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Techno-Pedagogical Content Knowledge among Prospective Teachers of English under Kannur University

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ABSTRACT

The techno-pedagogical content knowledge consists of their technological knowledge, pedagogical knowledge, content knowledge, techno-pedagogical knowledge, technological content knowledge and pedagogical content knowledge. So, the present study was carried out to find out the Techno-pedagogical Content Knowledge among Prospective Teachers of English under Kannur University. The sample consists of 100 prospective teachers of English under Kannur University and was selected through simple random sampling method. The Techno-pedagogical Content Knowledge of the Prospective Teachers of English was analysed by Technological Knowledge Test; and Pedagogical and Content Knowledge Test which were developed by the investigator and the supervising guide. For analysing the collected data, the investigator used the statistical techniques such as Percentage Analysis, Karl Pearson's Product Moment Coefficient Correlation, One Way ANOVA and Post-hoc Analysis. The findings of the study reveal that the prospective teachers having sufficient technological knowledge possess sufficient techno-pedagogical knowledge and technological content knowledge.

***Keywords**: Techno-pedagogical Content Knowledge, Prospective Teachers of English.*

Introduction

Teaching English in India is a challenging one, since the attitude towards the English Language. A teacher should be competent enough to transact the subject matter in English productively. Thus, teacher education helps a prospective teacher to acquire knowledge in various spheres which relate to teaching learning process. Like all subject teachers, contemporary teachers of English also should possess knowledge in technology, pedagogy and content and get thorough training in these three areas. Moreover, they should be aware about how to integrate technology in English classroom. In addition, the prospective teachers of English should be aware about which teaching method is apt for teaching certain content and adopting the best technique or strategy for that. The knowledge in content is also essential for a prospective teacher in English like knowledge in poetry, essay, novel, drama, grammar etc. Most of the English teachers confront the problem in teaching concept in an effective way so the effective incorporation of technology in pedagogy and content makes it is easy as pie. So, prospective teachers get an accurate idea about all the knowledge necessary for an English teacher and through training they can improve it as well.

The techno-pedagogical content knowledge of a teacher helps in making the teaching learning process much easier and to minimise the difficulty in understanding the concept. Techno-pedagogic Content Knowledge (TPCK) was introduced as a theoretical framework for integration of technology in teaching and also to incorporate three kinds of knowledge: technological knowledge, pedagogical knowledge and content knowledge for making the teaching learning process as more integrated whole

(Schmid et al., 2009). The TPCK Framework stems from Shulman's concept of Pedagogical Content Knowledge (PCK) (Schmid et al., 2009).

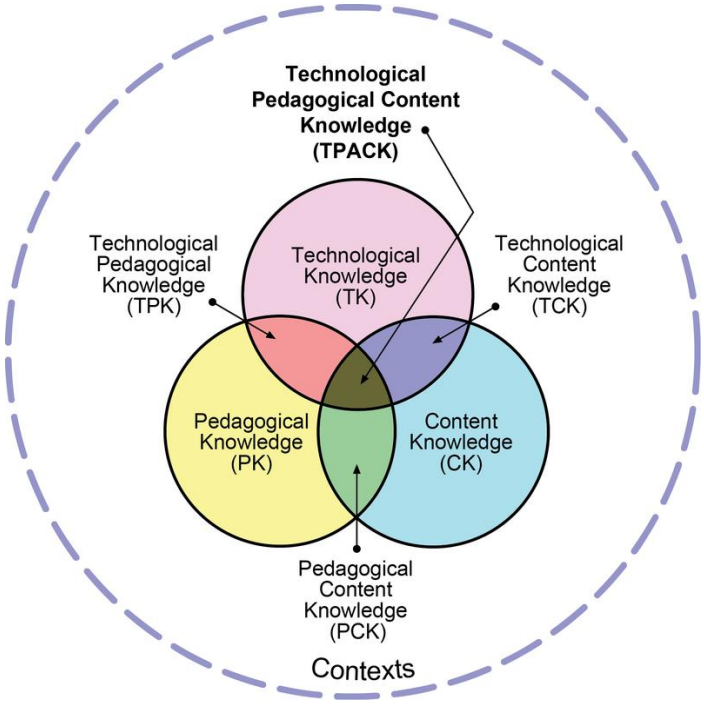

Figure 1: Components of TPCK Framework

Note. From "Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers" by Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S.,2009, *Journal of Research on Technology in Education, 42*(2), 123–149.

