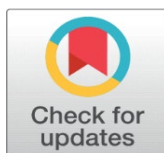
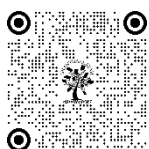


# TECHNO PEDAGOGICAL AND CONTENT KNOWLEDGE (TPACK): AN EFFECTIVE TOOL FOR CONTENT DELIVERY FOR TEACHERS

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## ABSTRACT

Teaching is the process of imparting knowledge, skills, and interpersonal abilities to a learner or audience in an educational setting. Teaching is a complicated practice that requires an interweaving of many kinds of specialized knowledge. With the passage of time technology has made an entry in the field of teaching. Advent of computer, television, internet, mobile, interactive white board etc. has brought bigger changes in the field of teaching-learning process. The present era is an era of science and technology and now a days it is required that teachers must be well aware of use of technology in teaching-learning process. New inventions in the field of science and technology have been incorporated in teaching-learning process to make it more interesting and comprehensible for the learners. The introduction of technology in Education sector has given rise to new terminology “Techno Pedagogical Content and Knowledge” also known TPACK. Term TPACK contains various terms viz. ‘Content Knowledge(CK)’, Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK). TPACK is the end result of various combinations and interests, drawing from different terms related with it – and from the three larger underlying areas of content, pedagogy, and technology – in order to create an effective basis for teaching using educational technology.

**Keywords:** Techno Pedagogical Content and Knowledge, Content Knowledge, Pedagogical Knowledge, Technological Knowledge, Pedagogical Content Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge

## 1. INTRODUCTION

Teaching is the process of imparting knowledge, skills, and interpersonal abilities to a learner or audience in an educational setting. It is a part of the broader concept of education and is closely related to learning, which is the student's activity of acquiring knowledge. Teaching is a complicated practice that requires an interweaving of many kinds of specialized knowledge. With the passage of time technology has made an entry in the field of teaching. Advent of computer, television, internet, mobile, interactive white board etc. has brought bigger changes in the field of teaching-learning process. Teaching-learning in classroom has changed drastically. Classroom teaching is now not limited to only classroom, learners can access learning content from any corner of the world.

The present era is an era of science and technology and now a days it is required that teachers must be well aware of use of technology in teaching-learning process. Teachers work incessantly on making teaching interesting and understandable for the learners, they also keep themselves updating with the changes occurring around them. They teach keeping in mind very aspects of life and the individual differences of the learners. Their commitment has always

been appreciated. Teachers are always keen to learn and adopt new changes that can enhance their professional growth and make their teaching more effective.

New inventions in the field of science and technology have been incorporated in teaching-learning process to make it more interesting and comprehensible for the learners. The introduction of technology in Education sector has given rise to new terminology “Techno Pedagogical Content Knowledge”. This new term has posed new challenges for the teachers, which they are trying to handle effectively and efficiently.

### **Technological Pedagogical and Content Knowledge (TPACK):**

Technological, pedagogical, content knowledge, originally TPCK is now known as TPACK, or technology, pedagogy, and content knowledge.

The term refers to (teaching) knowledge that take into account both pedagogical (teaching and learning methods, motivation, the development of students' skills etc.), and technological aspects (using computers, the Internet, interactive whiteboards, etc.).

The term for the knowledge that combines technology, pedagogy, and content is Technological Pedagogical Content Knowledge (TPACK). TPACK is an educational model that describes how to effectively integrate technology into teaching. TPACK divides a teacher's contextual knowledge in teaching into three broad categories: content knowledge (CK), pedagogical knowledge (PK), and technological knowledge (TK). At the intersection of two categories are more specific forms of knowledge: pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK). At the intersection of all three categories is technological pedagogical content knowledge (TPACK). Contextual knowledge also includes information apart from the three categories, such as an awareness of school policies.

These terms are defined below:

| <b>Term</b>                                         | <b>Definition</b>                                                     |
|-----------------------------------------------------|-----------------------------------------------------------------------|
| Content knowledge (CK)                              | A teacher's knowledge of the subject matter they are teaching         |
| Pedagogical knowledge (PK)                          | A teacher's knowledge of pedagogy                                     |
| Technological knowledge (TK)                        | A teacher's knowledge of technology                                   |
| Pedagogical content knowledge (PCK)                 | A teacher's knowledge that combines pedagogy and content              |
| Technological content knowledge (TCK)               | A teacher's knowledge that combines technology and content            |
| Technological pedagogical knowledge (TPK)           | A teacher's knowledge that combines technology and pedagogy           |
| Technological pedagogical content knowledge (TPACK) | A teacher's knowledge that combines all three categories of knowledge |

**Content Knowledge (CK)** – This describes teachers’ own knowledge of the subject matter. CK may include knowledge of concepts, theories, evidence, and organizational frameworks within a particular subject matter; it may also include the field’s best practices and established approaches to communicating this information to students. CK will also differ according to discipline and grade level – for example, middle-school science and history classes require less detail and scope than undergraduate or graduate courses, so their various instructors’ CK may differ, or the CK that each class imparts to its students will differ.

