

## **TPACK: A New Dimension to EFL Teachers' PCK**

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### **Abstract**

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This paper focuses on the technological pedagogical content knowledge (TPACK) of English as a foreign language (EFL) teachers. The paper first addresses how technology is connected with EFL teachers' professional knowledge and the importance of TPACK in EFL teaching. In the second section, the paper discusses four points concerning EFL teachers' challenge in developing TPACK. These points include integration of technology into teachers' present knowledge system, the relationship between new and old knowledge, teachers' willingness to accept new technology and teachers' weaker position in using new technology. The last section covers the support to develop EFL teachers' TPACK and suggests what specific measurements should be taken. The paper concludes that the development of TPACK for EFL teachers is a connection of two sources of knowledge, i.e. the formal knowledge and skills provided and supported by schools and teaching community and the practical knowledge in using technology.

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**Keywords:** EFL teaching, technology, teacher knowledge, TPACK

### **1. Technology and teaching English as a foreign language**

Teaching English as a foreign language refers to teaching English to English language learners in a nonnative English speaking environment. For example, when Chinese students are learning English in China, they are regarded as EFL learners.

Usually EFL is taught by a nonnative English speaking teacher, who are also English language learners and who usually do not speak English as naturally and idiomatically as English native speakers do.

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Because of the scarcity of exposure to natural English speaking environments and little opportunities of real time communications with native English speakers, EFL learners heavily depend on technology for learning authentic English, especially listening and speaking. As early as in the 1960's, vinyl records and later tape-recorders were essential for learning oral English (Yang, 2000). It is the development of technology that makes learning oral English possible in a non-English speaking environment. Thus, for EFL teachers, how to use technological tools is always a part of their professional knowledge of teaching.

In today's digital world, the demand to integrate technology into EFL teaching is even higher than ever before when the unbounded Internet resources are available for learners to use such as listening to online live news broadcast, watching English movies and chatting with native English speakers via social media websites, e.g., Skype or MSN. Harris and Hofer (2010) pointed out that because of digitalization, today's technologies have occupied the forefront. To use it or not is no longer a question for EFL teachers. Instead, what is worth discussing is how well EFL teachers can use it. If they fail to catch up with the latest educational technology, they will certainly fall behind and stay behind effective teaching (Mishra, Koehler & Kereluik, 2009).

Besides, the arrival of Internet is also a driving force that pushes teachers to develop expertise that needs to be grounded in the application of technology. Especially for EFL teaching in a non-English speaking environment, the integration of technology into the classroom actually decides the effectiveness of teaching and learning (Chapelle, 2009). This issue is becoming more urgent with economic globalization that pushes students to learn English today for more pragmatic purposes, e.g., their future career development (Liu & Wang, 2009).

## **2. TPACK in English as Foreign Language Teaching**

Shulman (1987) initiated the concept of pedagogical content knowledge (PCK), in which he integrated different types of knowledge such content knowledge, pedagogical knowledge and knowledge of context into a type of knowledge exclusively applicable to teachers.

Teaching is a process that is far more complex than the transference of knowledge from a teacher to learners (Dewey, 1902).

Effective teaching is built on teachers' understanding of subject matter, teaching and students. Experienced teachers are those who can seamlessly blend all forms of knowledge together so as to make her or his teaching comprehensible and knowledge learnable to students (Shulman, 1986). In Dewey's words, being capable of blending different types of knowledge is to "psychologize" their professional knowledge (Dewey, 1902).

Because technology application in EFL classroom is essential, EFL teachers need to "technologize" their professional knowledge, and in another word, to integrate technology into their PCK. Koehler and Mishra (2008) introduced the concept of *Technological Pedagogical Content Knowledge* (TPACK). They explained that the three major types of knowledge (content, pedagogy and technology) should be interacted into the teacher's professional knowledge to develop TPACK that is needed for successful teaching to digitally savvy students.

Koehler and Mishra (2008) explained that TPACK is composed of different types of knowledge. The first component of TPACK is technological knowledge (TK), which plays a central part in teachers' professional knowledge system. Because of the availability of unbounded resources for online English learning, TK plays a more significant part for EFL teaching. English as a foreign language is different from other subjects in that it is learned as a tool to facilitate study or work. Therefore, speaking and listening abilities are the essential parts of English competence. To help students develop these abilities, the mere English linguistic and lexical knowledge is far from enough. Teachers need to create a classroom like a natural English environment where authentic English can be experienced and practiced. Such a simulated environment can only be created if teachers are technologically competent by using audio and visual resources.

