



# AWARENESS ABOUT TPACK AMONG PROSPECTIVE TEACHERS

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## ABSTRACT:

The present study is an attempt to assess the Awareness about TPACK among Prospective teachers. Technological Pedagogical Content Knowledge (TPACK) has emerged as a useful frame for describing and understanding the goals for technology use in Prospective teacher education. The study was conducted on Prospective teachers from five Colleges of Education in Chennai. For the collection of data the investigator is used in this study was largely based on the questionnaire of Schmidt et al.(2009). Normative survey was adopted and a sample of 300 Prospective teachers who were randomly selected from five Colleges of Education. The questionnaires with a 5-point likert scale which has been constructed using Google form was used to calculate .The data were analyzed qualitatively and quantitatively to check the significant mean difference among the variables. Data analysis procedures included Cronbach's alpha statistics on the TPACK knowledge domains and factor analysis for each domain. The results revealed that prospective teacher possess high awareness about TPACK. Futher no significant difference among Prospective teachers based on their Gender, Locality and Types of management of institutions.

**Key Words:** *Technological Pedagogical Content Knowledge (TPACK), Prospective Teachers*

## 1. INTRODUCTION:

TPACK or technological pedagogical content knowledge is a model that helps teachers considers how their knowledge domains intersect in order to effectively teach and engage students with technology.

A teacher ready to tap students into 21<sup>st</sup> century learning but teaching with technology adds a whole new layer of knowledge and expertise, it's an approach that looks at the combination of what teachers know how they teach and the role of technology in order to better impact students learning.

The TPACK framework describes the kinds of knowledge required by teachers for the successful integration of technology in teaching. It suggests that teachers need to know about the intersections to technology, pedagogy, and content. The TPCK framework acronym was renamed TPACK (pronounced "tee-pack") for the purpose of making it easier to remember and to form a more integrated whole for the three kinds of knowledge addressed: technology, pedagogy, and content (Thompson & Mishra, 2007–2008). The TPACK framework builds on Shulman's construct of Pedagogical Content Knowledge (PCK) to include technology knowledge as situated within content and pedagogical knowledge.

