A TEACHER TRAINING PROGRAMME FOR WRITING AND GRAMMAR SKILLS WITHIN THE MODEL OF TPACK

Research Article

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Abstract

Teaching a foreign language is shaped extensively by the impacts of technological advances in the 21st century. English teachers are always required to enhance their theoretical and practical knowledge on how to use technology in their classes. TPACK (Technological, Pedagogical and Content Knowledge) framework was introduced to understand the teacher knowledge required for effective technology integration. This study displays the TPACK training programme for 24 in-service English Language teachers (teaching young learners aged 8-12). During this programme, each skill was taken separately to enhance the teacher pedagogical knowledge. But in this paper, we focus on writing and grammar skills which are diagnosed to be the more problematic ones. The researchers used the TPACK scale developed by Schmidt (2009) as pre-test and post-test to see the impact of the training on the usge of digital tools for the improvement of these two skills. Immediate and Delayed Workshop Evaluations were conducted just after the training. Both tests showed an increase in the knowledge and skill of integrating technology into their English classes within the model of TPACK. The results of this study also revealed improvement on knowledge of ICT tools.

Keywords: TPACK (Technological, Pedagogical and Content Knowledge), EFL (English as a Foreign Language), teaching grammar, teaching writing, MoNe (Ministry of National Education)

1. Introduction

TPACK framework widens and develops the pedagogical content knowledge (Schulman, 1987). It was introduced to understand the teacher knowledge required for effective technology integration. Seven components are defined (Koehler & Mishra, 2009) as Technology Knowledge, Content Knowledge, Pedagogical Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical Content Knowledge (p.10)" (Mishra & Koehler, 2008). There are numerous digital tools prepared for EFL& ESL. A knowledgeable teacher would choose the one which will enhance learning and would teach the learners. The need to train teachers for better practices of TPACK is widely emphasized in the literature (Aydin, 2013; Christensen, 2002; Hampel & Stickler, 2005; Lee, 2000; Mouza, 2016). This study was designed with such a need in mind. A TPACK training program on writing and grammar skills would hopefully become a sample that would lead to a more effective design of such programs in the future.

Pedagogical knowledge is acquired during teacher initial education, and they practice the methodological knowledge in their practicum which is the main function of the pre-service training. Kumaravadivelu (1994), Nunan (1987) and Thornbury (1996) found that teachers do not pursue the basic principles of these methods, which therefore makes us wonder whether or

not all the language teaching methods taught in language education programs are worth the time and attention given to them. Grammar-Translation method, for example, is taught like the other methodologies to supply the necessary foundation for the pedagogical knowledge of the pre-service teachers. What is observed in most cases within Turkish context is surprisingly interesting as EFL teachers seem to favor teaching grammar explicitly and do not follow the basic principles of the Communicative Approach which is comparatively more modern and popular all around the world. In-service training is highly important to refresh and update the pedagogical knowledge of EFL/ ESL teachers, specifically the ones teaching young learners.

Young learners show different characteristics compared to older learners. Their cognitive development includes different stages. Thus, teaching English at earlier ages needs to be carefully planned. Talking about the structure of the language for example, will not help them learn, instead it will create confusion. Running English classes by using carefully selected digital tools on the other hand, will enable learning where the language structures are acquired instinctively. Games, videos, songs, and puzzles could provide the required classroom atmosphere where young learners enjoy and have fun.

Grammar and writing are important skills in foreign language learning in general. Students who are trained to make use of grammar and writing strategies show better progress. Having a high knowledge of grammar in English will support both comprehension and production in foreign language. Writing as a productive skill, requires the display of linguistic knowledge and thus, enables learners to self - check their progress. It will also help learners improve their understanding of grammar, how the language works, and how the sentences are constructed. Teaching grammar and writing to young learners of English is easier if you read stories, let them read and act out and ask them to write a different ending to the story. However, if the teachers explain the grammar rules or give information about the language structure explicitly using the story, then the story becomes boring, and acquisition of the linguistic structures is delayed. Younger learners need to attain the structures in time intuitively.

