview to the in-service and pre-service English teachers.

An invitation to participate in an online survey was sent the link to the survey for in-service teacher groups and pre-service teachers in some universities for about four months. The 100 respondents submitted their answers and 99 respondents completed the survey, 70.3% female and 29.7% were male. The participants consisted of 46.9% in-service teachers and 53.1% pre-service teachers. The age of the participants is about 18-up to 41 years old. The in-service teachers are about 1-26 years teaching experience. 32.3% were teaching elementary schools, 27.3% were teaching junior high, 8.1% were teaching senior high school, and the rest of the 32.3% were teaching another level. The collected data were then analyzed.

FINDINGS AND DISCUSSION

The survey's components are related to Pedagogical Content Knowledge for Multimodal Literacy (a text that consists of more than one communication modes such as words, images, sounds, gestures, and movements). There are 6 sub-components of the survey, those are (1) student's preliminary concepts about the topic of inquiry; (2) understanding to prepare students for a writing task; (3) facilitating multimodal meanings of the text; (4) leading students in composing a multimodal text; (5) supporting students in their autonomous construction a multimodal text; (6) sequencing the teaching and learning phases to facilitate student's multimodal meaning-making.

The online survey responded by 99 from 100 teachers on teachers' pedagogical content knowledge for multimodal literacy indicates that they have particular assumption that technology helps them as well as students better in multimodal literacy (see Figure 1). Around 75.90% respondents admitted that using technology; they can draw out student's initial concepts about the topic of inquiry (P1.1). Dealing with the potential of technology to build students' understanding in preparing writing task, 66.30% respondents showed that technology assists them to do it (P1.2). In facilitating students' deconstruction of the multimodal meanings of the mentor (exemplary text), 73.90% respondents acknowledged that with the help of technology, they could play that role (P1.3). Moreover, the 70.4% respondents confess that they can lead students in composing a multimodal text using technology (P1.4). Then, 70.60% respondents can support students in their independent construction of a multimodal text (P1.5). Last, the role of technology in helping them to sequence the teaching and learning phases to facilitate student's multimodal meaning-making is admitted by 73.80% respondents (P1.6). Those statistic data attest that technology plays the significant role in promoting multimodal teaching literacy to students. In other words, pre-service and in-service teachers have sufficient knowledge about multimodal literacy and it helps students in learning language.

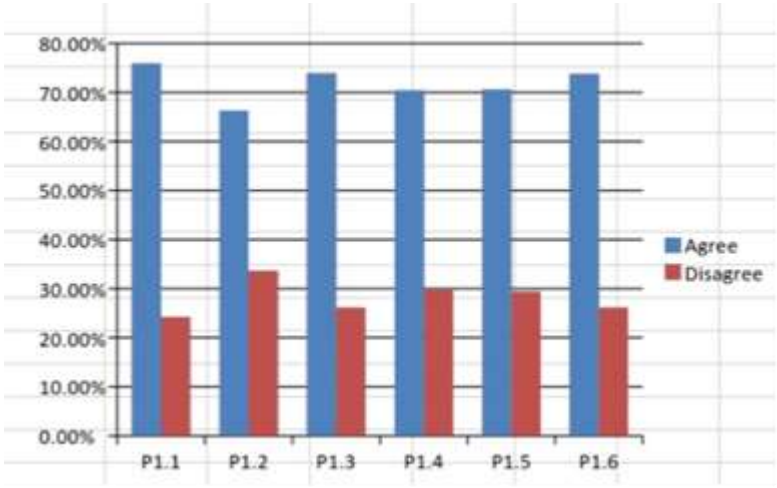

Figure 1. Pedagogical Content Knowledge for Multimodal Literacy

The second focus was to investigate the nature of the relationship between English teachers in TPACK and 21st C learning. The survey's components are using technology to (1) stimulate students critical thinking about authentic issues, (2) able to use technology to guide my students in managing their learning, (3) able to use technology to help my students develop diverse perspectives for factual issues is able to use technology to help my students engage in reflection, (4) to facilitate students in participating in collaboration with technology and (5) be able to guide my students in constructing representations of knowledge using technology.

