

## Students' Perspective on the Importance of EFL Teachers' TPACK (Technological Pedagogical Content Knowledge) and XK (Contextual Knowledge) for learning English during the Pandemic

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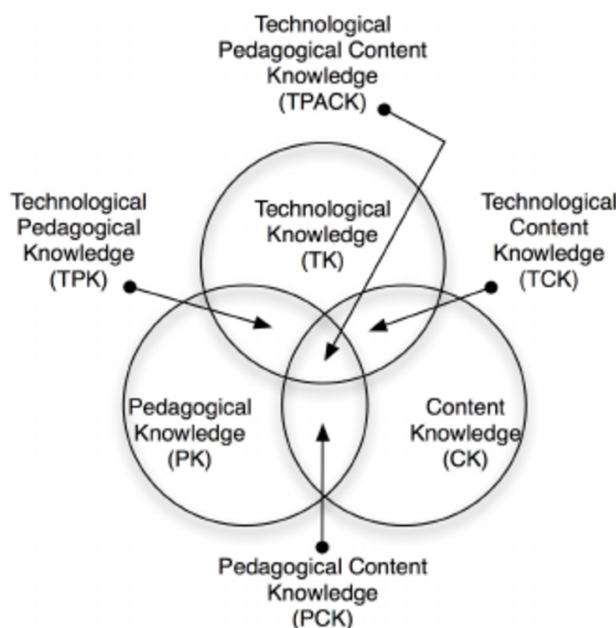
Article information	
<b>Abstract</b>	<p>To date, Technological Pedagogical Content Knowledge (TPACK) seems to be the most widely-used framework for informing teachers' interplay of technological, pedagogical, and content knowledge. Mishra (2019) formally included Contextual Knowledge (XK), which has subsequently been conceptualized by scholars as Knowledge of Teachers and Knowledge of Students. While numerous research has been devoted to teachers' TPACK competence, scant attention has been given to which of the seven known TPACK subdomains (TK, PK, CK, TPK, TCK, PCK, and TPACK) are more important for students when it comes to learning a particular subject. Besides, insight into the nature of XK, more specifically Knowledge of Students in online lessons during the pandemic, should be obtained from the students themselves. To this end, this explanatory sequential mixed-method study gathered data from 61 students from a reputable private university in Indonesia using questionnaires and interviews as data collection instruments. Descriptive statistics and the thematic analysis of the findings showed that CK (Content Knowledge) was regarded as the most important TPACK subdomain, and the components of XK seemed aligned with the principles of Pedagogy of Care, particularly the ways teachers gave attention to and built relationships with their students during the pandemic.</p>

<b>Keywords</b>	pandemic, pedagogy of care, students' perspective, TPACK, XK
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## Background

The onset of the COVID-19 pandemic, together with its consequent closure of schools and the enactment of Emergency Remote Learning, brought the need for teachers to successfully integrate technology into their classroom. While Information and Communication Technology (ICT) integration has been the thrust of education in this modern era all over the world (Al-Zahrani, 2015; Wang, 2021; Yusuf, 2005), the sudden switch to online learning mode left many teachers and institutions grappling with whatever technology and infrastructure they had on hand (Lie et al., 2020). At this point in time, approximately 20 months after the spring of 2020, scholars in the field of education had conducted numerous studies investigating teachers' experience, impact, as well as factual and perceived competence in teaching with technology during the pandemic (Kholik et al., 2020; Mourlam et al., 2021; Van der Spoel et al., 2020, Wen & Kim Hua, 2020). One of the essential parameters in measuring such competency is TPACK (Technological Pedagogical Content Knowledge).

TPACK (Koehler & Mishra, 2009; Mishra & Koehler, 2006) seems to be by far the most frequently used framework to assess the integration of technology into teaching. Teachers' knowledge thereof has become the point of assessment in pre-service teacher training and/or certification programs (Hill & Uribe-Florez, 2020; Joo et al., 2018; Kholik et al., 2020; Tseng et al., 2019). The TPACK framework comprises seven subdomains, which represent a segment of the Venn diagram showing the intersection of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK), as shown in Figure 1.

