

## Chapter 49

# Identifying the Contributors to Improve Mobile-Based TPACK Competency of Elementary School Teachers in China

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### ABSTRACT

*Self-Efficacy (SE) and technology acceptance are two contributors related to Technological Pedagogical and Content Knowledge (TPACK). Many studies have indicated that TPACK is correlated with SE and the level of technology acceptance in both traditional and online learning environments. Studies using mobile learning devices in the classroom, however, are yet to be established. The authors conducted an empirical study by investigating mobile-based TPACK, SE, and technology acceptance of more than 500 English teachers from about 220 elementary schools in China, who used Android system-based pad in classrooms for one year. As a result, SE and technology acceptance had indirect positive effects on mobile-based TPACK, while no significant difference was observed in gender for TPACK. However, younger teachers and teachers with higher levels of education showed superior TPACK levels than other participants in the study. Finally, several implications for teacher professional development, limitations, and future research plans are presented.*

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## **INTRODUCTION**

Nowadays, mobile learning constructs a new learning environment different from the past. Mobile learning devices such as tablets and mobile phones with iOS or Android system are making their way into classrooms of many countries through technological integration in education. In the process of integrating mobile technology with education, teachers have become a key factor in improving the effectiveness of mobile learning (Jung & Latchem, 2011; Ng & Nicholas, 2013).

However, the frequency and level of information and communication technology (ICT) used by teachers in the classroom is still limited by multiple factors (Corbeil & Corbeil, 2007; Ozdamli & Uzunboylu, 2014). Many teachers have difficulties in managing information resources, designing learning activities, and monitoring the learning process, especially when using mobile learning devices (Ahmad et al., 2013; Embong et al., 2012a; Embong et al., 2012b). Therefore, improving teachers' specific knowledge and skills about mobile technology integration will be key in the near future (Ekanayake & Wishart, 2014; Georgina and Hosford, 2009).

Since the Technological Pedagogical and Content Knowledge (TPACK) was proposed a decade ago (Koehler & Mishra, 2005), the concept has been applied in many countries' teacher professional development. With the rapid development of mobile learning in Chinese elementary schools, teachers faced some difficulties on identifying the effective contributors of the mobile-based TPACK learning. The current study aims to explore the main contributors for mobile-based TPACK on the basis of a statewide survey.

## **LITERATURE REVIEW**

### **Technological Pedagogical and Content Knowledge**

Proposed by Koehler and Mishra in 2005, based on Shulman's pedagogical content knowledge (PCK), the TPACK framework comprises three parts, namely: technological knowledge (TK); pedagogical knowledge (PK); and content knowledge (CK) (Koehler et. al., 2007). Besides TK, PK, and CK, the additional four elements originated from this framework were pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical and content knowledge (TPACK), as shown in Figure 1.

Although some researchers argued that TPACK takes the concept of technology integration and packages it as a framework that is much too big (i.e., one that embodies seven distinct knowledge types) while simultaneously making it too small by dividing the "package" into so many pieces that they have become impossible to distinguish from one another (e.g., TK vs. TCK), thus might be vague to enable reasonable application (Brantley & Ertmer, 2013). However, many other researches indicated that TPACK provides a new perspective on repositioning and developing professional qualities of teachers. Many scholars emphasized the importance of TPACK application in teachers (Finger, Proctor & Albion, 2010; Harris, Grandgenett, & Hofer, 2010; Koehler, Shin, and Mishra, 2012), regarding TPACK as a framework to cultivate world language teachers (Van, 2008); a tool to design the mobile learning environment (Wong, et.al., 2015); and, an indicator of future teachers' technology integration into laptop infused classroom (Hughes, 2013). Therefore, improving TPACK capabilities has become an important research focus in IT-enabled professional development of teachers.

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