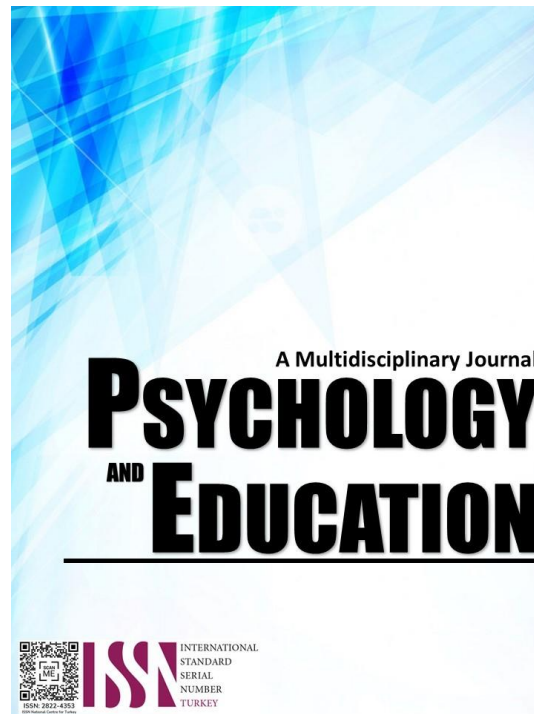


TPACK PROFICIENCY OF THE INTERNATIONAL TEACHERS IN CHINA: BASIS FOR INTERVENTION PROGRAM



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TPACK Proficiency of the International Teachers in China: Basis for Intervention Program

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Abstract

Nowadays, the way young people learn is different from before. Previously, students only listened to each lesson taught by their teachers. But now, there are many ways that students can use to learn, just like using technology. Based on the results of the survey, most of the respondents agree and strongly agree with the statements across all the seven elements of TPACK. This is a clear manifestation that the international teachers in China have adequate knowledge of the use of technology in teaching. This is supported by the advanced facilities where these teacher-respondents are currently teaching. This study could be a basis for policy formulation on how the other countries' education system addresses the shortage and lack of access of teachers to technology tools for an improved teaching and learning process.

Keywords: *learning, intervention program, TPACK proficiency, international teachers, China*

Introduction

Learning is dynamic and progressing. The change is influencing it in time, and teachers are among the greatest influencers. Instructional competencies are essential practices that teachers must master to effectively instruct students to maximize knowledge and skill acquisition (West, Swanson, & Lipscomb, 2017). Nowadays, the way young people learn is different from before. Previously, students only listened to each lesson taught by their teachers. But now, there are many ways that students can use to learn, just like using technology. Shulman, in 1986, believed that the usual idea of knowledge in teaching is that teachers have a set of content knowledge – specific knowledge about the subject they are teaching – and a set of pedagogical knowledge – knowledge about how to teach, including particular teaching methods. He calls this pedagogical content knowledge or PCK (McGraw-Hill, 2019). Technology plays a major role in helping the teachers deliver lessons and students' learning which completes the model of PCK, and this is Technology, Pedagogy Content Knowledge (TPACK). This research aims to assess how TPACK is applied in Chinese classrooms, especially in international schools.

Students benefit a lot from using technology in the classroom. This is an essential tool especially in learning a second language. Moreover, teachers seemed to appreciate that technology is available to them as means of enhancing education and making it more authentic for the students (Ruggiero & Mong, 2015). In today's era where different types of technology are available to students, they find it not

only a tool for teaching as well as a learning tool. Teachers also benefit from the advancements that technology brings to the classroom. These developments help to facilitate teachers' teaching.

Pedagogy refers to the interactions between teachers, students, the learning environment, and the learning tasks. Learning is dependent on the pedagogical approaches teachers use in the classroom (UNESCO, 2018). Effective pedagogy is based on the teacher's strategy in lesson development, the student's abilities, and the availability of resources. When the teacher's pedagogy is effective, it will lead to good results in the students' learning.

