



# TECHNO - PEDAGOGICAL CONTENT KNOWLEDGE OF PROSPECTIVE TEACHERS

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## Abstract

The present investigation focuses on the study of Techno - pedagogical Content Knowledge of Prospective Teachers. The survey method is adopted in this present study. The sample consists of 267 Prospective Teachers in Coimbatore District, TamilNadu, India. The main findings of the study are: There is no significant difference between the variables of male and female, rural and urban, arts and science, joint family and nuclear family, graduate and post graduate of the Prospective Teachers in their Techno - pedagogical Content Knowledge. There is no significant association between family annual income of the Prospective Teachers and their Techno - pedagogical Content Knowledge. This study recommends that Techno - pedagogical Content Knowledge of Prospective Teachers is an essential aspect to counteract with the socialistic situations prevailing in educational institutions and the progress of the society.

**Keywords:** Techno - pedagogical Content Knowledge, Prospective Teachers

## INTRODUCTION

Teachers play an important role in our life to become successful in career and business. A good teacher helps us to become a good human being in society and a good citizen of the country. Teachers know that students are the future of any nation. So the future development of any nation is in the hands of teachers. What an individual become in life is depends on teachers.

Techno - pedagogical content knowledge is based on the aspects of Technological Knowledge (TK) , Pedagogical Content Knowledge (PCK) and Technological Content Knowledge (TCK)

Technological Knowledge (TK) describes teachers' knowledge of, and ability to use, various technologies, technological tools, and associated resources. TK concerns understanding educational technology, 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) 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 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) 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 educational technology offerings, and considering which specific educational technology tools might be best suited for specific subject matters or classrooms.

## LITERATURE REVIEW

Javier Rodriguez Moreno, Murian Agreda Montoro and Ana Maria Qrtiz colon (2019) TPACK in Department of Pedagogy. The TPACK models represent a high-impact advance in teacher training regarding their technological, pedagogical and content knowledge. This research presents an analysis of several publications in international databases that address the matter of the TPACK Model.

Accordingly a review of the scientific literature applying the documentation as a systematization method was performed. The documentary analysis was based on four different criteria public, topic, main results, and methodological design. Anderson, S. Griffith, R. & Crawford, L. (2017) “TPACK in Special Education: Pre-service Teacher Decision Making While Integrating iPads Into Instruction”. This study provides insight into pre-service teachers’ experiences with integrating technology into lessons with children who had mild learning disabilities. Participants course with a fieldwork component. The researchers collected and analyzed lesson plans, journal entries, focus group interviews, and field notes. The findings illustrated pre-service teachers’ use of iPad apps during fieldwork, identified their technology related instructional decisions, and determined how those choices exhibited emerging dimensions of technological, pedagogical, and content knowledge (TPACK).

Bulent Ecevit (2017) “The factors affecting Techno-pedagogical competencies and critical thinking skills of Preservice Mathematics teachers, Turkey”. Students’ high level thinking skills, like critical thinking, having been developed thanks to the use of technology. This research aims to investigate whether Techno-Pedagogical competencies and critical thinking skills show statistically significant differences in terms of some variables and whether there is statistically significant relationship between critical thinking skills and Techno-Pedagogical competencies of pre-service elementary Mathematics Teachers.

Muhammad Ozdemir (2016), “An examination of the Techno-pedagogical Education competences (TPACK) of pre-service Elementary school and preschool teachers”. The purpose of this study is to determine the Technological pedagogical content knowledge of pre-service elementary school and preschool teachers. The fundamental problem of the study consists of the investigation of teachers TPAK by their year of study and fields. This is a descriptive study. It should be supplemented with practice in teaching practicum courses and should be included in practice evaluation forms as a criterion. Lekkam Hanane (2015) “ICT and the Development of Techno-Pedagogical Skills among the Algerian University Teachers, University of Tlemcen, Algeria”. By carrying a survey among 240 Algerian university teachers, to describe the importance given to ICT in education; emphasizing their impact on the techno-pedagogical skills of the higher education teachers.

