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Exploring In-Service Teachers' Self-Efficacy Beliefs regarding Online Teaching: A Qualitative Multi-Case Study

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Abstract: *This qualitative multi-case study aims to understand the self-efficacy beliefs of in-service teachers concerning online teaching. The technological pedagogical content knowledge framework was incorporated to outline the self-efficacy beliefs of in-service teachers for conducting online teaching successfully, especially in this advanced learning environment. The self-efficacy theory by Bandura and TPACK framework by Koehler and Mishra was used as the conceptual foundation, and in keeping with that, semi-structured interviews were conducted with five in-service teachers who were also enrolled in a teacher education program. The study found the high self-efficacy of in-service teachers regarding online teaching as in-service teachers find themselves comfortable in online teaching. Based on the literature review and findings of the study, it is suggested that the TPACK framework informed online teaching should be incorporated in pre-service and in-service teacher training programs in order to enhance their knowledge, skills, and positive attitudes towards effective online teaching.*

Key Words: TPACK Framework, Self-Efficacy Beliefs, In-Service Teachers, Online Teaching, Twenty-First-Century Skills, Qualitative Multi-Case Study.

Introduction

Technology is playing a fundamental role in every field of life and also has developed its path in the field of education. Technology has imprinted every field of life with its innovations, and it has transformed not only our way of thinking but also the trends of teaching and its styles (Akram, Malik, & Jumani, 2021). However, teaching with technology is not enough until it is blended with the technological, pedagogical, and content knowledge of a teacher (Schmid, Brianza, & Petko, 2021). It is important not only to integrate technology in their teaching but also teachers should have to be competent and efficient in their skills and competency in using technology according to the type of content and level of students (Lavidas, Katsidima, Theodoratou, Komis, & Nikolopoulou, 2021). Once they get together, enhanced learning and teaching environments take place, thus making the learning of students permanent and efficient (Santos & Castro, 2021).

While in this age of innovation and advancement, where information and knowledge are being upgraded on a daily basis, teachers should pay more attention to their knowledge of content and their methods of teaching. Programs are currently offered to teachers in many institutions to develop different skills and habits to make their teaching appropriate that fit the standards of teaching and learning (Ahmed Abdullah & Sultana Mirza, 2020). An educational institution is a place where we can find students and teachers with different backgrounds and with different competencies. Therefore, teachers find themselves more responsible for upgrading their knowledge and skills (Hassan, 2019). As technology is rapidly changing, many teachers are trying their best to deal with the problems related to the use of technologies (Zahid Ali, Thomas, & Hamid, 2020). Students of this age are smarter

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than we think, and following that, teachers should be ready to deal with them, and they should feel confident while they are in contact with them (Padmavathi, 2017).

The self-efficacy of teachers is the primary aspect of teaching. Therefore, it is worthy of understanding the self-efficacy beliefs of teachers regarding technology and online teaching. In past research studies, it was found that in traditional classes, the self-efficacy of teachers has a close relationship with the students' performance (Goddard, Hoy, & Hoy, 2000). Talking about the success of the educational institution and making students high achievers, it is important to know what a teacher thinks about their efficacy and how competent they feel themselves.

In recent years, researchers have shown that teachers who use technology like the computer for more than five hours a day have scored higher than the teachers who make less use of technology in all the domains of the TPACK framework (Saltan & Arslan, 2017). Many studies show that score of the TPACK framework is higher in teachers with experience than the pre-service teachers. Özgün-Koca, Meagher, and Edwards (2010) concluded that in-service teachers are more capable of using technology in different phases of teaching. It is also seen in other studies that in-service teachers that received training regarding ICT have a high level of TPACK (Chai, Koh, Tsai, & Tan, 2011). Research by Kazu and Erten (2013) showed that the majority of the teachers had positive perceptions of TPACK. In a recent study, it was concluded that teachers had a high level of self-efficacy regarding all the domains of TPACK. Findings also showed a high level of efficacy of teachers regarding TPACK, and they were also in support of using technology sufficiently (Kazu & Erten, 2014).