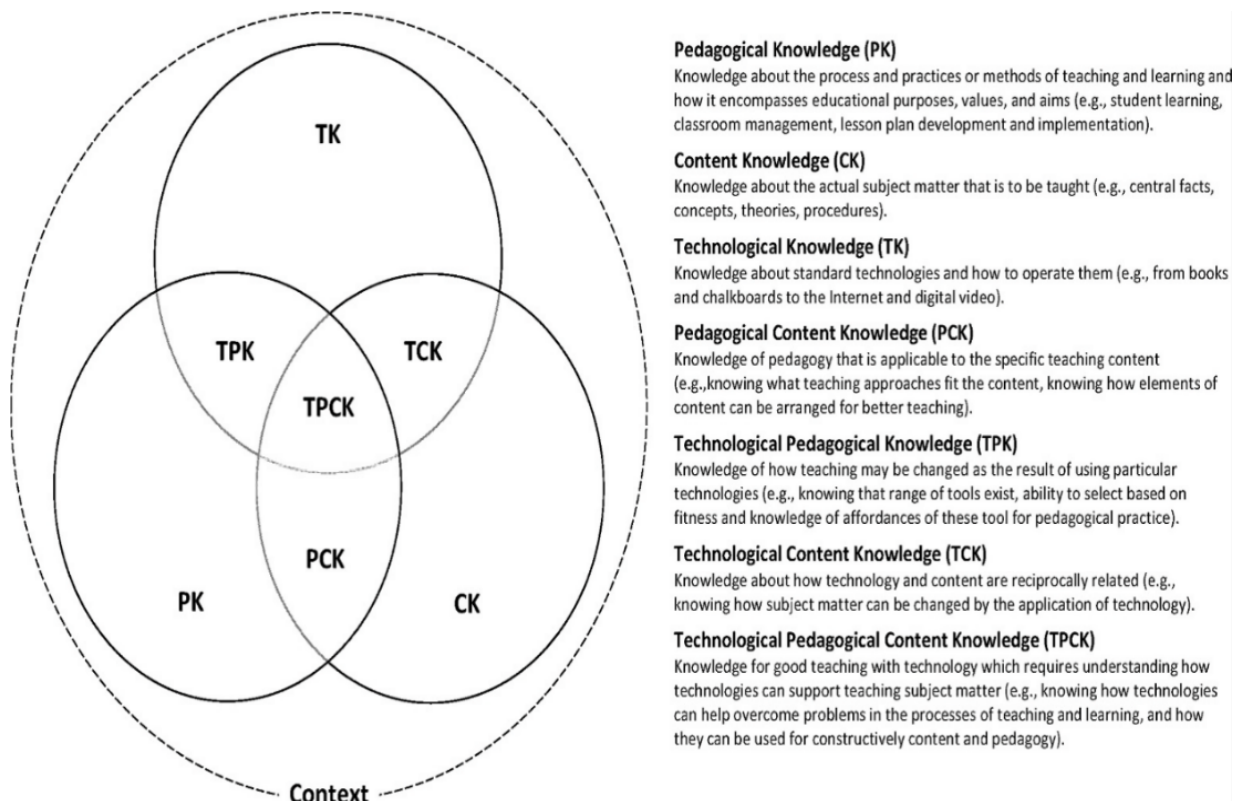
**Figure 1***The TPACK Framework*

Briefly put, the Content Knowledge (CK) subdomain refers to the mastery of the teachers' respective subject, such as history or mathematics. The Pedagogical Knowledge (PK) subdomain indicates knowledge of teaching and learning processes, methods, and approaches. Teachers' know-how on leveraging information technology fruitfully in their works and lives constitutes the Technological Knowledge (TK) subdomain. At the intersection of the PK and CK is the Pedagogical Content Knowledge (PCK) subdomain, which represents teachers' skills in delivering the subject matter through appropriate pedagogical approaches. The TK and CK combine to form the Technological Content Knowledge (TCK) subdomain which in turn signifies the fruitful orchestration of technology to represent content. The interplay of the TK and PK gives rise to the Technological Pedagogical Knowledge (TPK) subdomain, which is manifested in the influence of technology on teaching and learning design. Lastly, at the core of the framework, the Technological Pedagogical Content Knowledge (TPACK) subdomain is the successful integration of the previously-mentioned subdomains and is generally seen as the hallmark of effective technological implementation by teachers that goes beyond the "knowledge of all three concepts individually" (Koehler & Mishra, 2009, p. 66). A

graphical representation of the short definitions of each of the TPACK subdomains is given in Figure 2.

## Figure 2

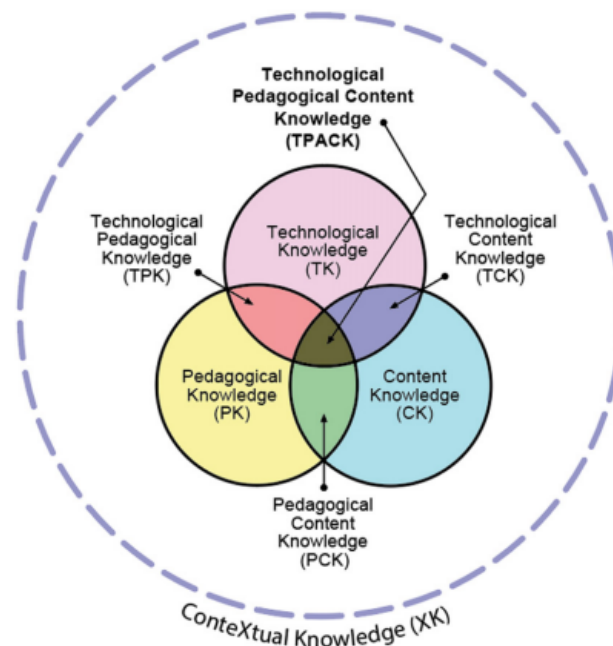
*The TPACK Framework and Definitions of Each Subdomain (Koehler & Mishra, 2009 in Schmid et al., 2020)*



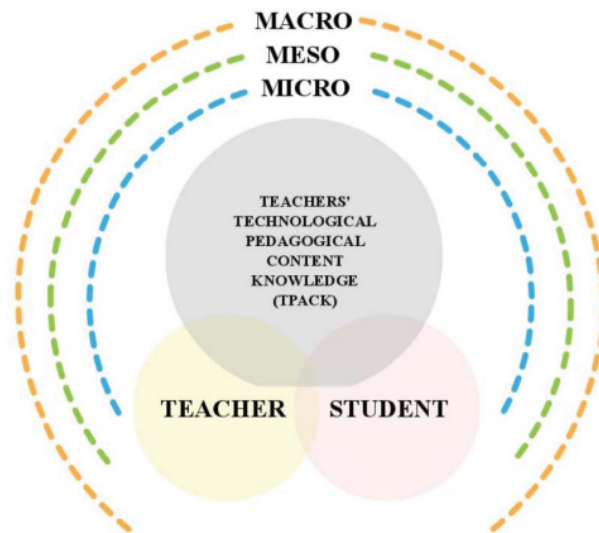
Ten years later, Mishra ‘upgraded’ (in his own word) the TPACK framework, by adding the over-arching, all-encompassing outer circle named Contextual Knowledge, or XK (Mishra, 2019). It is further explained as “everything from a teacher’s awareness of available technologies, to the teacher’s knowledge of the school, district, state, or national policies they operate within” (Mishra, 2019, p. 76). While context itself has been an important factor and was conceived at the very beginning of the creation of the TPACK framework (Rosenberg & Kohler, 2015), it is only in 2019 that the diagrammatic representation of TPACK was revised (Figure 3) and a name given to it.

### Figure 3

*The Revised TPACK Framework Incorporating Contextual Knowledge (XK)*



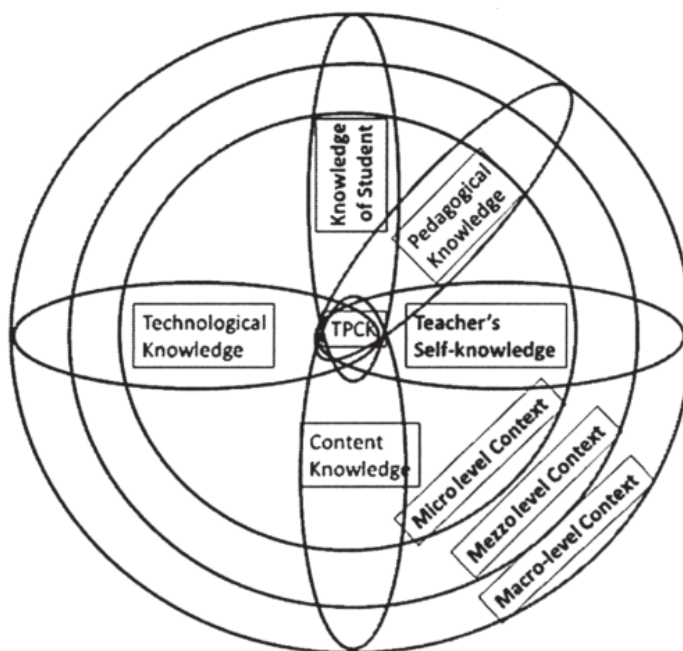
Long before Contextual Knowledge received its name, several studies had been conducted to further specify the nature of XK, with the work of Porras-Hernandez and Salinas-Amescua (2013) being perhaps the most influential (Rosenberg & Kohler, 2015). Porras-Hernandez and Salinas-Amescua (2013) divided XK into three levels (micro, meso, and macro) and two actors (teacher and student) (see Figure 4).