The content knowledge refers to a person's knowledge in particular subject matter, pedagogical knowledge includes a teacher's knowledge about the process, methods , strategies etc. in teaching in the classroom properly(Shulman, 1986) and technological knowledge is the knowledge in technological management , word processing , networking, spreadsheet etc. and comprehending how these knowledge can be best utilised in our day to day life in a productive way. With the advent of technology and its unavoidable role in education placed technology in foreground of teaching learning process. Thereafter, technological knowledge also becomes a significant component in teacher knowledge. At the beginning, technological knowledge was isolated from content knowledge and pedagogic knowledge and was considered to be the knowledge which needed to be learned. Thus, the technological knowledge faced various problems as mentioned by Shulman in 1980s (Mishra & Kohler,2006). For promoting the technological knowledge among teachers, there conducted many workshops. Along with that teacher training programme fostered learning of software and hardware skills to strengthen the teachers' knowledge in technology. With this idea, many scholars supported technological knowledge and opined that good teaching demands the synthesis of technological knowledge with that of content knowledge and pedagogic knowledge (Mishra & Kohler, 2006). Subsequently, the relationship between CK, PK and TK became stronger and thought it would be inappropriate to see technological knowledge as an isolated one (Mishra & Kohler, 2006). Afterwards, these three bodies of knowledge blended together. Thereby, there formed Technological Pedagogical Content knowledge (Mishra & Kohler, 2006). Many scholars opined that the technological knowledge cannot be set as a context free and a good teaching needs the teacher's relevant understanding of how technology can be incorporated in content and pedagogy (Hughes,2005). Among this, content knowledge, pedagogic knowledge and pedagogic knowledge were mentioned by Shulman (Shulman,1986) and techno-pedagogic knowledge and technological content knowledge were introduced by Mishra and Koehler (Mishra & Koehler, 2006).

Need and Significance of the Study

Most of the educational institutions have adopted technology based teaching learning process to meet various technological and social development which reshape all aspects of a child's life. Therefore, the possibility, utility and availability of technology in pedagogy and content is inevitable. In the context of prospective teachers in English, the awareness and attitude towards technology is vital. Moreover, they need it to integrate a technology in pedagogy and in transacting a content in an English classroom. An educator with techno-pedagogical content knowledge can reduce their frustration in their work and minimises the workload, improve their skills and knowledge, improve quality in education. In order to be a productive citizen as a teacher they need techno-pedagogical content knowledge among prospective teachers. A prospective teacher in English also feels it is a piece of cake while transacting a content if he or she fuses required technology in pedagogy and the teacher can make readiness in learning English Language. In India, Learning English is considered to be a tedious task, since it is foreign language and the fear on grammar, lack of vocabulary etc. Thus, a teacher of English has a plenty to do generate interest among learners by adopting best methods or techniques or strategies while transacting a content in English. Moreover, if the teacher uses required technology like videos, pictures etc. while teaching any content, it also increases the scope of readiness of learners in learning English Language. Thus, a prospective teacher in English must be proficient to integrate technology, pedagogy and content for making English learning environment a fearless one and approach English Language in a fearless way just like children's attitude towards their mother tongue.

The teacher education programme itself has given much importance for Information Communication Technology in education and gives training in the area as well. Moreover, a prospective teacher gets platform for self-analysis of their ability, strength and weakness in technology, pedagogy and content and also can improve it by practice during their practice teaching.

According to National Education Technology Plan (NETP) Department of Education (2017) recommends that, technology has a vital role in learning. We can see a vast change in teaching from teacher-centred to learner-centred in which technology has an unavoidable place . Thus, it is important to synthesis technology in teaching- learning process.(Government of India,2017)

Contemporary education cannot think of a room without technology. In order to prepare children for 21st century world, they must unbox the vast opportunities and facilities in technology. Thus, we can say the role of a teacher is high in demand to integrate technology in English classroom. It is only through the teachers can unveil the deeper knowledge of children in various areas including technology. So, prospective teachers of English need to update and receive training in the field of technology and should comprehend how he or she can incorporate in pedagogy and content along with, since teachers have more influence in transforming young minds to a productive citizen. Moreover, directly or indirectly a teacher influences the society. Thus, a prospective teacher must understand how learning and technology correlate, for that reason he or she must simultaneously exercise technology, pedagogy and content in English classroom .Technology can open new learning environment and develop technical knowledge, communication skills, critical thinking etc. So, the teachers' role move from a source of information to distributor to students.