In Pakistan, many studies tried to find the reasons and halts in proper technology integration, which in turn hinder quality in online teaching. A study revealed that teachers faced some issues in implementing ICT in their daily lessons (Zualfiqar Ali & Azhar, 2018). In contrast, some other researchers disclosed that many participants went through different issues while studying online, like poor training regarding the use of technologies, the inexperience of using a desktop, and lack of different skills (Anwar, Khan, & Sultan, 2020). Also, that there was an inadequate system of internet and poor connections between teachers and students, and it caused many limitations in online learning (Dogar, Shah, Ali, & Ijaz, 2020). Online teaching is hindered due to the high cost of the internet, lower attendance and interest of learners, and lack of TPACK knowledge (Noor, Isa, & Mazhar, 2020).

In-service teachers have more responsibility than pre-service teachers, as they are currently in the teaching field. In-service teachers tend to have more efficacies regarding technology as they are dealing with a technology-oriented curriculum. According to previous researches, it is assumed that in-service teachers are efficient and agree with the fact that they can use technology in their teaching (Padmavathi, 2017). Thus, today's curriculum is also in support of technology-based content, and teachers should be prepared enough to teach twenty-first-century students.

Theoretical Framework

Bandura's (1997) self-efficacy theory and the Technological Pedagogical Content Knowledge framework of Mishra and Koehler (2006) were used to frame this study. The TPACK framework identifies the knowledge and areas in which teachers require to be competent when they are teaching different levels of students in an online environment. Bandura's self-efficacy theory highlights the behavioral outcomes of an individual that depends on their capability beliefs.

Self-Efficacy Theory

Bandura (1977) introduced the concept of self-efficacy, and it's a belief and assessment of an individual ability to reach a higher level of his capabilities. In education, self-efficacy is the ability of a teacher to serve in class and to believe in oneself to teach to its fullest. Under the social cognitive theory, those teachers who don't think of themselves to be successful while teaching students put less effort into preparing themselves and conveying their knowledge to students (Tschannen-Moran & Hoy, 2007).

The self-efficacy of teachers affects all the activities conducted in the classroom by teachers. Furthermore, it also affects the use of technology, and students who are there to learn are also influenced by their confidence.

TPACK Framework

The TPACK framework has its roots in the

pedagogical content knowledge framework (PCK) of Shulman (1986). The technological pedagogical content knowledge (TPACK) framework is an intersection of teachers' PCK and technology awareness to improvise teaching with technology (Koehler, Mishra, & Cain, 2013). TPACK is fundamentally the junction at which pedagogical knowledge, content awareness, and technological knowledge intersect (Graham, 2011). The framework consists of three components of a teacher's knowledge, namely content, pedagogy, and technology. It also explains the interlinking of pedagogical content knowledge, technological content knowledge, technological pedagogical knowledge, and TPACK (Koehler et al., 2013).

Teacher's knowledge of specific content to be taught falls under content knowledge (CK), and it includes a profound understanding of theories, phenomena, practical applications of knowledge, etc. Pedagogical knowledge (PK) is the teachers' knowledge of practices and the process of education. It includes knowledge of teaching methods, assessment strategies, aims and purposes of education, etc. Technological knowledge (TK) is the knowledge of educational technologies that can be used to improve and enhance the teaching-learning process. Pedagogical content knowledge (PCK) is the amalgamation of both content knowledge and the knowledge of teaching/delivering that particular content (pedagogical knowledge) (Yigit, 2014).

Decision-making about the most appropriate technology to be used for effective content delivery and using that technology to enhance the teaching of specific content comes under the umbrella of technological content knowledge (Choi & Young, 2021; Kurt, Akyel, Koçoğlu, & Mishra, 2014). Technological pedagogical knowledge (TPK) is concerned with using technology accompanied by correct pedagogy. It includes using appropriate pedagogy to teach efficiently with technology (Yurdakul, Odabasi, Sahin, & Coklar, 2013). Technological pedagogical content knowledge (TPACK) is the integration of all of the above dimensions. It is concerned with the teaching of any content with pedagogy while consulting the appropriate technology.

