Transition to Online Learning: Implementing the TPACK Framework by English Teachers due to the COVID-19 Pandemic

Achmad Ivansyah Obos[1], Aridah[2], Desy Rusmawaty[3]
English Education Study Program, Universitas Mulawarman[1,2,3]
Email korespondensi: aivanscr7@gmail.com

ABSTRACT: The objectives of this research is to explore how the English teachers implement TPACK in online learning context and to know the challenges faced by the English teachers when they implement the TPACK in the online learning context. There were several studies in the implementation of TPACK as a theory for teaching, but still less on the discussion about the challenges that the English teachers faced while implementing it, particularly in the online learning due to the COVID-19 pandemic. This study employed a descriptive design with a qualitative approach, which were analyzed descriptively through reducing inappropriate data, displaying and concluding data. The results of the data revealed that the English teachers of Bunga Bangsa Islamic Junior High School Samarinda had implemented TPACK in online learning context by using WhatsApp, Zoom meeting and Google Classroom as the technologies used to teaching, conducting demonstration and recitation method as the pedagogy to teach about "object pronoun" and "will and going to" as the content. There are some challenges faced by the English teachers when they implemented TPACK in online learning context such as limited quota, bad signal of internet, students' behavior and adapt to the applications used such as WhatsApp, Zoom meeting and Google Classroom.

Keywords: online learning, pandemic of COVID-19, TPACK framework

ABSTRAK: *Tujuan dari penelitian ini adalah untuk mengeksplorasi bagaimana guru bahasa Inggris menerapkan TPACK dalam konteks pembelajaran online dan untuk mengetahui tantangan yang dihadapi oleh guru bahasa Inggris ketika mereka menerapkan TPACK dalam konteks pembelajaran online. Ada beberapa kajian dalam penerapan TPACK sebagai teori untuk mengajar, namun masih kurang pembahasan mengenai tantangan yang dihadapi guru bahasa Inggris selama menerapkannya, khususnya dalam pembelajaran online akibat pandemi COVID-19. Penelitian ini menggunakan desain deskriptif dengan pendekatan kualitatif, yang dianalisis secara deskriptif dengan mereduksi data yang tidak sesuai, menampilkan dan menyimpulkan data. Hasil data mengungkapkan bahwa guru bahasa Inggris SMP Islam Bunga Bangsa Samarinda telah menerapkan TPACK dalam konteks pembelajaran online dengan menggunakan WhatsApp, Zoom meeting dan Google Classroom sebagai teknologi yang digunakan untuk mengajar, melakukan metode demonstrasi dan resitasi sebagai pedagogi untuk mengajarkan tentang "object pronoun" dan "will and going to" sebagai konten. Ada beberapa tantangan yang dihadapi guru bahasa Inggris ketika mereka menerapkan TPACK dalam konteks pembelajaran online seperti kuota yang terbatas, sinyal internet yang buruk, perilaku siswa dan beradaptasi dengan aplikasi yang digunakan seperti WhatsApp, Zoom meeting dan Google Classroom.*

Katakunci: *kerangka TPACK, pandemic COVID-19, pembelajaran online*

INTRODUCTION

The worldwide COVID-19 pandemic has altered many facets of society, including the educational system (Bhagat & Kim, 2020). Due to this, traditional face-to-face learning must now abruptly transition to online or virtual learning, often known as e-learning or remote learning (Lapitan et al., 2021; Tavitiyaman et al., 2021). The government implemented a scheme that involved temporary school closures and the use of an online system to replace the traditional methods of teaching and learning. Regarding the implementation of educational policy during the COVID-19 emergency period, Mr. Nadiem Anwar Makarim, Minister of Education, released a Ministerial Circular Letter. In order to offer innovative and worthwhile learning opportunities for educators, students, and parents, the letter defines the learning process done online or remotely. As a result, the teaching and learning processes in Indonesia have been transformed to online learning.

Online learning has grown significantly over the past three decades and it is now widely used in education around the world (Singh & Thurman, 2019). Due to the growing popularity of online learning over the past several years, more schools and universities are now offering online courses (Beatty & Ulasewicz, 2006; Li & Akins, 2005). Accepting material is now possible both in an online class and in an offline class where the teacher is teaching. The development of technology can help teachers better explain subjects to their students. Carliner (2004) defined that online learning as a technological way of accessing to learning activities. This statement is in line with Anderson (2008) defined online learning is a branch of remote education that has always focused on granting access to a learning environment while being more flexible in time and place than school-based education.