The results of the nature of the relationship between English teachers in TPACK and 21st C learning are shown in Figure 2. The survey manifested the well-developed teachers' technological, pedagogical and knowledge to confront teaching challenges in 21st century. Almost all respondents provided the positive attitude in using technology for several purposes addressed in every single question. In details, the data show that using technology, 95.70% respondents can stimulate critical thinking on authentic issue (P2.1); 96.80% respondents can guide students in managing their learning (P2.2); 96.70% respondents can help students develop diverse perspectives for authentic issues (P2.3); 97.80% respondents can use technology to help students engage reflection (P2.4); 98.60% respondents able to facilitate students in participating in collaboration (P2.5) and 95.70% respondents can guide students in constructing representations of knowledge (P2.6).

The third issue investigated kinds of technology media tools known by English teachers. The survey focused on investigating the use of social media (e.g., Facebook, Edmodo, Instagram), communication tools (e.g., Messenger, Skype, Google Hangouts), web-based collaboration tools (e.g, Google Drive), and online presentation tools (e.g., PPT online, Canva, Prezi). The findings showed that the visualization of teachers' understanding of technology media tools in Figure 3 attested that teachers mostly ascertain and are able to use various technology media tools. The use of social media and web-based collaboration (P3.1 and P3.2) showed the highest percentage (93.50%) among others. The familiarity with communication tools, such as Messenger, Skype, and Google Hangouts was admitted by 92.40% (P3.2) respondents. Last, 80.5% respondents denote that they were able to use kinds of online presentation tools like Ppt Online, Canva, Prezi (P3.4). This result indicated teachers' sensitivity to current technology as well as ability to utilize it for achieving their instructional goals.

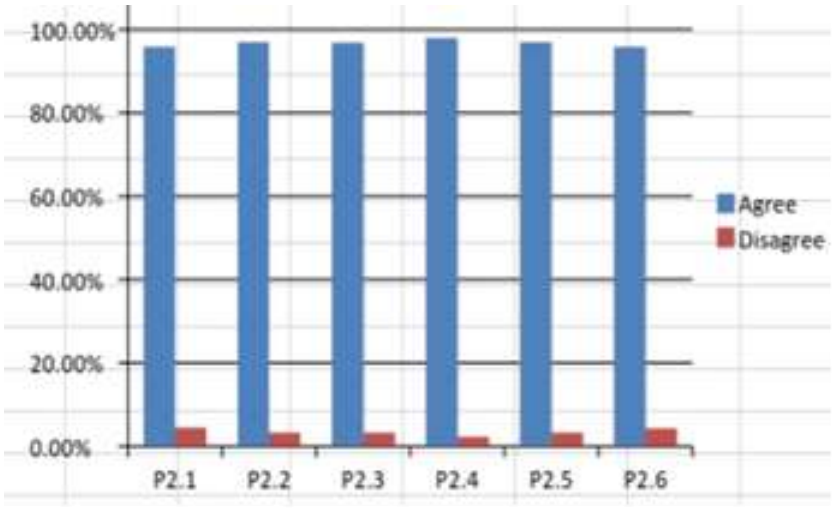

Figure 2. The nature of relationship between English teachers in TPACK and 21st C learning