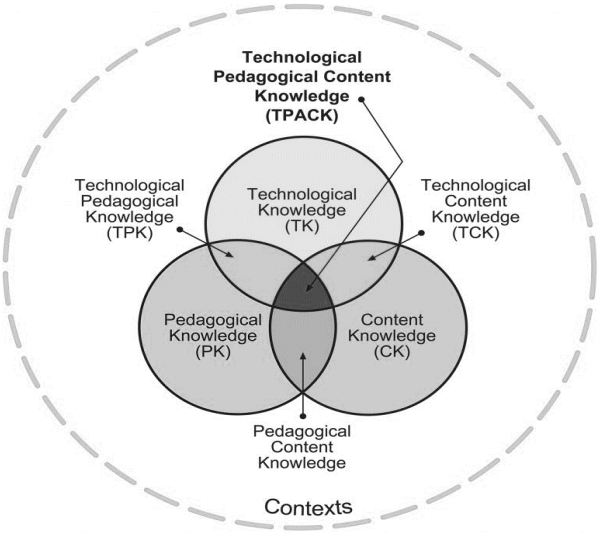

Figure 1: Schema of Technological Pedagogical Content Knowledge (TPACK)

Methods and Materials

This qualitative multi-case study (Stake, 2013; Thomas, 2021) is designed with the purpose of investigating the self-efficacy beliefs of in-service teachers concerning online teaching. When qualitative research aims to get an in-depth understanding of the issue, and the main purpose is to look at the problem through participants' eyes, the qualitative case study research is appreciated (Stake, 2013; Yin, 2018). As our interest

was to explore the beliefs of teachers currently working in schools about online teaching, this study utilized a semi-structured interview design. Qualitative research has the edge that it explains the attitudes, believes, and opinions in their original setting. This kind of qualitative research allowed us to explore the behaviors, feelings, and beliefs of participants. Self-efficacy theory by Bandura and Koehler and Mishra's TPACK framework was used for the construction of an interview guide. In this study, the data were collected via semi-structured interviews. Each interview lasted for approximately 45 minutes.

Participants

Participants in this study were five in-service school teachers who were studying as students of an Education Department in a private university in Lahore. This sample was selected purposefully to yield the most relevant information (Patton, 2015). Participants were teaching in schools and were enrolled in a Master of Philosophy in Education program as regular students in the evening shift. All participants had passed a course of *Technology Integration in Education* in the same batch.

Table 1: Demographic Information of Participants

Participants	Age	Gender	Academic Qualification	Prior teaching Experience
Participant 1	29	Female	MEd	10 years
Participant 2	23	Female	BSEd (Hons)	2.5 years
Participant 3	24	Female	BSEd (Hons)	6 months
Participant 4	24	Female	BSEd (Hons)	6 months
Participant 5	23	Female	BSEd (Hons)	1 year

Data Collection and Analysis Methods

An interview guide consisting of twenty open-ended questions related to teachers' self-perception, online teaching, TPACK, and technology, was constructed to collect data from teachers (Patton, 2015). At first, the demographic information of participants was gathered. Several probing and follow-up questions were also asked to create in-depth data. These interviews helped us find out in-depth meanings of teachers' experiences while using technology. Their self-efficacy beliefs regarding online teaching and concerning their online teaching experience were explored. Interviews were analyzed using the method of within-case study analysis (Miles, Huberman, & Saldaña, 2020;Saldaña & Omasta, 2021). Within-case analysis revealed unique insight into teachers' self-efficacy beliefs regarding online teaching in relation to the TPACK framework (Miles et al., 2020).

Trustworthiness of the study's findings was ensured by member checking—soliciting teachers' views of the credibility of the study's findings and interpretations (Creswell & Poth, 2018). Furthermore, A peer review was conducted by holding a meeting of three authors in which interview transcripts, coding and final findings were discussed (Miles et al., 2020).

