

TPACK: AN EMERGING TOOL FOR TEACHER EDUCATORS TO NEW GENERATION

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Abstract

This study's goal was to create and verify an instrument that would assess preservice teachers' self-reports of their Technological Pedagogical Content Knowledge (TPACK) and other knowledge areas connected to the framework. In order to better understand how technology is used in learning and teaching, academics have developed the concept of TPACK (technological pedagogical content knowledge). This article defines the TPACK construct and describes many ongoing research and development initiatives that make use of the TPACK framework. Along with future directions for this study, the power of the TPACK framework in research and evaluation work on technology integration is explored. As a result of the development of information technology, several studies in the field of education have recently demonstrated the efficacy of technology-assisted teaching. According to Shulman, who pioneered the notion that teachers should develop a complex, situated, and integrated body of knowledge known as technological pedagogical and content knowledge (TPACK), successfully integrating educational technology into the teaching of specific courses is a challenging task. As a result, there have been frequent discussions over instructors' professional awareness of TPACK. This covers both scholarly viewpoints and instructional strategies. The TPACK is a theoretical framework that focuses on how technology is incorporated into education. It may have a substantial influence by giving instructors a comprehensive understanding of the full body of knowledge they need to apply technology in the classroom.

Keywords: Technological Pedagogical Content Knowledge, Components of TPACK, Importance of TPACK in Pre-service teachers' curriculum

Introduction

Technology has entered in to all the parts of human life and it is an unavoidable aspect of modern educational system also. Inclusion of technology in education changed the way of teaching learning process and to enhance the learning experience. Currently traditional educational system wants to transfer to the online mode. Internet provides an indescribable wealth of information and resources to the students and they are able to access information about whatever subject they want. Various technological tools enabled teachers to make their lessons more interactive and interesting.

Integration of technology in education is defined as the use of technology to achieve the learning goals and to empower learning through the inculcation of various technologies. This integration is defined not only by the amount or type of technology used, but also by how and why it is used is also important. Teaching process is not a simple process of teacher' lecturing and students' listening. It is a process of analysis, design, practice and reflection.

So, implementation of technology in class room requires a well planning and should be based on the real needs of the student and the institution. It should be practical, attainable, and efficient.

Integration of technology itself cannot change the education. In order to take its benefit completely, it must be integrated in education properly. If the technology is successfully integrated, it can provide a lot of opportunities to the educators and students. The success of technology integration depends on the teacher's ability to explore the relationship between pedagogy and technology. The teacher should also consider how the technology selected should be in match with the objectives of the lesson, methods of instruction, evaluation, feedback and follow-up initiatives. It provides teachers the opportunity to reflect on their teaching and avoid mechanistic integration of technology.

Integration of technology should be based on teaching learning principles. Most of the teachers considered technology as a tool for instruction and fail to relate it to pedagogy. Educational technology has become a focus of many reform minded individuals. Unfortunately, this focus directed to a techno-centric approach without sufficient importance on content and pedagogy. Present educational technology reforms need to avoid this techno-centric approach and focus on learning theory, pedagogy and content. In order to successfully implement technology in classroom, a teacher must know the content, the best way to teach that content and the knowledge about the technology that will enhance that content. So, the knowledge about technology cannot be treated as context-free and the good teaching requires a clear understanding of how technology relates to the pedagogy and content.

A perfect balance between Technological knowledge, Pedagogical knowledge and Content knowledge is essential for an effective teaching-learning process. In this regard, Kohler and Mishra (2005) developed the TPACK model, based on Schulman's (1986) pedagogical content knowledge. In TPACK Model, technology has been integrated into teachers' knowledge, skills and competencies. The core areas of TPACK framework are Content, Pedagogy and Technology. These basic components form the foundation of TPACK framework. This framework goes beyond the mere observation of the three basic knowledge constructs and goes further by emphasizing the types of knowledge found at the intersections of three primary forms as well as looking at these three knowledge bases in isolation. The new knowledge domains are Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and Technological Pedagogical Content Knowledge (TPACK).

Components of TPACK

1. **Technology knowledge (TK):** Technology knowledge is the knowledge about various emerging information technologies and operation of relevant hardware and software programs. It ranging from low-tech technologies, such as pencil and paper, to digital technologies, such as the Internet, digital video, interactive whiteboards, and software programs.
2. **Content Knowledge (CK):** Content knowledge is the knowledge about actual subject matter that is to be learned or taught.

3. **Pedagogical Knowledge (PK):** The third component Pedagogical knowledge denotes the methods and processes of teaching. It includes fundamental knowledge in classroom management, assessment, lesson plan development and student learning.
4. **Pedagogical Content Knowledge (PCK):** Fourth component Pedagogical Content Knowledge is similar to Shulman's idea of knowledge of pedagogy appropriate to teaching a specific content. It refers to the knowledge about developing suitable teaching practices for a given subject area.
5. **Technological Content Knowledge (TCK):** Technological Content Knowledge refers to an understanding of how technology and content influences and limits each other. Teachers need to master the subject they teach and also have a clear understanding of how the subject matter can be changed through the application of particular technologies.
6. **Technological Pedagogical Knowledge (TPK):** Technological Pedagogical Knowledge refers to the knowledge of how teaching and learning can change when certain technologies are used in particular ways. This includes knowledge of the pedagogical possibilities and limitations of a variety of technological tools related to disciplinarily and developmentally appropriate pedagogical designs and strategies.
7. **Technological Pedagogical Content Knowledge (TPACK):** Seventh and final component TPACK is different from knowledge of all three concepts individually. It deals with knowledge about how appropriate information technologies and pedagogical methods or strategies can be incorporated to facilitate learning in a given subject area.

Importance of TPACK in Pre-service teachers' curriculum

In response to the Covid-19 Pandemic, governments worldwide announced the shutdown of services, including educational institutions to limit the disease's spread. Learning from home in the Covid-19 Pandemic period posed various challenges both for teachers and students. The situation is most challenging for developing countries. They have taken some extreme lockdown measures and as a part of this, the education system was fully changed to online mode. However, a lack of resources makes equitable access challenging. Limited resources and lack of ability of teachers to integrate technology in learning was a challenge for various educational institutions. TPACK is a new requirement for teachers' knowledge structure and it could help teachers effectively by the use of various information technology and digital means to make concept teaching clearer and more efficient.

Professional development is important to ensure teachers gain the knowledge required to effectively integrate technology in the classroom. Pre-service teacher course curriculum can play a major role in maintaining the quality of teacher education and professional development. So, improving the curriculum of pre-service teachers' education is an important way to improve teachers' TPACK. There are three general areas need to be taken in to consideration when we plan development opportunities for teachers. First of all, teachers need strong knowledge about the content area in which they teach and professional development should always contain this strand. Second, teachers need professional development to understand and develop the pedagogical knowledge required to create a constructivist, student centred learning

environments. Finally, teachers need strong technological knowledge. TPACK is therefore a promising framework for teachers to understand how technologies can be integrated in our classroom.

References

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