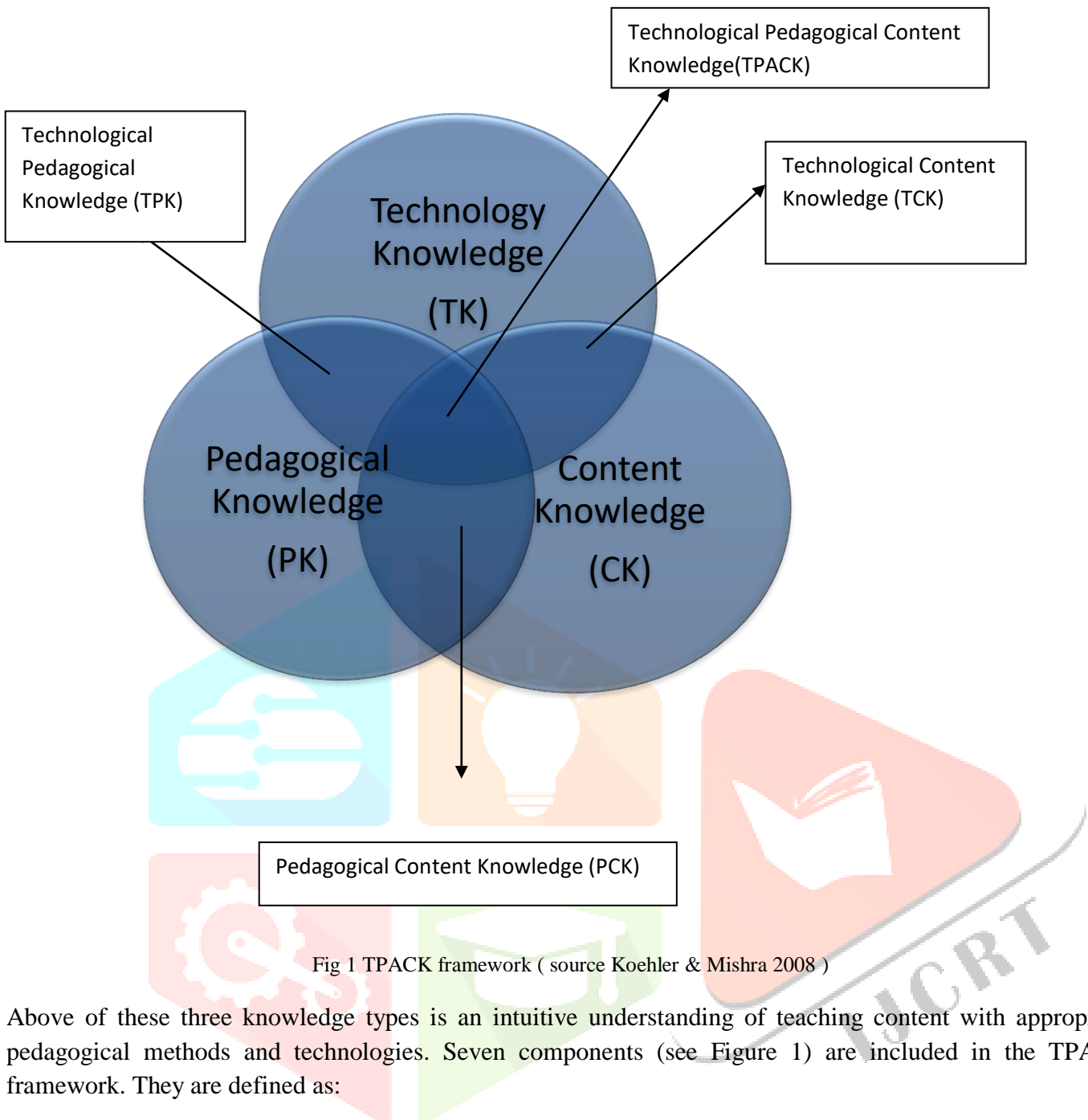


Fig 1 TPACK framework ( source Koehler & Mishra 2008 )

Above of these three knowledge types is an intuitive understanding of teaching content with appropriate pedagogical methods and technologies. Seven components (see Figure 1) are included in the TPACK framework. They are defined as:

1. Technology knowledge (TK): Technology knowledge refers to the knowledge about various technologies, 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” (e.g., central facts, concepts, theories, procedures).
3. Pedagogical knowledge (PK): Pedagogical knowledge refers to the methods and process of teaching and includes knowledge in classroom management, assessment, lesson plan development, and student learning.
4. Pedagogical content knowledge (PCK): Pedagogical content knowledge refers to the content knowledge that deals with the teaching process .(e.g., knowing what teaching approaches fit the content, knowing how elements of content can be arranged for better teaching)

5. Technological content knowledge (TCK): Technological content knowledge refers to the knowledge of how technology can create new representations for specific content. It suggests that teachers understand that, by using a specific technology, they can change the way learners practice and understand concepts in a specific content area.

6. Technological pedagogical knowledge (TPK): Technological pedagogical knowledge refers to the knowledge of how various technologies can be used in teaching, and to understanding that using technology may change the way teachers teach.

7. Technological pedagogical content knowledge (TPACK): Technological pedagogical content knowledge refers to the knowledge required by teachers for integrating technology into their teaching in any content area. Teachers have an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies. (Schmid et al.,(2020)

Using TPACK as a framework for measuring teaching knowledge could potentially have an impact on the type of training and professional development experiences that are designed for both preservice and inservice teachers. Hence, there is a continual need to rethink our preparation practices in the teacher education field and propose new strategies that better prepare teachers to effectively integrate technology into their teaching.

## REVIEW OF RELATED LITERATURE:

**Schmid et al., (2020)** conducted study on “Developing a short assessment instrument for Technological Pedagogical Content Knowledge (TPACK) and comparing the factor structure of an integrative and a transformative model”. conducted a study on analysed and organized a variety of approaches found in technology uses in prospective teachers into their classroom.

**Ajith Kumar (2017)** conducted a study on relationship between Technological Pedagogical Content Knowledge (TPACK) and technology anxiety of student teachers of university of Calicut. The results revealed that, 15.80% of student teachers belong to high TPACK, 64.84% average TPACK and 19.36% low TPACK. It is concluded that, majority of the student teachers falls under average TPACK category and there is no significant relation between TPACK and technology anxiety of student teachers for the total sample.

## 2. NEED OF THE STUDY:

TPACK is the most effective factor in changing the face of education system that encourages the student's willingness to engage in the classroom to improve educational excellence. Teachers motivate students to engage with TPACK. They care about student's progress and constantly looking for new ideas to improve their learning. The prospective teachers can be up-to date with technology and develop innovative strategies for effective teaching. TPACK do the right thing to enhance their quality of teaching. Hence the investigator attempts to study the “awareness about TPACK among prospective teachers” as the teachers empower the whole nation and strengthen the life of the students.

