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Techonological Echnological Pedagogical Content Knowledge (TPACK): A Framework For Developing Teaching Efficiency

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TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE (TPACK): A FRAMEWORK FOR DEVELOPING TEACHING EFFICIENCY , Abstract The technological pedagogical content knowledge (TPACK) framework is increasing in use by educational technology researchers around the world who are interested in issues related to technology integration. How three own body of knowledge i.e technological, pedagogical and content knowledge, intersect each other and generate a new knowledge.

ABSTRACT

The technological pedagogical content knowledge (TPACK) framework is increasing in use by educational technology researchers around the world who are interested in issues related to technology integration. Three own body of knowledge i.e technological, pedagogical and content knowledge, intersect each other and generate a new knowledge. The framework proposes that combining these three core types of knowledge results in four additional types of knowledge: pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK). The TPACK , arising from the core intersection of these three information components. Some similar frameworks have been developed both independently and directly out of the TPACK framework, most based upon Shulman's model of Pedagogical Content Knowledge. The TPACK framework offers several possibilities for promoting research in teacher education, teacher professional development, and teachers' use of technology. It offers options for looking at a complex phenomenon like technology integration in ways that are now flexible and adaptable to analysis and development. TPACK framework develop the ability of teachers to use and understand the advent technology that reduce the generational digital divide, which is a common barrier because it challenges teachers to keep up with the ever changing technology in classroom.

KEYWORDS

CK, PK, TK, CPK, CTK, TPK, TPACK.

INTRODUCTION

Knowledge related to the effective use of educational technologies has become widely recognized as an important aspect of an teachers' knowledge-base for the 21st Century. Early in the history of educational technology, educators were taught in technology classes that focused primarily on technology skills independent from the pedagogical or content courses.

Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts. Individual teachers, grade-level, school-specific factors, demographics, culture, and other factors ensure that every situation is unique, and no single combination of content, technology, and pedagogy will apply for every teacher, every course, or every view of teaching.

Technological Pedagogical Content Knowledge (TPCK)

In 20th century PCK framework was developed by Shulman's (1986, 1987) and it gives the concept of pedagogical content knowledge (PCK). Rapid development in technology in 21st century Koehler & Mishra, (2006,2009) explicitly integrate the component of technological knowledge into the PCK model and termed as technological pedagogical content knowledge. The TPACK framework is most commonly represented using a Venn diagram with three overlapping circles, each representing a distinct form of teacher knowledge (see Fig. 4). The framework includes three core categories of knowledge: pedagogical knowledge (PK), content knowledge (CK), and technological knowledge (TK). The framework proposes that combining these three core types of knowledge results in four additional types of knowledge: pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and technological pedagogical content knowledge (TPACK).

The TPCK framework was simply renamed as TPACK (pronounced "tee-pack") for the purpose of making it easier to remember and to form a more integrated whole for the three kinds of knowledge addressed: technology; pedagogy, and content (Thompson & Mishra, 2007-2008).

Content Knowledge (CK)

It is Teachers' knowledge about the subject matter to be learned or taught. The knowledge of content is critically important for teacher (Koehler & Mishra, 2009). As Shulman (1986) noted, this knowledge would include knowledge of concepts, theories, ideas, organizational frameworks, knowledge of evidence and proof, as well as established practices and approaches toward developing such knowledge. It is differed the in Knowledge and the nature of inquiry between fields, and teachers should understand the deeper knowledge fundamentals of the disciplines in which they teach. For example, in the case of science, this would include knowledge of scientific facts and theories, the scientific method and evidence-based reasoning. In the case of social study, such knowledge would include knowledge of art history, famous paintings, sculptures, artists and their historical contexts, as well as knowledge of aesthetic and psychological theories for evaluating art.

The cost of not having a mastery over content knowledge can be prohibitive; for example, students can receive incorrect information and develop misconceptions about the content area.

