The Application of TPACK for Teaching Content Courses: Process, Students' View, and Product in Indonesian Context

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Abstract: Due to the pandemic breakout in 2020, all facets of human life have been subject to unexpected changes. To sustain learning activities, many educational institutions have utilized Technological Pedagogical Content Knowledge (TPACK) as way-outs. It is true for delivering content courses at the English Department, Faculty of Letters, State University of Malang, East Java, Indonesia. One affected course is teaching English for Young Learners (EYL) for sixth-semester students. Thus, this article aims to describe the implementation of TPACK, the students' view, and the product results from the process. The design of this study is an exploratory sequential design. The participants were twenty-one Offering C students taking the EYL course. Thus, data were collected qualitatively (classroom observations, semi-structured interviews, video watching, mid and final-term assessments) and quantitatively (the Likert scale questionnaire). The findings reveal that: 1) the process of teaching EYL courses TPACK involved flipped learning in the initial meeting followed by a discussion session, and the technology used was Google meet, Google class, YouTube, WhatsApp, and technical tools like a tutorial video for media demonstration, and video making; 2) the students agree on the use of technology for their learning of EYL course and feel that they have had a lot to learn from TPACK for their course, and 3) the products generated from the teaching-learning process are video and intellectual rights certificates (HKI).

Keywords: content course, product, process, TPACK views

INTRODUCTION

It goes without saying that in the ever-changing educational domain, the role of information and communication technology (ICT) continues to emerge as an urgent trend for educators in all subject areas. Due to the pandemic breakout in 2020, all facets of human life have been subject to unexpected changes. To sustain learning activities, many educational institutions have utilized Technological Pedagogical Content Knowledge (TPACK) as a way-outs (Yatun et al., 2021; Hariati et al., 2022). It is in line with the government that in such a crisis, the learning process must be implemented virtually (Kementerian Pendidikan Kebudayaan Riset dan Teknologi, 2020). TPACK was introduced to the educational research field as a framework for understanding teacher knowledge for effective technology integration provides a theoretical lens for describing whether teachers can effectively design and conduct technology-enhanced instruction and describes the kinds of knowledge required for practical pedagogical purposes in a such technology-enhanced learning environment (Mishra & Koehler, 2006; Taopan et al., 2020). Thus, it is imperative for teachers in the 21st century to integrate technology for teaching and learning (Limbong, 2017) and through meaningful integration in the classroom (Kurt et al., 2014).

As a body of knowledge, the TPACK framework incorporates seven knowledge domains as follows: Technological Knowledge (TK), Pedagogical Knowledge (PK), Content Knowledge (CK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK) (Mishra & Koehler, 2006). More specifically, Technological Knowledge (TK) refers to technology as a means of information and communication at work and in daily life. In contrast, Pedagogical Knowledge (PK) is how to plan a lesson, manage the classroom, select teaching strategies, and assess students' learning outcomes. Next, Content Knowledge (CK) deals with knowledge about the subject being taught, while Pedagogical Content Knowledge (PCK) is knowledge of planning instruction and teaching practices relevant to the subject to teach. Further, Technological Content Knowledge (TCK) discusses knowledge of exploiting technology to deliver the subject. Henceforth, Technological Pedagogical Content Knowledge (TPACK) is the aggregate of teachers' pedagogy, content, and technology knowledge. In the virtual learning process, the TPACK framework is considered the basic knowledge that any teacher should acquire (Mishra & Koehler, 2006; Abbit, 2011; Harris & Hofer, 2014; and Kapici & Akcay, 2020).

Teachers, students, and school communities everywhere have been compelled to adapt to the unprecedented challenges during the pandemic. Some studies have been conducted dealing with the implementation of virtual academic encounters. For instance, research conducted by Harris and Hofer (2011)

revealed that using technology enables the inclusion of various learning activities in the classroom. It is to say that integrating technology in virtual classrooms results in teachers' more expansive repertoire of technological knowledge, which will impact the standards of the learning process. Further, Bao's study (2020) discovered that most university students have a positive attitude and satisfaction with online learning delivery. This study revealed that relevant implications of the learning pedagogy approach and appropriate integration of technological tools could be beneficial to ensure continuous success in delivering learning content during this COVID-19 pandemic time.