In our TPACK training programme, we introduced the theoretical background, showed examples how we could make use of digital tools and then asked the participants to try them in the hands on/workshop sessions. Each workshop session ended up by asking them to make a presentation on how they could utilize the digital tools in line with their curriculum. The English Language Teaching curriculum designed by the MoNE has adapted universal principles of foreign language education and it is skill based (listening, reading, spoken interaction, spoken production, and writing). The structure of the language is not explained. But writing covers both lexis and structure. The curriculum of MoNE is organized around themes and within a thematic framework, all the language concepts are interrelated and presented as a whole. Teachers could create other activities suitable for learners' age and level which make learning more meaningful. Here, technology supports both the teacher and the digital native learners.

In our TPACK training program, we introduced the theoretical background, showed examples how we could make use of digital tools and then asked the participants to try them in the hands on/workshop sessions. Each workshop session ended up by asking them to make a presentation on how they could utilize these digital tools in line with their curriculum. The English Language Teaching curriculum designed by the MoNE has adapted universal principles of foreign language education and it is skill based (listening, reading, spoken interaction, spoken production, and writing). The curriculum of MoNE is organized around themes and within a thematic framework, all the language concepts are interrelated and presented as a whole. Teachers could create other activities suitable for learners' age and level which make learning more meaningful. Here, technology supports both the teacher and the

digital native learners. The workshops conducted during our TPACK training programme aimed to improve the participant teachers' technological and pedagogical knowledge on the above-mentioned issues.

2. Literature Review

Koehler and Mishra (2008) defined teaching as an ill-structured and complex discipline which requires high level of knowledge to apply in different contexts and cases. They also referred to the fact that integrating technology is not easy. The importance of teacher training is pointed out by Hampel, et.al. Much effort and cost in creating online material can be wasted without the adequate training of teachers to present and support the learning (Hampel & Stickler, 2005). Teachers need to possess the ability to develop knowledge and skills required to match digital tools with content and pedagogy (Mouza, 2016). According to Christensen (2002), the teacher who received necessary trainings on how to make use of technology and embed into the curriculum can teach differently from the one who did not. The need to train EFL teachers in using technology in their classrooms was demonstrated in different studies. In a study, Aydin (2013) investigated 157 Turkish EFL teachers and found that they had a little knowledge in using software programs and they needed technical and instructional support. In studies from a variety of fields all over the world, similar need to train teachers was seen. Walker et. al. (2012) investigated 36 teacher participants and students and found that teachers improved their technological skills while adapting them into their teaching capacity. However, the group that was trained with a design of problem solving showed better results in their implementation. On the other hand, the group that was trained only about possible technological tools showed increase in their attitudes towards technology in the classrooms. In another study with 47 geography teachers, Doering et. al. (2014) revealed that teachers improved themselves in TPACK efficacy after the training was conducted. Based on the pre and post-test surveys, all components of TPACK were improved. In addition, perceived technology knowledge remained the lowest of all domains both before and after the weeklong institute. They also stated that this is not a surprising finding as a week is a relatively short time period to observe practically significant changes in perceived knowledge.

Bandura (1997) linked teacher self-efficacy with better performance in the classroom. Thus, improved self-efficacy for teachers is something essential to be achieved. Abbitt (2011) also investigated self-efficacy and TPACK in the study with 45 pre-service teachers and found that technological knowledge is closely related to teachers' self-efficacy beliefs in using technology. Thus, we as researchers, believed that a teacher who doesn't use technology in class might feel much more confident after having hands-on experience with technology for a week or as a contrast, a teacher who is confident in using technology might feel better for updating and adding more to his/her technological knowledge at the end of the training week.

