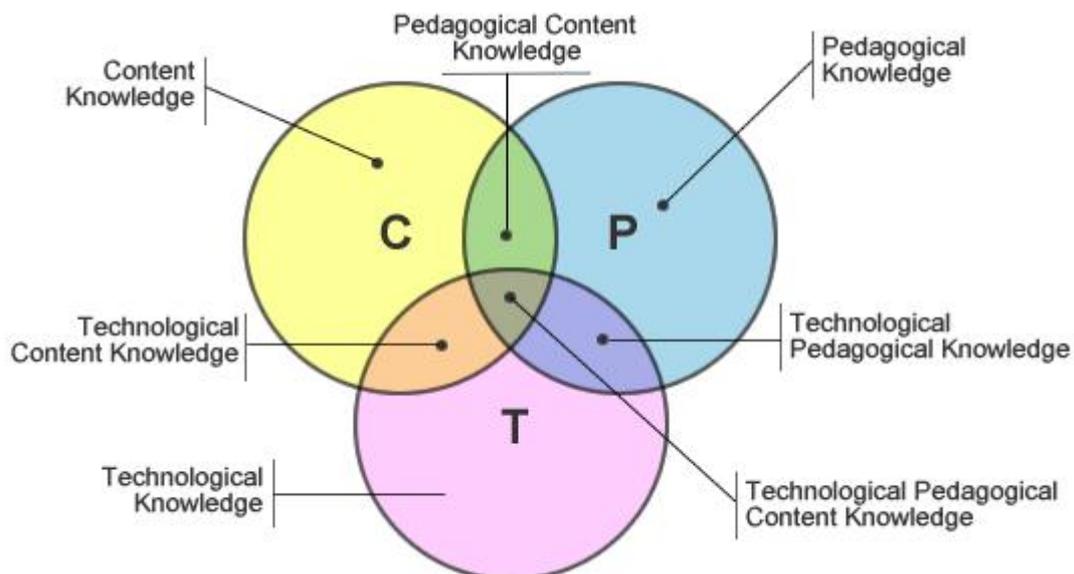


TPCK - Technological Pedagogical Content Knowledge

Technological Pedagogical Content Knowledge (TPCK) attempts to capture some of the essential qualities of [knowledge](#) required by teachers for technology integration in their teaching, while addressing the complex, multifaceted and situated nature of [teacher knowledge](#). At the heart of the TPCK framework, is the complex interplay of three primary forms of knowledge: [Content \(CK\)](#), [Pedagogy \(PK\)](#), and [Technology \(TK\)](#). See Figure above. As must be clear, the TPCK framework builds on Shulman's idea of Pedagogical Content Knowledge.

The TPCK approach goes beyond seeing these three knowledge bases in isolation. On the other hand, it emphasizes the new kinds of knowledge that lie at the intersections between them. Considering P and C together we get [Pedagogical Content Knowledge \(PCK\)](#), Shulman's idea of knowledge of pedagogy that is applicable to the teaching of specific content. Similarly, considering T and C taken together, we get [Technological Content Knowledge \(TCK\)](#), the knowledge of the relationship between technology and content. At the intersection of T and P, is [Technological Pedagogical Knowledge \(TPK\)](#), which emphasizes the existence, components and capabilities of various technologies as they are used in the settings of teaching and learning.



Finally, at the intersection of all three elements is [Technological Pedagogical Content Knowledge \(TPCK\)](#). True technology integration is understanding and negotiating the relationships between these three components of knowledge. A teacher capable of negotiating these relationships represents a form of expertise different from, and greater than, the knowledge of a disciplinary expert (say a mathematician or a historian), a technology expert (a computer scientist) and a pedagogical expert (an experienced educator). Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, [transactional] relationship between all three components.

Content (CK)

Content Knowledge is knowledge about the actual subject matter that is to be learned or taught. The content to be covered in high school social studies or algebra is very different from the content to be covered in a graduate course on computer science or art history. Clearly, teachers must know and understand the subjects they teach, including: knowledge of central facts, concepts, theories and procedures within a given field; knowledge of explanatory frameworks that organize and connect ideas; and knowledge of the rules of evidence and proof (Shulman, 1986). Teachers must also understand the nature of knowledge and inquiry in different fields. For example, how is a proof in mathematics different from a historical explanation or a literary interpretation? Teachers who do not have these understandings can misrepresent those subjects to their students (Ball, & McDiarmid, 1990).

Pedagogy (PK)

Pedagogical Knowledge is deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses (among other things) overall educational purposes, values and aims. This is a generic form of knowledge that is involved in all issues of student learning, classroom management, lesson plan development and implementation, and student evaluation. It includes knowledge about techniques or methods to be 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; develop habits of mind and positive dispositions towards learning. As such, pedagogical knowledge requires an understanding of cognitive, social and developmental theories of learning and how they apply to students in their classroom.

Technology (TK)

Technology knowledge is knowledge about standard technologies such as books and chalk and blackboard, as well as more advanced technologies such as the Internet and digital video. This would involve the skills required to operate particular technologies. In the case of digital technologies this would include knowledge of operating systems, and computer hardware, as well as the ability to use standard set of software tools such as word processors, spreadsheets, browsers, email etc. TK would include knowledge of how to install and remove peripheral devices, install and remove software programs, create and archive documents. Most standard technology workshops and tutorials tend to focus on the acquisition of such skills.