On the contrary, a study in Vietnam by Van Nguyen et al. (2022) revealed that in-service K-12 EFL teachers came across pedagogical problems of how to use ICT to teach their students as prior to the practice, they require more insights into what effective practice-oriented pedagogical strategies are needed to facilitate teachers to enhance their ICT-related skills. The findings are also anticipated to help bridge the gap between the theory and practice of ICT-related teacher PD in Vietnam and countries with contextual similarities. In brief, the intensive application of technology in virtual classes during the pandemic, on the one hand, may scaffold the learning process. However, on the other hand, it may create pedagogical problems for teachers since they are not technologically well-prepared (Friedhoff, 2008).

The result of previous studies shows that most research is directed toward the students' perception of the use of technology, such as video conferencing applications, during the pandemic (Nehe, 2021; Safitri & Tyas, 2022; Kaniadewi, 2022) and Google classroom platform (Oktaria & Rohmayadevi, 2021; Diana et al., 2021). Other studies also explore the students' feelings about online learning and their problems at the secondary school level (Inawati & Setyowati, 2020; Suhaimah & Setyowati, 2021) and university level context (Bao, 2020; Setyowati et al., 2021). More specifically, some studies are directed at exploring the use of technology for skill courses amidst the pandemic, such as speaking (Kaniadewi, 2022) and writing (Setyowati et al., 2021). However, very few studies explore technology use in TPACK mode for content courses at the university level.

Based on the previously mentioned evidence, this study intends to disclose how the "English for Young Learners Course" as a content-based virtual instruction was implemented for tertiary students in one semester. As a global picture, EYL Course is delivered to provide the sixth-semester students with working knowledge of basic principles of teaching English to young learners, characteristics of young learners, and practical skills for teaching elementary and kindergarten students, selecting and using various learning materials and strategies including songs, games, stories, selecting as well as designing non-projected learning media including big books, flashcards, puppets, and other visuals, designing learning assessment, developing and applying lesson plans. To attend the course, the students should meet some prerequisite pedagogical subjects like Lesson Planning, Learning Materials, Teaching Methods & Media, and Assessment (English Department, 2020). Thus, the formulated research questions are as follows: 1) How was TPACK implemented in the teaching of the EYL course? 2) What are the students' views on the use of TPACK for the EYL in terms of Strengths, Weaknesses, Opportunities, and Threats (SWOT)? 3) What are the products of using TPACK in the EYL course?

METHODS

The design of this study is an exploratory sequential design. In this design, the qualitative data is followed by quantitative data collection (Cresswell, 2012). Cresswell (2012) also states that the design has two phases in collecting data. The first phase collects qualitative data (such as interviews and observations); the second is for the quantitative data (such as surveys) of randomly selected participants. As part of this study, the participants involved were 21 students (of Class C) taking EYL courses in the 2020-2021 academic year. First, the researchers collected the qualitative data from classroom observations, video watching, and interviews through WhatsApp chats. Then, a survey was conducted through a close-ended questionnaire in 1-5 Likert scale form virtually distributed to the students for the quantitative data collection and documentation of mid and final-term assessment.

To answer Question 1, the researchers employed observations, video watching, and interviews through WhatsApp chats to collect the data about the implementation of TPACK in the EYL course, in which the observation-and-interview-based data were recorded in Zoom and Google Meeting Recordings. The type of observation used was participant observation in that the researchers immersed themselves during the entire semester's learning process. Afterward, all the data from the observation and interview were coded based on their theme and were analyzed qualitatively. The data were analyzed in a SWOT analysis (Strengths, weaknesses, opportunities, and threats), plus suggestions for future improvement of EYL class. Thus, there were five themes of the qualitative data, namely the strengths (coded 'Str'), the weaknesses (coded 'Wkn'), the opportunities (coded 'Opp'), the threats (coded 'Thr'), suggestions (coded 'Sug'), and video watching was coded "Vid."