## 3. HYPOTHESES OF THE STUDY:

- There is no significant difference between male and female prospective teachers in their awareness about TPACK.
- There is no significant difference in awareness about TPACK of prospective teachers studying in colleges of education located at rural and urban areas.
- There is no significant difference in awareness about TPACK and its dimension with respect to type of management of institution.

#### 4. METHODOLOGY:

The present study employed a normative survey method and sampling techniques used for the study is stratified random sampling techniques. To find out the students 'awareness about TPACK' data were collected from male and female Prospective teachers studying in various types of managements of institutions through Google forms.

##### 4.1 SAMPLE FOR THE STUDY:

The 300 prospective teachers from five College of Education were chosen randomly for this study. Out of 300 students ,150 male,150 female were chosen to participate in the normative survey method. The background variables included in the study were, i)Gender ii.)Locality iii.)Type of the management of institution.

##### 4.2 SAMPLING PROCEDURE:

Stratified random sampling method was used by the investigator for the present study. The population of the study consists of prospective teachers studying in Government, Government-aided, and Self-finance College of Education. In total 300 prospective teachers were selected as the sample from five Colleges of Education .

##### 4.3 TOOL USED:

The questionnaire developed to assess the Awareness about TPACK used in this study was largely based on the questionnaire of Schmidt et al.(2009).Given that the original content-related items from Schmidt et al.(2009) were formulated for prospective teachers,awareness on CK, PCK, TCK, and TPACK subscales. For the CK subscale, items focusing on knowledge of theories and concepts of a subject were adapted from Valtonen et al. (2017).With regards to the PCK and TCK subscales, the literature and the definitions provided by Mishra and korhler (2006) were used. Finally, TPACK items were again largely adapted from the questionnaire of Schmidt et al. (2009). In the scale, explicit mention was made of digital media (e.g., computer, tablet, mobile phone, and internet). The Awareness about TPACK questionnaire contains 28 items with 5-point likert scale ranging from "Strongly Agree" to 'Strongly Disagree' .The scores for the categories Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree ranges from 5 to 1. The maximum score for each statement is 5 and the minimum score is 1.The reliability and the validity of the scale is 0.756 (cronbach alpha reliability)

##### 4.4 STATISTICAL TECHNIQUES USED:

The collected data were analyzed qualitative and quantitative to fulfill the objectives of the study. The investigator used descriptive and differential analysis as a statistical technique for the present study.

#### 5. ANALYSIS AND INTERPRETATION OF DATA:

Hypothesis: 1

The level of awareness about TPACK among prospective teachers will be moderate.

Levels of awareness about TPACK among prospective teachers.

Variable	Size of sample	Maximum possible score	Mean	S.D
TPACK	300	140	112.30	11.43

The above table details the mean and S.D for the awareness about TPACK among prospective teachers. The maximum possible score for TPACK is 140. The mean score is 80.21% for the whole sample.

Hence, it's observed that prospective teacher possess high awareness about TPACK.

Hypothesis: 2

There will be no significant difference between male and female Prospective teachers in their awareness about TPACK and its dimension.

Variable	Gender	N	Mean	S.D	C.R	Level of Significance
PK	Male	150	15.95	2.126	0.245	NS
	Female	150	16.01	2.113		
CK	Male	150	16.30	2.145	0.482	NS
	Female	150	16.42	2.171		
TK	Male	150	15.7	2.028	0.286	NS
	Female	150	15.69	1.980		
PCK	Male	150	16.50	1.694	0.223	NS
	Female	150	16.45	1.778		
TPK	Male	150	15.76	2.138	0.330	NS
	Female	150	15.84	2.060		
TCK	Male	150	16.04	2.036	0.416	NS
	Female	150	15.94	2.131		
TPCK	Male	150	15.97	2.088	0.169	NS
	Female	150	16.01	2.013		
TPACK	Male	150	112.23	11.56	0.101	NS
	Female	150	112.37	11.330		

NS – Not significant

It can be inferred from the table above that both male and female prospective teachers do not manifest significant difference in their awareness about TPACK and in all its Dimensions. It is therefore concluded that in this study both the male and female prospective teachers are similar in their awareness about TPACK and in all its dimensions.

Hence, the formulated hypothesis that there will be no significant differences between male and female prospective teachers in their awareness about TPACK and its dimensions.

## Hypothesis 3

There will be no significant difference in awareness about TPACK of prospective teachers studying in Colleges of Education located at rural and urban areas.