**Figure 4***The Conceptual Framework for Contextual Knowledge (XK) in TPACK*

In sum, the micro level refers to teachers' knowledge about the classroom and other learning environments, like classroom layout, design, and the available resources therein. The meso level is the teacher's knowledge of the school and its environment, namely the management, support staff, or even the presence of a community center near the school. Lastly, at the macro level, teachers should possess some knowledge of a broader context such as the government or ministerial policy regarding curriculum and ICT incorporation. The term 'student,' according to Porrás-Hernández and Salinas-Amescua (2013), means teachers' knowledge of both learners' external (living condition) and internal factors, such as their needs, attitudes, perceptions, and interest. By the same token, teachers should also know themselves (teacher as actor), specifically in terms of self-efficacy and belief in the use of technology (Porrás-Hernández & Salinas-Amescua, 2013). The resulting modified framework with the inclusion of student and teacher was put forward by Porrás-Hernández and Salinas-Amescua (2013) as shown in Figure 5.

## Figure 5

*Suggested TPACK Framework by Porras-Hernandez and Salinas-Amescua (2013)*



Past empirical research on Contextual Knowledge (XK) (Brianza et al., 2022) evidenced the growing importance of Knowledge of Students within the overall TPACK-XK paradigm. In the study of Lewthwaite et al. (2015), interview data with Australian lecturers revealed how the knowledge of students' cultural, linguistic, geographical, social, and political backgrounds determined the role (as learner, as facilitator, and as agent of change) that teachers would adopt, which in turn informed the lecturers' TPACK approach. For instance, knowledge of students' geographical location made the teachers aware of problems in Internet connectivity, which in turn led them to record synchronous lessons to be made available during asynchronous moments. Knowledge of students' family and other social obligations resulted in teachers' adjustment of assessment deadlines and flexibility in synchronous attendance (Lewthwaite et al., 2015). Harris and Hofer (2017), upon examining teachers from seven K-12 schools in the US, identified contextual factors (including students' differential learning needs) as decisive in determining teachers' appropriation and enactment of TPACK.

In the myriads of studies concerning TPACK, the focus of the studies so far appears to be, understandably, the teachers. Extensive research has been done with regard to assessing teachers' self-perception of their TPACK competence

(Castéra et al., 2020; Efwinda & Mannan, 2021; Roussinous & Jimoyiannis, 2019). In more recent times, specifically within the context of the COVID-19 pandemic, Mourlam et al. (2021) carried out a study to investigate the self-perception of TPACK competence before and during the pandemic on 167 teachers in the US. They reported that five subdomains showed a statistically-significant decrease, with the exception of TK and TCK. It was concluded that teachers' perception of their pedagogical knowledge was greatly influenced by the dynamic instructional context, which in this case was the Emergency Remote Learning (Mourlam et al., 2021). Yet another study was conducted by Wen and Kim Hua (2020), who investigated the effect of three factors, namely ICT competence, infrastructure and online resources, and working environment, on teachers' intention to use educational technologies. They recruited 153 Malaysian ESL teachers and utilized survey questionnaires as the data collection instrument, adopting the TPACK subscales developed by Schmidt et al. (2009) for the ICT competence variable. The teachers in this study rated themselves quite highly on ICT competence. However, the pandemic had underscored the necessity for accessibility of infrastructure and online resources, which in turn became the more dominant factor in teachers' intention to use technology as compared to ICT competence (Wen & Kim Hua, 2020).

On the other hand, research on students' perception of their teachers' TPACK has been, by and large, scarce. In recent times, two studies have stood out. Fathi and Yousefifard (2019) conducted a study with a survey design involving 148 Iranian EFL students to explore their perspectives on their teachers' TPACK. The questionnaire consisted of 35 questions adapted from Tseng (2016) on a 5-point Likert Scale. The result showed that the students perceived their teachers to be competent in the subdomains of TK, PK, CK, and PCK, and less so in those of TCK, TPK, and TPACK, suggesting that technological integration training was still needed in that college (Fathi & Yousefifard, 2019). Chuang et al. (2018) developed a Structural Equation Model to find the structure of students' perception of their English teachers' competence in an online learning environment through four variables: Subject Matter Knowledge (SMK), Knowledge of Students' Understanding (KSU), Technological Knowledge (TK), and TPACK. They administered a survey to 287 high-school students in Taiwan. The finding revealed that TK and KSU had a direct association with TPACK. This implied that students'



perception of their teachers' performance in online teaching was greatly influenced not only by the teachers' technological know-how but also by their ability to assess students' learning capabilities and needs (Chuang et al., 2018).

As for research concerning the contextual factor in TPACK, there is similarly a paucity of studies that take into account students' voices on the matter. In the systematic review of Brianza et al. (2022) on Contextual Knowledge (XK) within TPACK, the subjects or participants of the articles reviewed were, invariably, teachers or preservice teachers. Consequently, Knowledge of Students within XK remains an underexplored field; Rosenberg and Koehler (2015) concluded that research on XK in TPACK tends to focus on teachers and school or classroom, rather than on students and society.

Therefore, several questions remain, particularly in light of the recent pandemic, when many teachers and students were jumpstarted into technology in teaching and learning. What can students say about the importance of the teachers' TPACK in their learning? Is TPACK truly the pinnacle of knowledge that a teacher should have in terms of technological integration in teaching, or is XK more important, at least from the students' perspective? What type of XK, in particular Knowledge of Students, is perceived to be more important in online classes during the outbreak?