National Education Policy (2020) also stressed the importance of digital technology, virtual labs, online learning, blended learning etc (Government of India,2020). And it focuses on the creation of National Educational Technology Forum (NETF) for the utilisation of technology in education (Government of India,2020). It focuses on the professional development of teachers , use of e-content in teaching learning process etc. through DIKSHA (Digital Infrastructure for Knowledge Sharing) platform, which is an initiative of National Council for Educational Research and Training (NCERT) and Ministry of Education (MoE) (Government of India,2020). So, without any further thought we can say the prospective teachers must have knowledge in technology and must be trained in integrating technology in pedagogy and content (Government of India,2020).

Objectives of the Study

- To find out the techno-pedagogical content knowledge among prospective teachers of English under Kannur University.
- To find out the significant difference in techno-pedagogical knowledge among prospective teachers of English under Kannur University based on the technological knowledge (limited/moderate/sufficient).

- To find out the significant difference in technological content knowledge among prospective teachers of English under Kannur University based on the technological knowledge (limited/moderate/sufficient).

Method

- ***Research Design***

The investigator adopted descriptive survey method to study the techno-pedagogical knowledge among prospective teachers of English under Kannur University.

- ***Sample and Sampling***

The sample of the study is Prospective Teachers of English under Kannur University and is selected through simple random sampling method.

- ***Tools Used for the Study***

To identify the techno-pedagogical content knowledge among prospective teachers of English, the investigator developed two tools with the help of the supervising teacher entitled 'Technological Knowledge Test' and Pedagogical and Content Knowledge Test'.

- ***Data Collection and Analysis***

The data were collected from eight B.Ed. Colleges under Kannur University and the collected data were analysed through SPSS 16.0 software. The investigator used Percentage analysis, ANOVA and Post-hoc analysis for the study.

- **Findings**

Techno-pedagogical Content Knowledge among Prospective Teachers of English under Kannur University

For finding out the level of techno-pedagogical content knowledge among prospective teachers of English, the investigator used percentage analysis. The table 1 shows the result obtained.

Table 1: Percentage Analysis of Techno-pedagogical Content Knowledge

	Number of Prospective Teachers							
	Limited	**%**	**Moderate**	**%**	**Sufficient**	**%**	**Total**	**%**
Technological Knowledge	36	36%	60	60%	4	4%	100	100%
Techno-pedagogical Knowledge	62	62%	32	32%	6	6%	100	100%
Technological Content Knowledge	77	77%	19	19%	4	4%	100	100%
Content Knowledge	25	25%	70	70%	5	5%	100	100%
Pedagogical Knowledge	23	23%	71	71%	6	6%	100	100%
Pedagogical Content Knowledge	23	23%	63	63%	14	14%	100	100%

The table 1 reveals that percentage of teachers who possess sufficient technological knowledge (4%), techno-pedagogical knowledge (6%), technological content (4%), content knowledge (5%), pedagogical knowledge (6%) and pedagogical content knowledge (14%) is comparatively low, but the percentage of prospective teachers who possess limited techno-pedagogical knowledge (62%) and technological content knowledge (77%) is comparatively high and percentage of prospective teachers who possess moderate technological knowledge (36%), content knowledge (70%), pedagogical knowledge (71%) and pedagogical content knowledge (63%) is comparatively high.

In addition, it is comprehensible that the percentage of prospective teachers who possess sufficient pedagogical content knowledge is higher than that of techno-pedagogical knowledge and technological content knowledge. It is clear from the table that, the percentage of prospective teachers who possess limited pedagogical content knowledge is lower than that of techno-pedagogical knowledge and technological content knowledge, and the prospective teachers who possess moderate pedagogical content knowledge is higher than that of techno-pedagogical knowledge and technological content knowledge.

