

In-service EFL Teachers' Sociocultural-based TPACK Beliefs and Practices: Voice of Teachers and Students

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Abstract

Many aspects of English as a foreign or second language (EFL/ESL) teachers and students' technological pedagogical content knowledge (TPACK) have been extensively studied. However, it has been relatively sparse regarding TPACK research on in-service EFL teachers' online development programs reflected from the lens of a sociocultural approach. This mixed-methods design surveyed 125 in-service EFL teachers' (53 males and 72 females, 39-47 years) and 375 students (177 males and 198 females, 17-19.4 years) to rate their in-service teachers' beliefs sociocultural-based TPACK during their two semesters online professional development program. In-depth interviews with 25 teachers and 50 students were then conducted to draw their in-service teachers' practices of sociocultural-based TPACK during online teaching practicum as part of their professional development program funded by the Indonesian Ministry of Education. The findings indicated that the in-service teachers had a high level of pedagogical, technological content knowledge but their sociocultural TPACK practices were restricted school-based cultural interactions because of their low understanding of cultural concepts during the online professional development program. Teachers' low understanding of sociocultural conceptions, limited experiences, and access to wider cultural communities became the main barriers for the implementation of sociocultural-based TPACK. Successful practice, challenges, and future prospects regarding the implementation of sociocultural-based TPACK were also discussed in the study.

Keywords: sociocultural approach, in-service EFL teachers, teachers' beliefs, students' beliefs, TPACK

Introduction

The rapid development of technology in educational fields has influenced instructional practices at all educational levels, including in teacher professional development programs in English as a foreign language (EFL) context (Arifani, 2020;

Arifani, Susanto, et al., 2020). As a result, the teacher professional development (PD) program, whether structured or unstructured, has also been migrated from the traditional face-to-face to online-based platforms. Different from previous traditional professional development program which emphasizes on EFL teacher' pedagogical content knowledge (PCK) (Arifani, 2020; Arifani, Susanto, et al., 2020; Cabell & Hwang, 2020; Metscher et al., 2021; Yazdanmehr et al., 2020), current PD has focused on teacher technological pedagogical content knowledge (TPACK) (Archambault & Crippen, 2009; Koh et al., 2010; Sahin, 2011; Tafazoli et al., 2019).

Because of the benefits of TPACK in EFL pedagogy, researchers from around the globe have investigated its effectiveness. Most of the previous works of TPACK class suggested three main categories: a group of researchers, which develops various TPACK questionnaires using different theoretical approaches (Baser et al., 2015; Bostancıoğlu & Handley, 2018; Chai et al., 2013; Mishara & Koehler, 2006), a group of work, which investigates teachers' or students' self-reported TPACK levels using different TPACK instruments, and teachers' or students' TPACK beliefs and practices using different quantitative, qualitative and mixed approaches (Koh et al., 2010; Rasyidah et al., 2021; Sahin, 2011; Tafazoli et al., 2019).

The first category of TPACK instrument design and validation yields two different instruments, general and specific TPACK questionnaires for EFL teachers and learners (Baser et al., 2015; Bostancıoğlu & Handley, 2018; Mishara & Koehler, 2006). Within the context of general TPACK, the instrument fails to explain specific technological and pedagogical needs for EFL teachers and learners. Meanwhile, the specific TPACK questionnaire for assessing EFL teachers and learner instructional practices has failed to facilitate students to interact, engage, and adapt to wider targeted culture communities. Some experts support the essential roles of sociocultural theory in foreign language learning (Lund, 2008; Tour, 2020; Wilson et al., 2017). Meanwhile, the second and third categories mainly study EFL teachers' and learners' TPACK perspectives within the incidental participants' initiation within a short period which the results cannot explain participants' actual reflections.

However, there has been a void regarding TPACK research applying sociocultural approaches within well-organized and prolonged online professional development programs. This study unveils the in-service EFL teachers' and students' beliefs and practices in implementing TPACK using sociocultural approaches during their two-semester online teacher professional development program.