Lee (2000) summarized main barriers of computer assisted language learning as financial, availability of hardware, and software, technical and theoretical knowledge, and lack of acceptance of technology. Doering et. al. (2014) also reported barriers such as limited access to equipment, limited technology knowledge, and limited technical support and infrastructure but no resistance to change. Teachers' knowledge is not the only factor influencing their practice, their beliefs such as resistance to change or not feeling confident, are other factors to influence technology integration into the classrooms (Ertmer, 1999; Koh, Chai, & Tay, 2014). Ertmer (1999) reported the physical barriers as lack of hardware, software, time, technical support and earlier training and mental barriers because of not having pedagogical and scientific knowledge.

3. Methodology

3.1. Research Design

Ponce and Pagán-Maldonado (2015) defined educational research from two different point of views. One refers to education as a natural phenomenon which occurs in a linear way for all students and teachers. That is why, it can be understood best by quantitative methods. On the other hand, the second view education as something that is complex because of its multiple social, and cultural relationships. Then qualitative methods become apparently essential based on this view. In short, quantitative research method in education searches for precise truth to understand the values, and qualitative research methods investigate education's contextual cultural and social ways. Therefore, this study adopted a mixed-method research design to gain more profound insight on how a teacher training program can foster in-service EFL teachers' TPACK efficacy.

This mixed-method study was conducted as part of a teacher training program funded by *the Scientific and Technological Research Council of Turkey* (TUBITAK) 4005. It aimed to reveal the participants' existing experiences and practicum of TPACK in their classrooms and the knowledge gained after five-day on-site training program. Our focus here is based on using ICT tools to teach writing and grammar in the light of TPACK. With this purpose in mind, the impact of the intervention provided by the teacher training workshop program was investigated by immediate and delayed evaluation forms, and with Technological Pedagogical Content Knowledge (TPACK) scale (Schmidt et al., 2009) in the form of pre and post-test. In line with the general aim of the whole training programme, the authors of this paper focused on writing and grammar as two problematic skills in ELT and addressed the research questions as follows:

1. Did this teacher training program improve this group of EFL teachers' TPACK efficacy to a statistically significant degree?

2. In what ways did teachers improve themselves in using ICT tools to foster their students' English writing and grammar skills as a foreign language?

3. What problems did teachers face implementing ICT tools in teaching writing and grammar ?

A five-day on-site teacher training workshop was conducted to foster 24 in-service EFL teachers' TPACK efficacy and 19 of them participated in this study which focused on TPACK for teaching writing and grammar. The workshops on writing and grammar were two parts of a whole training program. The other skills that were covered were listening, pronunciation, reading, and speaking. Both sessions to train teachers in terms of TPACK grammar and writing were held by the authors. The workshops were designed according to the sample training models in the literature for TPACK (Harris & Hofer, 2009; Janssen & Lazonder, 2016; Koehler & Mishra, 2009; Mouza, 2016; Schmidt et. al.,2009) and teacher training and education models (Adams, 2012; Chong & Cheah, 2010; Schön, 1987).

The training model was outlined in such a way that each session was divided into two parts as *lecture* and *workshop*. Lecturing part lasted for 45 minutes, and it was followed by 75 minutes workshop. In *lecturing*; the theoretical knowledge about teaching writing and grammar was refreshed, examples of ICT tools used for teaching grammar and writing were introduced. The lectures aimed to improve teachers' Technological Knowledge (TK), Pedagogical Knowledge (PK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK) respectively. In the *workshop;* the participants worked in groups and prepared a lesson plan for grammar and writing skills, chose the ICT tool suitable for classroom application. They worked on the books they use in their classes. Each group had 15 minutes to present their lesson plans followed by 5 minutes' discussion. The lecturer gave feedback for each group for 3 minutes (15 minutes in total).