The second component is technological content knowledge (TCK). Content knowledge is the "formal knowledge", widely referred to by educators as "the knowledge base" (Cochran-Smith & Lytle, 1999, p. 254). For EFL teaching, English language itself is the content knowledge. When teachers integrate technology into such knowledge as technological content knowledge (TCK), they have a "deep understanding of the manner in which the subject matter (or the kinds of representations that can be constructed) can be changed by the application of technology" (Koehler & Mishra, 2008, p.16).

This means that EFL teachers are capable of selecting, editing, applying and integrating particular technology that best matches the content to be taught. In other words, those with strong TCK are capable of deciding what content to teach according to what technology is accessible and available. For example, with easy access to online video resources such as TED (technology, entertainment, design) video lectures, EFL teachers in China are now teaching English based on the content of TED lectures and they facilitate students' discussion about the content and ideas delivered on TED lectures (Meng & Bo, 2014).

The third component is technological pedagogical knowledge (TPK). An experienced teacher is different from a novice one because the former knows more about how to use different teaching models and strategies and how to facilitate classroom communication (Nilsson, 2008). For EFL teaching, when technology is integrated into teachers' pedagogical knowledge, the difference between a good and a bad teacher more greatly depends on teachers' good understanding of how technology can be used in teaching strategies. Mishra et al (2009) explained that TPK is a type of knowledge that is concerned with how teachers use "a range of tools...for a particular task, the ability to choose a tool based on its fitness, strategies for using the tool's affordances, and knowledge of pedagogical strategies and the ability to apply" (p. 1028).

Based on TK, TCK and TPK, teachers develop TPACK. In defining TPACK, Mishra et al (2009) explained it as follows:

TPACK is the basis of good teaching with technology and requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones (p. 1029).

A strong TPACK is especially significant for EFL teaching. Today communicative language teaching has been recognized as a more effective method to teach English for the communicative purpose (Bygate, 2001), and such a purpose is reachable in the classroom only with a strong support of technology.

Technology also partly helps to solve the problem of big size classes, which is usually typical of EFL teaching. For example, all the five Chinese universities surveyed used computers to customize learning at different levels and paces (Liu, 2011). Teachers could readjust each individual student' learning according to their progress recorded on their e-portfolio on the system. Besides, a strong TPACK also helps EFL teachers to identify students' problems and enhance communication and relationship between teachers and students and also among students. Liu (2011) investigated how technology was integrated into English learning in five Chinese universities and he found that the five universities used English learning websites as a platform for students to raise questions, share learning strategies and seek suggestions in learning English. Messages usually drew active responses from EFL teachers and students. In short, in every aspect of teaching EFL, technology inevitably plays an essential role. Without it teaching English for communicative purpose is implementable in EFL contexts.

### **3. EFL teachers' challenges**

Because technology is omnipresent in today's digital world, a computer-illiterate teacher can hardly process teaching activities without resorting to technology. So it is essential that teachers integrate technology into curriculum (Mishra et al, 2009). Teachers are facing the urge to learn technology and apply it in teaching (ibid, p. 49). However, considering that teaching is a highly complex activity that draws on many kinds of knowledge (Mishra & Koehler, 2006), the development of a strong TPACK is not a smooth route for teachers. Because effective teaching depends on flexible access to highly organized systems of knowledge (ibid), merely knowing how to use technology is far from enough. When technology is introduced into classroom, teachers have to reconsider how to use "analogies, illustrations, examples, explanations and demonstrations"(Shulman, 1986, p. 9) to make knowledge more accessible and comprehensible to students. What's more, for individual teachers, TPACK is not uniform in pattern.

Mishra and Koehler (2006) pointed out that there is no single technological solution that can be applied for every teacher, every course, or every view of teaching. Unlike conventional knowledge, a strong TPACK also requires EFL teachers to expand their professional knowledge to different stages of teaching such as curriculum planning, implementation, and evaluation processes (Coppola, 2004).

And they must be skillful in making lesson plans supported by language learning software and internet resources and be capable of handling the complex relationships among technology, content, and pedagogy, and developing appropriate, context-specific strategies and representations (Harris, Mishra & Koehler, 2009).

Another issue facing teachers is how to balance the old and the new technology. Unsuccessful change always comes as intrusion that occupies the central place by rejecting the old. For example, based on a survey of 36 university EFL instructors in five Chinese universities, Liu (2011) found that the majority of the students practiced listening and speaking at the computer lab. The consequence is that the interaction between teacher and students or among students was replaced by students' monologue in front of a computer. Nothing substantial was learned. Thus when we take the nature of technological change into consideration, we need to keep a good balance, which is a guarantee for successful technological integration. Technology keeps on constant change and to embrace the new by rejecting the old means that the instant we put new technology into instructional application, it becomes obsolete (Mishra & Koehler, 2006). Such instability of technological updating requires teachers to be "life-long learners who are willing to contend with ambiguity, frustration and change" (Koehler & Mishra, 2008, p. 11). Even if teachers are prepared to be lifelong learners, they may feel frustrated by rapid changes of technology which often happen in piecemeal fashions (*ibid*). Thus, to keep the old is also a comfort zone for teachers who have been used to an established way of teaching and the entry of new technological tools may "destabilize the established routines of classroom life including norms of time and space" (Somekh, 2008, p. 452).