Literature Review

Integrating sociocultural approach into TPACK: Theoretical framework

Vygotsky's (1979) social constructivism theory (SCT) assumes that learning English as a foreign language is very complex and dynamic as results of social and cultural interactions (Poedjiastutie et al., 2021; Tour, 2020; Wilson et al., 2017). In the traditional paradigm, social and cultural interactions are implemented using face-to-face communication with peers, people from different target cultures. This situation becomes very problematic when learners' learning environment does not support the conditions mentioned above. In the era of technology, teachers can facilitate their learners to interact

and engage in various cultural situations to optimize their learning. Technology promotes its benefits to connect, interact, value, engage, communicate, and make meanings in a wide range of technology channels in authentic situations from diverse cultural backgrounds (Arifani, 2020; Arifani et al., 2021; Hafner et al., 2015). With those two postulates of socio-culture and technological approaches, this study aims to integrate sociocultural theory within the TPACK questionnaire since previous TPACK instruments in EFL/ESL setting are not developed using a sociocultural lens (Baser et al., 2015; Bostancıoğlu & Handley, 2018; Chai et al., 2013; Mishara & Koehler, 2006). Therefore, current TPACK studies in the EFL setting cannot optimize learners' language learning through social and cultural interactions using technologies because of the absenteeism of sociocultural theories.

This study combines two theoretical frameworks, a sociocultural approach involving social interaction, community engagement, and adaptation (Tour, 2020; Wilson et al., 2017) and a TPACK framework comprising PCK, TK, PK, CK, TPK, TCK, TPACK (Bostancıoğlu & Handley, 2018). To yield a harmonious integration, called a socio-cultural-based TPCK, the authors blend the category of TPK, TCK, and TPACK and sociocultural frameworks to produce a socio-cultural-based TPCK within the context of social interaction, community engagement, and adaptation. Specifically, sociocultural-based TPK refers to EFL teacher's knowledge to adapt and apply effective instructional strategies from different target cultures using relevant technologies. Socio-cultural-based TCK refers to EFL teacher's knowledge to teach culturally rich English language content using relevant technology. Finally, sociocultural-based TPCK refers to EFL teacher's knowledge to facilitate students' learning of culturally rich English language contents using effective pedagogy and technology integrations to interact, engage, and adapt to various cultural events and communities. Those three categories are then applied as the theoretical framework to rate EFL teachers' and learners' beliefs and practices of socio-cultural-based TPACK in their online teaching practicum during an online teacher training program.

Previous research of TPACK in EFL/ESL settings

After conducting a comprehensive review of TPACK published works in Scopus and SSCI scholarly journals from 2006 and 2021, the authors find three emerging issues from the previous studies. The first issue deals with the shortcoming of existing TPACK questionnaires. Most TPACK in the previous studies assess participants' TPACK separately. As a result, they do not provide opportunities for EFL learners to engage in various cultural contexts as one of the essential elements in foreign language learning. The second issue addresses the objectives of the previous research, which are limited to self-report beliefs without investigating their successful practices and challenges. The last issue deals with participants and the context involved in the previous studies. Most previous studies examine TPACK within less-structured situations, where participants obtain their TPACK incidentally based on their initiatives and as part of their study.

Regarding the shortcomings of existing TPACK instruments, the authors locate five different TPACK instruments (Baser et al., 2015; Bostancıoğlu & Handley, 2018; Chai et al., 2013; Mishara & Koehler, 2006). From those five types, the pioneers, Mishara and Koehler (2006), are designed to describe general teachers' knowledge of the six TPACK categories and their specific technological, pedagogical and English content

knowledge cannot be captured. Similarly, Baser's et al. (2015) and Chai's et al. (2013) instruments emphasized more on technological views than other aspects (Bostancıoğlu & Handley, 2018; Selwyn, 2016). Meanwhile, the last one, Bostancıoğlu & Handley (2018), has developed more specific TPACK for English language teaching, but they are absent from a sociocultural perspective. Lund (2008) emphasizes the vital roles of sociocultural theory for second/foreign language learning.

The last part of this literature review deals with narrow scopes of previous research describing participants' TPACK performances, attitudes, beliefs, and gender perspectives (Archambault & Crippen, 2009; Koh et al., 2010; Sahin, 2011; Tafazoli et al., 2019). Two different studies by Archambault & Crippen (2009) and Tafazoli et al. (2019) found that different genders had different levels of technological mastery and attitudes. The first study asserted that males tended to have higher technological knowledge than females, but females had better pedagogical knowledge than males. Those inconclusive findings suggest the importance of different areas of TPACK to search further studies regarding successful practice and challenges in applying the TPACK framework.