Pedagogical Knowledge (PK)

It is teachers' deep knowledge about the processes and practices or methods of teaching and learning in which circumstance process. It also includes other things such as overall educational purposes, values, and aims. This type of knowledge applies to understanding how students learn, general classroom management skills, lesson planning and student assessment. It includes knowledge about techniques or methods used in the classroom; the nature of the target audience and strategies for evaluating student

understanding. A teacher with deep pedagogical knowledge understands how students construct knowledge and acquire skills and how they develop habits of mind and positive dispositions toward learning. As such, pedagogical knowledge requires an understanding of cognitive, social, and developmental theories of learning and how they apply to students in the classroom.

Technology Knowledge (TK)

Technology knowledge is always in dynamic state than the other two core knowledge domains in the TPACK framework (pedagogy and content). Thus, it is very difficult to define as technology become outdated after a time period. Somehow it refers to teachers' knowledge about traditional and new technologies that can be integrated into curriculum start from low-tech technologies such as pencil and paper to digital technologies such as the Internet, digital video, interactive whiteboards, software programs, webcams, screencasting, AI, Virtual classroom, social networking, Web 2.0. This includes understanding information technology broadly enough to apply it productively at work and in everyday life, being able to recognize when information technology can assist or obstacle the achievement of a goal, and being able continually adapt to changes in information technology (Koehler & Mishra, 2009). The definition of TK used in the TPACK framework is close to that of Fluency of Information Technology, as proposed by the Committee of Information Technology Literacy of the National Research Council (NRC, 1999).

Pedagogical Content Knowledge (PCK)

Consistent with and similar to Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. Central to Shulman's conceptualization of PCK is the notion of the transformation of the subject matter for teaching. Specifically, according to Shulman (1986), this transformation occurs as the teacher interprets the subject matter, finds multiple ways to represent it, and adapts and tailors the instructional materials to alternative conceptions and students' prior knowledge. PCK covers the core business of teaching, learning, curriculum, assessment and reporting, such as the conditions that promote learning and the links among curriculum, assessment, and pedagogy (Koehler & Mishra, 2009)

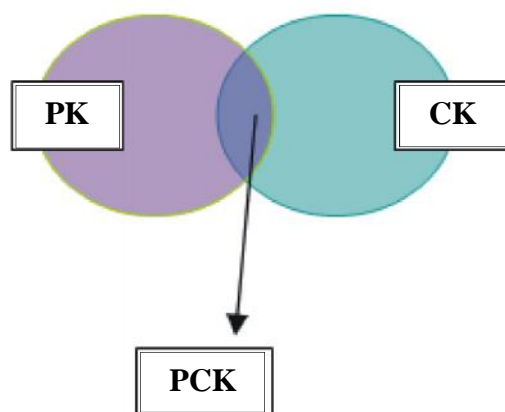


Figure-1

Technological Content Knowledge (TCK)

“An understanding of the manner in which technology and content influence and constrain one another. Teachers need to master more than the subject matter they teach; they must also 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 particular technologies. Teachers need to understand which specific technologies are best suited for addressing subject-matter learning in their domains and how the content dictates or perhaps even changes the technology—or vice versa” (Koehler & Mishra, 2009).

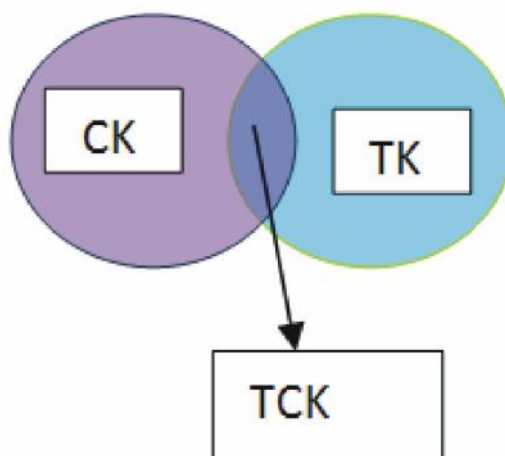


Figure-2

Technological Pedagogical Knowledge (TPK)

“An understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies” (Koehler & Mishra, 2009).