Table 1. Course Outline

Lectures	Workshops
- Teaching how to teach writing and grammar - Asking for the familiarity they have with possible ICT tools to use - Introduction of possible ICT tools - Introducing contextual variables determining how to teach writing and grammar through ICT tools - Sample activity of a textbook used by MoNE, reflection, and discussion over it - Introducing leadership skills as advising, and mentoring to lead TPACK in their schools	- Assigning group work to create writing/ grammar activities for the units in their course books MoNE book). Using different ICT tools is the requirement. - Live lecturer feedback - Discussion and reflection

3.2. Data Collecting Tools

3.2.1. Immediate and Delayed Teacher Training Workshop Evaluation Forms

Three open-ended questions about what, how, why, and when to use ICT tools to teach writing and grammar was developed by the researchers as immediate teacher training workshop evaluation form, and it was conducted at the end of the training. 8 weeks after the training, three similar and revised open-ended questions were developed as Google Form and the participants (19) were asked to answer the questions. The collected data was on the participants' classroom applications and the problems they encountered. Through these forms, consents of each participant to attend the study were also retrieved.

The questions directed to the participants in this study as *immediate evaluation form* were as follows:

1. How did you teach grammar and writing in your classrooms before this project?

2. Could you please write about in what ways you improved in using technology while teaching grammar and writing in your classrooms after these seminars and workshops?

3. How are you planning to teach grammar and writing through ICT tools after this project?

The questions directed to participants 2 months after the workshop as *delayed evaluation form* were as follows:

1. What kind of problems did you face while implementing technology-supported lesson plans?

2. How did you handle with these problems? Please explain.

3. Did your students experience any problem while implementing technology-supported lesson plans? Please explain.

3.2.1. Technological Pedagogical Content Knowledge (TPACK) Scale

The five-level Likert scale developed by Schmidt et al (2009) instrument was used in this study. The reliability process displayed that Cronbach's alpha for these 32 items were all higher than .70 (Schmidt et al., 2009). In this study, this scale was conducted to understand the outcomes of the teacher training programme on TPACK. The scale consisted of 32 items and its eight questions were re-adapted according to the content (teaching *grammar* and *writing)*. Informed consents were taken from the participants and each form included demographic information of the participants such as age, gender, teaching experience, and teaching level.

3.3. Sampling or Study Group

This study consists of 19 Turkish in-service teachers who teach English to young learners (aged 8-12). These participants voluntarily attended the teacher training workshops on how to use TPACK to teach grammar and writing. They also showed consent to fill in the forms. %84 (n=16) of the participants were aged over 32 and %16 (n=3) of the participants were aged between 27-32. Additionally, %68 (n=13) of these participants were *females* and %32 (n=6) of them were *males*. The experience in teaching English as a foreign language ranged from 6 to 30 years (*16,7 years* in average). This demonstrates that teachers who participated in this study were generally in their mid-career of teaching.

3.4. Data Analysis

The data collected through immediate and delayed teacher training workshop evaluation forms were analyzed with the method of thematic analysis. First, codes were attributed to each participant's response to six questions. While codes were labelled, literary background and the training model based on TPACK teaching EFL writing and grammar using ICT tools were taken into consideration. Next, all the codes were brought together to make up themes based on the research questions in mind.

The scale, on the other hand, was analyzed by the statistical software *Statistical Package for the Social Sciences* (SPSS) 12. Paired samples *t-test* was used to understand if the mean scores that participants gained after pre and post-test demonstrated a statistically significant change. This change was investigated to understand whether participants in this study showed higher results in terms of TPACK efficacy to teach grammar and writing after the training program was conducted. This analysis also provided results about mean difference, standard deviation, and correlation between the values.

3.5. Validity and Reliability

The study included three stages which were early tests and forms, teacher training program, and later tests and forms. The quantitative scale designed by Schmidt et al. (2009) to understand teachers' TPACK efficacy, was found reliable based on Cronbach's alpha score higher than .70. For content validity, the researchers demanded expert opinions from three nationally known researchers for immediate, and delayed teacher training workshop evaluation forms. These evaluation forms enabled the researchers to see to what extent the training program was effective and prolific.

Increasing the consistency and transparency of the coding process, intercoder reliability can help provide confidence that specific efforts were made to ensure the final analytic framework represents a credible account of the data (O'Connor & Joffe, 2020). That is why, the findings collected as themes from the forms were coded separately by both researchers and then intercoder reliability was calculated. Cohen's Kappa statistical method in SPSS 12 software

was used to understand if both researchers' codes were at a moderate level of agreement. The preliminary result based on this calculation was ,495 which was quite low as below.

