
A Study of TPACK among Secondary School Teachers

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Abstract

We have numerous discussions about how to “use technology in the “classroom. As teachers, we feel a push to incorporate technology into our classroom because of the new outcomes that demand it. And the TPACK model provides a fresh framework for the incorporating of technology in teacher “education. TPACK stands for “technology, Pedagogical content Knowledge. It is a hypothesis that was created” to explain the set of knowledge that teachers need to teach their students a subject, teach effectively, and use technology. The concept of TPACK “comes around by the seminal piece on the TPACK model was written in 2006 by Punya Mishra” and Mathew J. Koehler in “Technological Pedagogical Content Knowledge: A framework for Teacher Knowledge”. We have three “knowledge domains areas to consider: Technology, Pedagogy and content knowledge.”Arranging these three categories into Venn diagram helps us to see the four areas that are “developed by Mishra and the teacher may effectively encourage technology in teacher education.” The use of technology in teacher education is effectively aligned with the content. For the best result, educators need to be proficient in each of the three areas. The main goal is to (1) How the Integration of technology in Teacher education with reference to “TPACK can be beneficial. (2) How the connections can be made in between teacher education technology and TPACK”. “TPACK is a term used increasingly to describe what teachers need to know effectively” integrate technology. TPACK is an essential part of the education system “today as it incorporates the growing demand on the use of technology in the content and how it can be” taught. The NPE-2020 talks in detail about linking the pedagogical content knowledge with technology. “The NEP discusses about providing importance to the entire disciplinary surface.” And there should be no distinction depending on the nature of subject. This will overall lead to technology outgrowth of knowledge and dynamisms in education system.”

Key words: TPACK, Secondary School Teachers

Introduction

Today's, the world is revolving around digital revolution in almost every field. Covid pandemic has introduced everyone with a new term of digital learning and online learning.

So, in the 21st century the technologies advancements and globalizations have brought many changes in the way of knowledge is constructed, preserved, and transmitted. The emergence of new information communication technologies (ICTs) in education. The change in the nature of context learners require teachers to change their role from direct learning to designing learning environments that suits the interest and needs of the digital learners. For this teacher needs to develop technology competencies to blend technology in teaching, and work in networks and collaborate with peers at global level. With the integration of technology, pedagogical, content knowledge (TPACK) in the educational scenarios, educational processes get speed, accuracy and accessibility. This approach should teach us a new paradigm as per the needs and goals of 21st century learning environments. NEP (National Education Policy) 2020 also emphasized the need and importance of technology-based education for 21st century learners.

NEP-2020 (National Education Policy) teachers will need training in high-quality pedagogy and content. Gradually, teacher education will be integrated in multifunctional college and universities by the year 2030. Our teachers will be required to have a 4-year integrated B.Ed., as there minimum degree requirement.