Findings

The section presents five cases of in-service teachers who were, at the time of interviews, doing the MPhil Education program and had studied a course titled *technology integration in education*. Each case has been discussed in detail, preceded by its demographic description. Later on, a brief analysis and interpretation of each case are provided.

Participant 1

Demographic Profile

29 years old female teacher with experience of ten years in the field, source of account: authors directly contacted the subject via cell; the origin of data: online interview via Zoom Cloud Meeting software.

She has done her graduation and masters as a private candidate. She is currently pursuing her MPhil in Education in a private university as a regular student. She attends school in the morning and university in the afternoon.

In her school, she uses technology very often. Nowadays, she is conducting online classes. In these classes, she shares slides, videos, and flashcards (auto-generated from Google) with the students. She claims that she is very close to technology and finds herself equipped with skills

related to technology usage. However, she considers that technology can be disadvantageous for our mental health.

As her content knowledge is concerned, she feels confident. She beliefs that she knows the aims, objectives, and applications of content in real life.

She claims that, as a primary class teacher, she knows and uses different strategies and materials to deliver content knowledge. She actively integrates technology into her classrooms. She uses questioning, computer-generated worksheets, activities, and quizzes to assess students' performance. She is highly concerned about the performance of all of her students. She says, "I make my brilliant student busy at work and teach slow learners through other strategies made for them. The goal of my teaching would remain the same, but the path would be different. I use differentiated instruction methods in my classroom." She assumes the demonstration method, role-play method, and learning by making some helpful approaches to make students' thinking effective.

She says that she can use technology to assess students. She says, "It will help in having a digital record of students' learning and is also time-saving. Online worksheets are very beneficial in the Google classroom. Students can edit, and the teacher can grade easily." She assumes that technology is helping teachers in boosting the motivation of students, track their progress, acknowledge their interests, and identify gaps in their knowledge.

She feels confident in using TPACK for teaching. It gives her different perspectives on how to become proactive for future challenges. It makes her bolder and more confident. According to her, TPACK is so much important and useful. She thinks that TPACK and technology integration is the only way toward quality teaching because when technology is integrated into lessons, it improves teaching and learning.

She seems highly confident in using technology for educational purposes. She uses technology in her classrooms to enhance students' learning because she has a strong belief that technology integration can add to her success as a teacher. In the pedagogical practices, she appears to be an optimistic and knowledgeable person as she is aware of different teaching methods and their usage. Her content knowledge and experience of delivering this knowledge to learners via technology make the foundations of confidence she possesses. Consequently, she turns out to be a huge supporter of the TPACK framework, and according to her, it's the only way to achieve quality in education.

Participant 2

Demographic profile

23 years old female teacher having 2.5 years of teaching experience, source of account: authors directly contacted the subject via cell; the origin of data: online interview via Zoom Cloud Meeting software.

She has done her Honors Degree in Human Development, and now she is pursuing MPhil in Education. She attends school in the morning and the university in the afternoon.

She uses mobile and laptop for novel reading and using social networking sites, and she also uses it very often for studies. She beliefs that the biggest issue caused by technology is that we have left doing brain work, and our minds are being paralyzed. She also believes that there is a threat to privacy due to technology. She claims that she does not have that many skills in technology because she doesn't have an interest in technology.

As her content and pedagogical knowledge is concerned, she has sufficient knowledge for 2-3 subjects. She is always learning new things, so she assumes that her knowledge is up-to-date and she knows the applications of the content she teaches. She is very confident in her pedagogical practice as she says, "When I teach, I use brainstorming first. Then I teach them about the topic. I use the internet to clear the ambiguities. I use formative assessment. For that, I use direct observations and quizzes." She believes that for coping with students with differences, a teacher should increase the attention span of students and should use differentiated instruction as she says, "I am not very confident in it. However, I will try to plan activities that engage both slow learners and fast learners. There are many brain games software which has different levels of player' competency. I use those games to teach different concepts to individuals with differences." She claims that she can teach to improve students' existing knowledge

and that she knows the objectives of the subject she teaches.