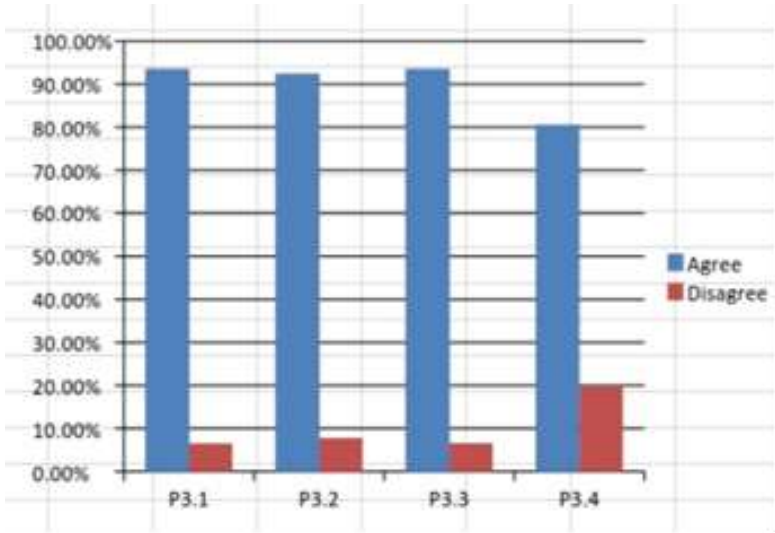

Figure 3. The result of the technology media tools known by English teachers

The results from the interview showed that the responses of the understanding of multimodal meaning-making are varied. The responses (83%) are they do not give positive responses. It meant that teachers and pre-service teachers do not know well-known with the multimodal literacy. Only 17% of 60 teachers and pre-service teachers know about the multimodality in teaching English.

There are some responses as evidenced by interviews and observations. 50 teachers at first did not understand the meaning of multimodal. In this interview, teachers heard about the word 'multimodality.' Some of the teachers gave different responses through the interviewee explained the term into another context. This finding offers a new perspective for teachers and pre-service teachers the term of multimodality in teaching English.

Another focus of the interview was that use technology to facilitate deconstruction and joint construction of multimodal texts. The findings showed that experienced teachers who teach more 7-10 years and pre-service teacher used simple technology tools, such as PowerPoint presentation and video for learning. Meanwhile, teachers with 1-3 year experience used various technology tools in teaching their students. Some of the tools included online dictionary, C-Maps tool, YouTube, Facebook, Prezi, and video presentations.

The implementation of Technological Pedagogical and Content Knowledge in English Language Teaching described as shown in Table 1.
The knowledge of English teachers in TPACK for multimodal literacy related to six components, those are (1) student's preliminary concepts about the topic of inquiry; (2) understanding to prepare students for a writing task; (3) facilitating multimodal meanings of the text; (4) leading students in composing a multimodal text; (5) supporting students in their autonomous construction a multimodal text; (6) sequencing the teaching and learning phases to facilitate student's multimodal meaning-making. It is about 72% teachers have been already familiar with the TPACK multimodal literacy, while the other 28% do not pay attention to these six terms. This will be homework for the lecturers who prepare pre-service teachers, policy makers, stakeholder, and the teachers' development department that should pay attention to this gap. This finding related to Li and Xia (2016) that by having sufficient education for pre-service teachers in university or some workshops for in-service teacher through persistent lifelong learning and practice the knowledge into classroom, teachers update their concept and technological equipment to improve their ability in selecting, controlling, and assessing information technology in their EFL teaching. This finding also in line with Niess (2005) that technology, pedagogy and content knowledge for English teachers give an insight framework in teaching and learning process. Implementing technology in teaching and learning process is one of the challenges deal with teacher professional development. Preparing teachers to cope with 21st-century quality learning requires teachers' skill in understanding and dealing with different tools, information, and work that integrate with computer-based within the context of the lessons.

However, though English pre-service and in-service has sufficient knowledge related to the TPACK, they have difficulty in understanding the term of multimodal literacy. Most of the teachers do not become familiar with the term though they have understood about a text that consists of more than one communication modes such as words, images, sounds, gestures, and movements. Pre-service and in-service need more explanation about the multimodal literacy in applying the term into English classroom in the context of TPACK.