In terms of Knowledge of Students, the COVID-19 pandemic brought to light the principles that encompass the Pedagogy of Care (Noddings, 1988). Noddings (1988) propounds the ethic of care to be at the heart of the pedagogical approach, placing special emphasis on students' needs. Within the context of online teaching, Pedagogy of Care is conceived as the effort on the part of the teachers to put caring and building relationships at the forefront of remote learning (Dunn & Rice, 2019). This is generally translated into creating a sense of 'presence' in the online classroom through frequent prompt feedback, multiple contact opportunities, and positive, personal comments (Moorhouse & Tiet, 2021). With the Emergency Remote Learning caused by the pandemic, the need to provide care to the students is more acutely felt. Mehrotra (2021), reflecting on her own teaching experience during the pandemic, suggested various strategies inspired by the Pedagogy of Care, including sharing power (revealing feeling and concern), co-creating

meaning (discussing adjustment to course requirements with students), community care (students caring for each other), mindfulness, and creativity (sharing quotes and poetry). Moorhouse and Tiet (2021) attempted to foster online relationships with their students by using informal language to give feedback (with cheerful icons) and engaging them in group chats via an instant messaging service. They also made use of Avatar images to represent themselves in a light-hearted manner, told stories about themselves at the beginning of the lessons, and created a poll to ask how students were doing at home (Moorhouse & Tiet, 2021). Indeed, the effort exerted by the online teachers to get to know and reach out to their students might be the kind of 'Knowledge of Students' that students sorely needed in such a situation.

In sum, this study then attempted to provide answers to the following questions:

1. Among the seven TPACK domains, which is perceived to be most important for online learning during the pandemic by students?
2. What kind of Contextual Knowledge (XK), specifically Knowledge of Students, is perceived to be most important for online learning during the pandemic by students?
3. Between TPACK and XK, which do is perceived to be is more important for online learning during the pandemic by students?

## **Research Methodology**

### **Research Design**

This explanatory sequential mixed-method study employed survey questionnaires and interviews as data collection instruments. In this study, quantitative data were followed by qualitative explanations to provide further insight into the numerical input (Creswell & Clark, 2017).

### **Participants**

A total of 61 college students from a reputable private university in Surabaya, Indonesia, took part in this study. They hailed from various faculties and were at different stages in their studies, from sophomore to senior levels. The majority of participants were undergraduate students, and some were in graduate programs. Their participation was on a voluntary basis, and the participants

indicated their consent to participate in this research in the Google Forms provided.

In order to provide a homogenous teachers' Content Knowledge in which the students could think of the answers, the students were selected on the basis of their previous or current enrolment in an English course in the university, since English is a compulsory subject for all students. This is in accordance with the suggestion of Voogt et al. (2013) who has stated that TPACK needs to be discipline-specific in its measurement. However, in order to overcome language barriers as well as to cater to the different levels of the students' competence in English, all questionnaire items and interview questions were translated into the students' first language, *Bahasa Indonesia*, and the data collected from them were subsequently translated into English.

### **Research Instruments**

The instruments used in this study included a survey and a set of interview questions. The choice of instruments was informed by the research design, which in this case was the exploratory sequential mixed-method. This design necessitated the collection of quantitative data first, followed by qualitative data. Hence, the survey and follow-up interviews were viewed as the most apt. The survey was divided into three parts. In the first part (Part A), in line with Research Question 1 which pertained to students' perception of the teachers' TPACK, the 35 questions (five questions per domain) were adapted from Fathi and Yousefifard (2019). In the present study, the number of questions per domain was reduced so as to accommodate more questions for Contextual Knowledge, as well as to ensure its suitability for the context of the present study. For example, since the English syllabus taught across all faculties placed more emphasis on grammar and reading comprehension, questions pertaining to speaking or role-playing were deleted. Another example is that, in Fathi and Yousefifard's (2019) study, there were two questions under Technological Knowledge (TK) which first asked students whether their teachers were conversant with hardware, and another question asking about software. These two questions were combined in our study to ask the participants whether or not they saw their teachers to be comfortable with basic technology. The resulting questionnaire consisted of 19 close-ended questions, with an average of three questions per domain. During the

implementation, the questions were not neatly organized into the different TPACK domains, nor were they presented in an orderly manner from TK to TPACK, like in Fathi and Yousefifard (2019). Instead, the questions were jumbled so that students did not perceive the competencies as if they were in gradation, going from low (TK) to high (TPACK). The complete questions in English can be found in Appendix A.

For Research Question 2, Part B of the survey questionnaire was self-developed based on an unpublished work of one of the authors. In that work, conducted in mid-2021, the author gathered the nominations from students in this same university for the most technologically-savvy faculty member, with an open-ended answer option at the end for students to indicate the reason for the choice. From the answers, interesting themes emerged and were transformed in this study into statements indicating teachers' interpersonal acts, from which the participants were able to choose to be most important for them. One example of the questionnaire statement in this part was "My teacher dresses formally, even for online class," which was inspired by a student who nominated his teacher for this reason. Other parts of Part B of this questionnaire were adapted from the work of Moorhouse and Tiet (2021) on Pedagogy of Care, specifically during the COVID-19 pandemic. Examples of the statements in this part were "My teacher tries to know me personally" and "My teacher lets us know more about himself/herself." It was believed that these statements were reflections and outcomes of teachers' Knowledge of Students (cultural, linguistic, geographical, social, and political background), as detailed in Lewthwaite et al. (2015). The complete questionnaire in this part can also be found in Appendix A.

Lastly, in Part C, which was the third and last part of the questionnaire for Research Question 3, the students were asked simply to compare the teachers' competencies in Part A and Part B, and to provide their opinion of their relative importance for learning English. Thus, this part only contained one close-ended question, coupled with an open-ended question for the students to further explain their choice. Part C of the questionnaire is also included in Appendix A.

To gain in-depth insight into the quantitative data, short, written structured interviews or WSI (Whetzel et al., 2003) were conducted on selected participants who indicated their agreement to be interviewed. The interview questions were

inductive in nature and depended on the results of the quantitative data analysis. The main intent was to get open-ended responses to the close-ended question in the survey. The interview questions are in Appendix B.

### **Data Collection**

The survey questions were created in Google Forms and were first pilot-tested on six students (two male and four female students of the English Education Department). Based on the way they responded, the online form was modified to circumvent potential misunderstandings and to make the instruction more explicit.

The finalized questionnaire, also a Google Forms, was then distributed to WhatsApp groups belonging to one of the authors and her colleagues. Besides distributing the questionnaires to the classes taught by the authors, other faculty members were asked to share them with their students and colleagues.

While potentially there were hundreds of students in the university who had taken or were taking English lessons online, the time constraint for collecting the data resulted in only 61 responses to the Google Forms questionnaires being returned within the stipulated date. They were 20 male and 41 female students, belonging to various departments, namely English Education (n=35), Psychology (n=9), Pharmacy (n=6), Engineering (n=7), Education (n=2), Communication Science (n=1), and Management (n=1). Five participants were from the English Education Master study program, and the remaining were undergraduate students. What was common for all of them was that they had taken or were taking an English course conducted online during the pandemic.