Based on the statements of the experts above, the researchers concluded that online learning as well as any course offered to students who are not physically present in the same room, can be a way that can make the teaching-learning process more student-centered, inventive, and adaptable. Students and teachers are not required to attend school. Instead, they learn and teach remotely through technology. Tablets, smartphones, laptops, and computers can all be used with internet to access platforms and websites that are available to teachers and students. There are various online learning platforms that can be used combined with technology, such as *WhatsApp, Google Classroom, Ruang Guru, Quipper* and *Zoom Meeting*. Minister of Education and Culture issued Circular No. 36962/MPK.A/HK/2020 dated 17 March 2020 concerning online learning to prevent the spread of COVID-19 by providing learning facilities and the websites (Table 1) as stated in this circular letter.

Table 1. Learning Facilities and Websites for Access Available for Free From Minister of Education and Culture

Learning Facility	Website
Learning House	https://belajar.kemdikbud.go.id
Google G Suite for Education	https://blog.google/outreach-intiative/education/offline-access-covid-19
Smart Class	https://kelaspintar.id
Microsoft Office 365	https://microsoft.com/id-id/education/products/office
Quipper School	https://quipper.com/id/school/teachers
Ruang Guru Online School	https://ruangguru.onelink.me/blPk/efe72b2e
Sekolahmu	https://sekolah.mu/tanpabatas
Zenius	https://zenius.net/belajar-mandiri

These facilities can be used effectively as a tool for learning, much like a classroom. By utilizing these facilities and websites, students and teachers will have a growing amount of control on how they can utilize and access technology. With the advancement of science and technology, online learning has become a reality that must be accepted. The variety of available online learning tools has altered educational regulations in recent years. Online learning is a method of instruction that uses a platform to facilitate teaching and learning even when it takes place over a vast distance rather than face-to-face. The goal of online learning is to offer high-quality educational services through a network that is extensive and accessible to a wider range of study space enthusiast (Sofyana & Rozaq, 2019). In short, all learning forms are carried out virtually.

This was a sudden change in how learning was being delivered. Many teachers lacked or had little expertise with online education. Even for teachers who had previously taught online, the transition to totally online instruction has been difficult (Sykes, 2020). The teachers have to know what kinds of materials are available, how to use them, why they should be used, when they should be used, and how to integrate them into the learning-teaching process in online education. The difficulties that teachers frequently confront include lack of access and affordability, the cost of internet connectivity, a lack of technological know-how, difficulties with pedagogy and materials, and worries about assessment (Bashir et al., 2021).

Teachers had to adapt to teaching online, which required them to employ a variety of digital tools and resources to solve issues and apply new teaching and learning strategies (Eickelmann & Gerick, 2020). In order to continue the learning process even when it is done online with all of the limitations that entails, it is necessary for educational institutions to develop breakthroughs in learning methods and models that must be embraced. Instead of educating students face-to-face, teachers at all grade levels are starting to create virtual learning environments. The rapid transition to virtual learning presented challenges for

teachers in terms of digital communication, integrating technology tools, designing online education, and evaluating students' levels of knowledge.

In the contemporary pandemic, when teachers must be proficient in technology, there are many qualities that teachers must possess. Technology tools should be accessible, and teachers should be knowledgeable on how to conduct online learning, in accordance with the new policy on home learning. Technological knowledge will help teachers to conduct teaching and learning with technology effectively. In line with Voithofer & Nelson (2021) agreed that the way teachers put their technological skills into practice will determine how much technology can increase students' learning. A theory that related to the technological knowledge is TPACK (Technological Pedagogical and Content Knowledge).

The studies by Koehler (2006) regarding the essential elements of teacher knowledge for effective teaching, namely knowledge of content, pedagogy, and technology, serve as the foundation for the basic conceptual framework for TPACK in the field of education. The problem needs to be handled because education technology development is accelerating with the passage of time and cannot be stopped. Technology was included as a new significant knowledge in PCK by Mishra and Koehler in 2006. TPACK, or Technological Pedagogical and Content Knowledge, thereby replaces Shulman's original structure (Koehler et al., 2014). This framework is one approach to the problem of integrating technology in the classroom.