Successful integration of technology also depends on teachers' willingness to accept technology and their willingness comes from their belief that technology really makes a difference for their students. However, because it takes time to examine whether students' learning outcomes will be significantly different, it is not easy to convince teachers that their change will greatly enhance their students' learning.

Zhao, Push, Sheldon and Byers (2002) cautioned that it is less likely for teachers to adopt technological innovations if it departs too far away from teachers' existing values, beliefs and practices. What's worse, many teachers grow a fear of using Internet when they find their students are addicted to online games and naturally they often link them to an "overriding sense of moral panic about declining standards of literacy" (Thurlow, 2006, p. 678).

Even if they attempt to introduce new technology, they may feel hesitated in an unfriendly environment. Koehler and Mishra (2008) argued that the social and institutional contexts may complicate technology integration. This is true of the majority of Chinese EFL teachers when their performance is evaluated by their students' performance on the final exams rather than the process of their instruction.

Finally, considering the constant change of digital technology, teachers are less knowledgeable in terms of technology than their students who, as Bennett, Maton and Kervin (2008) termed, are 'digital natives' and savvy online game players. Like immigrant parents are disempowered by their children who are better in English and more capable of communicating in English, teachers are dwarfed by their students when it comes to the use of technology (Greenhow & Robelia, 2009).

#### **4. Support**

A strong TPACK cannot be achieved without a joint effort of teachers, community and leadership. Today's digital world is an unbounded one connected by Internet that offers widespread access to almost a vast array of human knowledge (Harris et al, 2009). Facing such a world, teachers will feel frustrated and helpless. Constant and effective support is a necessity to develop teachers' TPACK. First, a friendly environment is necessary to create a school culture to encourage teachers' innovation and new effort (Ertmer & Ottenbreit-Leftwich, 2010). Although teachers are powerful in making curricular decisions in their own classroom, they will be less powerful when they are asked to introduce technology into the class because they are usually less technologically knowledgeable than their students (Greenhow & Robelia, 2009). Koehler and Mishra (2008) regarded teachers as autonomous agents who possess "the power to significantly influence the appropriate (or inappropriate) integration of technology in teaching" (p. 3). The key issue here is how teachers' autonomy will help EFL teachers to develop TPACK.

If teachers practice their autonomy in isolation rather than in professional cooperation, they would be short of concrete models for imitation (Lortie, 1975). Harris et al (2009) also noted that developing technological skills in isolation gives little help to strengthen teachers' knowledge in using technology for effective teaching.

Besides, with overwhelming resources teachers can find by gently clicking the mouse on Google, joint effort is a must for effective development and application of TPACK otherwise they will get lost in the ocean of resources and what they find from Internet may be far different and may not be suitable for students. Fullan (2007) recommended collaborative cultures or professional learning community to develop teachers' TPACK. Kruse, Louis and Bryk (1994) noted five critical elements that lend support to effective professional learning community: reflective dialogue, deprivatization of practice, collective focus on student learning, collaboration, and shared norms and values. For EFL teachers, their TPACK should first be developed from a bottom-up model. Their initial experience and use of technology are reflected and shared with colleagues in seminars and workshops. Group work as a form of collaboration is useful to generate appropriate technology-added lesson plans that are applicable to all teachers (Zhao et al, 2002).

In such a supportive community teachers should also share the underlying principles of teaching. To achieve this goal, principals play an irreplaceable role. Leithwood, Day, Sammons, Harris and Hopkins (2006) argued that school leadership is the crucial factor to guarantee the effectiveness of pedagogical innovation. Wu (2012)'s comparative study lends empirical support to this belief. The principals in the experimental group spent more time in classrooms, engaging teachers in conversations about instruction and coordinated teachers' regular seminars and workshops. Those EFL teachers whose principals were more supportive in developing a learning community for teachers were better prepared to usher in new technology. Such a supportive context is what Fullan termed "collegiality". Under this learning-friendly context, teachers and principals collaborate to reach the goal in "agreed-upon directions" (Fullan, 2007, p. 140) and consequently TPACK will be developed by concerted efforts of all teachers.

Fullan contended that "change is a process, not an event" (2007, p. 68). It is especially true for teachers' change of attitude toward the application of technology. Since most of teachers are 'digital immigrants' (Greenhow & Robelia, 2009), the goals set for them to use technology should be approachable, modifiable and controllable.