Investigating the English Language teachers in developing TPACK and multimodal literacy in Indonesia context described that teachers have new paradigm about multimodal meaning-making in their teaching and learning process for both teachers and students. Though in-service teachers and pre-service teachers know and apply to use some modes in teaching English using different forms-visual and auditory sources, such as images, background music, speeches, language, and movement, the term multimodality is new and becomes challenges for them. The multimodal literacy makes senses further than the linguistics position of communication (Drajati, et al., 2017). This requires of visual, sound impression, and colors are also tools for communicating meaning to both for teachers and students.

By having the knowledge of multimodal literacy, both pre-service and in-service teachers agreed that there is strong relationship between English teachers in TPACK and 21st C learning. Most teachers are using technology to stimulate students' critical thinking about authentic issues, to guide my students in managing their learning, to use technology to help their students develop diverse perspectives for factual issues, to facilitate students in participating in collaboration with technology and to guide their students in constructing representations of knowledge using technology. Multimodality literacy in TPACK framework gives new perspectives for various students to learn English better through images, sounds and movements to create a better learning environment to achieve students' language mastery (Moreno, 2002; Rance-Roney, 2010). Giving the students varied modes in language learning create life-story learning. This provides an impact for encouraging students to direct, deploy and comprehend how these means relate to each other (Mayer, 2003).

The relationship between English teaching in TPACK and 21st C in line with the research done by Susannah and Ann (2016) that making use of

technology in language classroom gives innovative strategies to enhance learning and technology.

Some innovative strategies include integrating learning theory and technology, creative problem solving through technology, using technology to enhance teaching and learning methods, visualizing information through technology (with art and design), and additional technology tools for practical application. Those activities need the skill to think critically, collaboration and relating between theories and facts that help students in their future life and prepare them for the 21st century learning (Tan, 2006).

Table 1. The implementation of TPACK framework in English language teaching

No	TECHNOLOGY TOOLS	IMPLEMENTATION	PROBLEMS
1	Blog	In this research, Academic Writing class was undergone using a blog as the technology tools by pointing out the function of a blog to improve the student's writing quality through peer review as a part of reflective learning activity. The course initiated by teachers' instruction to find several journal articles related to their interest. The reading task comes after it followed the instruction to create a personal blog for each student. Third, the own journal review done by posting it in a personal blog. Students then collect the blog links and share each other. The peer gives the feedback or constructive comments for the article review written in a blog.	The respondent needed a high respect and a more reviewing activity in real class. Less feedback and interaction from teacher and other students The students less active in writing (just follow instructor's instruction in writing)
2	Mediated Online Discussion: MOOCs Task using Canvas Network Edmodo	The MOOC is packed with some activities such as viewing a video, reading the material, having quiz then having an online discussion for the last task. The participants enrolled the MOOCs by Canvas Network two weeks before this course began. The students have four modules to be finished in four weeks completion, a week on each, which is done by them outside of face to face learning in the classroom to get badges or certificate. After completing four modules, students were asked to fill the questionnaire, submit the process and progress of MOOCs' in a report.	Internet connection The various comments from different points of view in feedback create confusion. No reflection from the online discussion instructors
3	Text to speech software C-Maps Software	Teachers were trained for getting sufficient knowledge and be familiar to TTS and Google Site. Then, they were asked to create the listening material and put it in Google Site. In the end, teachers delivered their own material using TTS to students. Teachers used technology in joint construction such as comics, video, and games of multimodal texts	The way of the output producing system since teachers need to get right pronunciation, some typos might be a problem because TTS only convert words to sound without any confirmation whether the written word is correct or not. For several texts such as narrative text or conversation text, TTS can't produce a good intonation to be considered as actual output for listening comprehension. TTS can't provide appropriate tone for some punctuation such as question mark. These weaknesses make the output of TTS less attractive because the tone is not various. Teachers did not find an advanced setting for better output in TTS program Teachers also find it difficult in uploading the material to Google site since they need to upload it first to Google Drive.