After analyzing the quantitative data from the Google Forms, nine students were selected for the written interview. Apart from the fact that they indicated their consent to be interviewed, the selection of the students was also based on their responses to the questionnaire. Specifically, the trend of the questionnaire responses was observed for the highest and lowest mean values among the subdomains, and the nine were chosen depending on their answers to the

questions in those subdomains. The choice of interview participants also took into account their gender, age, and faculty. The interviews were conducted over WhatsApp using its chat function. This media was chosen so as to be able to gather as much information as possible in writing in a short time and to enable the participants to think through their answers calmly, without feeling intimidated or pressed for time, as could happen in a face-to-face interview.

### **Data Analysis**

The responses to the pilot test of the questionnaire were used to analyze the reliability or internal consistency and the validity of the questions. The qualitative responses of Part A were first quantified into numbers (Very Important – 6, Important – 5, Somewhat Important – 4, Not So Important – 3, Not Important – 2, and Not Important at All – 1) and put in Microsoft Excel. Cronbach's alpha was then computed to find the reliability value. This turned out to be 0.975, which was deemed optimal. IBM SPSS 23 was used to compute the validity of the questionnaire through repeated-measures ANOVA. The results indicated that all questions were valid, showing correlations that are significant at 0.01 level (2-tailed).

Next, the responses from the participants in Part A were likewise quantified and tabulated in Microsoft Excel. For the purpose of answering Research Question 1, descriptive statistics were calculated to show which among the seven subdomains obtained the highest mean among the participants.

As for Part B of the questionnaire, the quantitative data were simply organized to show the number of students choosing a particular trait and ordered from the highest number of votes of the choice to the lowest. In the same way, the data obtained in Part C were tabulated showing the number and percentage of the students' choices.

The interview data, as well as the more qualitative input in parts B and C, were collated together and analyzed manually, in accordance with Miles et al.'s (2014) interactive, three-step qualitative data analysis, with coding and categorization included. The reliability of the written structured interview (WSI) lied in the uniformity of the administration (the same questions given through

WhatsApp chats) and the absence of interviewee bias (Whetzel et al., 2003). The validity of the interview transcripts rested on the fact that they were written by the interviewees themselves.

## Findings

### Students' Perspectives of the Most Important TPACK Domains for Online Learning during the Pandemic

As shown in Table 1 below, the mean scores signified that the participants opined that all the TPACK subdomains were “important” and “very important” for them in learning English online during the pandemic.

**Table 1**

*The Students' Perspectives of the Most Important TPACK Domains for Online Learning during the Pandemic*

TPACK Subdomains	N	Mean	Median	SD	Skewness	Kurtosis
Technological Knowledge (TK)	61	5.172	5	0.769	-0.920	0.613
Pedagogical Knowledge (PK)	61	5.152	5.25	0.732	-1.709	4.093
Content Knowledge (CK)	61	<b>5.377</b>	5.5	0.711	-1.922	4.979
Technological-Pedagogical Knowledge (TPK)	61	<b>4.918</b>	5	0.788	-0.330	-0.181
Technological-Content Knowledge (TCK)	61	4.975	5	0.910	-0.799	0.079
Pedagogical-Content Knowledge (PCK)	61	4.984	5	0.768	-1.280	3.249
Technological-Pedagogical-Content	61	5.126	5	0.765	-1.498	4.015

Knowledge (TPACK)							
TOTAL TPACK	61	5.091	5.05	0.654	-1.310	3.025	

Table 1 also shows that the subdomain that deemed to be the most important was Content Knowledge (CK), followed by Technological Knowledge (TK) and Pedagogical Knowledge (PK), respectively. The subdomain with the lowest mean was Technological-Pedagogical Knowledge (TPK). The TPACK domain was found in the middle, in the fourth position. The highest and the lowest means are highlighted in Table 2 in bold.

It can then be surmised that, while all of the TPACK subdomains were regarded as at least “important” by the students during the pandemic online learning, the category that they deemed most important was related to their perceived knowledge of the teachers’ English and their use of English in class. The second most important for them was related to the teachers’ general usage of technology (or gadgets) and technical problem-solving capability. Coming third in importance was the teachers’ general pedagogical skills, such as classroom management and teaching approach. It is worth noting that the TPACK subdomain, which is scholarly known to be the skill representing effective integration of technology in the delivery of the subject, was only rated in the fourth place.

Next, in order to discover the reason behind such choices of the participants, the written structured interviews were conducted to elucidate the more salient outcome of the survey result, which in this case was the highest mean score of CK and the lowest mean score of TPK. The participants who indicated either ‘Very Important’ or ‘Important’ to questions related to Content Knowledge (CK), and ‘Somewhat Important’ or ‘Not So Important’ (no one answered ‘Not Important At All’ nor ‘Not Important’) to the questionnaire statements related to Technological-Pedagogical Knowledge (TPK) were selected. The first interview question was phrased as “Why did you choose ‘Very Important’ or ‘Important’ to statements no. 1 and 15?” To recap, the statements related to CK were as follows:

1. My teacher conducts the class in English.
15. My teacher has sufficient knowledge of English.



Three main themes emerged from the transcript analysis. Firstly, it seemed that the teacher's Content Knowledge was perceived to be the most fundamental, as well as the most important of all. This could be seen, for example, in Peter's comment: *"For me, the most important thing in teaching [English] is knowledge [of English]."* Secondly, Content Knowledge was also seen to be necessary for the students to learn English, through being immersed in the environment, doing the exercises, and applying it in their lives. For instance, Charles mentioned, *"For me, the main key to learning English lies in understanding and repetition or exercises. I think that the [teacher's] skills and use of English in class are the 'main learning menu' in an English class."* Lastly, knowing the content was perceived to be the prerequisite to be able to teach well. Elaine's comment was illustrative of this point when she said that *"I think those [statements] are very important because teachers who have sufficient knowledge [of English] surely can deliver the materials well and clearly."*

Next, the interviewees were asked for the reasons behind their responses to statements in the questionnaire which were related to Technological-Pedagogical Knowledge (TPK). The statements in this domain were the following:

5. My teacher can use technologies to explain clearly.
16. My teacher can use technologies to motivate me to learn.
18. My teacher can use technologies to interact more with us.

Similarly, the second interview question asked the following: "Why did you choose 'Somewhat Important' or 'Not-So-Important' to statements no. 5, 16, and 18?"