For Question 2, the instruments used were a questionnaire and documentation of the students' grade

and products. The questionnaire had nine questions incorporating data about the students' name and ID, offering, the individual and team project, the students' perception of the class, and five questions in Likert Scale mode. The Likert Scale questions were about the students' opinion about the online class (items 1 and 2), the EYL practice in online/offline mode (item 3), the possibility of using online classes after the pandemic (item 4), and EYL classroom practices with real students (5). Of the 21 students joining the English for Young Learners class, only ten were willing to complete the questionnaire. The data from the questionnaire was then analyzed quantitatively in the form of a percentage, calculated in Excel, and presented in the form of charts/diagrams. The data from documentation of the students' grades and products were analyzed qualitatively. For Question 3, the researchers employed observation, documentation, and interviews about the products that resulted from the use of TPACK in the EYL course.

RESULT AND DISCUSSION

During the pandemic, most courses were done virtually or online. Therefore, using digital technology to reach the teaching and learning objectives was inevitable. Implementing TPACK in the EYL course started at the beginning of the semester. The learning media used for the EYL course were reflected in the course profile and the teaching and learning process observation. The EYL courses used the Zoom Meeting application, Google meeting application, Google Classroom, YouTube, WhatsApp application, and others that helped learners reach the learning outcomes, such as Kine Master for video editing, Video application on smartphones, and interactive PowerPoint presentation.

The teaching and learning process mostly used Zoom Meetings, and for a small part of the session, the class also used Google Meetings. Most of the teaching and learning processes in the EYL course follow the standard three phases of teaching: pre-activity, main-activity, and post-activity. What made the teaching and learning process different was the use of flip-learning. In the pre-activity, the EYL lecturer began the class with greetings and directly jumped to the questions and answer session about the previous and today's topics. The question-and-answer session objective was to relate the previous knowledge and the new knowledge the students were about to learn.

The main activity encouraged the students to ask questions about the material that day based on the listed readings. If none of the students asked questions, the lecturer took most of the session, asking the students about the material, assuming the students had read the material before the class began. Most of the main activities employed the question-and-answer technique. If the students failed to give the correct answer, the lecturer would give clues and some explanation directing the students to get the correct answer. The examples of the questions and directions are depicted in Quote 1.

Quote 1
"*Open the chapter in Pinter's book about Bloom's theory. What does it say about teaching English to Young learners? Anybody can answer?" (*Data1/Lec/T&L)
"*What is the difference between the 4th, 5th, and 6th syllabus seen from the Bloom's theory"* (Data 2/Lec/T&L)

If the students successfully answered the lecturer's question, the lecturer gave positive oral feedback, like a *very good, good, good job, one hundred for you.* Sometimes the main activities were also about the students' presentation of the assigned chapters. The lecturer encouraged other group members to ask questions to the presenters and directed the presenters to find the correct answer. The presentations were about the development of media for EYL. The presentation was equipped with video making of the media and how to use it for classroom teaching. For the latter, the students presented it in the peer teaching mode making their friends as the EYL students. The lecturer asked one or two students to summarize the meeting in the post-activity. The summary was also in the form of a written report of the material delivered that day. The summary should be submitted in Google Classroom.

The students had to choose one option from the five-point scale questionnaire. The choices were Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). The researchers combine the Strongly Agree (henceforth SA) and Agree (Henceforth A) as positive opinions, while Disagree (Henceforth D) and Strongly Disagree (Henceforth SD) as negative opinions. However, depending on the question in the questionnaire, the positive and negative opinions were the opposite for the reverse coding. The data from the questionnaire showed that many students felt positive about the teaching and learning process. They felt that they gained knowledge and skills during the learning process of the EYL course even though it was done online because of the pandemic of COVID 19 as depicted in Figure 1.
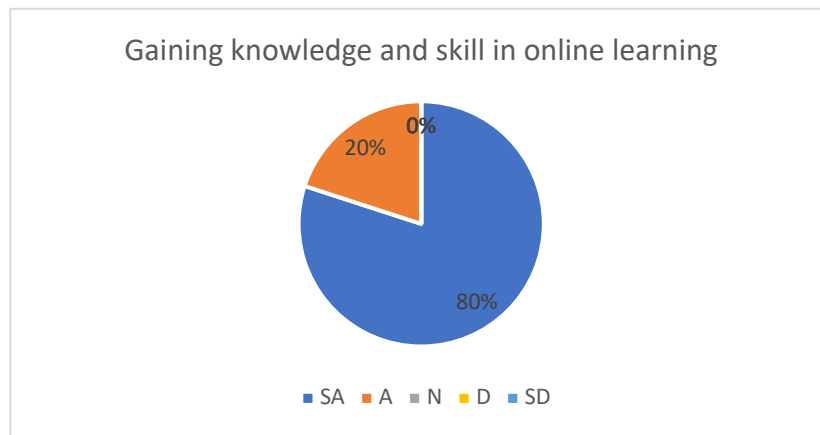
Figure 1. Learning EYL in online mode