Dr. Nimsha Beni, Lalit Sharma (2019) “Teacher-Educator, Technological Pedagogical and Content Knowledge (TPACK) Teacher Training Colleges. The Conquest of any educational practices rests on the understanding and familiarity of teacher educators towards the efficient use of TPACK competencies in whole education process. Understanding knowledge and levels of teacher educators towards TPACK matters a lot and is very essential. Leena Sharma (2018) “Construction and Validation of Technological pedagogical & Content Knowledge (TPACK) Scale. The technological, pedagogical, and content knowledge (TPACK) framework has been regarded as potentially effective in guiding teachers to integrate technology into the classroom. This framework helps the teachers to understand the complex relations between different components of the model. There have been numerous studies about the development of TPACK scale in international contexts which were beyond the cultural and language boundaries. Padmavathi. M (2017) “Preparing Teachers for Technology Based Teaching-Learning Using TPACK”. Technological Pedagogical Content Knowledge (TPACK) is a conceptual framework for teachers to teach effectively using technology. This framework originates from the opinion that use of technology in educational context would be effective only if content, pedagogy and technology are aligned carefully. It implies that for teachers to use technology in their teaching, they need to be competent in all three domains. This present paper is an attempt to understand the assumptions and components of Technological Pedagogical Content Knowledge (TPACK) as a conceptual framework.

## SIGNIFICANCE OF THE STUDY

This research provides an important way to know awareness of Prospective teachers while implementing TPACK Strategies. The TPACK strategies describe experiences, challenges and solutions that might be adapted by any teacher involved in integrating technology in education. First, it provides participants and readers with multiple professional development benefits and will add to the body of research on teachers. In addition, a pedagogical designed for supporting technology and integrating with teaching and learning practices. This can lead to valuable insights into improving education by using educational technology. Hence the investigator has chosen this topic.

## STATEMENT OF THE PROBLEM

Techno - Pedagogical Content Knowledge of Prospective Teachers

## OBJECTIVES OF THE STUDY

To find the level of Techno - Pedagogical Content Knowledge of Prospective Teachers.

To find the differences in the Techno - Pedagogical Content Knowledge of Prospective Teachers with reference to gender, locality of college, major subjects, marital status, type of family, degrees and their family annual income.

## OPERATIONAL DEFINITION

According to the investigator,

Techno Pedagogical: - It refers Teaching or learning with the use of technology through e- services.

Content Knowledge: - It refers Cognition in learning or the processes of increasing knowledge through senses.  
 Prospective Teachers: - It refers to the Students those who are studying B. Ed. course in College of Education.

## HYPOTHESES

1. There is no significant difference between male and female Prospective Teachers in their techno - pedagogical content knowledge
2. There is no significant difference between rural and urban area Prospective Teachers in their techno - pedagogical content knowledge
3. There is no significant difference between arts and science Prospective Teachers in their techno - pedagogical content knowledge.
4. There is no significant difference between married and unmarried Prospective Teachers in their techno - pedagogical content knowledge.
5. There is no significant difference between Prospective Teachers belongs to nuclear and joint family in their techno - pedagogical content knowledge.
6. There is no significant difference between the Prospective Teachers having graduate degree and post graduate in their techno - pedagogical content knowledge.
7. There is no significant association between family annual income of the Prospective Teachers and their techno - pedagogical content knowledge.

## METHOD USED

In the present study, the investigator used the descriptive survey method to study the Techno - pedagogical Content Knowledge of prospective teachers.

## POPULATION AND SAMPLE FOR THE STUDY

The population for the present study is the Prospective Teachers in Coimbatore District. The sample consists of 267 Prospective Teachers who were selected Government, Private and Government Aided Colleges in Coimbatore District. In this study, the sub-groups are selected in accordance with the demographic variables, such as gender, locality of college, major subjects, marital status, type of family, degrees and family annual income.

## TOOLS USED

The investigator has used the following tools

1. Personal Data Sheet.
2. Techno - pedagogical Content Knowledge Scale developed and standardized by the Investigator (2022).

Techno - pedagogical Content Knowledge Scale had five point rating scale with thirty statements. The reliability of the tool was checked by using Test – retest method. Reliability co-efficient was found to be 0.85, which showed the tool was highly reliable. The validity of the tool was found by taking the square root of reliability and it was 0.92, which showed that the tool was highly valid.

## STATISTICAL TECHNIQUES USED

The statistical Techniques Mean, Median, Standard deviation, Percentage analysis, t-test and Chi-square test were used for analysis and testing the hypotheses.

**DATA ANALYSIS AND INTERPRETATION**  
**TABLE 1: LEVEL OF TECHNO - PEDAGOGICAL CONTENT KNOWLEDGE**  
**OF PROSPECTIVE TEACHERS**

VARIABLE	Low		Moderate		High	
	No.	%	No.	%	No.	%
Techno - pedagogical content knowledge	34	12.73	48	17.98	185	69.29

It is inferred the above table that 12.73 % of prospective teachers are showing Low Level, 17.98% of them showing moderate level and 69.29 % of them are showing High level of techno - pedagogical content knowledge.