The last part deals with research participants and context. Previous studies report that participants and context involved pre-service teachers (Ekrem & Recep, 2014; Turgut, 2017; Wu & Wang, 2015), in-service teachers as part of their undergraduate or master programs (Cheng, 2017; Tafazoli et al., 2019; Tseng et al., 2011), novice and experienced teachers from various educational fields (Nazari et al., 2019; Rasyidah et al., 2021; Sari et al., 2021). The participants and contexts suggest that most TPACK research involving teachers from various educational contexts and levels are done during incidental online conferences and as parts of their undergraduate and postgraduate studies (Cheng, 2017; Sari et al., 2021; Tafazoli et al., 2019; Tseng et al., 2011). Consequently, there is little information on TPACK study under EFL in-service online professional development program. To date, this study aims to scrutinize in-service teachers' beliefs and practices of sociocultural-based TPACK during their online professional development program. This study, therefore, posits two main research questions:

1. What are the in-service EFL teachers' and students' beliefs of TPACK using sociocultural approaches during their online teacher professional development program?
2. What are EFL teachers' and students' perspectives on current practices and challenges to promote in-service teachers sociocultural-based TPACK in their online teaching practicum as part of the online teacher development programs?

Method

Design

This mixed-method study aimed to address the two predetermined research questions, quantitative and qualitative approaches. First, to address the in-service EFL teachers' beliefs of sociocultural-based TPACK (TK, TPK, TCK, and TPCK), the integrations of the TPACK questionnaire and sociocultural frameworks were administered to 125 EFL teachers (53 males and 72 females, 39-47 years old) and 375 EFL students (177 males and 198 females, 17-19.4 years old). Second, focus group

interviews were conducted to 25 EFL teachers (11 males and 14 females) and 50 students (25 males and 25 females) using the integrations of the TPACK framework by Bostancıoğlu & Handley (2018) and sociocultural approaches by Tour (2020) and Wilson et al. (2017) to draw their successful practices, failures, and challenges of the integrations into teaching practicum as part of the online professional development program.

Participants and context

The first group of participants involved 125 in-service EFL teachers (53 males and 72 females, 39-47 years) from 125 different schools (87 private and 38 public) senior high schools in a Provincial level of East Java Indonesia. All the in-service teachers have attended an online teacher's professional development program for two semesters funded by the Indonesian Ministry of Education. The small number of participants is due to the tight administrative, academic, and pedagogic tests and a high passing grade determined by the government for the EFL teachers to enroll on the program. The teachers also have to fulfill administrative qualifications: (1) Registered at the national teacher database; (2) Passing the pretest; (3) holding at least an undergraduate degree in English education from an accredited department and college; (4) Qualified in English major; (5) Having at least five years English teaching experience; and 6) Less than 58 years old. The online professional development program is completed with Teaching Knowledge and Performance tests before getting a certificate of recognition as a professional English teacher from the Indonesian Ministry of Education (Arifani et al., 2021). The second group of participants involved 375 students from the same 125 schools (177 males and 198 females, 17-19.4 years) in rating their in-service teachers' beliefs of sociocultural-based TPACK during their two-semester online professional development program.

This national online professional development project was hosted by five English Education Departments nominated by the Indonesian government based on their accreditation status and the quality of lecturers at the institution (Arifani et al., 2020; Arifani et al., 2021). In this study, the authors involved the research participants from all the five host universities who have been attending the online professional development program. This online project had three different phases. In the first phase, all accepted participants learned how to design an online teaching plan using the Indonesian e-learning platform prepared by the government. Online discussion forums using both synchronous and asynchronous platforms were also conducted to produce standardized lesson plans, teaching media, video tutorials, teaching materials, and teaching evaluation using an online platform. This phase took 30 sessions. During this first phase, all the participants were supervised by PhD English lecturers (associate professor and professor)

In the second phase, the participants conducted their teaching practicum in their schools using the same e-learning platform. This teaching practicum session took approximately 30 meetings. During the online teaching practicum, two supervisors (senior English lecturers from the host university and superintendent from the same English majors holding master degrees) were involved intensively to monitor, assess, and evaluate the running of online teaching practicum. Online teaching reflection and discussion was also conducted each time the teaching practicum was done for improvements.