From the analysis of the students' written responses, the salient points could be summarized as follows: (1) technological skill was not the most important when it came to teaching English, especially for older teachers; (2) basic technological know-how was sufficient; and (3) the first two points were valid as long as the teacher had good content and pedagogical skill, possessed an attitude of openness to receive technological help when needed, as well as employed other means to connect to and to motivate the students. Two representative quotes from the interviewees are given below:

Yes, it's important to be able to use technology these days, but for me, it's enough just to know how to operate it. The students can also help if there are [technological] problems. In terms of motivation, it can be given in other ways such as in words, or simply by playing videos. No need for advanced technology. (Claire)

If the teacher cannot operate technology well, it doesn't matter to me, especially teachers who are older. An example is Mrs. S, [an English teacher who is above 60 years old] who is teaching me English grammar now. Although she is not so skillful in using technology, she can teach well in class. This might be because her knowledge of grammar is more than enough, so she can teach even without the help of sophisticated technology. (Peter)

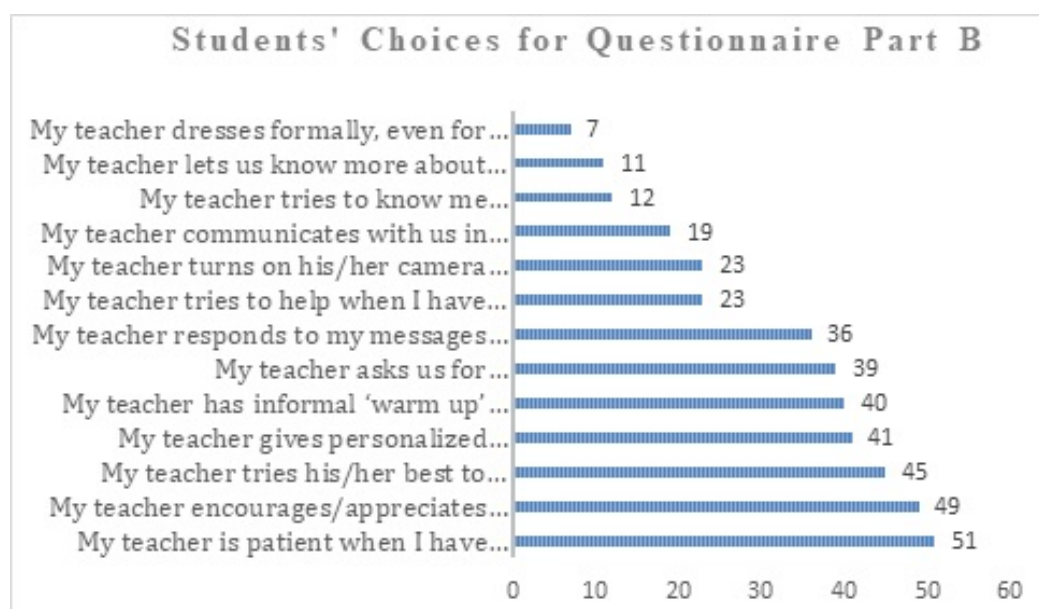
### **Students' Perspectives of Important Contextual Knowledge for Online Learning during the Pandemic**

To answer this question, the participants were asked to indicate their choice among the 13 teachers' interpersonal acts that were perceived to be important in learning English online during the pandemic. The participants could select more than one option. There was an open-ended question to ask the participants to add any other acts that were not mentioned in the preceding options. This entire part is denominated as Part B of the questionnaire. The inter-personal acts were then interpolated to constitute the efforts on the part of the teacher to understand the students' backgrounds and needs within the paradigm of Contextual Knowledge (of Students).

The question posed to the students was "Besides skills/knowledge/ability of the teacher as mentioned in Part A above, are there other things that you think important or very important when learning English online?" The results are shown in Figure 6 below.

**Figure 6**

*Results of the Participants' Choice of Important Teachers' Contextual Knowledge during Online Learning*



The results showed that the top five items that received the highest vote were “My teacher is patient when I have technical difficulties,” followed by “My teachers encourages/appreciates my responses/works” and “My teacher tries his/her best to adapt to the online learning environment,” “My teacher gives personalized feedback,” and “My teacher has an informal ‘warm up’ session before beginning the class,” respectively.

With regard to the open-ended question, some answers were grouped under three broad categories created in accordance with Miles et al.’s (2014) qualitative data analysis procedure as shown in Table 2.

**Table 2**

*Summary of the Students' Responses to the Open-Ended Question in Part B.*

<b>A Teacher’s knowledge of the students’ understanding of the materials:</b>	
1	My teacher knows who doesn’t understand and who doesn’t understand at all.
2	At the end of the lesson, my teacher always asks how deep our understanding of the material has been.

- 
- |   |   |
|---|---|
| 3 | My teacher not only focuses on the slower students but also on the faster ones. |
|---|---|
- 

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**B Teacher’s flexibility in the demands of the students:**

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- |   |   |
|---|---|
| 1 | My teacher doesn’t give too many assignments.               |
| 2 | My teacher can adjust the condition during online learning. |
- 

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**C Teacher’s kindness or effort to go out of his/her way:**

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- |   |   |
|---|---|
| 1 | My teacher always smiles and is friendly.   |
| 2 | My teacher records the lessons, so students who have technical difficulties could watch it at a later time. |
| 3 | My teacher translates what he/she has said into Bahasa Indonesia.   |
- 

Finally, the results from both the close-ended and open-ended questions were synthesized to form four propositions of the Knowledge of Students that a teacher should have, based on the number of votes, although some statements were grouped together.

1. Students might experience technical or learning difficulties in an online class and the teachers should adjust their teaching practice or demands accordingly.

2. Feedback, appreciation, and encouragement are important to the students.

3. A warm and friendly environment in class, as shown by the teachers’ attitude or informal sessions before class, also matters to the students.

4. The extent and depth of students’ mastery of the materials should be known to the teachers.

### **Students’ Perspectives of the Comparative Importance of TPACK and XK for Online Learning during the Pandemic**

Table 3 shows students’ perceptions of the importance of TPACK and XK for online learning during the pandemic.