The data in Figure 1 shows that all the students agreed (100%, SA 80%, and A 20% respectively) that they acquired the knowledge and had the skill of practicing the theory to EYL students even though the course was conducted in the online setting. The result supports by Nehe (2021) study, which shows that the students positively respond to video conferencing applications for online meetings during the pandemic. However, when asked whether offline meeting was not necessary for EYL theory learning, many had different opinions, as shown in Figure 2.
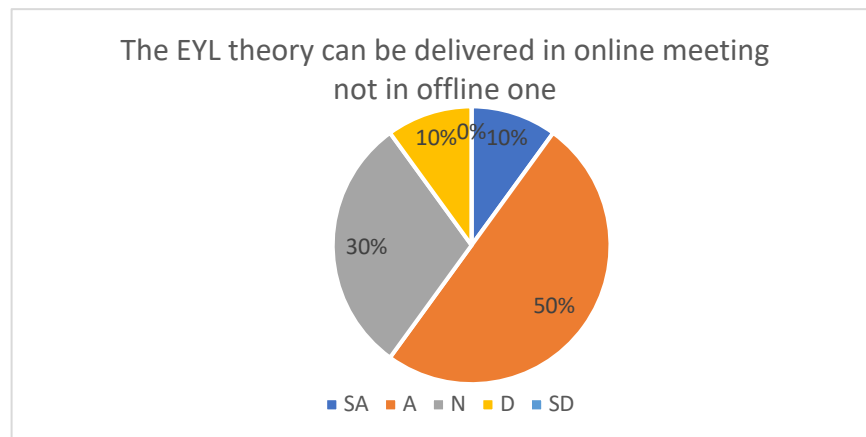

Figure 2. Learning EYL theory in online mode

Based on the data in Figure 2, even though more than half of the students (SA 10% and A 50% respectively) felt that offline meeting was not necessary for learning EYL theory, some of them were undecided (N 30%) and the rest disagreed about the idea (D 10%). This implies that the students preferred the online meeting to learn the theoretical foundation of teaching young learners. On the other hand, the students preferred the offline mode for the practice.
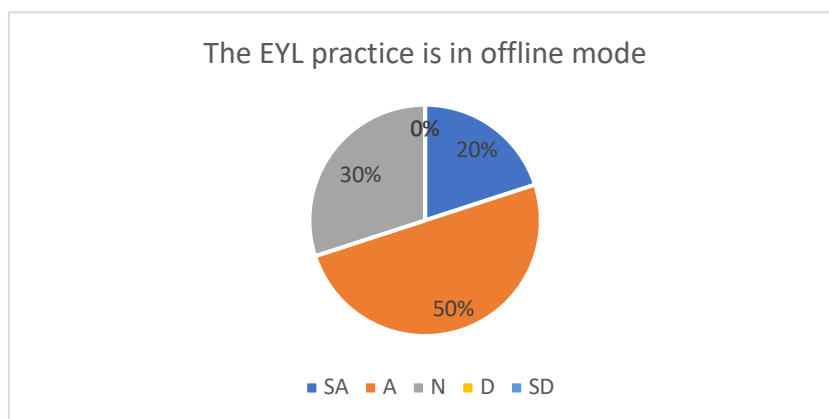