In the last phase, three types of post-tests: English content knowledge, pedagogical knowledge, and performance tests, were applied to determine their accomplishment and

recognition as professional English teachers before obtaining extra monthly funding from the government. At the end of the online project, a questionnaire containing the integrations of TPACK by Bostancıoğlu & Handley (2018) and sociocultural approaches by Tour (2020) and Wilson et al. (2017) was administered to 125 teachers and 375 students to draw the in-service teachers' beliefs of sociocultural-based TPACK. Finally, focus group interviews using a zoom application were applied to reflect 25 EFL teachers' and 50 students' practices of TPACK using sociocultural approaches during their online teaching practicum as part of online professional development.

Instrument

Development of questionnaires

A sociocultural-based TPACK by Bostancıoğlu & Handley (2018), Tour (2020) and Wilson et al. (2017) were mixed to draw the in-service teachers' self-reported beliefs. The author adapted four categories of TPACK, namely TK (6 items), TPK (6 items), and TCK (6 items), and TPCK (6 items). Meanwhile, the CK and PK were omitted since the two were melted into the categories mentioned above. Among the four categories, three of them, namely: TPK, TCK, and TPCK with 18 question items were reflected into the three categories of sociocultural frameworks of social interaction, community engagement, and adaptability. Each category was then integrated into broader social interaction, community engagement, and adaptability. Consequently, the three core TPACK categories contained sociocultural integrations. Meanwhile, the TK category (6 items) was not blended using sociocultural approaches since this category only described participants' technological knowledge and it did not explain how to use the technology in their online teaching practices. Finally, a 24-questionnaire item with five intervals from "low" to "high" had been constructed. The mean scores ranged between 1-2.5, 2.6-3.5, and 3.6-5 represented low, moderate, and high socio-cultural levels (Dashtestani & Hojatpanah, 2020).

The amendments of the TPACK questionnaires into sociocultural-based questionnaires were made to accommodate the sociocultural elements in the TPACK instruments. In addition, a panel of three CALL and socio-culture experts who held university PhD and professor lecturers were invited to validate the modified contents of the questionnaire items. The Cronbach's alpha scores of 0.84 to 0.94 indicated acceptable reliability of the four sociocultural-based TPACK categories.

Approval from authorities: board of education, host universities, school principals, in-service teachers, and students were obtained to enter the online teacher professional development program to collect the research data. All the research participants were selected voluntarily, and their confidentiality and anonymity were also guaranteed.

Focus Group Interview

A semi-structured interview was also designed to draw the EFL teachers' and students' practices, failures, challenges, and prospects in implementing sociocultural based-TPACK in online teaching practicum during their online professional development program. Three sets of socio-cultural-based TPACK questions were developed for the in-service teachers and students to explain their successful practices, failures, challenges,

and prospects of each TPK, TCK, and TPCK category during online professional development. Three senior PhD teachers majoring in CALL pedagogy and socio-culture evaluated the interview content using an open-ended evaluation checklist. Their comments were used to determine the content appropriateness of the interview questions. The interview questions were then piloted to 25 in-service EFL teacher groups who attended the same online professional development program from different host universities. The interview was conducted five times using the zoom application. Additional WhatsApp calls were also conducted several times for confirmation and verification. After all the in-service teachers accomplished their online teaching practicum as part of their two-semester online professional development program, these interviews were applied.

Data analysis

This research began when the authors and their research team obtained approval letters from five host universities (two public and three private) after visiting them several times. Next, online zoom meetings were conducted five times to all participants from five different host universities. The descriptive statistics test was then applied to interpret the mean and standard deviation for each questionnaire item. Next, the non-parametric Mann–Whitney U test was applied to explain the beliefs between teachers and students. Finally, the validity and reliability of the questionnaire were estimated using exploratory factor analysis and Cronbach's Alpha tests.

The qualitative data, including a sample of 25 teachers' and 50 students' interviews of their TPACK practices, were analyzed thematically in terms of successful practices, failure, challenges, and prospects using three dimensions of sociocultural frameworks social interaction, community engagement, and ecological adaptability during in-service teachers' online teaching practicum as part of their online professional development program. The authors and team cross checked and exchanged the coding results for thematic building from the interviews to avoid a subjective interpretation. The authors and team interpreted one emerging theme. The authors and research team also consulted any biased interpretations to experts holding PhD degrees and professors majoring in CALL and sociocultural fields.

