



## TECHNO-PEDAGOGICAL PERSPECTIVE IN SOCIAL SCIENCE TEACHING: REDEFINING TPACK FRAMEWORK

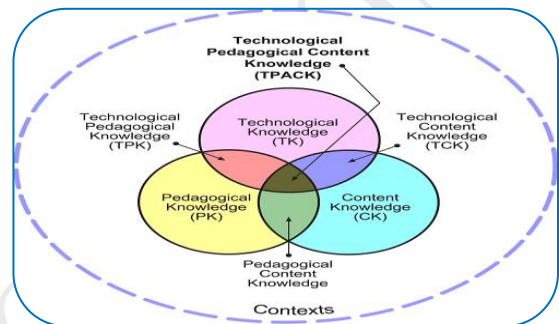
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### ABSTRACT :

Teaching is considered as a complex and ill-structured activity especially in the 21<sup>st</sup> century with the rapid growth of information and communication technologies (ICT). This complexity has been furthered again with the integration of technology in the teaching process. The paper intends to find a compatible solution encompassing teaching within the framework of integrating technology into the content and pedagogical knowledge and examine the ways teachers endorse the technological, pedagogical and content practices in Social Science teaching. This is examined by using Technological, Pedagogical and Content Knowledge analysis (TPACK) (Mirshra & Koehler, 2006) as a framework to explore the technology integration practices in Social Science education. The very framework is built upon the Pedagogical Content Knowledge (PCK) of Lee Shulman, which conceptualizes on the inclusion of technological knowledge in teaching process. The TPACK framework is instrumental to the teachers for effective teaching with the inclusion of technological knowledge. The insertion of technology in education is reshaping or transforming the teaching/ learning paradigm and not just an add-on to the existing system of education. The utilization of technology modifies the pedagogical techniques and in turn pedagogy provides the basic requirements to the effective integration of technology, hence there is a reciprocal interaction among the two. The paper also propose to depict the multifaceted integration of three important aspects of knowledge ie. Content knowledge, pedagogical knowledge and technological knowledge. The interaction of these three bodies of knowledge provides us theoretical as well as experiential knowledge on how we can successfully integrate technology into the teaching of Social Sciences. This study also analyses how technology supports teachers in identifying the learners with content specific understandings and conduct effective blending of technology in the classroom context. The focus group discussion data of second semester student teachers who are presently undergoing the school based teaching practice were utilized to assess the teacher's knowledge about the integration of technological knowledge into the pedagogical and content knowledge in the school education. 'Inclusion of the excluded techniques' in teaching was observed as an effective strategy for the development of TPACK in student teachers, which would in turn enhance the integration of technology in teaching and it makes the complex activity of teaching into a fascinating bustle.

**KEYWORDS :** student teachers, technological knowledge, technological pedagogical content knowledge, technology integration.



## INTRODUCTION:

The teacher educators know that teaching is a complicated practice that requires an interweaving of many kinds of specialized knowledge. In this way, teaching is an example of an illstructured discipline, requiring teachers to apply complex knowledge structures across different cases and contexts (Mishra, Spiro, & Feltovich, 1996; Spiro & Jehng, 1990). The teaching is a craft and it is a highly complex practice which takes place in the context of a classroom. This needs flexible access to rich and integrated knowledge from various domains. It also requires the knowledge of thinking and learning of the student, subject matter and nowadays, most importantly the knowledge about the use of technology and its integration in the teaching –learning process.

The increasing use of technology will bring changes in the understanding about the teaching – learning and its tools will help the teachers and students in and out of the school in the educational purpose. So the teachers have to integrate the current technologies in education and incorporate with the pedagogical and content knowledge.

## TEACHING WITH TECHNOLOGY: CONSTRAINTS

As the complex activity, the integration of technology will again complicate the teaching process. The integration of technology is the act of including technology in teaching. In the current situation, the technologies used for education are newer and digital and the direct application of these technologies is some ways difficult. The traditional pedagogical technologies are replaced with the new digital technologies and it will become characterized by transparency, stability, specificity in the educational system. The digital technologies -such as computers, handheld devices, and software applications—by contrast, are protean (usable in many different ways; Papert, 1980); unstable (rapidly changing); and opaque (the inner workings are hidden from users; Turkle, 1995). On an academic level, it is easy to argue that a pencil and a software simulation are both technologies. The latter, however, is qualitatively different in that its functioning is more opaque to teachers and offers fundamentally less stability than more traditional technologies. By their very nature, newer digital technologies, which are protean, unstable, and opaque, present new challenges to teachers who are struggling to use more technology in their teaching. (Koehler & Mishra, 2009).