Variable	Locale	N	Mean	S.D	C.R	Level of Significance
PK	Urban	150	15.96	2.126	0.135	NS
	Rural	150	15.99	2.113		
CK	Urban	150	16.31	2.142	0.394	NS
	Rural	150	16.41	2.175		
TK	Urban	150	15.72	1.991	0.161	NS
	Rural	150	15.68	2.017		
PCK	Urban	150	16.52	1.700	0.401	NS
	Rural	150	16.44	1.712		
TPK	Urban	150	15.72	2.159	0.99	NS
	Rural	150	15.81	2.038		
TCK	Urban	150	16.07	2.055	0.638	NS
	Rural	150	15.91	2.112		
TPCK	Urban	150	16.03	2.107	0.282	NS
	Rural	150	15.96	1.993		
TPACK	Urban	150	112.39	11.570	0.138	NS
	Rural	150	112.21	1.327		

NS-Not Significant

It can be inferred from the table above that both urban and rural area prospective teachers do not manifest significant difference in awareness about TPACK and in all its dimensions. It is therefore concluded that in this study of prospective teachers studying in Colleges of Education located at rural and urban areas are similar in their awareness about TPACK and in all its dimensions.

Hence, the formulated hypothesis that there will be no significant differences between urban and rural area of prospective teachers in their awareness about TPACK and its dimensions is accepted and retained.

## Hypothesis-4

There will be no significant difference in their awareness about TPACK and in all its dimensions among Prospective teachers with respect to type of management of institutions.

Variable	Groups status	Sum of squares	df	Mean square	F-value	Sig value	Level of Significance
PK	Between Groups	.845	2	.423	.094	.910	NS
	Within Groups	1337.991	297	4.505			
	total	1338.837	299				
CK	Between Groups	2.210	2	1.105	.237	.789	NS
	Within Groups	1386.910	297	4.670			
	total	1389.120	299				
TK	Between Groups	.112	2	.056	.014	.986	NS
	Within Groups	1196.484	297	4.029			
	total	1196.597	299				
PCK	Between Groups	.810	2	.405	.134	.875	NS
	Within Groups	898.027	297	3.024			
	total	898.837	299				
TPK	Between Groups	.306	2	.153	<b>.035</b>	<b>.966</b>	NS
	Within Groups	<b>1313.694</b>	<b>297</b>	<b>4.423</b>			
	total	<b>1314.000</b>	<b>299</b>				
TCK	Between Groups	3.036	2	1.518	.349	.706	NS
	Within Groups	1291.934	297	4.350			
	total	1294.970	299				
TPCK	Between Groups	1.092	2	.546	.129	.879	NS
	Within Groups	1252.894	297	4.218			
	total	1253.987	299				
TPACK	Between Groups	19.732	2	9.866	.075	.928	NS
	Within Groups	39051.268	297	131.486			
	total	39071.000	299				

NS-Not Significant

The F ratios calculated for TPACK and in all its dimensions with respect to type of management of institutions revealed that there is no significant difference among Government, Government aided and Self finance Colleges of Education in their awareness about TPACK and in all its dimensions.

Hence, the formulated hypothesis that there will be no significant difference among Government, Government aided and Self finance Colleges of Education in their awareness about TPACK and in all its dimensions is accepted.

### **FINDINGS:**

- The study revealed that, there is no significant difference between male and female prospective teachers in their awareness about TPACK and in all its dimensions.
- The study revealed that, there is no significant difference between of prospective teachers studying in colleges of education located at rural and urban areas in their awareness about TPACK and in all its dimensions..
- There is no significant difference in awareness about TPACK and in all its dimensions among prospective teachers studying in Government, Government –aided and Self finance Colleges of Education.

### **CONCLUSION and IMPLICATIONS:**

The present study was an attempt to identify the Awareness about TPACK of prospective teachers belonging to Colleges of Education in Chennai. The technology has become a part of academics. So, TPACK has helped both teachers and students to develop new skills and capabilities that supported them and enhance their knowledge. The TPACK framework allows researchers and educators to make inferences about educational technology and may allow them to make predictions about practical approaches for using technology in teaching and learning (Koehler, Shin, Mishra, 2012). TPACK is considered as a powerful tool for teaching and learning with the help of wide range of applications. WhatsApp, social networking sites, wikis, blogs, discussion forums, etc. work in a web environment; are highly useful and also mandatory in communicating information. But many teachers are afraid to use them. One of the possible remedies to get rid of fear is to provide intensive training in Integration of Technological Pedagogical Content Knowledge with the content in the Colleges of Education. In such a way, the practice of TPACK implementation in subjects could be improved and it will be more helpful to the Prospective teachers.

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