**Table 3**

*Students' Perception of the Importance of TPACK and XK for Online Learning during the Pandemic*

<b>Options</b>	<b>No. of votes</b>	<b>Votes percentage</b>
TPACK is more important than XK when it comes to learning English online.	1	11%
TPACK and XK are equally important when it comes to learning English online.	52	85%
TPACK is less important than XK when it comes to learning English online	2	3%
<b>TOTAL</b>	<b>61</b>	<b>100%</b>

The majority of the students (85%) opined that TPACK and XK are equally important in English online learning during the pandemic. Some selected answers to the open-ended question in which they justified their selection are illustrated below:

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*It's important for the teacher to create a conducive online learning environment. To be honest, I get sleepy easily during class because I have to work, join online classes, and do many assignments.*

---

*In online lessons, it's not only the students who have to be understanding of teachers' technical difficulties; the reverse should also be true.*

---

*The academic capability of the teacher is equally important to the ability of the teacher to connect with his/her students, especially in online learning where it is difficult for us to interact directly.*

---

*Online learning is still beset with communication problems, so misunderstandings can arise. Therefore, both TPACK and XK are equally important to ensure that the messages or the materials are delivered correctly.*

---

The qualitative data revealed the main reasons why the participants believed that TPACK and XK were equally important: (1) a conducive learning atmosphere could be created, (2) two-way communication in the absence of

physical presence could still be smooth, and (3) students felt understood and appreciated.

## **Discussion**

### **The TPACK Domain was Perceived to be the Most Important for Online Learning during the Pandemic by the Students**

The study resulted indicated that the TPACK subdomain was not the most important when it came to learning English online. Instead, students perceived that the Content Knowledge (CK) subdomain was chief in importance, while Technological-Pedagogical Knowledge (TPK) was the least important. Interview data showed that the CK of the teacher was foundational and essential. On the other hand, TPK was seen as simply complementary and the basic knowledge of it was regarded as sufficient, beyond which the teachers could have recourse to the students' help when needed. This perhaps spells good news for English teachers, who might despair of their technological capability during the pandemic, to know that in the eyes of the students, it is enough to know that the teachers do their best in using technology. Indeed, several studies have documented English teachers' low self-perception of their TPACK skills (Köse, 2016; Nazari et al., 2019; Turgut, 2017). The majority of the participants in this study, English Education majors, might even see themselves as lacking in technological know-how, and this was reflected in their responses. Nonetheless, while it is certainly true that English teachers should continually develop themselves professionally in the use of technology (Drajati et al., 2018; Tai, 2015), the results of the present study demonstrated that their mastery of English was valued more by the students.

### **Contextual Knowledge (XK), Specifically Knowledge of Students, was Perceived to be Important for Online Learning during the Pandemic by Students**

Regarding what type of XK (Contextual Knowledge), specifically Knowledge of Students, was deemed important for the online English classes during the pandemic, the results showed that this knowledge pertained to (1) the possible technical difficulties of the students, (2) their emotional needs (to be responded to, understood, and appreciated), (3) creation of a warm and friendly learning environment, and (4) students' understanding of the course materials. As for the last point, this knowledge might be comparable to the Knowledge of Students'

Understanding (KSU) in the study undertaken by Chuang et al. (2018) in which the students similarly perceived that English teachers' KSU was valuable for them, and it directly influenced their evaluation of the teachers' TPACK.

Points 1 to 3 in the Knowledge of Students that were revealed in this study seemed to converge into the principles of Pedagogy of Care (Noddings, 1988), specifically in an online learning environment (Moorhouse & Tiet, 2021). In their study, Moorhouse and Tiet (2021) conducted warm-up activities at the beginning of each class, like getting students to ask what they wanted to know about their teachers. They also established a class group chat via an instant messaging platform, where students posted messages in a light-hearted manner, conveyed encouragement during difficult moments like when the school had to be closed down again and provided feedback to students' posts and questions. Their students responded well to those personal touches and became actively engaged in the group chat. The students also posted pictures of technical problems at home and obtained sympathetic responses from teachers and classmates (Moorhouse & Tiet, 2021). In the present study, choices such as "My teacher encourages/appreciates my responses/works" and "My teacher has an informal 'warm up' session before beginning the class" indicated some agreement with the results of Moorhouse and Tiet (2021). The students in this study also revealed that they needed their teachers to be understanding of their possible technical difficulties during online classes. All these seemed to be expressions of Pedagogy of Care that might be a part of the Contextual Knowledge (XK) that online English teachers should possess and practice.

### **Students' Perspectives of the Comparative Importance of TPACK and XK for Online Learning during the Pandemic**

This study also unveiled students' perspectives of the comparative importance of TPACK and XK. The majority of the participants in this study regarded TPACK competence to be as important as XK's. Hence, while TPACK is always diagrammatically represented to be the core knowledge of the overall TPACK-XK diagram (Mishra, 2019), the XK should not be seen as peripheral. Teachers' knowledge of technological integration should go hand in hand with the Knowledge of Students, especially during a pandemic situation. In Mishra's (2019)

own words, XK should indeed be the over-arching, all-encompassing knowledge that determines the choice and deployment of technology in the classroom. This has pedagogical implications on teachers' training and professional development in the sense that developing teachers' TPACK should be done in a holistic manner (Mourlam et al., 2021), taking into account the context in which the teachers are immersed, focusing on teacher's knowledge of themselves as the agent, as well as the knowledge of the learners (Porrás-Hernández & Salinas-Amescua, 2013).

### **Implications and Limitations of the Study**

While preliminary in nature, the findings of the present study carry several implications. Firstly, the students' choice of Content Knowledge (CK) as the topmost skill among the TPACK subdomains may remain relevant even as the education undertaking is gradually getting back on its feet post-pandemic. In the context of Indonesian EFL teachers, the exhortation of Renandya et al. (2018) for Indonesian EFL teachers to improve their English proficiency for a more effective lesson delivery cannot be over-emphasized. Indeed, teachers' content knowledge exerts the most powerful influence on students' achievement (Diamond et al., 2014). Curiously, there is a discrepancy between Indonesian EFL teachers' perception of their English skills and their English scores, with many failing to achieve the required standard (Lie et al., 2019). Thus, this study renews the call of Renandya et al. (2018) for a more contextualized English proficiency test and the concerted effort by teacher training institutions and English language teachers' associations to raise the standard of Indonesian teachers' English proficiency.

Secondly, students' voices regarding their teachers' actions that they appreciated most during the pandemic, as well as them placing equal importance on TPACK- and XK-related questions, underscored the importance of teachers' acquisition of Contextual Knowledge (XK) in tandem with TPACK skill. Karakaya Cirit and Canpolat (2019) classified pre-service teachers' knowledge of understanding students within the overall scheme of Contextual Knowledge to be rather inadequate. In particular, the teacher trainees in their studies were unable to adjust their teaching practice based on the students' sociocultural background and individual differences. Hence, the findings of the present study suggest that more research be done on Contextual Knowledge, so as to inform the pedagogy of teacher training institutions and professional development programs.