Table 2. Preliminary Kappa Intercoder Reliability Measures

Symmetric Measures	Value	Approximate Significance
Measure of Agreement Kappa	,495	<,001
N of Valid Cases	33	

After researchers made agreed revisions on a variety of codes to increase intercoded reliability, the calculation and Cohen's Kappa value were found highly reliable ,961 as below.

Table 3. Kappa Intercoder Reliability Measures after revisions

Symmetric Measures	Value	Approximate Significance
Measure of Agreement Kappa	,961	<,001
N of Valid Cases	33	

4. Findings

4.1. TPACK Efficacy Scale: Pre-Test and Post-Test

TPACK scale designed by Schmidt et. al. (2009) was conducted as pre-test and post-test throughout the study. Paired samples t-test was then adapted to understand whether 19 EFL teachers having participated in this research improved in TPACK, or to what extent they improved. The findings gained by SPSS 12 shed light on this issue in details as stated below.

Table 4. T-test Results of Complete TPACK Scores before and after the teacher training workshop (n=19)

Paired Samples Statistics	Mean	Std. Dev.	Std. Mean	Errror	df	Sig
Pre-test (32 Items)	128,9474	15,86216	3,63903	-1,752	18	,048*
Post-test (32 Items)	138,5263	18,35262	4,21038			

* p<0.05.

The findings revealed that this teacher training workshop program was effective in a statistically significant degree in fostering 19 in-service EFL teachers' TPACK on teaching writing and grammar. On the other hand, seven subcategories displaying if participants improved in Technology Knowledge (TK), Content Knowledge (CK), Pedagogical Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), Technological Pedagogical Content Knowledge (TPACK) were measured as outlined in the table 4.

Table 5. T-test Results of TPACK Subcategories before and after the teacher training workshop (n=19)

Paired Samples Statistics	Mean	Std. Dev.	Std. Error Mean	t	df	Sig
Pre-test (TK)	25,9474	4,77812	1,09618	-2,187	18	0,021*
Post-test (TK)	29,2105	4,73262	1,08574			

Pre-test (CK)	17,0000	2,18581	,50146	-,199	18	,422*
Post-test (CK)	17,1579	2,40978	,55284			
Pre-test (PK)	30,3684	3,20088	,73433	-,440	18	,333*
Post-test (PK)	30,8421	3,78980	,86944			
Pre-test (PCK)	8,0526	1,47097	,33746	-1,433	18	,084*
Post-test (PCK)	8,6842	1,37649	,31579			
Pre-test (TCK)	7,6842	1,52944	,35088	-2,517	18	,011*
Post-test (TCK)	8,6842	1,29326	,29669			
Pre-test (TPK)	20,4737	3,76192	,86304	-1,352	18	,097*
Post-test (TPK)	22,0526	3,20544	,73538			
Pre-test (TPACK)	19,4211	3,35519	,76973	-2,382	18	,028*
Post-test (TPACK)	21,8947	3,10724	,71285			

$p<0.05$

The findings in Table 5 demonstrated that teachers in this study improved their Technological knowledge (TK) and Technological Content Knowledge (TCK) after the training in a statistically significant degree as p values were lower than ,005. In contrast, based on the findings of the scale, teachers in this study did not improve themselves in Content Knowledge (CK), Pedagogical Knowledge (PK), Pedagogical Content Knowledge (PCK) regarding grammar and writing teaching as p values were higher than ,05. At last, it was displayed that Technological Pedagogical and Content Knowledge (TPACK) which is the main framework of combined knowledge, increased after the training program. To conclude, t-test results of the scale revealed that teachers improved their TPACK in general in addition to the higher knowledge of TK and TCK.