Findings

The first part of the findings section addresses the first research objective. The first objective aimed to explain the in-service EFL teachers' and students' beliefs of sociocultural-based TPCK during their online teacher professional development program and to find whether they have different perceptions or not. Table 1 indicates the results of beliefs on in-service EFL teachers' levels of sociocultural-based TPK in terms of the mean and standard deviation. Apart from technology selection in teaching strategies about which the teachers perceived a moderately high level, the students perceived to have a low level of sociocultural-based TPK other items.

Table 1
ESP teachers' and students' beliefs on sociocultural-based TPK

Items	Participants	N	M	SD	Mann Whitney U test	p
The teacher can choose technologies that enhance teaching strategies.	Teachers	125	4.70	0.47	2150.0	0.197
	Students	375	4.55	0.75		
The teacher can choose technologies that enhance students' learning.	Teachers	125	4.25	0.91	2674.0	0.352
	Students	375	4.30	1.17		
The teacher can adapt the use of the technologies to different teaching activities.	Teachers	125	3.14	1.40	2090	0.112
	Students	375	3.09	1.37		
Using technology, the teacher can design practical teaching activities to promote student learning through social interaction, engagement, and adaptation from different cultures.	Teachers	125	4.25	0.91	2674.0	0.001
	Students	375	2.65	1.22		
The teacher can choose relevant technologies to be used in assessment involving peers, stakeholders, and professionals from broader cultural contexts	Teachers	125	1.80	0.83	1643.5	0.221
	Students	375	1.87	0.79		
The teacher can engage students in solving various cultural issues using digital technologies and resources.	Teachers	125	1.80	0.87	2554	0.107
	Students	375	1.62	0.70		

Notes:

- Likert scales description: 1. No level; 2. Low level; 3. Average level; 4. Moderately high level; 5. High level of sociocultural-based competence.
- Note: confidence level $\frac{1}{4}$ 90%, $p_{.05}$.

In contrast, the students believed that the in-service teachers had low competence in applying technology and teaching strategies to promote broader cultural interaction, engagement, and adaptation. The teachers and students also reported that the in-service teachers had a low competence in applying technology and teaching strategies for assessment involving peers, stakeholders, and professionals and solving EFL cultural issues in broader cultural events and contexts.

The results of the Mann-Whitney U test are presented in Table 3 reveal that there were no significant differences between teachers' and students' perspectives of in-service teachers' sociocultural-based TPK competence regarding choosing, adapting, and enhancing learning, engaging and solving various cultural issues in broader contexts using relevant technologies and effective teaching strategies.

Table 2 reveals the results of beliefs on in-service EFL teachers' levels of sociocultural-based TCK in terms of the mean and standard deviation. Again, the teachers and students were primarily aware and confident of the in-service teachers' technological content knowledge in teaching English skills and components.

Table 2*ESP teachers' and students' beliefs on sociocultural-based TCK*

Items	Participants	N	M	SD	Mann Whitney U test	p
The teacher knows about technologies that he/she can use to teach listening in English.	Teachers Students	125 375	4.70 4.55	0.47 0.75	2150.0	0.197
The teacher knows about technologies that he/she can use to teach speaking in English.	Teachers Students	125 375	4.55 4.30	0.75 1.17	2702	0.163
The teacher knows about technologies that he/she can use to teach reading in English.	Teachers Students	125 375	4.25 4.30	0.91 1.17	2674.0	0.352
The teacher knows about technologies that he/she can use to teach writing in English.	Teachers Students	125 375	3.14 3.09	1.40 1.37	2090	0.112
The teacher knows about technologies that he/she can use to teach English vocabulary and grammar	Teachers Students	125 375	4.25 4.30	0.91 1.17	2674.0	0.352
The teacher knows about technologies and rich-cultural content that he/she can use to teach to interact, engage, and adapt to various cultural events and environments.	Teachers Students	125 375	1.80 1.87	0.83 0.79	1643.5	0.221

The statistical analysis results using the same test indicate no significant differences between EFL teachers' and students' perspectives regarding the TCK category. Furthermore, the participants of both groups had the same opinion about the low level of sociocultural-based TPACK competencies regarding the use of technologies to enhance learners' cultural interaction, engagement and adaptation in the content knowledge (English skills and components) using technology.