**TABLE 2: DIFFERENCE BETWEEN PROSPECTIVE TEACHERS IN THEIR TECHNO - PEDAGOGICAL CONTENT KNOWLEDGE**

Variables	Sub variables	N	Mean	S.D	Calculated 't' value	Table value	Remarks at 5% level
Gender	Male	49	64.53	5.225	1.129	1.96	Not Significant
	Female	218	63.45	4.807			
Locality	Rural	125	63.37	5.149	0.877	1.96	Not Significant
	Urban	142	63.89	4.663			
Subject	Arts	139	63.32	5.093	1.129	1.96	Not Significant
	Science	128	64.00	4.663			
Marital status	Married	65	63.55	4.684	0.178	1.96	Not Significant
	Unmarried	202	63.68	4.971			
Type of family	Joint Family	191	63.37	4.796	1.493	1.96	Not Significant
	Nuclear Family	76	64.36	5.096			
Degree	Graduate	169	63.91	4.766	1.114	1.96	Not Significant
	Post Graduate	96	63.20	5.146			

From the table – 2, it is inferred that there is no significant difference between male and female, rural and urban, arts and science, married and unmarried, joint family and nuclear family and graduate and post Graduate prospective teachers in their techno - pedagogical content knowledge. This may be due to the fact that prospective teachers give more preference to extend their techno - pedagogical content knowledge. By comparing the mean scores science group prospective teachers (Mean: 64.00) having more score than arts (Mean: 63.32) group prospective teachers.

**TABLE 3: ASSOCIATION BETWEEN FAMILY ANNUAL INCOME OF PROSPECTIVE TEACHERS AND THEIR TECHNO - PEDAGOGICAL CONTENT KNOWLEDGE**

VARIABLE	df	Chi-square value	Table value	Remarks at 5% level
Family annual income	4	1.577	9.49	Not Significant

Table – 3 shows that there is no significant association between family annual income of the prospective teachers and their techno - pedagogical content knowledge. This may be due to the reason that Family annual income does not influence their techno - pedagogical content knowledge.

## FINDINGS

The findings of the present study;

1. The calculated 't' value (1.129) is lower than of the table value (1.96) at 5% level of significance. Therefore null hypothesis is accepted. Hence "There is no significant difference between problems of male and female prospective teachers in their techno - pedagogical content knowledge.
2. The calculated 't' value (0.877) is lower than of the table value (1.96) at 5% level of significance. Therefore null hypothesis is accepted. Hence, "There is no significance difference between problems of rural and urban area prospective teachers in their techno - pedagogical content knowledge.
3. The calculated 't' value (1.129) is lower than of the table value (1.96) at 5% level of significance. Therefore null hypothesis is accepted. Hence, "There is no significant difference between arts and science prospective teachers in their awareness of techno - pedagogical content knowledge.
4. The calculated 't' value (0.178) is lower than of the table value (1.96) at 5% level of significance. Therefore null hypothesis is accepted. Hence, "There is no significant difference between married and unmarried prospective teachers Students in their techno - pedagogical content knowledge.
5. The calculated "t" value is (1.493) is lower than of the table value 1.96 at 5% level of significant. Therefore null hypothesis is accepted. Hence, "There is no significant difference prospective teachers belonging to Nuclear and Joint Family in their techno - pedagogical content knowledge.
6. The calculated "t" value is (1.114) is slightly lower than of the table value (1.96) at 5% level of significance. Therefore null hypothesis is accepted. Hence, "There is no significant difference between prospective teachers having graduate degree and post degree in their techno - pedagogical content knowledge.
7. The calculated chi-square value (1.577) is lower than the table value ( 9.49 ) level of significance. Therefore null hypothesis is accepted. Hence, "There is no significant association between family annual income of the prospective teachers and their techno - pedagogical content knowledge.

## CONCLUSION

This study shows that 69.29 % of prospective teachers have high level of techno-pedagogical content knowledge. This may due to the fact that prospective teachers may adopt the technical oriented and their subject related knowledge up to date in their field of teaching and learning process. Prospective teachers may have lot of differences in their usage of Techno - Pedagogical content knowledge. But good teachers always remain committed to their profession and try to develop their professional skills and their common skills also. Therefore the prospective teachers, who are the basic pillars of the education systems in India need to get a hold all kind of strength from the family, school, society and the nation, to launch a strong community bond which is desirable for the progress of mankind.

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