4.1.2. Themes collected through Immediate and Delayed Teacher Training Workshop Evaluation Forms

Evaluation forms were applied to gain insights about the impact of the TPACK training in general, and on writing and grammar in specific. For this purpose, the second research question sought responses to the items the participants felt improved in using ICT tools mainly for grammar and writing, secondarily for other skills. Recurrent themes that were found throughout the answers of the participants to three questions on the evaluation forms were as follows:

1. *They improved their knowledge as they learned about ICT tools.*

Most of the participants mentioned in the evaluation form that they have learnt a variety of ICT tools throughout the training program such as *Grammarly*, *Google Classroom*, *Story Jumper* and mostly having increased knowledge about more *Web 2.0 tools*. For instance, Teacher10 (aged 27+, 8 years' teaching experience, female) referred to the significance of this increased knowledge on writing by stating that *with web2.0 tools she can improve learners' writing skills especially by giving assignment.* Teacher7 commented by referring to several Web 2.0 tools in particular:

> As I work at a primary school. I haven't bothered myself about grammar because kids usually have a tendency to memorize what their teacher says in a way. Besides this, I use some tools like morpakampus and okulistik. On these applications almost every unit at any grade has some exercises about grammar such as put the words to make a sentence etc. First of all, I became aware of the fact that there are lots of technological tools (such as

grammarly, edmodo, concordance, penzu, etc.) that can be used to reach our goals *(Teacher7, aged 32+, 21 years' teaching experience, female).*

Teacher12 *(aged 32+, 30 years' teaching experience, male)* mentioned that being introduced to many ICT tools on grammar and writing enabled him to teach more efficiently.

> "I used one or two digital tools like whatsapp, ms office, and eba. After so many tools introduced for teaching especially grammar and writing along with listening and speaking, now I believe and am sure that I can help my students with learning those skills more efficiently".

2. *They improved their knowledge as they learned how to use these ICT tools in their classrooms after this training.*

Participants also felt improved in terms of the knowledge about how to use these ICT tools. They revealed in their responses that they learnt how to plan, assess, and evaluate the tools in an interactive way. Teacher15 *(aged 32+, 25 years' teaching experience, female)* pointed out the knowledge of using appropriate tools considering individual differences saying "*I was teaching in a classical way using smart board. I have learned how to use different ICT tools and how to adapt them for different needs and ages after this training*". Teacher1 *(aged 32+, 16 years' teaching experience, female)* maintained this comment by attributing this know-how on teaching grammar and writing by saying " *I learned lots of useful ICT tools and how to use them to teach grammar and writing*".

> First, I will study on these tools on my own and decide on which one is the best, the most useful for me and my students, then I will put that one(s) in action with my students *(Teacher7, aged 32+, 21 years' teaching experience, female).*

3. *They improved their knowledge as they learned how to create more entertaining classroom atmospheres using ICT tools after this training.*

Some teachers also told that they found these tools funny and entertaining. That is why, they stated that they can create funnier and more engaging classes after this training program. Teacher5 (*aged 32+, 8 years' teaching experience, male*) also referred to this fun stating that the knowledge he gained in this workshop will bring more fun to his classrooms.

> "I have had the opportunity to have more detailed information about the ICT tools which are integrated into teaching English language in secondary schools. Thanks to your enlightening lectures, I believe, we will be able to achieve our targets faster in teaching process and have more fun with the kids in the classroom. I will start to take more advantage of ICT tools as I personally experienced it well during this seminar. It would be great to make the kids love English more than ever".

4. *They improved as they updated themselves about ICT tools and their use after this training.*

Some participants in this study expressed that they felt up to date about the latest ICT tools to use in the classroom after this training program.

> "I have been quiet familiar with the technics, but I was not aware of the new web tools. I feel I updated myself with the technology. I learnt lots of things. That is why, first I will try the apps by myself and then decide on which ones can be used or not" *(Teacher18, aged 32+, 18 years' teaching experience, male).*

5. *They improved their knowledge as they felt more adequate to use ICT tools in their classrooms after this training.*

A few participants in the study also stated that they increased their self-efficacy in using ICT tools more effectively in their classrooms. For instance, Teacher3 *(aged 32+, 18 years' teaching experience, female)* stated that *she really feels herself adequate now*. Teacher14 *(aged 32+, 7 years' teaching experience, male)* also expressed that *he feels much better in many ways now*.