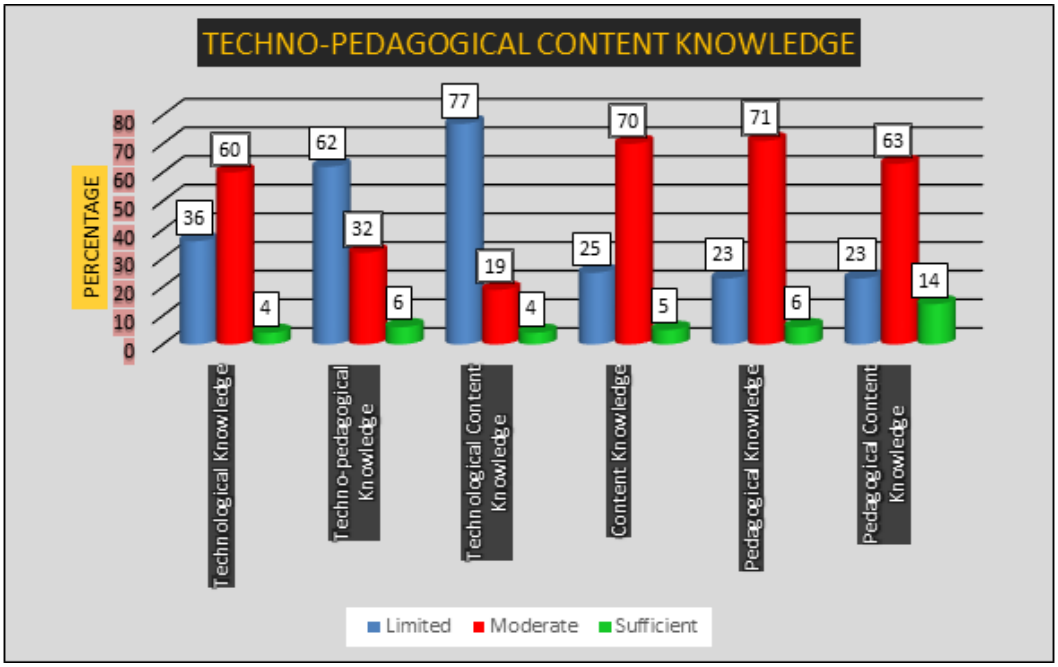

Figure 2: Percentage Analysis of Techno-pedagogical Content Knowledge among Prospective Teachers of English

Analysis of Significant difference in the means of Techno-pedagogical Knowledge among Prospective Teachers of English under Kannur University based on the Technological Knowledge

In the study, the investigator used ANOVA to find out the significant difference in the means of techno-pedagogical knowledge of prospective teachers of English based on the technological knowledge.

The result shows, F (2, 97) =11.650, MSE= 5.92 $p < .000$, $\eta 2 = .19$, and reveals that there exists significant difference in the mean scores of techno-pedagogical knowledge of the prospective teachers of English based on their technological knowledge.

For understanding individual group difference between the levels of technological knowledge, the investigator conducted Scheffe'spost-hoc test. The result of the post hoc analysis is given in the table 2.

Table 2: Scheffe's post hoc test of significant difference based on the Technological Knowledge

Levels of Technological Knowledge (Pair Wise)		Mean Difference	Std. Error	Sig.
Limited	Moderate	-1.98333*	.51324	.001
	Sufficient	-4.83333*	1.28310	.001
Moderate	Limited	1.98333*	.51324	.001
	Sufficient	-2.85000	1.25717	.082
Sufficient	Limited	4.83333*	1.28310	.001
	Moderate	2.85000	1.25717	.082

**. The mean difference is significant at 0.05 level*

The result of post-hoc analysis reveals there exists a significant difference between the pairs of limited and sufficient (p = .001) and limited and sufficient (.001) except moderate and sufficient (p= .082).

When comparing the estimated marginal means, it reveals that the prospective teachers having sufficient technological knowledge (M=7.75) possess more techno-pedagogical knowledge than prospective teachers having limited and moderate knowledge.

Analysis of Significant difference in the means of Technological Content Knowledge among Prospective Teachers of English under Kannur University based on the Technological Knowledge.

In the study, the investigator used ANOVA to find out the significant difference in the means of technological content knowledge of prospective teachers of English based on the technological knowledge.

The result shows, F (2, 97) = 10.683, MSE= 5.92 p < .000, η2 = 0.18, and reveals significant there exists a significant difference in the mean scores of technological content knowledge of the prospective teachers of English based on their technological knowledge.

For understanding individual group difference between the levels of technological knowledge, the investigator conducted Bonferroni's post-hoc test. The result of the post hoc analysis is given in the table 3.