Before the TPACK framework formed, it initially came from the term of Pedagogical Content Knowledge (PCK) which appeared in the article by (Shulman, 1986) which focused on observations regarding the combination of content knowledge and pedagogical knowledge. Shulman, then got criticism about the concept of PCK which according to experts, it was lacked and had to be developed. Shulman then gave permission to other researchers to develop the idea. As time goes by, technology has grown in two decades. Mishra & Koehler proposed the concept of technological knowledge (TK) so that teachers have the latest thinking to teach, namely the concept of TPACK (Cruze, 2011). TPACK automatically forms (Figure 1) into three knowledge consisting of TK, CK, PK. Then, it forms into four more knowledge, namely PCK, TPK, TCK, and TPACK. TPACK has seven components which are content knowledge abbreviated as CK, pedagogical knowledge abbreviated as PK, technological knowledge abbreviated as TK, pedagogical content knowledge abbreviated as PCK, technological content knowledge abbreviated as TCK, technological pedagogical knowledge abbreviated as TPK, and technological pedagogical and content knowledge abbreviated as TPACK.
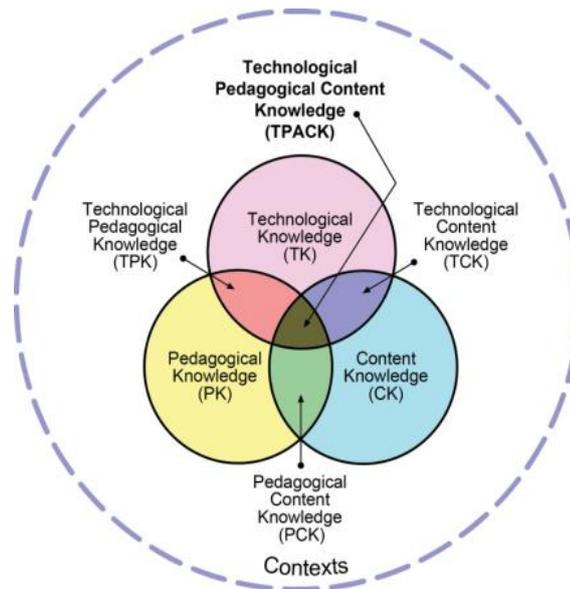
Picture 1. TPACK Framework (Koehler & Mishra, 2009)

In the Indonesian context, several studies were found based on general issues, such as a study of Drajati et al., (2021) they found that the integration of the TPACK-21CL framework into lesson plans had a favorable influence on English pre-service teachers in terms of problem-solving and learning values. Pre-service teachers displayed various degrees of knowledge and practice in constructing lesson plans with the framework. A study from Makawawa et al., (2021) they found that during the COVID-19 pandemic, the majority of primary school teachers in North Sulawesi, Indonesia, already possessed TPACK competencies in online education. However, the technological knowledge (TK) and pedagogical knowledge (PK) abilities still need to be strengthened in terms of TPACK competences. The correlation analysis of the TPACK constructs also revealed a substantial impact of the pedagogical knowledge (PK) and technological pedagogical knowledge (TPK) components on the perception of online learning among TPACK primary school instructors. Additionally, it was discovered that elementary school teachers' TPACK competency was unaffected by their gender. A study from Putri (2019) her findings revealed that the seven TPACK components were utilized by the teacher. The teacher highlighted the usage of several TPACK elements, such as technological knowledge (TK) and technological content knowledge (TCK) during the teaching and learning process. The use of technology by teachers nowadays is important because if the students are pay attention to them, the teachers will have an easier time explaining the material. The concept of the 2013 curriculum, which encourages teachers to use technology while teaching, is also in accordance with the usage of technology in the teaching and learning process. A study from Windiarti et al., (2019) they found that several challenges were noticeable for the teachers when they tried to incorporate e-learning. The learning tool is the source of the challenges. To facilitate the learning process, a good internet connection and software accessibility are required. The

Penulis Koresponden: Achmad Ivansyah Obos (hanifahoktarina@stain-madina.ac.id)

students will find it simpler to use the learning tool if it has high quality. The knowledge of teachers and time management are the other challenges. E-learning is still unfamiliar to the teachers. They still need to acquire the skills necessary to integrate e-learning into the teaching and learning process. As a result, they still find it challenging to manage their time.