The teaching with technology is further complicating with the social and contextual factors and the notion that the technologies are neither neutral nor unbiased. Social and institutional atmosphere are often unsupportive of teachers' efforts to integrate technology use into their work. Teachers often have insufficient experience with using digital technologies for teaching and learning. The teachers are not much equipped with the use of technology and they have a feeling that they are not fit for preparing lessons in the classroom with the help of technology. Another problem is that the use of technology with the existing pedagogy to exchange a content matter to the student. The teachers are using a specific pedagogy of teaching to a particular content to the students. The exposure to new knowledge and acquisition of the skill to use is a challenging task for the teachers. It needs a well developed training for adapting this technology but there is often been provided inadequate training for this multifarious task. Understanding all these constraints will help to solve the problem of technology integration in teaching-learning process.

## INTEGRATING TECHNOLOGY IN TEACHING

With all these constraints, we need an approach to integrate the technology in teaching process. The approach which treat teaching as an interaction between what teachers know and how they apply what they know in the unique circumstances or contexts within their classrooms. (Koehler & Mishra, 2009). The integration of technology should be designed creatively and constructed according to the various subject matter and classroom contexts. To have a handle on the task of technology integration, we need some specific approaches and find out the conduct of this complexity.

The teaching with technology include three main components ie. the content, pedagogy and technology. The integration of all these knowledge components together contributes the effective integration of technology in teaching. Content knowledge is defined as “the concepts, principles,

relationships, processes, and applications a student should know within a given academic subject, appropriate for his/her and organization of the knowledge." Pedagogy is the science of teaching, instruction and training. Pedagogical content knowledge (PCK) was first introduced by Shulman (1986, 1987) and defined as teachers' ways of representing and formulating the subject-matter knowledge in the context of facilitating student learning. (Ozden,2008).According to Shulman, PCK includes knowledge on how to teach a specific content or subject-matter knowledge. In addition to Shulman's Pedagogical Content Knowledge, the technological knowledge is also included in this framework. Learning is promoted when teachers consider how pedagogy can be adapted to meet the unique content and skills of using technology in specific teaching learning process.

### **NEW APPROACH: THE TPACK FRAMEWORK**

Shulman's (1986) framework of PCK extended by Mishra and Kohler in 2006 as TPACK ie. Technological, pedagogical and content knowledge to integrate technology in education. It is explained as a complex relationship between the knowledge of content, pedagogy and technology and how we can use this knowledge in teaching-learning process. It is also envisaged as an understanding of the complex relationship among the students, teachers, technology, pedagogy, content and tools used in the process of teaching.

This framework of integrating ICT is rapidly developing one in the educational scenario nowadays. This complex framework includes seven kinds of knowledge of teachers such as technological knowledge (TK), pedagogical knowledge (PK), content knowledge (CK), technological content knowledge (TCK), pedagogical content knowledge (PCK), and technological pedagogical knowledge (TPK), technological pedagogical content knowledge (TPACK). (Gur &Karamate, 2015)

### **CONTENT KNOWLEDGE**

Content knowledge (CK) is teachers' knowledge about the subject matter to be learned or taught. It includes various levels of academic disciplines like primary school science, high school social science and graduate level sociology. Knowledge of content is of much importance for teachers. 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. The acquisition of knowledge and its inquiry is different between various disciplines and the teachers must understand the fundamental aspects of teaching in various subjects. In the case of social science subjects like history, geography, civics etc, the teachers have knowledge about the geographical locations, historical contexts and social conditions.

### **PEDAGOGICAL KNOWLEDGE**

Pedagogical knowledge (PK) is teachers' deep knowledge about the processes and practices or methods of teaching and learning. They encompass, among other things, overall educational purposes, values, and aims. (Mishra & Koehler, 2013). This pedagogical knowledge is the understanding of how students learn, lesson planning, classroom management and evaluation and assessment of students. It applies the technique and methods of teaching, various strategies for evaluation of students, the psychological level of the students etc. 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. (Mishra & Koehler, 2013).

### **PEDAGOGICAL CONTENT KNOWLEDGE**

PCK is 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. (Mishra & Koehler, 2013). 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. It includes the various conditions that promote learning like teaching, curriculum, assessment and evaluation and its relation among curriculum, assessment and pedagogy.