Table 3 illustrates the results of beliefs on in-service EFL teachers' levels of sociocultural-based TPACK in terms of the mean and standard deviation. The statistical test using the same tools reveals that there were no significant differences between the perceptions of the teachers and students concerning the in-service teachers sociocultural-based TPACK for selecting relevant technologies, teaching strategies, rich-cultural content, implementing effective teaching strategies, providing equitable access, and using relevant content knowledge to promote students' cultural experiences.

Table 3*ESP teachers' and students' beliefs on sociocultural-based TPACK*

Items	Participants	N	M	SD	Mann Whitney U test	p
The teacher can select appropriate technologies, teaching strategies, and relevant content knowledge containing rich- English culture exposures from wider communities.	Teachers Students	125 375	3.14 3.09	1.40 1.37	2090	0.112
The teacher can select technologies that use ineffective classroom teaching strategies and relevant content knowledge containing rich- English culture exposure from wider communities.	Teachers Students	125 375	4.55 4.30	0.75 1.17	2702	0.163

The teacher can use technology effectively to connect students to peers, stakeholders, professionals or other people from different cultures.	Teachers	125	3.01	1.32	1835.5	0.001
	Students	375	1.95	0.76		
The teacher can use relevant technologies to help students pursue their curiosities.	Teachers	125	4.55	0.75	2702	0.163
	Students	375	4.30	1.17		
The teacher can use technologies that enable students to become active participants to interact, engage, and adapt to the various cultural environments to support their language learning	Teachers	125	1.80	0.87	2554	0.107
	Students	375	1.62	0.70		
The teacher can provide equitable access to their students to interact and engage in various cultural situations using digital tools and resources.	Teachers	125	2.10	1.02	1832.0	0.375
	Students	375	2.11	1.32		

The two groups of participants did not have the same idea about in-service teachers' use of technology to connect students to various cultural events and situations. In addition, a low level of use of sociocultural-based TPACK was identified regarding the influential roles of technology to enable students' active participation and provide them equitable access to various cultural situations.

The second part of the findings elaborates EFL teachers' and students' perspectives on current practices to promote their sociocultural-based TPACK in their online teaching and learning practices. The results of the interviews with the EFL teachers and students regarding their sociocultural-based TPACK practices are presented below.

Teachers' and students' practices in applying sociocultural-based TPACK

As the results of the interviews depict, the majority of the teachers believed that YouTube channels could support their English teaching and learning (listening, speaking, reading, writing, grammar, pronunciation and vocabulary) ($n = 25$). However, they also reported that other applications such as e-story, digital reading, quizzes, Mentimeter, Hot Potatoes, Quizlets, Quizalize, Kahoot, and Word-Wall were practical teaching and assessment methods ($n = 18$). Furthermore, from the different types of digital content and sources, it was found that most of the teachers selected and adopted them during teaching and learning activities based on topic relevance and difficulty level ($n = 24$).

Meanwhile, students mentioned that they liked to be involved in project work and uploaded it into YouTube channels for obtaining "like" comments from viewers ($n = 50$), classroom discussion and presentation using Zoom, Google Meet or Telegram application ($n = 28$). They also felt that learning English skills, grammar, and pronunciation from YouTube, movies, English applications, and interactive quizzes could support their English ($n = 48$).

I use a word-wall digital application to teach vocabulary and English expressions as pre-reading and speaking activities. This activity can provide students with relevant vocabulary and expression that they can use for reading comprehension and speaking (Teacher 19)

Usually, I utilize a *Quizalize* application. I use it for listening and listening tests because the audio contents and pictures can be replaced easily. I just put relevant audio from the internet into the apps and started to make some questions in the apps simultaneously. All the students' answers' can be displayed with their names and identities (Teacher 25).

I usually share and ask the students to watch a short film from YouTube and ask them to answer some questions and ask them to retell or to perform the content of the story in groups. Then, I assign them to record and upload their performances to social media to get viewers' comments. The students like to watch short movies or relevant stories from YouTube (Teacher 2).