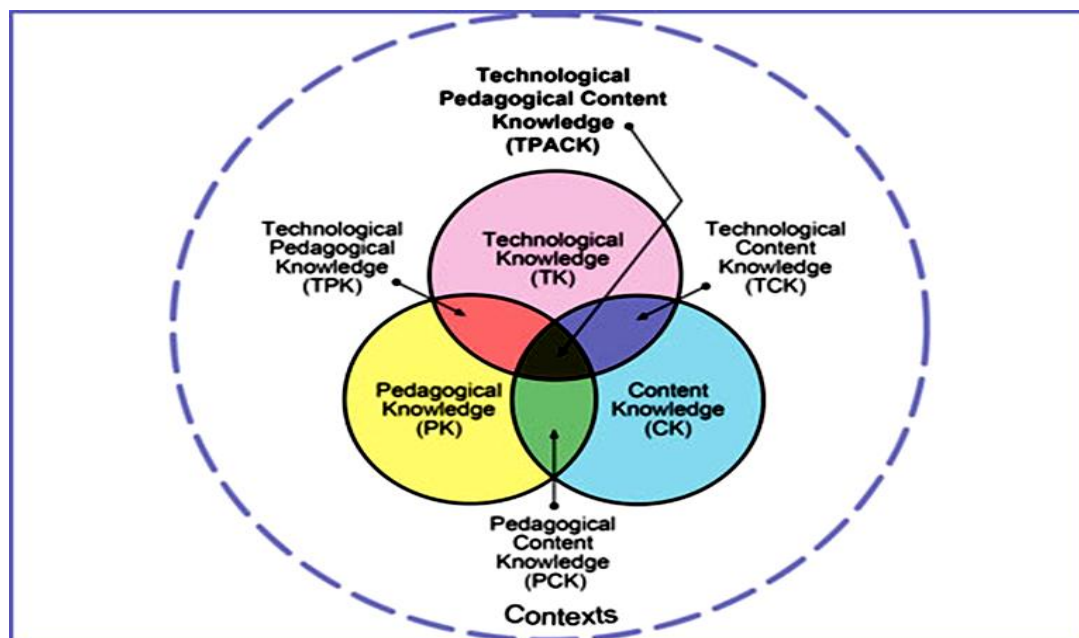


Fig 1.1: The TPACK Framework and Its Knowledge Components (Koehler & Mishra, 2009).

- ❖ **Wu, Y. T., Chai, C. S., & Wang, L. J. (2022).** Video-based flipped learning (VFL) has become a popular form of flipped learning. However, teachers' technological pedagogical content knowledge (TPACK) for video-based flipped learning is still under-explored. The finding of the study showed that the secondary school teachers are generally expressed sufficient confidence in their TPACK for VFL. They tended to have strong learner-centered pedagogical beliefs and moderate teacher-centered pedagogical beliefs. Besides, compared with the senior high school teachers, the junior high school teachers showed significantly higher confidence in their technological pedagogical content knowledge

(TPACK) for VFL ($p < 0.05$). This study also found that the teachers' learner-centered pedagogical belief was significantly correlated with their content knowledge (CK), pedagogical knowledge (PK), pedagogical content knowledge (PCK), technological content knowledge (TCK), and technological pedagogical knowledge (TPK) ($p < 0.05$). In contrast, their teacher-centered pedagogical belief was significantly correlated with their TCK, TPK, and TPACK ($p < 0.05$).

- ❖ **Van Loi, N. (2021).**Technology- driven changes have led to the needs for knowledge and skills to integrate information and communication technology into instructional activities. The study examines that Vietnamese teacher's perception of TPACK in EFL context. A 34-item survey adapted from Bostancioglu and Handley (2018) was used to collect data from 120 English teachers of 33 high schools in two Mekong Delta's provinces of Vietnam. Quantitative analysis showed that the teachers had a high level of basis computer and office technologies, and pedagogical content knowledge, but they rated their ability to integrate technologies with pedagogical content knowledge just above the average level. No significant differences in their TPACK were observed in terms of their teaching experiences, technology training, and gender, except for technology use of frequency. The findings confirm that trainers and educators should pay closer attention to supporting teachers both pre-service and in-service to develop TPACK as an integrated ability, instead of knowledge of technology per se. besides, teachers TPACK levels interact with the use frequency, so it is crucial for teachers to use technology frequently to increase their TPACK self-efficacy.
- ❖ **Mensah, B., Poku, A. A., & Quashigah, A. Y. (2022).**In Ghana, the integration of technology into the teaching and learning process seems to be making strides in tertiary education. The findings of the study showed that teachers possessed a high level of content and pedagogical knowledge in geography. The analysis, however, showed that teachers were not as confident as they were in content and pedagogy compared to technological knowledge and its subsequent integration into the teaching and learning of geography. It was, therefore, recommended among others that courses at the higher education level should integrate Information and Communication Technologies (ICTs) into teaching and learning to help student-teachers appreciate the place of specific technologies, hardware and software in the teaching and learning of their respective disciplines.

Rational of the study

As it is known that teacher is an important part of overall education system. As far as the teachers are concerned, they play a significant role in personality and development of child. Teaching is a responsible job and teacher is the key on whom the future of children and mankind depend, so i.e. the teachers have to be advanced in the use" of technology and "how to merged their use of technology so that they make their teaching effective and advanced full. In the present scenario the use of information communication technology in education like integration "of technology in teaching "learning process, to make teaching learning "process more effective and advance full. According, to some of the researcher study the researchers has found that in today's era of 21st century, technology is important, but how the

teacher is taking the use of technology in context formation, pedagogical formation and building the technology in very effective way of the teachers making use of TPACK and Self-Efficacy in their teaching process.