According to Koehler and Mishra (2013), content knowledge is the “knowledge about actual subject matter that is to be learned or taught”. Teachers must know about the content they are going to teach and how the nature of knowledge is different for various content areas. Years of preparation in teaching play a vital role in building the content knowledge of teachers regarding the subjects they are teaching in the classroom.

Technological Pedagogy Content Knowledge (TPACK) is a theory that was developed to explain the set of knowledge that teachers need to teach their students, to teach effectively, and to use technology (McGraw-Hill, 2019). TPACK is an essential part of the education system today as it incorporates the growing demand for the use of technology in the classroom and continues the focus on the content and how we teach it. Therefore it sets up education for the future and the students for their future (Craig, 2017).

This research utilized the model of TPACK by Schmidt et al., 2010. This study aims to help the teachers in some international schools in China to upskill and reskill their knowledge on the use of technology in teaching. This will serve as a basis for an intervention program in the school where needed. Moreover, the results of this study will serve as a basis for other countries education systems to address the shortage and lack of teachers' access to technology tools for an improved teaching and learning process.

Literature Review

This section presents a survey of related literature, concepts, and writings of TPACK framework, which have significant bearing or relation to the study. Several research on TPACK highlights the significance of the use of technology in the teaching process. They help the teaching and learning process become better as we are now in the technology world. This advancement in the field of teaching both benefit teachers and students.

Teachers' knowledge is thought to have a significant impact on their decisions and behaviors related to technology use (Baturay et al., 2017). Asking how teachers can better integrate technology into their teaching, Mishra and Koehler (2006) attempted to identify the types of knowledge required for this purpose. Building on Shulman's (1986) theory of pedagogical content knowledge (PCK), Mishra and Koehler (Mishra & Koehler, 2006) proposed the TPACK framework, which included the new arena of educational technology. This framework offered the first theoretical conceptualization of integrating technology into instruction (Rosenberg & Koehler, 2015).

As shown in Figure 2, according to M. Koehler and Mishra (2009), the TPACK framework comprises seven distinct components: CK (knowledge of teaching content); PK (knowledge of teaching methods); TK (knowledge of technology usage); TCK (knowledge of how technology enables new expressions of specific content); TPK (knowledge of how the techniques of teaching and learning can change when particular technologies are used); PCK (knowledge of the transformation of subject matter for teaching); and TPACK (integrating knowledge of content, pedagogy, and technology to achieve truly meaningful and deeply skilled teaching with technology).

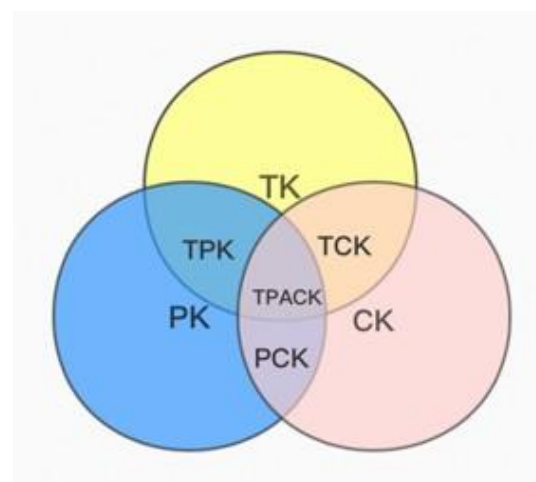


Figure 1. *TPACK Framework*

The TPACK framework is thought to benefit insights into the complex phenomenon of technology integration since it separated the intertwined forms of knowledge and took account of their interactions. According to Koehler and Mishra (2009), TPACK has offered a proper way to observe and depict teachers' thought processes and actions about technology integration in diverse educational contexts.

Teacher knowledge and competency are vital elements for effectively integrating technology into instruction. However, only when the teachers believe in the value of technology will they proactively apply their knowledge and expertise to technology integration (Ding et al., 2019). That is, when teachers come across the need of integrating technology into teaching, they should not only upgrade their knowledge of instructional strategies, methods, and approaches but also change their attitudes, beliefs, and pedagogical ideologies (Ertmer & Ottenbreit-Leftwich, 2010).