The students like to make group presentations via the Zoom application as they are more confident (Teacher 13). Moreover, the students like to work on a project by explaining how to make something (procedure text), record the project, and upload it on a YouTube channel (Teacher 6).

My English is not perfect, but I liked when the teacher assigned me to upload a procedural text. Next, I present how to repair a broken handphone battery (Student 48).

We make an original short drama performance, and it is uploaded to YouTube. I like this type of job as it can improve our speaking abilities (Student 2).

I watch YouTube channels many times to understand passive and active voices (Student 49).

YouTube can perform many functions to improve my English grammar, pronunciation, and writing (Student 34).

The above excerpts implied that the in-service teachers applied effective teaching strategies through group work, classroom discussion, interactive quiz/task competition, and out-class project-based learning, and the students also found those teaching strategies interesting. The majority of the teachers selected relevant teaching content based on the difficulty level and the suitability of topics. The majority of teaching contents were audio and video-based modalities, and the students mentioned that those teaching contents were very contributive in supporting their English abilities.

The last part of the second findings elaborates EFL teachers' and students' perspectives on challenges in applying their sociocultural-based TPCK in their online teaching and learning practices. The results of the interviews with the EFL teachers and students regarding their sociocultural-based TPCK practices are presented below.

Teachers' and students' challenges in applying sociocultural-based TPCK

The majority of the teachers believed that their theoretical and pedagogical knowledge of how sociocultural should be implemented in their TPCK is minimal ($n = 18$), students' low English proficiency and confidence to engage in a new cultural environment ($n = 21$), limited access of English community ($n = 22$), low support from school policy and curriculum ($n = 20$). In addition, the majority of the students reported that they could not interact and engage with different cultural communities because of their low English proficiency ($n = 42$), limited English forum in the school and surroundings ($n = 47$), the school never invites guest lecturers from different countries ($n = 42$).

For me, sociocultural theories postulate that learners learn English from interaction with their peers and teacher. They have to speak English once or twice a week, such as making an English zone every Monday and Thursday (Teacher 11).

The school usually assigns the students to communicate and interact with native speakers during their school holiday in Borobudur Temple or Bali once a year. On this occasion, they are required

by their English teachers to describe their experiences, write and publish them in school magazines with their photos with a native speaker (Teacher 1).

Sometimes I ask my students to get in touch with peers from different cultures using their gadgets, but they are unconfident (Teacher 9).

I remember my teacher's words. He asks me to try to communicate with a native person from Australia to have an informal talk and practice my English, but I do not know how to find and start (Student 29).

When I had a school vacation in my junior high school, I was assigned to practice my English to talk to a foreigner who speaks English, but I can do it now because of the Covid-19 out-break (Student 3).

I am afraid to interact with a foreigner or native speaker because my English speaking and writing are not good. (Student 29).

I am scared to make written mistakes when I communicate with a native speaker. I probably can interact with a native speaker using a mobile application, but I do not know how to start (Student 11)

The above excerpts indicate the agreement between teachers and students towards the challenges of applying sociocultural-based TPCK. In addition, the two groups of participants verified three challenges concerning teachers' limited understanding, experience, school networking, policy and curriculum.

Discussion

While a plethora of studies dealt with the issue of TPCK for EFL teachers using general TPACK frameworks for language teaching from teacher's initiatives, this study endeavored to picture the present perceived practices, competence levels, and challenges concerning in-service teachers sociocultural-based TPCK within the government-initiated online professional development program. The results showed significant differences between the teachers' and students' perspectives concerning in-service EFL teachers' sociocultural-based TPCK in the questionnaire reports. In the interviews, the two groups of research participants claimed that the in-service teachers had a low sociocultural-based TPACK. More specifically, except for the use of technology to enhance effective teaching and learning strategies under the TPK category and the use of technological content knowledge in teaching English skills and components under the TCK category, the teachers reported that their in-service teachers had a low level of competence for the use of technology, pedagogy, and content to promote students' interaction and engagement to various cultural circumstances from their online instructional activities.