6. *They improved themselves as they learned how to motivate their students using ICT tools after this training.*

Teachers in the study also expressed that they learned to encourage and motivate their students in a more interactive way. Teacher1 *(aged 32+, 16 years' teaching experience, female)* mentioned that *she would try to choose the proper ICT tool for the subject and for her students to encourage them to use that tool*.

Finally, the third research question was to investigate the problems that teachers have encountered during the implementation of these tools. This part of the study was planned to understand the difficulties that teachers might encounter while teaching grammar and writing using ICT tools. Accordingly, a better teacher training workshop for the implementation of the field can be recommended at the end.

The problems that teachers encountered during the implementation of TPACK in their classrooms were as follows:

- Internet connection
- Lack of hardware
- No problem at all
- Paid apps
- Students' readiness
- E-mail addresses
- Parental objection
- No access to some websites
- Not common usage of that tool
- Software

Internet connection was the main problem reported by the participants. Teacher19 *(aged 27-32, 11 years' teaching experience, female)* recorded that *she encountered Internet connection troubles most.* Teacher5 *(aged 32+, 8 years' teaching experience, male)* reported the problem that students experienced outside the classroom. He expressed the trouble as follow: "*Communication problems may generally arise because of student. There are troubles from time to time about students' access to internet-based technological programs".*

Other common problems teachers often reported were about lack of hardware and students' readiness. Teacher8 *(aged 32+, 10 years' teaching experience, female)* reported the problem she encountered as *lack of hardware and students' not being ready to use these tools.*

Another problem that teachers experienced was paid apps. This prevented students from being able to use the app freely and easily. Teacher17 (aged 32+, 14 years' teaching experience, female) stated that *she did not encounter problem about technology use, she usually used her own internet package and searched to discover alternative apps that are free.* The trouble teachers generally have is related to internet connection or lack of hardware. Some free apps might also be paid after gaining reputation.

One of the most common troubles that some teachers encountered was regarding not owning an e-mail address of younger students. It was also expressed that it was related to their unreadiness to use ICT tools. Teacher7 *(aged 32+, 21 years' teaching experience, female)* recorded the statement that the troubles she experienced most were that *her students did not have an email address as they were too young (aged 7-9). Also, they did not have enough experience about how to use this kind of tools*. She also indicated that she offered *a solution that she requested to open an email address from an elder person in the student's family or she encouraged them to open a new email address.*

There were other minor troubles such as; there were *parental objections, less common usage of that ICT tool, not allowed to access to some websites*, and some *software-based troubles.*

All in all, the training program offered alongside with TÜBİTAK 4005 funded project was fruitful for improving participant teachers' TPACK efficacy and ICT tools' use although they have experienced some troubles during the implementation.

5. Discussions

The findings displayed that this training improved teachers' technological knowledge (TK), technological content knowledge (TCK), and technological pedagogical and content knowledge (TPACK) to a statistically significant degree. On the other hand, the improvement was not significant statistically in terms of content knowledge (CK), pedagogical knowledge (PK), and technological pedagogical knowledge (TPK). However, teachers also expressed that they learned about more ICT tools and how they can be used in their classes. They said they could now create more entertaining and encouraging classroom environments with these tools, and they felt more adequate and updated about these tools after this training program. This is Technological Pedagogical and Content Knowledge. They improved in all components of TPACK. The last finding was on the problems that teachers encountered in their classrooms while implementing the ICT tools.