Figure 3. EYL practice in offline mode

The data shows that almost two-thirds of the students (SA 20% + A 50%) agree that the practice of EYL is better done offline. The rest of the students felt undecided, and none disagreed. They also said they needed more practice with real students to practice the theory.
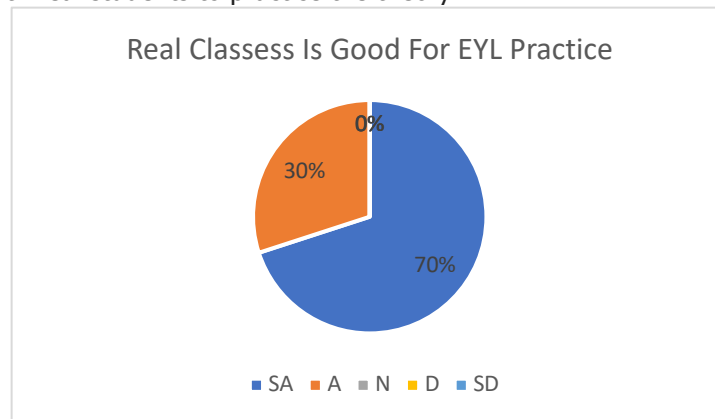

Figure 4. Offline practice with EYL students

The data shows that all students (SA 70% + A 30%) agreed that offline practicing EYL theory with real students (not peer teaching) was the best way to implement the knowledge. However, when the students were asked whether the online meeting was still compatible with the endemic situation, many felt undecided.
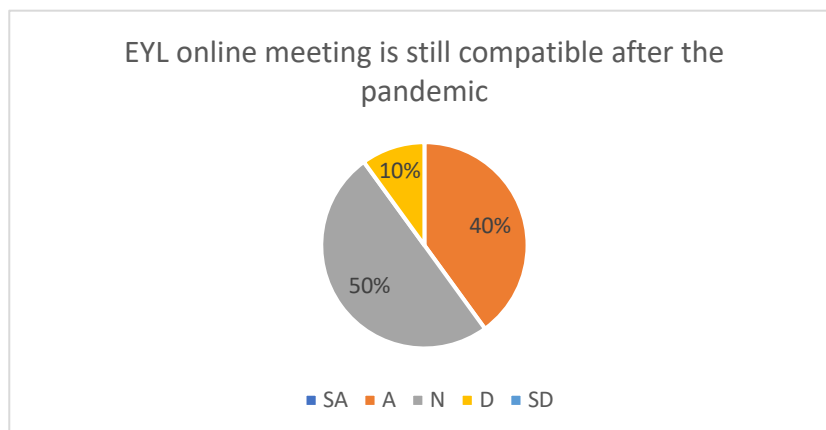

Figure 5. Online meetings after the pandemic

The data in Figure 5 shows that half of the students felt unsure (N 50%) about the idea. Interestingly some of them (A 40%) agreed that online meeting was still possible for content courses like EYL. The result of the study implies that the use of online meetings for the learning process probably still occurs even after the pandemic. The data shows various strengths that the students feel when using technology for the learning process during the pandemic of COVID 19. The strengths of using the technology are practical, efficient, flexible, easy, and enabling the students to have technology literacy for teaching EYL, as shown in Quote 2.

Quote 2
"The learning process becomes more efficient. We can record material so that it can be repeated and studied" (Str/EK).
"It is practical to use during online class, and it is easier for us as students to submit or communicate with others." (Str/KR)
"Both teacher and students can access the class anywhere. In addition to that, the meeting (especially in zoom) can be recorded, which can be distributed to students who did not attend the class." (Str/ GI)
"The obvious one is how easy to access those platforms as long as we have a good internet connection. The other thing is that we can still do the online, face-to-face interaction (Str/AdeF)
"The teacher and students can discuss in real-time without having to meet directly" (Str/AN)

Some students felt that learning was more efficient and flexible online. The result of this study supported the previous research by Setyowati et al. (2021), disclosing that the students felt positive about online learning

despite feeling discouraged initially. By and by, students, especially those in higher education, enjoyed online learning and got accustomed to it. Moreover, during the COVID-19 pandemic, online learning is the only option to minimize the outbreak because it is safer for everyone (Inawati & Setyowati, 2020). Besides the positive aspects, there exist some weaknesses.