In some of the studies the TPACK is been studied with technological pedagogical content knowledge (TPACK) for video-based flipped learning, TPACK in EFL context, technology into the teaching and learning process seems to be making strides in tertiary education. With the use of technology, the teachers make their teaching more effective more energetic. Now question arise that use of technology varies according to type of organization & individual traits of teachers. If the teachers use TK, CK, PK in their teaching the teaching become more attractive. Above studies also shows that there are different variables which play important role in TPACK. On the basis of above studies research question Aries in front of researcher.

1. Is there any difference in TPACK of Male and Female Secondary School Teachers?
2. Is there any difference in TPACK of Government and Private Secondary School Teachers?
3. Is there any difference in TPACK of Rural and Urban Secondary School Teachers?

In order to find out the answers of the above questions the researcher has selected the following topic.

Statement of the Problem

A Study of TPACK among Secondary School Teachers

Objectives of the Study

The objectives of the study were as follows:

- To study TPACK of Secondary School Teachers with reference to Gender.
- To study TPACK of Secondary School Teachers with reference to Locality of schools.
- To study TPACK of Secondary School Teachers with reference to their Types of schools.

Hypotheses

The hypotheses of the study were as follows:

There is no significant difference between TPACK of Male and Female Secondary School Teachers.

- There is no significant difference between TPACK of Rural and Urban Secondary School Teachers.
- There is no significant difference between TPACK of Government and Private Secondary School Teachers.

Operational Definitions

- ✓ **TPACK (Technology Pedagogy Content Knowledge):** “TPACK is a collection of information that goes beyond its three core components: Content, Pedagogy, Technology. Technology pedagogical content knowledge is the understanding that arises from the interaction between the content, pedagogy, technology knowledge. Mishra & Koehler (2006) includes seven types of knowledge i.e. Technological knowledge (TK), Pedagogical knowledge (PK), Content knowledge (CK), Pedagogical content knowledge (PCK), Technological pedagogical knowledge (TPK), Technological content knowledge (TCK, Technological pedagogical content knowledge (TPACK).
- ✓ **Secondary School Teachers:** In this secondary school teachers are the persons who are teaching IX & X” class in government and private schools of Bareilly Divisions.
- ✓ **Gender:** Gender means male and female teachers of secondary schools.
- ✓ **Types of School:** Types of schools refers to government and Private Schools. The school “which are seen by government schools, the schools which are seen by individual or group of individuals is known as private school.
- ✓ **Locality of School:** In the study locality of schools means the area in which school is located. The school which is located in the rural area is considered as rural locality and if the school is located in urban area is considered as urban locality.

Variables of the Study

Dependent Variable: TPACK

Independent Variable: Gender, Types of School, Locality of the school.

Method of the Study

In the study descriptive survey method is used.

Sources of Data

In the study sources of data is primary source of data.

Population

The population of the study comprises of all teachers working in Government and Private Schools of Bareilly divisions (Badaun, Bareilly, Pilibhit, Shahjahanpur) of Uttar Pradesh. The U.P. has 18 Division and 75 Districts in which the researcher is going to take Bareilly Division as a population. Bareilly district of Uttar Pradesh is growing as an educational Hub from last 5-10 years. Many universities and schools have established here in these years. The Bareilly situated near the Capital of India i.e. Delhi & Capital of Uttar Pradesh i.e. Lucknow.

Sample

In the study sample has been selected in following Steps.

- ✓ Firstly, one division out of 18 divisions of U.P State has been selected purposively.

- ✓ Bareilly division has four districts Badaun, Bareilly, Pilibhit, Shahjahanpur.
- ✓ From four districts of Bareilly divisions ten government and ten private schools of U.P board & CBSE board has been selected randomly.
- ✓ Researcher has been selected 400 teachers from the selected schools by using random sampling technique.

Tool Used

In the study a tool has been constructed by researcher for measuring of TPACK.

Research Methodology

- a. For the measurement of TPACK among Senior Secondary School teacher's questionnaire constructed by researcher.
- b. Sample was selected on the basis of pre designed sampling technique.
- c. The researcher has taken permission from the principal of school for data collection.
- d. Researcher has administrated the tools on selected teachers.
- e. Data has collected
- f. Collected data has been analyzed by using appropriate techniques.
- g. On the basis of data analysis findings has been mentioned.