Krashen (1988) introduced the concepts  $i+1$  in second language acquisition, where  $i$  is the present level and 1 is the level we can reach.



The introduction of new technology into classrooms should be completely based on the present situations integrating all factors such as teachers' present knowledge, students' needs, societal expectation and monetary and human resources. New technology cannot be force-fed to teachers. The integration of technology into teachers' present knowledge system requires teachers to restructure their schema. Thus, the integration should always maintain a two-way flow to assure that the knowledge of new technology will be merged with teachers' content and pedagogical knowledge. To achieve it, the application of new technology should be always open for modification so that teachers as the ultimate implementers can always have their voice heard and eventually the goal is crystallized with teachers' contribution. Prensky (2006) suggested that teachers should be 'digitalized' to catch up with today's students. But with a radical jump from chalk to smartboard, for example, the change may be too overwhelming for teachers to handle effectively. Like helping a 15-year-old child learning a second language, if completely immersed in the English speaking environment, he or she is likely to be choked in the deep water and eventually make little progress (Krashen, 1988). To be familiar with the smartboard, teachers need to learn how to use an array of web resources, how to integrate digital technology with the subject he or she is teaching and how to plan his or her curriculum digitally. All the know-how cannot be acquired by only one step.

Hall, Quinn and Gollnick (2008) noted that it usually takes about at least 5 years for a novice teacher to develop enough expertise for effective teaching. This is also true of the development of TPACK. So a systematic and constant support to teachers is important. Strudler, Archambault, Bendixen, Anderson and Weiss (2003) suggested that we need to take confirmed steps such as "comprehensive planning, professional development, and follow-up support" (p. 43). To follow the track of Strudler et al's suggestion, we first need to take an insightful look at what kind of TPACK teachers should develop.

Basically, a teacher's professional knowledge is composed of two major parts: knowledge and practice. Cochran-Smith and Lytle classify three conceptions concerning their relationship, namely, knowledge-for-practice, knowledge-in-practice and knowledge-of-practice. For the first conception, knowledge-for-practice, it is, as the authors pointed out, the knowledge that distinguish a teacher as a professional who is different from other professionals.

This kind of knowledge includes “knowledge of subject matter, of the standards and content of the various professions, and of research-based strategies for effective teaching and classroom organization” (Cochran-Smith & Lytle, 1999, p. 258) and also including technology for TPACK. This type of formal knowledge may qualify a person as a teacher as far as certification is concerned but pedagogically, a teacher in possession of such knowledge is a passive knower or “knowledge user”. By given “comprehensive planning, professional development, and follow-up support” (Strudler et al, p. 43), teachers can possibly possess some form of TPACK but this type of knowledge is not adequate for effective teaching. Kennedy (1991) explained that teachers’ knowledge is connected to different teaching contexts that render teachers to perform flexibly so that students can perceive meaning more effectively.

Because teaching at schools is dynamic by nature, teachers acquire knowledge through experience and reflection, i.e. the knowledge-in-practice. Cochran-Smith & Lytle explained that this type of knowledge is tacit and intangible that can only be constructed through collaboration with experienced teachers based on the knowledge they already have. In this sense, teachers also generate knowledge based on their experience and practice. Thus, the “comprehensive planning, professional development, and follow-up support” should always be connected with teachers’ practical experience and understanding of using technology in their teaching. Such a connection between formal knowledge and practical knowledge makes possible the development of knowledge-of-practice. According to Kennedy (1991), with knowledge-of-practice, teachers are capable of co-constructing knowledge and creating curriculum when teachers practice teaching in a broader context in society.

To help teachers develop TPACK in the form of knowledge-of-practice, support should be grounded in real classrooms where teachers are encouraged to reflect on their present teaching, identify problems, figure out solutions in regard of technology and generate new teaching concepts supported by technology. To achieve so, administration such as school district and school principals play an irreplaceable role. Leithwood et al (2006) pointed out that school leadership is the crucial factor to guarantee the effectiveness of school reform.

Thus, the interactive action of both bottom-up and top-down will finally turn “digital immigrants” (Greenhow & Robelia, 2009) to be native-like digital teachers who possess professional knowledge with the use of technology as a natural component interwoven with knowledge of subject matter and pedagogy.

## 5. Conclusion

EFL teaching for communicative purpose in a nonnative speaking context is only achievable when teachers use technology to create simulated environment in the classroom for students to learn and practice authentic English. The creation of such an environment requires EFL teachers to be technologically competent when they decide what to teach and how to teach. The constant updating of technology in education also pushes EFL teacher educators to revise applied linguistics program so as to develop strong and practical TPACK for future EFL teachers.

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