In sum, the way technology is utilized in the classroom helps make the teaching and learning process more effective. Students can learn to their maximum potential while teachers deliver lessons more efficiently. This innovation greatly benefits both teachers and students.

Methodology

A total of 43 foreign international teachers from across the eastern, central, and northern parts of Mainland China via non-probability volunteer sampling participated in this study.

Considering the different developing levels of the regions where the participants come from may have a possible socio-economical influence on the statistical results, the researcher ensured that the participants were all from provincial capital cities and that the levels of information technology facilities in their universities were similar.

An online invitation for the electronic questionnaire through Google Form was sent to the participants. As a result, all participants were well informed of the research goals. As shown on the survey platform, each participant took no more than 20 minutes to complete the questionnaire, which took place anonymously. Altogether, 43 valid questionnaires were achieved by the researcher.

Results and Discussion

This survey used a quantitative questionnaire consisting of a 30-item, 5-option Likert scale design, adapted from the works of Schmidt, Baron, Thompson, Koehler, Mishra, & Shin, T. (2009-2010).

The TPACK questionnaire is divided into several sections, each considering a different aspect of the TPACK framework. The seven sub-divisions of this questionnaire consist of Technological Knowledge (TK), Content Knowledge (CK), Pedagogical Knowledge (PK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK).

The first sub-division considered was Technological Knowledge (questions 1-6). Technological Knowledge is considered the knowledge to correctly operate computers, tablets, video recording devices, projectors, speakers, and other electronic devices that aid in the processing of information (Sahin, Celik, Akturk & Aydin, 2013).

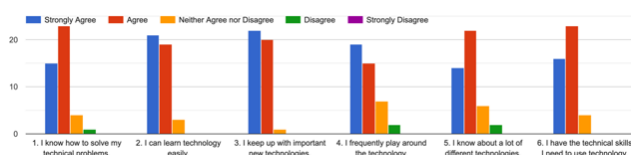


Figure 2. Graphical Presentation of the Respondents' Response to TK

Statements concerning how to solve one's technical problems (#1), knowledge about different technologies (#5), and having the technical skills that one can use technology (#6), showed the greatest agree responses among the respondents. Statements concerning someone can learn technology easily (#2), keep up with important new technologies (#3), and playing around with technology frequently (#4), displayed the responses where the respondents agree strongly. Only 2.5 percent (1 out of 43) and 5 percent (2 out of 43) of the respondents disagree with the #1, #4, and #5 statements.

Basic computer skills among teachers today are as important as other teaching tools (Sharma, 2018). The use of technology in teaching and learning has become very common these days (Ghora & Bhatti, 2016). Classroom activities involving technology increased students' awareness to be more effective thinkers and creative in dealing with their lessons. These provide easy access to discussions and engage them more in teaching-learning. The teachers, having been exposed to varied technologies in school and in life's activities, helped them have a strong facility in Technology Knowledge. Thus, Ghora and Bhati mentioned that technological knowledge is undoubtedly one of the foundations for technology integration. Studies have shown that raising teachers' technical skills increases the likelihood of them using technology in the classroom. In China, most international schools are equipped with technologies as part of the teachers' teaching tools.

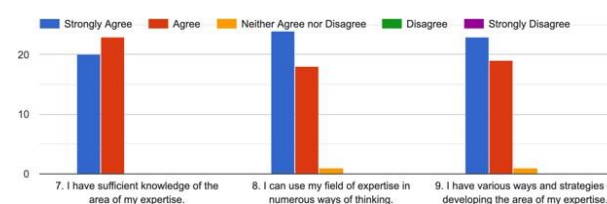


Figure 3. Graphical Presentation of the Respondents' Response to CK

The second sub-division considered was Content Knowledge (questions 7-9). Content Knowledge is referred to the body of knowledge and information that teachers teach and that students are expected to learn in each subject or content area (The Glossary of Education Reform, 2016). The results revealed that the respondents have sufficient knowledge of their field of expertise (20 out of 43 strongly agree) and (23 out of 43 agree). For statements, #8 use of an area of

expertise in numerous ways of thinking and #9 various ways and strategies of development revealed that 54 percent (23 out of 43) strongly agree. Only 2 percent (1 out of 43) said neither agree nor disagree.