She knows a few websites for online learning materials, and she believes that these are very helpful. When deciding about a suitable technology, she thinks that firstly, it should be checked whether the technology is understandable for students or not. She goes with her instinct, students' caliber, and the content to decide the appropriate technology. She has a view that students should be taught at their mental level.

Observing students during technology-integrated activities to assess their behavior, social, emotional, and cognitive assessment is a profound way of assessment, in her opinion. She argues that there is new technology every day in the market, and she does not consider herself an expert. Hence, she doesn't have much-developed skills in using technology in the twenty-first century. She feels like her expert areas are content and pedagogy, but she doesn't feel very confident in using evolving technology. Hence, she does not assume herself confident in adopting the TPACK framework. It is interesting to note that she is of the view that using only TPACK for quality teaching in the twenty-first century is not enough to cover all the aspects of teaching. She thinks that a better model should be introduced.

She appears to be moderately acquainted with technological knowledge. Her use of technology is restricted to netsurfing on social networking sites and study-related tasks. However, she lacks grit when it comes to purposeful usage of technology in teaching because it seems that she doesn't know about decision-making for the selection of appropriate technology to teach specific content. Hence, she lacks in TCK and TPK. Her areas of fortitude are her content knowledge and pedagogical practices. She is not an adherent of the TPACK framework as she believes that there is room for more research and a better model should come forward.

Participant 3

Demographic Profile

24 years old female in-service teacher; source of account: authors directly contacted the subject via a phone call; the origin of data: online interview via a phone call.

She is recently graduated from a public university and doing her MPhil from a private university in education. She is very passionate about her profession; therefore, she is doing teaching in a private primary school. As a teacher, she usually didn't use technology that much before, but due to pandemics and subsequent online classes, she is frequently using technology nowadays and getting to know many new technologies. She thinks that there are many challenges to using technology in junior school as she says students pay more attention to technology than their teacher, and she adds that it is a challenge to teach juniors with technology as they take more time to understand.

She thinks that she has sufficient knowledge about the content and technology. She believes that her knowledge is not fully upgraded. She claims," If I am teaching something, I get myself prepared for that particular content. I cannot say that my knowledge is fully up to date, but I try to update my knowledge. So, you can say that 50% of my content knowledge is up to date." She is confident in her teaching approach used while teaching. She narrates that she mostly uses the activity method while teaching and sometimes use worksheets for the better application of the content.

She believes assessing students is not a big deal now a day as we can take pre and post-test to assess their learning but teaching different learners is kind of difficult as there are a variety of different students. She explains that some students are fast learners, like they pick topics or understand very easily, but some of them need more time. She underscores, "I give both students different questions. I give the fast learner a bit lengthy question and the slow learner a short question so that they can end it at the same time. And not a single student feels bad or any complexity. If I have given them something to learn and the student does it early, I ask him to share with all the class and help them."

As far as making the thinking and learning of students effective, it is a challenging task, but she believes that she handles it efficiently and carefully. She claims that she is not a pro in using all the technologies for teaching, but she has some knowledge about most of the technologies. She is not satisfied with the fact that it is not easy to cater to individual differences in all the situations in online teaching. She adds, "Usually, it is easy to

cope individual differences with technology while teaching online as we can solve the problems by using different content games, but it is a little difficult in schools as most of the schools do not have that much technology. So, it depends on the situation, but if schools also provide the required technology, then I will be able to do so."

She believes that assessing students through technology is easy in online teaching, and she feels confident in teaching with TPACK as this is the need of today. She also thinks that TPACK is the only way to quality teaching as she answered, "I think this is the only way as it focuses on all aspects of online teaching and it is also in the latest trend of teaching. It should be used for teaching."