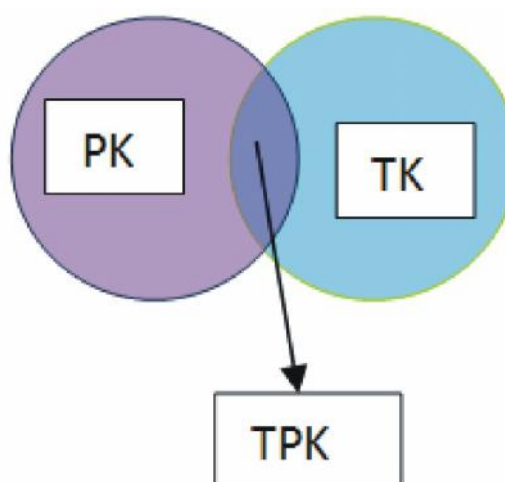


Figure-3

Technological Pedagogical Content Knowledge (TPACK)

“Underlying truly meaningful and deeply skilled teaching with technology, TPACK is different from knowledge of all three concepts individually. Instead, TPACK is the basis of effective teaching with technology, requiring 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 to develop new epistemologies or strengthen old ones” (Koehler & Mishra, 2009).

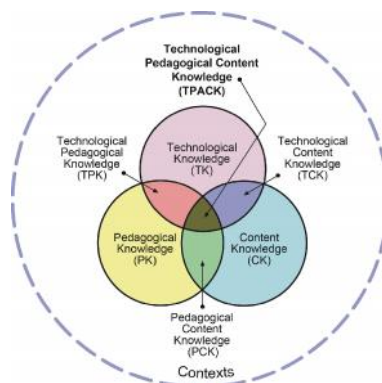


Figure 4 : (Source:- <http://tpack.org/>)

Implications of the TPACK Framework

Professional development

TPACK framework seeks to extend this tradition of research and scholarship by bringing technology integration into the kinds of knowledge that teachers need to consider when teaching. The TPACK framework seeks to assist the development of better techniques for discovering and describing how technology-related professional knowledge is implemented and instantiated in practice. By better describing the types of knowledge teachers need (in the form of content, pedagogy, technology, contexts and their interactions), educators are in a better position to understand the variance in levels of technology integration occurring.

Add- on Technologies in Education

In addition, the TPACK framework offers several possibilities for promoting research in teacher education, teacher professional development, and teachers' use of technology. It offers options for looking at a complex phenomenon like technology integration in ways that are now flexible and adaptable to analysis and development. Moreover, it allows teachers, researchers, and teacher educators to move beyond oversimplified approaches that treat technology as an "add-on" instead to focus again, and in a more ecological way, upon the connections among technology, content, and pedagogy as they play out in classroom contexts.

A Bridge for Digital Divide

The concept of digital divide was originally defined as a gap between those who access to digital technologies and those who do not. This access is associated with age, gender, education, income, ethnicity and geography. Main factor that play important role into the digital divide which makes it difficult to implement technology into the curriculum, is the generation digital divide. Herrington recognizes that the generation divide is interpreted to mean that people on one side of the gape, including the youth, have more access and greater ability to use new technologies than those on the other side like the adult who born before the advent of the internet. TPACK framework develop the ability of teachers to use and understand the advent technology that reduce the generational digital divide, is a common barrier because it challenges teachers to keep up with the ever changing technology in classroom.

CONCLUSION

The technological pedagogical content knowledge (TPACK) framework has the potential to provide a strong foundation for present and future technology integration in education. A strong TPACK framework can also provide theoretical guidance for how teacher can use technology in content-specific as well as general ways. As the technology is rapidly develop in all private as well as public sectors so accessibility technology is very common for public but must be have attitude to learn and adopt new

technologies. Upcoming day is for artificial intelligence which is growing day by day. There are any technologies come in the education system which are affordable, convenient to use and beneficiary for both teacher and students. But while using technology in our class, teacher must have keep in mind that teaching learning should not be machine dependent.

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