**Pedagogical Knowledge (PK)** – This describes teachers’ knowledge of the practices, processes, and methods regarding teaching and learning. As a generic form of knowledge, PK encompasses the purposes, values, and aims of education, and may apply to more specific areas including the understanding of student learning styles, classroom management skills, lesson planning, and assessments.

**Technological Knowledge (TK)** – This describes teachers’ knowledge of, and ability to use, various technologies, technological tools, and associated resources. TK concerns understanding edtech, considering its possibilities for a specific subject area or classroom, learning to recognize when it will assist or impede learning, and continually learning and adapting to new technology offerings.

**Pedagogical Content Knowledge (PCK)** – This describes teachers’ knowledge regarding foundational areas of teaching and learning, including curricula development, student assessment, and reporting results. PCK focuses on promoting learning and on tracing the links among pedagogy and its supportive practices (curriculum, assessment, etc.),

and much like CK, will also differ according to grade level and subject matter. In all cases, though, PCK seeks to improve teaching practices by creating stronger connections between the content and the pedagogy used to communicate it.

**Technological Content Knowledge (TCK)** – This describes teachers’ understanding of how technology and content can both influence and push against each other. TCK involves understanding how the subject matter can be communicated via different edtech offerings, and considering which specific edtech tools might be best suited for specific subject matters or classrooms.

**Technological Pedagogical Knowledge (TPK)** – This describes teachers’ understanding of how particular technologies can change both the teaching and learning experiences by introducing new pedagogical affordances and constraints. Another aspect of TPK concerns understanding how such tools can be deployed alongside pedagogy in ways that are appropriate to the discipline and the development of the lesson at hand.

TPACK is the end result of these various combinations and interests, drawing from them – and from the three larger underlying areas of content, pedagogy, and technology – in order to create an effective basis for teaching using educational technology. In order for teachers to make effective use of the TPACK framework, they should be open to certain key ideas, including:

- 1) concepts from the content being taught can be represented using technology,
- 2) pedagogical techniques can communicate content in different ways using technology,
- 3) different content concepts require different skill levels from students, and edtech can help address some of these requirements,
- 4) students come into the classroom with different backgrounds – including prior educational experience and exposure to technology – and lessons utilizing edtech should account for this possibility,
- 5) educational technology can be used in tandem with students’ existing knowledge, helping them either strengthen prior epistemologies or develop new ones.

Because it considers the different types of knowledge needed and how teachers themselves could cultivate this knowledge, the TPACK framework thus becomes a productive way to consider how teachers could integrate educational technology into the classroom. Then too, TPACK can also serve as a measurement of instructor knowledge, potentially impacting both training and professional development offerings for teachers at all levels of experience. Finally, the TPACK framework is useful for the ways in which it explicates the types of knowledge most needed in order to make technology integration successful in the classroom. Teachers need not even be familiar with the entire TPACK framework as such in order to benefit from it: they simply need to understand that instructional practices are best shaped by content-driven, pedagogically-sound, and technologically-forward thinking knowledge.

Techno-pedagogical competency is the ability of teachers to use technology effectively in teaching and learning. It includes the following skills:

- **Using technology**

Teachers should be able to use computers, software, and other technology to create study materials and assignments.

- **Troubleshooting**

Teachers should be able to troubleshoot basic technical issues and use the control panel to edit and rectify errors.

- **Planning**

Teachers should be able to plan for crossroads inside and outside the classroom, and design appropriate tasks.

- **Integrating technology**

Teachers should be able to integrate technology with the subject matter and content to enhance teaching and learning.

- **Evaluating learning systems**

Teachers should be able to evaluate the benefits and drawbacks of different learning systems.

- **Managing time**

Teachers should be able to manage time and integrate technologies efficiently.

Techno-pedagogical competency can help teachers make quality education accessible and affordable to all students.

Currently, technology is treated as if it is separate from teaching and learning. We have Professional Development workshops where we are instructed in the use of some particular software or app, and how to fit it into our classroom is not discussed. Mishra and Koehler point to this as a current negative impact. They claim that the lack of awareness of TPACK keeps technology separated and leads to four problems with using technology in the classroom. First, there are such rapid changes in technology that it is extremely difficult to keep up with all the latest advancements and apps. The second problem is that software is designed for business, not for education. This often means that students are learning how to use the program and not learning the content of the class. The third problem with keeping technology separate is the situational nature of the classroom. A teacher can adjust a lesson to make sure it meets the needs of the specific group of students, but the instructional video cannot. It's the same video every time it is played. Finally Mishra and Koehler say that keeping technology separate places an emphasis on "what" not "how." From the teacher's perspective the lesson becomes about what technology are we going to use today, what does it say, what skills does it require, instead of how can I teach my students.

Thus it is the need of the hour that TPACK framework should be adopted judiciously by the educators and teachers in such a way that technology may not be treated as separate from teaching and learning, rather it should be made an integrated and integral part of teaching and learning process. This will make teaching and learning process more effective.

## CONFLICT OF INTERESTS

None.

## ACKNOWLEDGMENTS

None.

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