She seems to be confident in teaching and strategies of teaching, but she lacks some of the skills of using technology, but that is something that she can overcome. She is likely to be a supporter of online teaching as she thinks that assessment of students with the use of technology is easy, and she finds herself confident in using different websites for making the learning of the students easier. She knows the objectives and purposes of the content she is teaching and finds her knowledge up to date. She thinks that she is not 100% confident in using all the technologies that can be used for teaching, but she finds her knowledge sufficient. She appears to be positive to teach in the twenty-first century with the help of the TPACK framework. She also believes in support that the TPACK framework is the only way to quality teaching.

Participant 4

Demographic Profile

24 years old female in-service teacher; source of account: authors directly contacted the subject via a phone call; the origin of data: online interview via a phone call.

She has graduated from a public university and is currently teaching as well as doing her MPhil Education from a private university. She seems to be very passionate and dedicated to her studies and her career. In her teaching profession, she is not a user of technology as she teaches in a public school, and they do not provide the facility of using technology in their teaching. She says, "If I talk about my institution where I teach, there is not much use of technology, and it depends on the institute you are teaching in that can provide technology. If a school provides required facilities, training, and skills, then we can teach technology integrated lessons."

She is aware of the new technologies that came across during Covid-19, but she finds it a challenge to use them as in public schools, most of the students do not get in touch with any technology, but due to the current situation, it became the need, so she finds it challenging to teach them online. She is confident in having skills in using technology as she elaborated that she daily interacts with technology in her university. She finds herself confident that she has full command of her content and its application at a different level, but side by side, she adds, "The knowledge and content we are providing cannot be applied in real-life situations. Mostly in primary and elementary level activity method is more useful but, in my institution, it is not possible."

As far as teaching methods and assessments are concerned, she mostly uses the lecture method, and for assessment, she gives tests and activities. She believes that pedagogical strategies and assessing different learners have been a challenge for teachers in public schools. She responds that she only uses the lecture method in her school situation, but she claims that regardless of these challenges, she is well aware of the objectives and purposes of the content she is teaching. She is struggling in her career as she is facing difficulties in her teaching due to the lack of resources and facilities in her school. She asserts, "It matters a lot to choose different methods for teaching effectively, but we cannot make it possible as we have little time span, and we cannot use any other method except lecture method." Talking about awareness of websites, she is confident that she knows the websites that can be helpful for students and her as well. She seems to be certain about technology selection suitable to content, and she claims that she uses audio-visual methods for coping with individual differences. As far as assessment with the help of technology is concerned, she asserts, "Online tests can be created, and with the help of them we can test their academic achievement, but our school does not demand it."

She is looking forward to teaching with technology as she thinks teaching brings a lot with it and she is very much prepared to teach with technology in the twenty-first century. She feels

that the TPACK framework is a complete package to teach with. She adds, "TPACK provides a complete package of content knowledge, pedagogical knowledge, technological knowledge as well as technological pedagogical knowledge. These all elements make teaching and learning effectively. It is necessary to follow TPACK to get our desired outcomes, and we can overcome our challenges and drawbacks." On the contrary, she does not agree with the fact that the TPACK framework is the only way to quality teaching. She thinks that every model has pros and cons, and there is always a gap; therefore, we cannot say that this is the only way to quality teaching.

This participant is very enthusiastic about her career. She seems to be confident and professional as she is facing the non-availability of resources in her teaching, but still, she thinks that she can do a lot and can learn a lot about teaching with technology. She is teaching in an institution in which she cannot use all her skills and her techniques due to a lack of resources. She does not use technology in her teaching, but she is aware of the usage as she uses technology in her university. She is optimistic about her skills and approaches that can be used while teaching in different situations and environments. She is well aware of the aims and objectives, but she claims that they cannot be fulfilled in her school due to resource constraints. Moreover, she knows the strategies and assessment methods, but again she cannot apply them in her school. She is positive about her skills and readiness to teach in the twenty-first century, but she does not agree with the fact that TPACK is the only way to quality teaching.