Lastly, it is believed that the findings related to the Pedagogy of Care will also remain pertinent in the future of post-pandemic education. While the form of care might be different from what the students in this study articulated, the tenet of having the students' interest at the core of the teaching practice should imbue all pedagogical approaches. Teachers have identified their role as, among others, creators of encouraging learning environments by making sure that students feel comfortable in class in order to promote their self-efficacy (Wijaya & Kuswandono, 2018). Going forward, Horse and Nakagawa (2020) proposed the virtue of generosity, expressed in the overflowing of communication and relation-building, to underpin the pedagogy of care as we emerge from the pandemic.

This study was not without its limitations. While English students may not place too much importance on their teachers' technological knowledge, the results might be different from students of other more scientifically-oriented subjects. Additionally, the relatively small number of participants made the quantitative results of this study not readily generalizable. The results on the type of Contextual Knowledge (XK), specifically the Knowledge of Students, were also still exploratory in nature. Further studies are then needed to discover and systematically construct all other parameters, specifically those pertaining to the Pedagogy of Care. Correlational studies can also be conducted to investigate, for example, the impact of XK on students' motivation or performance. With online or blended learning within the horizon of the field of education even in the post-pandemic era, TPACK and XK will not be out of style in the near future.

## **Conclusion**

The present study has examined the perspectives of university students on the importance of their teachers' TPACK (Technological Pedagogical Content Knowledge) and XK (Contextual Knowledge), in particular Knowledge of Students, for online learning during the pandemic. The findings revealed that, among the TPACK subdomains, the CK (Content Knowledge) was deemed to be the most important by the students, with TPK (Technological Pedagogical Knowledge) being the least important. The TPACK subdomain occupied the middle (4th) position among the seven. The interview results revealed that students regarded CK competence to be truly essential, while technological knowledge was seen as only complementary. As for the XK, the choices picked by the students and the

open-ended responses to the questionnaire seemed to point to the Knowledge of Students' Understanding (KSU) (Chuang et al., 2018), and the principles of Pedagogy of Care in online lessons (Moorhouse & Tiet, 2021). In sum, students wanted their English teachers to know how well they understood the lessons, and to be appreciative of their efforts, especially in moments of technical difficulties. Lastly, the majority of the participants assessed TPACK competence as equally important as XK during the pandemic, implying that XK should exert a significant influence on teachers' choice and deployment of technology in the classroom. This should not be overlooked in teachers' training and practice, especially post-pandemic, when blended or hybrid learning might still be put in place.

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## Appendix A

### Questionnaire Part A

When it comes to learning English online, how important for me is the following ability or knowledge of the teacher?

(Students answer the scale as: Not important at all – not important – not so important – somewhat important – important – very important)

#### A. Technological Knowledge (TK)

1. My teacher knows about basic technology (e.g., laptop, handphone, microphone, speaker, etc).

2. My teacher knows how to solve technical problems associated with technology (e.g. Internet connection problems, software malfunction, broken hardware, etc.).

#### B. Pedagogical Knowledge (PK)

3. My teacher can use a variety of teaching strategies (e.g. explanation, raising questions, and group work).

4. My teacher understands my learning difficulties.

5. My teacher knows how to manage his/her class (e.g. drawing up clear class rules, creating a friendly atmosphere in class, and developing a good relationship between students and the teacher).

6. My teacher adjusts the ways he/she teaches according to student performance and feedback.

#### C. Content Knowledge (CK)

7. My teacher has sufficient knowledge of English.

8. My teacher teaches the class in English.

#### D. Technological Pedagogical Knowledge (TPK)

9. My teacher can use technologies to motivate me to learn.

10. My teacher can use technologies to explain clearly.

11. My teacher can use technologies to interact more with us.

#### E. Technological Content Knowledge (TCK)

12. My teacher can use digitalized teaching materials with which I can learn English grammar better.

13. My teacher can use digitalized teaching materials with which I can comprehend an English text better.

#### F. Pedagogical Content Knowledge (PCK)



14. My teacher can conduct lectures in which I can understand English better.

15. My teacher can give exercises in which I can practice English more.

16. My teacher can conduct quizzes/games in which I can practice English more.

#### G. Technological Pedagogical Content Knowledge (TPACK)

17. My teacher represents content with appropriate strategies via the use of various technologies.

18. My teacher provides us with the opportunity to practice English with appropriate strategies via the use of various technologies.

19. My teacher can teach English online in an engaging way.

**Note:** In the actual questionnaire distributed to students, the questions were ordered at random and not grouped together under any particular TPACK subdomain.

#### **Questionnaire Part B.**

Besides the teachers' skills, knowledge, and ability above, which one(s) among the following do you consider important/very important when it comes to learning English online? (You may choose one or more than one answer.)

1. My teacher tries his/her best to adapt to the online learning environment.

2. My teacher dresses formally, even for online class.

3. My teacher tries to know me personally.

4. My teacher lets us know more about himself/herself.

5. My teacher has an informal 'warm up' session before beginning the class.

6. My teacher is patient when I have technical difficulties.

7. My teacher tries to help when I have technical difficulties.

8. My teacher responds to my messages outside of class hours.

9. My teacher communicates with us in instant messaging platform (WhatsApp Group) in an informal way.

10. My teacher gives personalized feedback.

11. My teacher asks us for feedback/ideas/concerns.

12. My teacher encourages/appreciates my responses/works.

13. My teacher turns on his/her camera when teaching.

14. Other: \_\_\_\_\_

**Questionnaire Part C.**

If you have to compare the skill/knowledge/ability of the English teacher in Part A, and his/her skill/action in Part B, what is your opinion?

- A. Those in Part A are more important for learning English than Part B.
- B. Those in Part A and part B are equally important for learning English
- C. Those in Part B are more important for learning English than Part A.

Please briefly describe the reason for your choice here:

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**Appendix B****Interview Questions**

(Note: the interview questions were only determined upon analyzing the questionnaire results)

1. “Why did you choose ‘Very Important’ or ‘Important’ to statement nos. 1 and 15?” The statements are given below for recall.

- 1. My teacher conducts the class in English.
- 15. My teacher has sufficient knowledge of English.

2. “Why did you choose ‘Somewhat Important’ or ‘Not-So-Important’ to statement nos. 5, 16, and 18?” The statements are given below for recall.

- 5. My teacher can use technologies to explain clearly.
- 16. My teacher can use technologies to motivate me to learn.
- 18. My teacher can use technologies to interact more with us.