### **TECHNOLOGY KNOWLEDGE**

Technology knowledge (TK) is always in a state of flux—more so than the other two core knowledge domains in the TPACK framework (pedagogy and content). Thus, defining it is notoriously difficult. Any definition of technology knowledge is in danger of becoming outdated day by day. (Mishra & Koehler, 2013). In the TPACK framework, the definition of TK is similar to (FITness) Fluency of Information Technology. It suggested that the persons can understand the information and communication technology in a broad sense and apply it in their everyday life and adapt the changes in it. It requires a deeper understanding of information technology and its processing, communication and problem solving. It is a developmental aspect of technology and it evolving over a lifetime of generative, open-ended interaction with technology.

### **TECHNOLOGICAL CONTENT KNOWLEDGE**

Technological content knowledge (TCK) includes an understanding of the manner in which technology and content influence and constrains one another. In planning for instruction, content and technology are often considered separately. (Mishra & Koehler, 2013). Technological content knowledge (TCK) considers the ways in which subject matter and technology are related. Although technology applications may constrain the representation of subject matter, newer technologies may provide opportunities for more varied and effective ways to represent content knowledge. Technology and content knowledge have a deep historical relationship. The progress in the fields of history, archeology, medicine and physics has coincided with the development of new technologies that afford the representation and manipulation of data in new and fruitful ways. The new ways of understanding the impact of technology on the practices and knowledge of a given discipline is significant for developing the appropriate technological tools for educational purposes. The technology constraints some of the content ideas and the content areas can limit the types of technologies. But the technological tools can provide a greater degree of flexibility in the content transaction in an educational system.

### **TECHNOLOGICAL PEDAGOGICAL KNOWLEDGE**

Technological pedagogical knowledge is the understanding of how teaching and learning can change when particular technologies are used in particular ways. It includes the knowledge about pedagogical tools and technological tools and its effective transaction in the classroom. To build TPK, a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed. (Mishra & Koehler, 2013).

### **TECHNOLOGY, PEDAGOGY, AND CONTENT KNOWLEDGE (TPACK)**

TPACK is a new form of knowledge that goes ahead of all three "core" components (content, pedagogy, and technology). TPACK is an understanding that emerges from interactions among content, pedagogy, and technology knowledge. It is a new strategy of teaching with technology and is different from knowledge of all three concepts individually. It requires an understanding of the effective content transaction of using technology, pedagogical techniques to teach the content with technology and the knowledge about the easy and difficult concept in which technology can facilitate to overcome the difficulties of teaching and students knowledge about the theories of epistemology and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.

With the integration of technology, pedagogy and content, the teachers can use TPACK in classroom at anytime and for any kind of subject matter. Every situation that teachers faced is a unique combination of these three factors and there is no single technological solution that applies for every

teacher, every course, or every view of teaching. Rather, solutions lie in the ability of a teacher to flexibly navigate the spaces defined by the three elements of content, pedagogy, and technology and the complex interactions among these elements in specific contexts. (Mishra & Koehler, 2013)

### TPACK IN SOCIAL SCIENCE

The social science teaching with the TPACK framework is influential for the effective transaction of content to the students. Content (C) is the subject matter that is to be learned/taught, while Technology (T) encompasses modern technologies such as computers, the internet, digital video, and more commonplace technologies including overhead projectors, blackboards, and books. Pedagogy (P) describes the collected practices, processes, strategies, procedures, and methods of teaching and learning. It also includes knowledge about the aims of instruction, assessment, and student learning (Horzum, Demirbas & Bayrakci). The TPACK framework describes good teaching with technology by including the components of content, pedagogy, and technology. Technological pedagogical content knowledge describes how teachers' knowledge of technology, content, and pedagogy interact to use technology strategically for instruction (Landry, 2010).

For the effective transaction of content in social science, teachers should learn how to use technology to transform teaching and create opportunities for student learning along with allowing students to use technology in the classroom. The strategic use of technology in social science instruction is critical and teacher educators and professional developers should know how to support teachers as they learn ways to use technology to enhance instruction (Landry, 2010).

In the social science teaching, the integration of ICT is vital in transforming the nature and extent of social studies subjects. The ideas and subject matter of social science will be more futuristic with the use of technology. The TPACK framework is a tool for analyzing the integration of technology in social science teaching. This framework is instrumental for the teachers to make their social science teaching more effective and systematic. The integration of technology is reshaping the teaching-learning paradigm and it will enhance the students' interest in learning. There also existed a reciprocal relation between technology and pedagogy i.e., technology modifies the pedagogy and pedagogy gives the basic requirements for the effective integration of technology in social science teaching.

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