Participant 5

Demographic profile

23 years old female in-service teacher having experience of 1 year in the profession; source of account: authors directly contacted the subject via a phone call; the origin of data: telephonic interview.

She is a graduate of a public university and currently doing MPhil in education as a regular student. She attends her university in the evening and teaches at a school in the morning.

She uses technology very often. Most of the time, she is online on Facebook, Twitter, WhatsApp, YouTube, etc. She claims that she is familiar with new software like different meeting apps and designing software like Adobe in-design, Photoshop, etc. She thinks that there is a privacy issue with people using technology as it does not protect anyone's personal information. She adds that poor time management while using technology is an issue and also that technology has halted our critical thinking. She declares that she has the skills to use technology, and even if she is not adapted to certain software, she would quickly learn it.

She is sure that her content knowledge and pedagogical skills are enough, but she thinks that it is not up-to-date. She believes that without the application of the content in the real world, its teaching and learning are useless. She claims that she has sufficient knowledge about the aims and objectives of the particular content. She adds that she knows what advantages and places do her subject has in real life. When it comes to pedagogical skills, she states, "I use demonstration where possible. Mostly, I use diverse methods. Sometimes, the lecture method is the best to work with. It basically depends on the context and situation. The best way to assess is the formative assessment. For this, I use observation, class activities, paper-pencil tests, and situations."

She claims that for a classroom having diverse students, she would use differentiated and personalized instruction and that she would try to polish their potentials and interests to help them achieve their goals.

She beliefs that for teaching content, she is tech-savvy, and she can search and find her desired content on the internet. She also knows some gaming software and some simulation technologies but has never used them in teaching. When coming to decision-making about technology, she argues that there are many things to consider, like feasibility, validity, learner's interest, ease of access, etc. In her view, technology is useful in assessing students. She uses rubrics to keep a good record of students' performance.

Considering her TPACK self-efficacy, she states, "I am prepared but not fully. I always consider that there is a lot left to learn. I can't be satisfied. I think I can best teach via TPACK. It combines technology, content, and pedagogy, which are all we need to be effective today." She thinks that it is the only way to quality online

teaching because it is in accordance with the needs of the modern era.

This participant seems active in using technology as she spends more time interacting with technology in her day-to-day life. She finds herself confident in having the required skills of using technology, and she claims that she is a quick learner and can learn all the skills regarding technology. She is optimistic that she knows all the strategies and methods to use, but she thinks that they are not up to date. She is very clear about her goals regarding teaching and makes use of several teaching methods during her instruction. She is vigilant in assessing students as she utilizes different assessing tools like rubrics and makes sure to use them often. She believes that she is not fully prepared to use TPACK in the twenty-first century because she argues that there is always something left to learn. In her opinion, she thinks that TPACK is the only way to quality online teaching as its fits to modern era.

Discussions

The focus of this study was to explore and understand the self-efficacy beliefs of in-service teachers regarding online teaching. For this concern, analysis was done within the scope of the TPACK framework. The study revolved around three main aspects, namely online teaching, teachers' self-efficacy perception, and TPACK. Digital learning has become an important part of our education system and is becoming useful to make our future students competent and admirable. Thus, it has become pivotal to use technology in the teaching and learning of students and in each subject (Bakar, Maat, & Rosli, 2020).

Some teachers reported moderate self-confidence regarding the technology used for teaching different subject matter as they believed that there was always room for improvement. Concerning the TPACK framework and teacher's readiness, it was observed that most teachers are optimistic about using TPACK in the twenty-first century. Only a few participants were of the view that the TPACK framework is the only way to quality teaching. Therefore, according to the overall perceptions of teachers, it is concluded that most in-service teachers find themselves confident in using TPACK in online teaching.