The finding that such a training program can be effective in improving teachers' TPACK efficacy was in line with other studies in the field (Christensen, 2002; Doering et. al., 2014; Hampel & Stickler, 2005; Lee, 2000; Tütüniş, Babanoğlu & Ünal, 2022; Walker et. al., 2012). The need for such training programs as shown in a variety of studies (Aydin, 2013, Lee, 2000) can also serve the basis for the efficiency of this training program. On the other hand, the finding regarding not having significant improvement in CK can be explained with teachers' not being aware of their CK skills. Knowledge of grammar teaching or teaching writing is obtained during their initial teacher education programme. Furthermore, significant

improvement in TK and TCK were confirmed with the findings from evaluation forms. Not having enough knowledge in PK and TPK can be linked to the shorter span of training programs as highlighted in the literature (Doering et. al., 2014).

Walker et. al. (2012) examined Math teachers, and the results were in line with this study in terms of increased positive attitude. This study was not in line with the findings of the study Doering et. al. (2014) conducted. In that study, TK was the lowest domain whereas PK, and TPK were the highest domains after the training received. The reason was interpreted as the length of the training programme which was longer than the length of our programme. Another point that our study displayed differently from that study was that some teachers felt more up-to-date and confident. Our study displayed that teachers who were not familiar with the necessary knowledge would feel up-to-date after such a training program but the ones who were already familiar would feel less confident as they felt the need to update themselves more. The different structure of training programmes on TPACK also cause the differences. The training programme offered in the study by Doering et. al. (2014) for example, focused on using a few technological tools but with a full focus on how to use, and what to use which mainly supports Pedagogical and Content knowledge (PCK). On the other hand, our study focused on introducing as many ICT tools as possible.

This study illustrated nine problems encountered in teachers' classrooms as internet connection, lack of hardware, paid mobile applications, students' readiness, not having e-mail addresses, parental objections, not having access to some websites, not common usage and lack of software. These problems can be briefly categorized as lack of necessary equipment or tools, not having enough knowledge and parental issues. These findings were mainly in line with the relevant literature (Doering et. al., 2014; Ertmer, 1999, Koh, Chai, & Tay, 2014; Lee, 2000) although this study did not reveal encountered problems linked to mental barriers such as resistance to change, not having necessary knowledge and not feeling confident, it investigated the problems encountered in their classroom following the training program which was on TPACK only, not involved in psychological issues like mental barriers or teacher well-being. We believe psychological issues play vital importance in teachers' professional development.

6. Conclusion and Suggestions

This study was conducted as a part of a general teacher training programme on TPACK. In line with the general aim of the whole training programme, the authors of this paper focused on writing and grammar as two problematic skills in ELT and addressed the research questions below:

1. Did this teacher training program improve this group of EFL teachers' TPACK efficacy to a statistically significant degree?
2. In what ways did teachers improve their knowledge of using ICT tools to foster their students' English writing and grammar skills as a foreign language?
3. What problems did teachers face implementing ICT tools in their classrooms?

Seven components of TPACK are defined as Technology Knowledge, Content Knowledge, Pedagogical Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge, and Technological Pedagogical Content Knowledge. The idea is to help students learn how technologies can be used to build on the existing knowledge, and to develop "new epistemologies or strengthen old ones (p.10)" (Mishra & Koehler, 2008). Our aim in this study was to improve teacher technological content

knowledge on teaching writing and grammar which in return would have an impact on the participants' classroom applications.

The findings displayed that this training improved teachers' technological knowledge (TK), technological content knowledge (TCK), and technological pedagogical and content knowledge (TPACK) to a statistically significant degree. On the other hand, the improvement was not significant statistically in terms of content knowledge (CK), pedagogical knowledge (PK), and technological pedagogical knowledge (TPK). Another finding was that teachers stated that they improved themselves in knowing more ICT tools, how to use these tools, creating more entertaining and encouraging classroom environments with these tools, and feeling more adequate and updated about these tools after this training program.

An astounding finding this study revealed was the fact that the participant teachers expressed that they improved their teaching and were able to create funnier and more motivating English classes after this programme. This was not mentioned much in the relevant literature but making English classes fun is an asset. In the literature of teacher education, making English classes fun is one of the pedagogical knowledge requirements (Medgyes, 2002).

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