The data also reveals that the weaknesses of online classes for EYL classes are to meet and have a proper discussion with their peer to finish the group project. Secondly, it lies in the limitation to finishing the group project with equal responsibility, as described in Quote 3.

Quote 3
"It is hard to do group projects (making media) since we live in different areas, and I feel a bit disappointed since we cannot practice with the real EYL classes in schools and only learn the theory and some cases or conditions" (Wkn/KR)
"When we had a group project that should be done together, especially in making media, I had difficulty sharing the work since we could not meet physically." (Wkn/NR)
"We cannot do an offline project together" (Wkn/AdeF)

Online learning has given limitations to face-to-face interaction. Group projects expose the students to real-world experiences and allow them to put what they have studied into practice, but they also teach them creativity and group dynamics (Ekblaw, 2016). Thus, it is understandable if they could not share equal responsibility to develop learning media for EYL. However, it does not mean that group projects cannot be handled. To anticipate the difficulties, the students can appoint a group leader to lead the discussion and distribute group members' job descriptions equally. Raymundo (2020) stated that group project is indeed feasible in online education. The group can also use file-sharing applications and maximize the use of Google apps for task completion (Ekblaw, 2016). About some positive and negative viewpoints, there are opportunities to cater.

The qualitative data shows that the use of technology has given benefits for digital literacy for future teaching. The students admitted that the online experience in the EYL course has increased their knowledge and skills in using technology for learning, as evidenced in Quote 4.

Quote 4
"It (the technology) helps us as future teachers to be more familiar with ICT since technology is still needed in offline classes. To become familiar with it will be a lot helpful" (Opp/BD)
"We have an increased knowledge in the use of applications that can support online learning" (Opp/EK)

The result of this study shows that the use of TPACK for teaching EYL class gave a positive experience for the students. As stated by Septiyanti et al. (2020), the students gained TPACK by watching lecturers teach in the classroom and self-learning using the internet. Additionally, research by Septiyani et al. (2020) yields that those lecturers perform five roles in supporting students in acquiring TPACK in learning: as a source, an example, a supervisor, a facilitator, and a motivator to use technology. Furthermore, using TPACK for the teaching and learning process is beneficial for learning preparations (Cahyono et al., 2016). As stated by Aisyah et al. (2021), when TPACK is applied in the classroom, it can enhance the students' digital literacy. It is in line with Rahmadi's (2019) opinion which states that teachers in the 21st century must possess adequate knowledge and skills to use a variety of technology to benefit classroom teaching. He further states that in this digital era, knowing the subject and teaching skills is insufficient for teachers. Therefore, he suggests that teachers should equip themselves with practical skills to apply technology for teaching. Henceforth, there are always two sides to everything: opportunities and threats.

Nevertheless, the use of technology for content courses is not free from the threats that might follow. The data shows that the threats are unstable connection, internet package, and internet access, as verified in Quote 5.

Quote 5
"Connection can be alarming sometimes. It makes us harder to focus during class or even students will not be able to access the class." (Wkn/GI)
"My biggest problem is the problem in the Internet connection. Sometimes there is an error in the connection, and it makes me cannot join the class or listen to the class properly." (Wkn/AI)
"It spends so much internet package, and sometimes I found that the signal is unstable." (Wkn/NF)
"It is quite hard to understand the EYL materials fully, although lecturers have always tried their bests to deliver the materials." (Wkn/BD)
"It is difficult to follow the lesson if the quota is not enough and signal are not qualified" (Wkn/EK)

Thus, Indonesian teachers should integrate ICT into teaching and learning (Kementerian Pendidikan Nasional, 2007a; Kementerian Pendidikan Nasional, 2007b; Kementerian Pendidikan Nasional, 2009). To facilitate ICT integration, the Ministry of National Education has emphasized the supply of ICT infrastructure in schools, such as computers, internet access, and online learning content (Kementerian Pendidikan Nasional, 2010). However, the use of technology is not without challenges. The problems that the students encounter when using online learning are unstable network connection (Suhaimah & Setyowati, 2021; Setyowati et al., 2021), internet quota (Inawati & Setyowati, 2020), and some issues in material comprehension (Setyowati et al., 2021). The study data shows that the problems faced by the students are common challenges found in online learning in an Indonesian setting. Ultimately, the respondents recommend the following.