Most in-service teachers seemed to be confident in having sufficient knowledge in terms of pedagogy, strategies, and aims, and objectives of the content they are teaching. They believed that they could confidently use technology but might get stuck at some point as technology is changing very rapidly and constantly. The result of this study is quite similar to the study of Özgün-Koca et al. (2010), which concluded that teachers are more likely to use teaching strategies and technology efficiently. In addition, a study conducted in Canada had 74 middle school teachers as participants (DeCoito & Richardson, 2018). It concluded that the teachers had high levels of understanding of technology usage. Most of the teachers use and appreciate technology. However, most of them looked at technology as a way to teach but not as an element in the whole teaching-learning process (DeCoito & Richardson, 2018). The results of our study are similar to another study conducted in Malaysia with 66 secondary school teachers. It indicated that the self-efficacy perceptions of in-service teachers about technology integration and TPACK are positively and strongly associated with each other (Bakar et al., 2020). However, an investigation in Saudi Arabia revealed that for online teaching, despite the optimism and confidence teacher shows, there is much room for further development. Teachers need to be substantially aware of choices and decision-making about technological tools (Albuloushi, 2019).

Reviewing the local studies, we came across some studies that showed that we as a developing country had not reached that stage where we can integrate technology frequently and where teachers are efficient enough to use the TPACK framework. Local studies showed some challenges and issues in using the TPACK framework like lack of skills, low budget, support from the institution and government (Khan, 2019). Few of the studies in Pakistan aimed to get the know-how of the framework (TPACK), which includes many aspects of teaching, and to assess teachers' knowledge about instructional technology. The results revealed that teachers are using technology at a very basic level, and they need a professionally advanced approach towards technology integration (Soomro et al., 2018). In addition, a study conducted by Khan (2019) showed some hurdles for instructors to integrate technological pedagogy in their daily lessons.

However, a local study showed strong evidence regarding the proficiency of the instructors. It also highlighted that instructors are very efficient in integrating technology, and it has made the performance of their students worthwhile (Zahid Ali, Busch, Qaisrani, & Rehman, 2020). Another local study regarding TPACK showed a positive association of the technological pedagogical model with the efficiency of instructors in many aspects (Aslam, Khan, Asad, & Ahmed, 2021). Many factors are helpful in making instructional strategies powerful and successful. Strategies like feedback, audio recording, and assessing students can be helpful. While dealing with the self-perception of the use of technology, participants of a qualitative study by Ahmed Abdullah and Sultana Mirza (2020) showed non-serious attitudes of novice teachers and their regularity issues. However, student teachers have positive thinking and confidence regarding the use of the TPACK model in e-learning (Naz, Hani, & Muhammad, 2020).

Conclusion

The study found the high self-efficacy of in-service teachers regarding online teaching. After reviewing both international and local studies, it was concluded that both of the studies have different findings in the self-efficacy of in-service teachers regarding online teaching. In addition, the review of local studies identified a gap in comparison to the results of our study regarding self-efficacy beliefs of in-service teachers regarding online teaching as interviewed in-service teachers find themselves comfortable in online teaching.

Based on the findings, this study recommends that classrooms should be facilitated with upgraded technology according to the need of the content and students. In addition, it is recommended that training regarding the TPACK framework should be conducted in every institution where teachers are integrating technology. At the same time, for better use of technology, teachers' skills and efficacy should be increased with the help of training programs. Training programs should be adopted according to the levels and competencies of the teachers. Moreover,

The sample of the study was limited, so the results may not be generalizable to all in-service teachers because it was limited to five in-service school teachers who were also studying as students of an Education Department in a private university in Lahore. Therefore, we cannot conclude that students from other institutions think the same. Hence, more research studies should be conducted on teachers' self-efficacy and in different contexts and dimensions so that the results can be more valid and generalized.

Furthermore, this study was conducted in an urban setting where teachers can perceive TPACK and online teaching as an easy approach to be used; in-service teachers in rural areas have less access to technological equipment and may have not as many resources as these teachers have (Zualfiqar Ali & Azhar, 2018). Future studies can be designed to explore the self-efficacy beliefs of in-service teachers in rural areas.

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