			When students find problems while listening, no chat bar can be used for contacting the teacher and friends to solve students' problem by discussion
4	Video: YouTube	The students watch the video in YouTube and copy the way people speak English.	No problem in implemented these two sources
5	Social Network Facebook	A Facebook group was used as a supplementary to support teaching writing in the class. First, the students were asked to open Facebook on www.Facebook.com and sign on the Facebook by insert username and password. After that, access the designated group. Then they have to post their own text creation on the assigned topic. Then, they discuss the post in the Facebook group enabling teacher and peers to give comment and feedback.	The time lag and slow responses in the process of learning by using Facebook Teaching in the countryside, the school does not have language laboratory
6	Presentation Tools Prezi, PowerPoint	Teachers use the tool for explaining the materials to the students	There is no difficulty in writing the materials using PowerPoint slides It's hard to create power point by using Prezi because it needs online connection

The investigation of multimodal literacy in the context of TPACK English classroom describe that there are two interesting findings in the term of technology media tools known by English teachers. First, the group of 1-3 years experienced teachers has more varieties in making use of technology tools in their classrooms. They knew and applied the tools such as YouTube, C-Maps tool, comics, video, online dictionary, blogs, mediated online discussion, social media and games in their classrooms. Second, the group of experienced teachers (more than 10 years teaching) and pre-service teachers use the modest technology media tools, such as power point and video in creating the classroom more alive and creative. Based on these kinds of data, it needs continued professional development related to the making use of technology tools into the classrooms. It can be started when the pre-service teachers are in the college. The other professional developments could continue to prepare experienced teachers with small discussion between teachers, teachers-universities lecturers, teachers-government continued professional development center.

The application of the use of technology in the English classroom still gives challenges. The other reasons are fear of change and limited time and facilities supported frequently perceived as the facts that cannot be doubted (Mishra & Koehler, 2009). There are problems arisen in using technology in the classrooms, non-technical and technical problem. The non-technical problems are teachers do not give any improvement in teaching learning process since there is no interactive communication. It needs the pedagogical point of view in the educational process. Teachers need to create a collaborative learning environment through students-students, student-teacher, and student-learning situation. The role of a teacher in teaching using TPACK framework gives scaffolding; facilitate a secure situation for students.

At the same time, teachers face the technical problem which is internet connectivity becomes the primary challenge for English teachers. It needs knowledge how technology-enhanced language learning can be used in an offline format, not always in an online format.

Regarding language learning, English language teachers played significant roles in developing the quality of the teaching-learning process. The TPACK framework is needed for teachers to improve the three most important points of technology, knowledge, and content in supporting each other and engaging of students' achievement. The results of TPACK framework are developing both teachers and students' multimodal literacy and achieve 21st century learning.

CONCLUSION

Technological Pedagogical and Content Knowledge (TPACK) and Multimodal literacy are a way to introduce educators and students to a different way and use them to develop English ability. In this investigation, the teachers have investigated the new perspective how their performance of their teaching and learning process in the classroom. The teachers, pre-service and in-service teachers, may have been known and apply the technology in their classroom, but they do not sure yet about the TPACK framework and the impact on it, multimodal literacy.

The investigation describes Indonesia teacher knowledge about TPACK framework and multimodal literacy. There are some technology software and tools to help teachers in the teaching process and become a challenge for teachers to learn and apply the TPACK framework. Though it is stated

on the data that TPACK framework and multimodal literacy is a new term and teachers feel unfamiliar with the two terms, it is assumed that it will give new ways for teachers to learn these terms quickly. It needs little help from lecturers to open the mindset of pre-service teachers and need some practices in making use of technology for language learning using TPACK framework to provide the advantages to developing the quality of English teachers' professional development. TPACK and the multimodal literacy for English pre and in-service teachers need to be developed by English teachers to build, improve, and innovate themselves to be professional teachers and learners. This kind of efforts could be better supported by university environment, stakeholders, and government.

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