The urgency of this research is the researchers want to explore more broadly about the implementation of TPACK by English teachers during the COVID-19 pandemic by looking at what types of technology support their teaching, the way how teachers teach by implementing various approaches or pedagogical methods and what contents are taught by the teachers. Besides, the researchers also want to know the challenges faced by the English teachers while implementing TPACK so the readers or educators can use this literature to overcome the challenges that arise in the future. There have been several studies in the implementation of TPACK as a theory for teaching, the novelty of this research highlighted the deficiency on the discussion about the challenges that the English teachers faced while implementing TPACK, particularly in the online learning due to the COVID-19 pandemic so that educators can use this literature to prepare for future online learning. Therefore, the objectives of this research are to explore how the English teachers implement TPACK in online learning context and to know the TPACK's challenges faced by the English teachers.

RESEARCH METHODOLOGY

This qualitative study employed the ethno-systemic narrative approach by combining narrative and ethnographic approaches. The ethnonarrative approach requires a particular conceptualization of text or context as well as a method of dealing with data that reflect developments and changes in our understandings of the processes involved in meaning construction (Hansen, 2006). The researchers focused on stories told by subjects through interview. The story seen as a complete entity with a beginning, middle, and an end. It is used when the study has a specific focus, such as classrooms, students, teachers, the subject's biographical or a life history (Mohajan, 2018). The researchers choose the subjects by purposive sampling. Purposive sampling is the use of researcher judgment to select a sample that they believe, based on prior information, will provide the data they need (Fraenkel et al., 2012). The subjects of this study are two English teachers of Bunga Bangsa Islamic Junior High School Samarinda with coding system (ATW) for the first participant and (NA) for the second participant. The considerations that make the subjects chosen purposively are (1) they understand the concept of TPACK framework and they are able to implement it in the classroom while teaching, (2) all teachers of Bunga Bangsa Islamic Junior High School Samarinda felt the transition from offline learning to online learning, so the researchers want to explore the information from the transition experiences by the subjects.

In order to attain the data, the researchers conducted interview. the interview conducted face to face when the English teachers have a free time. The aim of this interview was to obtain a verbal feedback from both English teachers.

English teachers are asked to say whatever comes to their mind. This may include what they see, think, do, and feel. The researchers conducted structured interview twice for two English teachers, once for the first participant and once for the second participant in order to obtain the information relating to how do the English teachers implement TPACK in online learning context and what are the challenges faced by the English teachers when they implement the TPACK in the online learning context. The results recorded through the researchers' audio-visual recording devices. To analyze the data, the researchers used Miles et al., (2014) theory. They suggested that data analysis techniques can be obtained with following concurrent activities: removing unnecessary data by focusing, simplifying, abstracting and transforming data that appears from written-up field notes. Displaying the data by in the form of a brief description that describes the analysis of the English teachers about how they implement TPACK and the challenges faced by them. Then, those are designed to combine structured information in a form that is coherent and easily achieved. The researchers concluded the data according to the research objectives that have been raised. The data that have been described are summarized in general to support and strengthen the research conclusion.

RESULT AND DISCUSSION

Result

English teachers implemented TPACK in online learning context

The findings of the study were written to explore the experiences of English teachers in implemented TPACK in online learning context. The results of interview in the form of story as the explanation from the participants. The researchers analyzed the story from the interview results by simplified and reduced the unnecessary data and displayed the data below. Both participants of the study have answered the interview questions conducted by the researchers. Table 2 below displays how the English teachers implemented TPACK in online learning context and the table adopted from Otrel-Cass et al., (2012).