The students gave various suggestions to improve the quality of the teaching and learning process in the EYL course during the pandemic. Among them was to give more chances to practice the theory with actual EYL classes, as depicted in Quote 5.

Quote 5
"I think it had better do the project both in online and offline classes" (Sug/Ar)
"I hope there is more time to do teaching practices with the actual EYL classes in schools and explore more about different characteristics of EYL and their learning environment so we can study more about how to develop learning activities to improve their skills more or giving any suggestion/solution if there are any problems/conditions. (Sug/KR))
"(We need) more practice in a real situation (Sug/EK)
"Maybe the classes can be recorded so that we can study by rewatching the videos anytime we want" (Sug/EK)
"I think we need to more practices with real EYL classes in schools" (Sug/NR)
"I think increasing the amount of teaching practice can be one of the good suggestions to improve EYL classes (Sug/AdeF)
"I think it is better to do the practice directly in elementary school or kindergarten to sharpen the skills of EYL teaching" (NR)

It is undeniable that teaching EYL is different from teaching adult learners. The characteristics of young learners make teachers must find strategies appropriate to their age and learning style. Thus, giving the preservice teachers fundamental practices in teaching EYL is essential. As stated by Genc (2016), teacher candidates must have the opportunity to gain experience in real classrooms. Despite its flexibility and efficiency, it made the students unable to practice their knowledge of EYL to real students in a real classroom. Preservice teachers are expected to build a teaching philosophy by applying what they have learned in class, primarily theoretical, to real-world teaching situations with real students and conditions (Genc, 2016). This will allow them to face and solve problems, manage class appropriately, give and receive feedback, manage time wisely, and apply suitable teaching strategies. The students' final grade was obtained from the quiz, the presentation, the group projects, the attendance, the assignments, and the individual project. The final examination was not given to the students because the course's grades came mainly from the group and the individual projects.
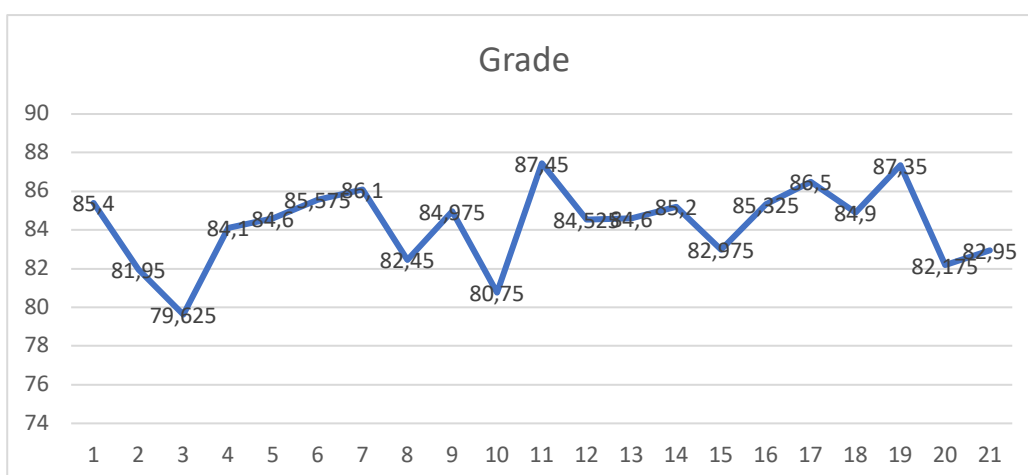