Table 3: Bonferroni's post-hoc test of significant difference based on the Technological Knowledge

Levels of Technological Knowledge (Pair Wise)		Mean difference	Std. Error	Sig.
Limited	Moderate	-1.70714 *	.48882	.002
	Sufficient	-5.17857 *	1.60003	.005
Moderate	Limited	1.70714 *	.48882	.002
	Sufficient	-3.47143	1.56771	.087
Sufficient	Limited	5.17857 *	1.60003	.005
	Moderate	3.47143	1.56771	.087

**. The mean difference is significant at 0.05 level*

The result of post-hoc analysis reveals there exists a significant difference between the pairs of limited and moderate (p = .002) and limited and sufficient (p= .005) except moderate and sufficient (p= .087).

When comparing the estimated marginal means, it reveals that the prospective teachers having sufficient technological knowledge (M=7.00) possess more technological content knowledge than prospective teachers having limited and moderate knowledge.

Conclusion

The study was carried out for identifying the techno-pedagogical content knowledge among prospective teachers of English under Kannur University. For finding out the level of techno-pedagogical content knowledge, the percentage analysis was carried out and the findings of the study reveals that the percentage of prospective teachers who possess sufficient technological knowledge, techno-pedagogical knowledge, technological knowledge, content knowledge, pedagogical knowledge and pedagogical content nowledge is almost equal. In addition, it is comprehensible that the percentage of prospective teachers who possess sufficient pedagogical content knowledge is higher than that of techno-pedagogical knowledge and technological content knowledge. It is clear from the table that, the percentage of prospective teachers who possess limited pedagogical content knowledge is lower than that of techno-pedagogical knowledge and technological content knowledge, and the prospective teachers who possess moderate pedagogical content knowledge is higher than that of techno-pedagogical knowledge and technological content knowledge

In the study, the investigator used One Way ANOVA to find out the significant difference in techno-pedagogical knowledge among prospective teachers of English under Kannur University based on their technological knowledge and the findings of the study revealed that there exists a significant difference. For understanding individual group difference between the levels of technological knowledge, the investigator conducted Scheffe's post hoc analysis and the result of the post-hoc revealed that there exists significant difference between limited and sufficient (p=.001) and limited and moderate (.001) except between sufficient and moderate(p=.082). When comparing the estimated marginal mean, it reveals that the prospective teachers having sufficient technological knowledge achieved more techno-pedagogical knowledge than the prospective teachers having limited and moderate knowledge.

For identifying the significant difference in techno-pedagogical knowledge among prospective teachers of English under Kannur University based on their technological knowledge, the investigator used One Way ANOVA and the findings of the study revealed that there exists a significant difference. For understanding individual group difference between the levels of technological knowledge, the investigator conducted Bonferroni's post hoc analysis. And the result of the post-hoc reveals that there exists significant difference between limited and moderate (p=.002) and limited and sufficient (p=.005)

except between sufficient and moderate (p=.087). When comparing the estimated marginal mean, it reveals that the prospective teachers having sufficient technological knowledge achieved more technological content knowledge than the prospective teachers having limited and moderate knowledge.

From the result obtained from the study, it can be concluded that prospective teachers who possess sufficient technological knowledge possess sufficient techno-pedagogical knowledge and technological content knowledge. Thus, it can be said that the stress should be given for the improvement of techno-pedagogical content knowledge among prospective teachers attentively. Furthermore, it is necessary to provide good exposure to hands on experience in technology along with the theoretical works. In addition, the prospective teachers must take initiatives to improve their techno-pedagogical content knowledge and the teacher educators also take initiatives to provide technology mediated classroom experiences. Those who use technology efficiently can achieve must knowledge in how to integrate technology in pedagogy and content transaction.

References

1. Government of India. (2020). National Educational Policy. In *Ministry of Education*. https://www.education.gov.in/en
2. Government of India. (2017). National Educational Technology Plan. In *Ministry of Education*. https://www.education.gov.in/en
3. Hughes, J. (2005). The Role of Teacher Knowledge and Learning Experiences in Forming Technology-integrated Pedagogy. *Journal of Technology and Teacher Education*, *13*(2), 277–302.
4. Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record: The Voice of Scholarship in Education*, *108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x
5. Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological Pedagogical Content Knowledge (TPACK): The Development and Validation of an Assessment Instrument for Preservice Teachers. *Journal of Research on Technology in Education*, *42*(2), 123–149.
6. Shulman, L. S. (1986). Those Who Understand: Knowledge Growth in Teaching. *Educational Researcher*, *15*(2), 4–14.

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