Table 2. English teachers implemented TPACK in online learning context

TPACK components	Indicators	First participant's and second participant's TPACK implemented
Technological Knowledge (TK)	Knowledge of software and hardware, including how to access, install, remove, create and/or archive digital material	*WhatsApp* and *Zoom meeting* – the first participant used *WhatsApp* to inform and upload materials, he also used *Zoom meeting* to meet his students and teaching by explaining the materials uploaded from *WhatsApp*. *Google Classroom* – the second participant used *Google Classroom* to provide the materials and the students were asked to submit their project in it,

		both second participant and the students can access as long as they have their *Google Account*.
Content Knowledge (CK)	What is known about a given subject	*Object pronoun* – the first participant taught about *object pronoun* in that day and discussed structurally about the definition of *object pronoun*, the examples of *object pronoun* such as *me, you, him, her, them, us* and others. The first participant also explained the differences between the *object pronoun* and *subject pronoun*. *Will and going to* – the second participant explained how to use *will and going to* by giving some examples, she also differentiates between *will* and *going to* by making two tables.
Pedagogical Knowledge (PK)	Teaching methods and processes	The first participant conducted demonstration method. The second participant conducted recitation method.
Pedagogical Content Knowledge (PCK)	Pedagogy specific to a particular subject matter or content	The first participant conducted demonstration method by making an activity called *"Find someone who"* for the students. The activity based on the material of *object pronoun*. The second participant conducted recitation method by asked the students to make five different sentences by using *will and going to* for each student.
Technological Content Knowledge (TCK)	Knowledge of how content and specific ICT technology may be relate, for example, how digital video technology affords new ways of representations	The first participant used *WhatsApp* to upload material about *object pronoun* in a portable document format (PDF) and read by students so they know what to learn and the first participant used the *Zoom meeting* to explain the material sent via *WhatsApp* with the aim to clarifying the material about *object pronoun*. The second participant used *Google Classroom* to provide the material

		about *will and going to* for the students so they can read the material.
Technological Pedagogical Knowledge (TPK)	Knowledge of the existence of ICT specific technologies including how they can be used and how teaching way change as a result of using them	The first participant asked the students through *Zoom meeting* to conducted the activity called *"Find someone who"* that related with the material about *object pronoun* and the students were asked to chat their friends and record the chat and uploaded through *WhatsApp* as the demonstration method. The second participant conducted recitation method by asked the students through *Google Classroom* to make five sentences of *will and going to* and collect them in Microsoft word text format to *Google Classroom*.
Technological Pedagogical and Content Knowledge (TPACK)	Knowledge of the integration among content, pedagogy and technology used by teachers.	The first participant used *WhatsApp* to upload material about *object pronoun* in a portable document format (PDF) and read by students so they know what to learn and the first participant used the *Zoom meeting* to explain the material sent via *WhatsApp* with the aim to clarifying the material about *object pronoun* (TCK). The first participant asked the students through *Zoom meeting* to conducted the activity called *"Find someone who"* that related with the material about *object pronoun* and the students were asked to chat their friends and record the chat and uploaded through *WhatsApp* as the demonstration method (TPK). The second participant used *Google Classroom* to provide the material about *will and going to* for the students so they can read the material (TCK). The second participant conducted recitation method by asked the students through *Google Classroom* to make five sentences of *will and going to* and collect them in Microsoft word text format to *Google Classroom* (TPK).

The TPACK's challenges faced by the English teachers

There are several challenges faced by English teachers when they implemented the TPACK in the online learning context, both participants have mentioned the challenges based on the experiences that they have been through. The first participant shared his opinion.

"I strive to keep my students from being exhausted by using online learning since I noticed that after 1-2 months, they became tired, and some students stated that they preferred to study in class. Apart from videos…. I find it really hard to use other educational material because the pandemic condition discourages me from being more innovative in creating other media even though I really want to teach outside the classroom by using authentic materials so students don't feel bored. To help students grasp the subject matter better, So I decided to constantly use the same videos that I have got from YouTube that I had before COVID-19." (ATW)

The second participant also shared her opinion.