Figure 6. The students' Grade

Figure 7 shows that the students' grades are mostly >80. If the scores are calculated in percentage, 62% of the students got a final grade of more than 84 (A), and 38 % got 79-83, equal to A-. It can be concluded that the final grade is satisfactory. The EYL course had two projects: the group project and the individual project. The group projects were the presentation of learning media for EYL and the video making of the media. Because of the pandemic, many students went back to their hometowns. Thus, they discussed the project with the help of the Zoom/Google Meet application. The task was distributed among the member of the group. One person was in charge of the development of the media, while other group members worked on the ideas, fund, report, and presentation. For the individual project, the students had to implement the lesson plan with the selected media to real primary school students in a limited number. The students could develop different media from the one they have made in the group project. In reality, many chose the latter because they could not meet in person to borrow and use the same media. They had two weeks to finish the individual project. Based on the report and the documentation of the video recording of the project, many students used the elementary school level students to practice the EYL theory. Sample media are displayed in Figure 7.

Figure 7. The students' Projects

Group projects were making learning media for teaching young learners. The students were divided into groups and developed the media: the pop-up book, flannel board, word cards, and flip cards. Three media developed by the students in the group project have the certificate of intellectual rights granted by the government (flannel board, word cards, and flip cards). The projects resulted in the grant of a certificate of Intellectual Property Rights for some media developed by the students. The intellectual rights are for the flannel board for fruits, the flip card for fruits, and the big book for fruits, as seen in Figure 8.

Figure 8. Certificates of Intellectual Property Rights

The procedure for proposing Intellectual Property Rights is as follows. Firstly, the students made groups to develop media according to a predetermined topic. After that, the lecturer evaluated the students' products and gave feedback. Based on the feedback, the students revised it, then practiced it for classroom peer teaching. The media used in peer teaching was then applied to teach English to children in the student's home environment for their final project. In the end, the lecturer proposed that the students' media obtain the certificates of Intellectual Property Rights (henceforth HKI). The HKI proposals were made through the university HKI Center. The Indonesian Ministry of Law and Human Rights approved the certificates. Figure 7 demonstrates the certificates of intellectual rights published by the Indonesian Ministry of Law and Human Rights and are devoted to all the group members who developed these media. These certificates of intellectual rights will benefit their future career as a token of appreciation. Referring to the results of the findings, seemingly, the virtual learning process of the EYL Course as a content subject being conducted via TPACK at the tertiary level

of education can be efficiently and effectively conducted during the pandemic even though some students occasionally were confronted by technical constraints. This is in line with what Bao (2020) argued, that most university students have a positive attitude and satisfaction with online learning delivery, applying appropriate integration of technological tools to ensure continuous success in delivering learning content during this COVID-19 pandemic. At the tertiary level of education, academically and technologically speaking, the students might be considered more mature and independent compared to those attending primary and secondary school, which require more teachers' guidance. As evidence, primary EFL teachers encountered pedagogical problems in using ICT to teach their students, for they lack insights into what effective practice-oriented pedagogical strategies are needed to facilitate teachers to enhance their ICT-related skills. In other words, the intensive application of technology in virtual classes during the pandemic may scaffold the learning process or create pedagogical problems for teachers since they are not technologically well-prepared (Friedhoff, 2008; Van Nguyen et al., 2022).

CONCLUSION

Based on the empirical evidence, it can be concluded that the online learning process of the EYL Course during the pandemic time is fairly satisfactory, as evidenced by the students' learning outcomes to practice teaching young learners in a limited scope to produce learning media for young learners, and to obtain the nationally acknowledged certificate of the intellectual right. After the pandemic, it is recommended to put the hybrid learning process into practice because the students, as prospective English teachers for young learners, need opportunities to teach English in real classes. From theoretical and practical viewpoints, teaching English to young learners differs from teaching adults. This study, however, has some limitations. First, the study only explores using TPACK for teaching EYL courses. The result of this study cannot be used as a generalization for other content courses. However, it might work under similar subjects' characteristics and teaching conditions. Thus, previous researchers are encouraged to explore using TPACK for other content course subjects and in different teaching conditions. Secondly, this study does not explore the cause-and-effect relationship on TPACK for teaching content courses. Therefore, future researchers are encouraged to investigate the effectiveness of TPACK for teaching content or skill courses. All this information can help teachers and lecturers have better insights and ideas on delivering subject materials effectively and efficiently in any teaching situation.

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