The first discussion dealt with the results regarding the high level of applying effective teaching strategies (1 item of TPK and 21 items of TPCK) and relevant cultural course contents for teaching English skills and elements (4 items of TCK) using technology to promote students' curiosity (1 item of TPCK). Rasyidah et al. (2021) also, in-service teachers effective teaching strategies using relevant multimedia content and technology such as Telegram Bot under teacher's self-initiation and creativity could play

essential roles in EFL teaching and learning success. Some other previous studies in another context (short online conference, seminar-workshop, and part of participants study program) have also reported their positive results regarding EFL teachers' TPACK without sociocultural approaches (Archambault & Crippen, 2009; Arifani et al., 2021; Koh et al., 2010; Nazari et al., 2019; Sari et al., 2021; Tafazoli et al., 2019). Then, under the two semesters professional development program, the findings of the study add similar results. These findings also add novelty in terms of more extended online professional development programs and promotion of cultural content and teaching strategies.

The second discussion dealt with a low level of the in-service teachers' in applying sociocultural-based TPCK for the use of technology, pedagogy and content to promote students' interaction and engagement to various cultural circumstances from their online instructional activities. The interviews from both teachers and students also reported similar opinions as to the questionnaire results. Previous studies from various participants and contexts did not report the emergence of sociocultural perspectives within their research projects (Cheng, 2017; Nazari et al., 2019; Sari et al., 2021; Tafazoli et al., 2019; Tseng et al., 2011). Most of the previous works reported their high level of TPCK without sociocultural approaches. Therefore, this study adds another novelty regarding the low level of sociocultural-based TPACK to facilitate learners to interact, engage, and adapt to various cultural events and environments using relevant technologies.

The in-service teachers were reported to integrate technology into their online classroom because they learned how to use adequate technology and online pedagogy from their online teacher professional development. However, they neglected the sociocultural approach to promoting students' social interaction, integration, and adaptation to more expansive cultural environments in their teaching, learning and assessment. Their online teaching practices using sociocultural frameworks were very limited to classroom peers' interaction because of their limited understanding of sociocultural conceptions and implementations. Broader cultural interaction was implemented once a year as part of their school vacation. It reflects that school policy and curriculum had a common understanding regarding the pivotal roles of sociocultural approaches in foreign language learning. Poedjiastutie et al. (2021) and Tour (2020) emphasize the critical roles of sociocultural approaches in supporting learning English as a foreign or second language acquisition. These findings also indicated low understandings of in-service teachers regarding the concept of sociocultural approaches as they perceived that learners' cultural interaction were limited to classroom settings involving peers, teachers, and digital content courses. Therefore, their narrow understanding restricted their teaching practices. Responding to this condition, school principals, teachers, and policy makers are advised to hold some meetings to discuss effective models of cultural integration into school curriculum not only for EFL teaching and learning but also for other educational purposes.

The present study had some limitations. For example, gender, teachers' teaching experience, and education degree might influence their perceptions. At the same time, different studies reported that teachers' attributes such as education degree, gender, and experience influenced their beliefs, level, and practices of TPACK (Archambault & Crippen, 2009; Tafazoli et al., 2019). This study did not address these essential issues.

Therefore, further researchers could conduct a similar study addressing those essential issues.

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Conclusion

This mixed-design provides insights into teacher professional development programs in an online project. Since the main obstacles of applying sociocultural approaches and TPACK rests on the in-service teachers, online training program coordinators from host universities, and the Ministry of Education, these three parties have to discuss and revisit the online training program curriculum to consider the findings of this research. If not, an online professional development program is just like learning the same content and pedagogical knowledge using technology without a clear destination for promoting our in-service teachers with wider sociocultural horizon, experiences, and networking. Further, they can share and apply their experience to classroom instructions. From the sociocultural lens, the implementation of TPACK is not constrained to facilitating students with effective teaching strategy using technology, but it is also designed to use the technology for connecting the students to wider cultural communities and events. EFL students have complicated issues of language proficiency and pedagogy. They have to learn both at the same time. Therefore, integrating sociocultural and TPACK becomes one of alternatives to facilitate and optimize students' English proficiency and pedagogy through technologies. The students need to interact, engage, and adapt to various cultural situations as their learning-partners. To arrive at this situation, school principals, teachers, and curriculum makers have to hold meetings for considering the integrations of the sociocultural framework in their educational program. Therefore, optimizing schools' networking with wider cultural communities can be optimized to support EFL teaching and schools' educational practices.

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