"Because the conditions are not supportive, I find myself struggling to use more engaging recitation methods. The challenges I faced don't seem to be just a few and maybe other teachers feel it too, limited quota that makes the students sometimes find it difficult to entering the Zoom, sometimes due to unfavorable weather causing bad signals, and the students always come late that makes me has to re-explain the material that I have conveyed. About the online platforms, it's really confusing when I use online platforms at the first time…. because I never taught online before pandemic." (NA)

Discussion

The participants used different applications as the technological knowledge (TK), methods as the pedagogical knowledge (PK), subject matter as the content knowledge (CK). Based on the interviews made by the researchers, both participants have answered how they implemented TPACK in an online learning context in the classroom. The first participant used *WhatsApp* to upload material about *object pronoun* in a portable document format (PDF) and read by students so they know what to learn and the first participant used the *Zoom meeting* to explain the material sent via *WhatsApp* with the aim to clarifying the material about *object pronoun* (TCK). The first participant asked the students through *Zoom meeting* to conducted the activity called *"Find someone who"* that related with the material about *object pronoun* and the students were asked to chat their friends and record the chat and uploaded through *WhatsApp* as the demonstration method (TPK). He has integrated the TPACK in online learning context to make the students can be active in the classroom, feel boosted, motivated and certainly can understand what the first participant has taught so it can be applied in their real life. The second participant used *Google Classroom* to provide the material about *will and going to* for the students so they can read the material (TCK). The second participant conducted recitation method by asked the

29

students through *Google Classroom* to make five sentences of *will and going to* and collect them in Microsoft word text format to *Google Classroom* (TPK). She has integrated the TPACK in online learning context to make the students can achieve their self-understanding about the material. Based on the analysis of the present study about TPACK implemented by English teachers as the first and the second participants, it demonstrated that they had covered the TPACK and implemented them practically. This finding similar with Putri (2019) her findings indicated that the teacher asked to the students to do the exercise in their own book as the pedagogical knowledge (PK), the exercise was a story which tell about The Battle of Surabaya as the content knowledge (CK), the students must scan the QR code in their book by using Line application as the technological knowledge (TK).

Another study from Rohmitawati (2018) her findings about the TPACK framework was applied interactively in the integration process of GeoGebra as technology (TK) using discovery learning strategies as pedagogy (PK) on the square area formula as content (CK) for quadrilateral properties in math subject. Teachers that participated as in sample gave the TPACK framework a positive review and said that using it in the classroom would be engaging and beneficial. These findings in line with other researchers (Chai et al., 2011; Harris & Hofer, 2011; Yurdakul et al., 2013) they stated that by applying TPACK models for conducting teacher skill learning can produce beneficial outcomes. The TPACK framework might be used as a guide for creating online training. Based on the results of research conducted by the researchers and previous studies, it can be concluded that technological knowledge (TK), pedagogical knowledge (PK) and content knowledge (CK) are related to one another which form a TPACK framework. Through the way teachers teach by using technology with the help of pedagogy to deliver the content to be taught so that classroom learning becomes more effective and efficient, effective which means students do not feel bored and interested in the material presented by the teacher through the type of technology used and the pedagogy carried out by the teacher that made the students have activities in classroom. Efficient, which means that teachers can deliver the same content in different classes without having to recreate the material from scratch, so teachers don't waste time and able to create new ideas by using technology to create further material.

Both participants have different perspectives about the challenges faced when they implemented TPACK in the online learning context such as limited quota, bad signal of internet, students' behavior and adapt to the platforms used such as *WhatsApp*, *Zoom* and *Google Classroom*. Similar with a study from Windiarti et al., (2019) revealed that the implementation of e-learning was fraught with difficulties for the teachers. The learning equipment, the quality of the internet connection, and the lack of software that is required to support the learning process are the hurdles. If the device is of high quality, students will have an easier time using it. The knowledge of teachers and time management are the other challenges. Another study from Agustina et al., (2020) found that the primary difficulties that students faced when taking online courses such as technical issues with the use of technology, heavy tasks, students' low motivation,

and unsupportive environment. This result prompts the need to solve these problems in order to raise the standard of online education. These findings in line with Zhong (2020) claims that major aspects, including inadequate access, internet accessibility, a lack of technology, students' capability to engage in digital learning and an inability to properly communicate with teachers, became the main effects in the adoption of online learning. Based on the results of research by the researchers and previous studies, it can be concluded that the challenges faced by teachers when teaching by implementing TPACK are not just a few, it is hoped that the challenges that arise can be overcome immediately from the school and cooperation between teachers and parents of the students in order to create better online learning. The school might consider holding a special training program for teachers who are not familiar with the use of the latest types of technology so that teachers will not be surprised again by similar challenges that arise in the future. Parents are expected to be able to monitor their children's behavior when studying online and ensure adequate quotas and a good internet network, so that the challenges arise can be handled properly.