Analysis of Data

Analysis and Presentation of Data of TPACK of Secondary School Teachers with reference to Gender

S. N.	Gender	N	Mean	SD	df	't'- Value	Level of significance
1.	Male	194	190.01	11.1	360	0.22	Not significant at 0.5 level
2.	Female	168	190.38	10.4			

From the table, it is observed that mean score of TPACK of Male teachers is 190.01, while mean score of Female is 190.38. It is observed that SD of Female schools Teachers is less than Male school teachers. The table value is .05% which is 1.96, and the Calculated 't' value is 0.22 which is not significant at .05 level. Thus Hypothesis 1 is accepted which signify that there is no significant difference in the TPACK of male and female school's teachers. It means that TPACK of Secondary school's teachers do not differ in relation to their Gender.

Analysis and Presentation of Data of TPACK of Secondary Schools Teachers with reference to Locality of Schools

S. N.	Locality of schools	N	Mean	SD	df	't'- Value	Level of significance
1.	Rural	175	189.9	10.59	360	0.25	Not significant at 0.05 Level
2.	Urban	187	190.1	10.60			

From the table, it is observed that mean score of TPACK of Rural teachers is 189.9, while mean score of Urban is 190.1. It is observed that SD of Rural schools Teachers is less than Urban school teachers. The table value is .05% which is 1.96, and the Calculated 't' value is 0.25 which is not significant at .05 level. Thus Hypothesis 2 is accepted which signify that there is no significant difference in the TPACK of Urban and Rural Secondary school's teachers. It means that TPACK of Secondary schools teachers do not differ in relation to their locality of schools.

Analysis and Presentation of Data of TPACK of Secondary School Teachers with reference to Types of Schools

S. N.	Types of School	N	Mean	SD	df	't'- Value	Level of Significance
1.	Government	182	10.14	11.18	360	0.906	Not significant at 0.05 Level
2.	Private	180	10.20	10.42			

From the table, it is observed that mean score of TPACK of Government teachers is 10.14, while mean score of Urban is 10.20. It is observed that SD of Government schools Teachers is less than Private school teachers. The table value is .05 % which is 1.96, and the calculated 't' value is 0.906 which is not significant at .05 level. Thus Hypothesis 3 is accepted which signify that there is no significant difference in the TPACK of Government and Private Secondary school's teachers. It means that TPACK of Secondary school's teachers do not differ in relation to their Types of schools.

Findings

- ✓ As per the study, TPACK revealed that half of the teachers' familiar about technology but they are no familiar about the integration Technological Pedagogical Content knowledge in their teaching-learning process.
- ✓ The data obtained on the basis of Gender, Types of schools, and Locality of schools. The study shows that there is no significant difference between the male and female teachers

of secondary school teachers, there is no significant difference between rural and urban schools and there is no significant difference between government and private schools of Secondary School teachers.

Educational Implications

There is a great need to increase awareness for the future teachers regarding TPACK knowledge, as the whole nation is in the hands of prospective teachers and teacher's educators.

- The findings of the study reveal that in spite of the compartmental knowledge in technology, pedagogy and content knowledge, our ongoing teaching practices should make preservice teachers familiar about the integration of technology, pedagogy, and content knowledge.
- Teacher educators should be made familiar about the framework by having periodical faculty development program so that teachers have the knowledge about this integration.
- There should be provision in new curriculum of the teacher education program for continuous updating of syllabi of the course as per changing needs and demands of the as well as society.
- It has also been found that teachers' attitudes and aptitude play an important role in teaching learning process, vision should be developed by our teacher training program to motivate and direct their teaching and learning with the help of technology and using related instructional methods. Using technology in teaching should not to be confused with technology driven approach how technology has been integrated pedagogically in the specific content.

Conclusion

The role of modern teacher in 21st century is very different from the teachers in the past where main motive was only to deliver wisdom to the individuals. Today's individuals can access content on search engines, where knowledge is being digitized or openly accessible, where jobs are changing rapidly, teachers need to enable people to become lifelong learners, to manage complex ways of thinking and complex ways of working that computers cannot take over easily. Therefore, teachers should not aware of technology, pedagogy and content knowledge but to be efficient enough in doing integration of these three important aspects in the teaching learning process. There is great need for our teacher's preparation program to prepare pupil teachers for 21st century.

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