Expert teachers can use their subject knowledge to organize and use content knowledge more effectively for their students to understand (Heggart, 2016). Teachers' content knowledge is important to respond to the needs of any particular classroom, recognize students who are struggling, and change how the information is presented to make it more understandable. In most international schools, teachers are teaching subjects that are aligned with their field of expertise.

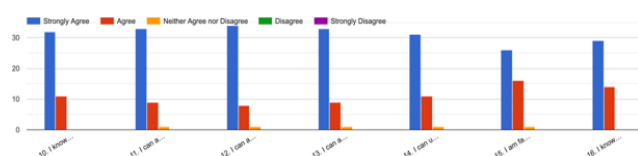


Figure 4. Graphical Presentation of the Respondents' Response to PK

The third sub-division considered was Pedagogical Knowledge (questions 10-16). According to Koehler and Mishra (2013), pedagogical knowledge refers to the methods and processes of teaching and includes knowledge in classroom management, assessment, lesson plan development, and student learning. Figure 3 above revealed that most of the respondents strongly agree with the seven statements under pedagogical knowledge, with sixty percent (26 out of 43) and above. It can be observed clearly that no one disagrees and strongly disagree.

Quality of education is acclaimed as a critical aspect of development. Consequently, to attain quality education, there should be effective teachers to ensure the development of the young people's potential (Lupag-padam et al., 2015). To develop such potential, teacher education institutions are tasked with preparing future teachers with in-depth knowledge and pedagogical competence. In the Philippines, for example, part of the curriculum in TEIs is to train future teachers with different teaching pedagogies that they can use by the time they practice their profession in the field.

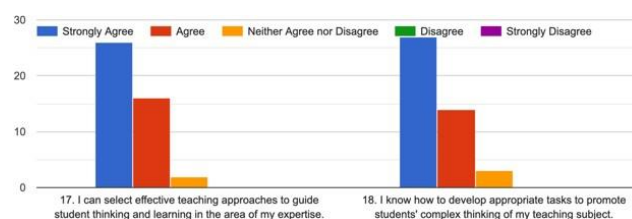


Figure 5. Graphical Presentation of the Respondents' Response to PCK

The fourth sub-division considers Pedagogical Content Knowledge (questions 17 & 18). Pedagogical Content Knowledge is a combination of different teaching elements, such as knowledge of the subject matter, students, and possible misconceptions, as well as knowledge of general pedagogy. PCK is knowing what, when, why, and how to teach specific content. PCK is how the instructor chooses to deliver the content. One could choose from a variety of different methods, such as group collaboration, note taking, small group discussions, or even lectures. A skilled instructor will effectively choose which method of delivery is best suited for the students they are instructing (Wright & Wilson, 2011). The analyses found that most of the respondents strongly agree with the statements concerning the selection of effective teaching approaches to guide student thinking and learning (with 25 out of 43) and knowing how to develop appropriate tasks to promote students' complex thinking (with 26 out of 43) responses.

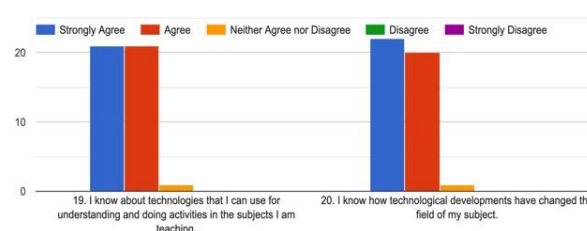


Figure 6. Graphical Presentation of the Respondents' Response to TCK

The fifth sub-division considered was Technological Content Knowledge (questions 19 & 20). Technological content knowledge refers to the knowledge of how technology can create new representations for specific content. It suggests that teachers understand that, by using a specific technology, they can change the way learners practice and understand concepts in a specific content area

(Koehler, et.al, 2013). Figure 5 displayed that 48 percent (21 out 43) of respondents strongly agree with the statement concerning their knowledge of technologies that can use for understanding and doing activities in the subject they are teaching (#19). It revealed almost the same result in the statement concerning their knowledge of how technological developments have changed their area of expertise (#20), with 22 out of 43 strongly agreeing and 20 out of 43 agreeing. Only 2 percent (1 out of 43) neither agree nor disagree with both statements under TCK.