CONCLUSION

The findings of the study reported that the English teachers of Bunga Bangsa Islamic Junior High School Samarinda had implemented TPACK in online learning context by using *WhatsApp*, *Zoom meeting* and *Google Classroom* as the technologies used to teaching, conducting demonstration and recitation method as the pedagogy to teach about *object pronoun* and *will and going to* as the content. Meanwhile, there are some challenges faced by the English teachers when they implemented TPACK in online learning context such as limited quota, bad signal of internet, students' behavior and adapt to the applications used such as *WhatsApp*, *Zoom meeting* and *Google Classroom*.

ACKNOWLEDGE

REFERENCES

Agustina, D., Matra, S. D., & Karimah, S. (2020). Challenges of Having Online Learning Activities: University Students' Perspectives. *INELTAL Conference Proceedings The International English Language Teachers and Lecturers Conference*.

Anderson, T. (2008). The Theory and Practice of Online Learning. *AU Press Canada. Athbasca University.*, *Second Edition*.

Bashir, A., Uddin, M. E., Basu, B. L., & Khan, R. (2021). Transitioning to online education in English departments in Bangladesh: Learner perspectives. *Indonesian Journal of Applied Linguistics*, *11*(1), 11–20. https://doi.org/10.17509/ijal.v11i1.34614

Beatty, B., & Ulasewicz, C. (2006). Faculty perspectives on moving from blackboard to the module learning management system. *Research and Practice to Improve Learning*, *50(4)*, 36–45.

Bhagat, S., & Kim, D. J. (2020). Higher Education Amidst COVID-19: Challenges and Silver Lining. *Information Systems Management*, *37*(4), 366–371. https://doi.org/10.1080/10580530.2020.1824040

Carliner, S. (2004). An Overview of Online Learning (2nd ed.). *European Business Review*, *16*(4), 430–430. https://doi.org/10.1108/09555340410561723

Chai, C. S., Ling Koh, J. H., Tsai, C. C., & Lee Wee Tan, L. (2011). Modeling primary school pre-service teachers' Technological Pedagogical Content Knowledge (TPACK) for meaningful learning with information and communication technology (ICT). *Computers and Education*, *57*(1), 1184–1193. https://doi.org/10.1016/j.compedu.2011.01.007

Cruze, C. I. (2011). *TPACK: A Framework for Educators to Implement Technology in their Classrooms*. Ball State University.

Drajati, N. A., Rakerda, H., Sulistyawati, H., Nurkamto, J., & Ilmi, M. (2021). Investigating the adoption of TPACK-21CL by English pre-service teachers in a COVID-19 teaching practicum. *Indonesian Journal of Applied Linguistics*, *11*(1), 124–133. https://doi.org/10.17509/ijal.v11i1.34625

Eickelmann, B., & Gerick, J. (2020). *Lernen mit digitalen Medien. Zielsetzungen in Zeiten von Corona und unter besonderer Berücksichtigung von sozialen Ungleichheiten*. https://doi.org/10.25656/01:20235

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). How to Design and Evaluate Research in Education. *New York: Mc Graw Hill*, *8th edition*.

Hansen, H. (2006). The ethnonarrative approach. In *Human Relations* (Vol. 59, Issue 8, pp. 1049–1075). https://doi.org/10.1177/0018726706068770

Harris, J. B., & Hofer, M. J. (2011). Technological pedagogical content knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related Instructional planning. *Journal of Research on Technology in Education*, *43*(3), 211–229. https://doi.org/10.1080/15391523.2011.10782570

Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge PUNYA MISHRA. *Teachers College Record*, *108*(6), 1017–1054.

Koehler, M. J., & Mishra, P. (2009). *What Is Technological Pedagogical Content Knowledge? MSU-Wipro STEM & Leadership View project Exploring State Educational Twitter Hashtags View project*. https://www.researchgate.net/publication/241616400

Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The technological pedagogical content knowledge framework. In *Handbook of Research on Educational Communications and Technology: Fourth Edition* (pp. 101–111). Springer New York. https://doi.org/10.1007/978-1-4614-3185-5_9

Lapitan, L. D., Tiangco, C. E., Sumalinog, D. A. G., Sabarillo, N. S., & Diaz, J. M. (2021). An effective blended online teaching and learning strategy during the

COVID-19 pandemic. *Education for Chemical Engineers*, *35*, 116–131. https://doi.org/10.1016/j.ece.2021.01.012

Li, Q., & Akins, M. (2005). Sixteen myths about online teaching and learning in higher education: Don't believe everything you hear. *Tech Trends: Linking Research and Practice to Improve Learning*, *49(4)*, 51–60.

Makawawa, J. C., Mustadi, A., Septriwanto, J. van, Sampouw, F., & Najoan, R. A. O. (2021). Primary school teachers perception of technological pedagogical content knowledge in online learning due to Covid 19. *Jurnal Prima Edukasia*, *9*(1), 86–96. https://doi.org/10.21831/jpe.v9i1.35245

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative Data Analysis A Methods Sourcebook Edition*.

Mohajan, H. K. (2018). Munich Personal RePEc Archive Qualitative Research Methodology in Social Sciences and Related Subjects Qualitative Research Methodology in Social Sciences and Related Subjects. In *Journal of Economic Development, Environment and People* (Vol. 7).

Otrel-Cass, K., Khoo, E., & Cowie, B. (2012). Scaffolding with and through videos: An example of ICT-TPACK. *Contemporary Issues in Technology and Teacher Education*, *12*, 369–390. https://www.researchgate.net/publication/259997734

Putri, S. E. (2019). *The Implementation of TPACK in Teaching Writing Recount Text in a Senior Highschool Level* (Vol. 7).

Rohmitawati. (2018). The Implementation of TPACK (Technology, Pedagogy, and Content Knowledge) Framework on Indonesian Online Mathematics Teachers Training. *Southeast Asian Mathematics Education Journal*, *8*(1).

Shulman, L. S. (1986). Knowledge Growth in Teaching. *American Educational Research Association*, *15*, 4–14.

Singh, V., & Thurman, A. (2019). How Many Ways Can We Define Online Learning? A Systematic Literature Review of Definitions of Online Learning (1988-2018). *American Journal of Distance Education*, *33*(4), 289–306. https://doi.org/10.1080/08923647.2019.1663082

Sofyana, L., & Rozaq, A. (2019). *Pembelajaran Daring Kombinasi Berbasis WhatsApp Pada Kelas Karyawan Prodi Teknik Informatika Universitas PGRI Madiun* (Vol. 8).

Sykes, D. (2020). *Online Education During a Pandemic: Teaching and Learning in Home Spaces Teaching During a Pandemic-Special Section of Literacies and Language Education: Research and Practice View project ONLINE EDUCATION DURING A PANDEMIC: TEACHING AND LEARNING IN HOME SPACES*. https://www.researchgate.net/publication/344013498

Tavitiyaman, P., Ren, L., & Fung, C. (2021). Hospitality students at the online classes during COVID-19 – How personality affects experience? *Journal of Hospitality, Leisure, Sport and Tourism Education*, *28*. https://doi.org/10.1016/j.jhlste.2021.100304

Voithofer, R., & Nelson, M. J. (2021). Teacher Educator Technology Integration Preparation Practices Around TPACK in the United States. *Journal of Teacher Education*, *72*(3), 314–328. https://doi.org/10.1177/0022487120949842

Windiarti, S., Fadilah, N., Dhermawati, E., & Pratolo, B. W. (2019). Teachers' Perception toward the Obstacles of E-Learning Classes. *Ethical Lingua: Journal of Language Teaching and Literature*, *6*(2), 117–128. https://doi.org/10.30605/25409190.v6.117-128

Yurdakul, I. K., Ferhan Odabasi, H., Sahin, Y. L., & Coklar, A. N. (2013). A TPACK course for developing pre-service teachers' technology integration competencies: From design and application to evaluation. In *Research Perspectives and Best Practices in Educational Technology Integration* (pp. 242–269). IGI Global. https://doi.org/10.4018/978-1-4666-2988-2.ch013

Zhong, R. (2020). *The Coronavirus Exposes Education's Digital Divide*. The New York Times. https://www.nytimes.com/2020/03/17/technology/china-schools-coronavirus.html