The educators should equip themselves with the knowledge and technical skills and apply technologies in producing a more effective teaching and learning process (Kasim & Singh, 2017). In the 21st-century learning environment, the use of technology in the classroom is an integral part of the teaching and learning process.

The second to last sub-division considers Technological Pedagogical Knowledge (questions 21-29). Technological Pedagogical Knowledge is the knowledge responsible for determining which technology would best fit the method of instruction delivery. This type of knowledge will allow for the proper choice of technology to co-inside with the selected instructional technique. Figure 6 (found below) displays this graphical presentation.

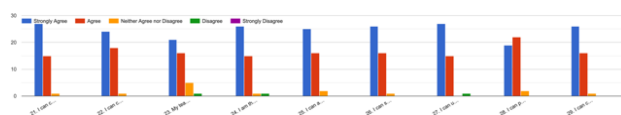


Figure 7. Graphical Presentation of the Respondents' Response to TPK

It can be observed that the respondents strongly agree with almost all the statements, with the only statement concerning the provision of leadership in helping others to coordinate the use of the content, technologies, and teaching approaches at one's school (#28) got a slight ahead between agree and strongly agree. Only 2.5 and 5 percent responded disagree and were uncertain or remained neutral in their responses.

Successful use of technology in the classroom requires thoughtful integration of technology and pedagogical processes during lesson preparation (Janssen, Knoef, & Lazonder, 2019). Teachers are well-trained in how integrating technology and software better enhances their teaching and delivers their lessons effectively.

Technology Pedagogy and Content Knowledge is a theory of education that focuses on the application of learning in teacher education integrated with technology. TPACK is an ideal portrait that every teacher must possess in the era of education.

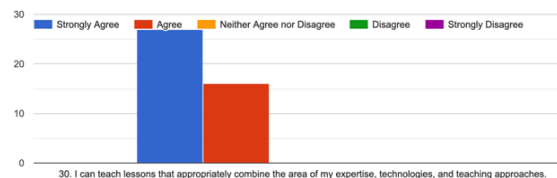


Figure 8. Graphical Presentation of the Respondents' Response to TPACK

The final sub-division considers TPACK (Technology Pedagogy and Content Knowledge) question no. 30. Technological Pedagogical Content Knowledge (TPACK) is an emergent form of knowledge that goes beyond all three "core" components (content, pedagogy, and technology); it is an understanding that emerges from interactions among content, pedagogy, and technology knowledge (Matthew, J., et. al, 2013, p.16). The results showed that 60 percent (26 out 43) strongly agree with the statement concerning their ability to teach the lessons appropriately when combining their teaching subject, approaches, and technologies.

Table 1. Respondents' Average Score per Section and Their Verbal Interpretation

Section	Average Score	Verbal Interpretation
TK	4.29	Strong Knowledge
CK	4.45	Strong Knowledge
PK	4.66	Strong Knowledge
PCK	4.55	Strong Knowledge
TCK	4.46	Strong Knowledge
TPK	4.48	Strong Knowledge
TPACK	4.63	Strong Knowledge

The result of the TPACK survey of this study clearly shows how international teachers in China use technology in their teaching as revealed in Table 1. The respondents demonstrate strong knowledge of every area of TPACK. The respondents show strong knowledge most based on the general mean in PK (4.66) and TPACK (4.63). Though all areas of TPACK got the verbal interpretation of strong knowledge, TK has the lowest mean (4.29).

Conclusion

Based on the results of the survey, most of the respondents agree and strongly agree with the statements across all the seven elements of TPACK. This is a clear manifestation that the international teachers in China have adequate knowledge of the use of technology in teaching. This is supported by the advanced facilities where these teacher-respondents are currently teaching. This study could be a basis for policy formulation on how the other countries' education system addresses the shortage and lack of access of teachers to technology tools for an improved teaching and learning process.

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