International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

A Study on Technological Pedagogical Content Knowledge of High School Teachers in Mokokchung District, Nagaland

Kerilhusa Peseyie

Assistant Professor, Mokokchung College of Teacher Education, Mokokchung, Nagaland

Abstract:
This study was aimed to find out the level of the Technological Pedagogical Content Knowledge of high school teachers of Mokokchung District and to compare their techno-pedagogical skills based on gender, locality and type of management of schools. Descriptive survey method was adopted for the study. The sample of the study consists of 118 high school teachers in Mokokchung District of Nagaland. Data were collected through Teachers' Technological Pedagogical and Content Knowledge Scale (TTPACKS) developed by Hemant Lata and Leena Sharma (2017). The collected data were analyzed with the help of statistical techniques. The findings of the study revealed that there is no significant difference of high school teachers based on gender, locality and type of management of schools. The result of the study revealed that the levels of Technological Pedagogical Content Knowledge of high school teachers are above average in nature.

Keywords: Technological Pedagogical Content Knowledge, high school teachers, gender, locality and type of management of schools.

Introduction:

A crucial component of modern teaching is the incorporation of technology, which means that teachers must acquire new abilities to use digital resources in the classroom. The framework known as Technological Pedagogical Content Knowledge (TPACK) emphasises how educators may integrate their expertise in technology, pedagogy, and content to produce memorable learning opportunities. In order to increase teaching effectiveness, particularly in the current digital era, TPACK highlights the significance of tying these three areas together.

It is crucial for teachers to know how to use technology in ways that improve teaching methods in high school, as it is progressively influencing the learning environment. This is especially crucial in places like Nagaland's Mokokchung District, where the educational landscape is evolving and instructors encounter difficulties finding resources, support, and training for integrating technology.

The purpose of this study is to evaluate the TPACK proficiency of high school teachers in Nagaland's Mokokchung District. The study looks at how technology, pedagogy, and topic knowledge interact to find areas where teachers' technical proficiency and its effect on instruction are strong, weak, and in need of development. The results will help guide plans to enhance technology integration in education and shed light on the professional development needs of teachers. Policymakers, administrators, and teacher training programs can better address the difficulties experienced by educators and enhance their capacity

to integrate technology into their instruction by having a thorough understanding of the current condition of TPACK in Mokokchung District. The ultimate objective is to establish a learning environment in which technology optimises student participation, creativity, and academic achievement.

Need and Significance

Teachers must successfully incorporate digital technologies into their teaching techniques because technology is an essential part of modern education. Teachers can improve learning experiences by combining technology, pedagogy, and topic knowledge with the use of the TPACK framework. Teachers in areas like Nagaland's Mokokchung District, however, have difficulties like a lack of resources, poor professional development, and a lack of technical support, all of which might impair their capacity to use technology efficiently.

The purpose of this study is to evaluate the TPACK proficiency of Mokokchung high school teachers, determining their areas of strength and weakness in incorporating technology into the classroom. The results will guide initiatives for enhancing technology integration in the district and provide insights into the professional development needs of teachers. In the end, this will help create an interesting and productive learning environment for kids by helping legislators, school officials, and educational organisations provide the assistance they need to improve technology use.

Review of Related Literature:

Kalaimani and Stephen (2022) surveyed high school teachers in Chennai on their Technological Pedagogical Content Knowledge (TPACK). The results showed that instructors' levels of TPACK were moderate, with no discernible variations by topic stream or gender.

Koyuncuoglu's (2021) investigated the graduate students' total TPACK proficiency and found it was at a reasonable level. The study also found gender-based inequalities, with female students having stronger pedagogical knowledge and male students having higher technological and technological content knowledge. Furthermore, the study revealed that TPACK proficiency differs throughout academic fields and educational levels.

Guru and Beura (2019) investigated the relationship between students' academic success in science and the techno-pedagogical proficiency of teachers in higher secondary schools. Using Rajasekar and Sathiyaraj's (2013) Techno-pedagogical Competency Scale, the study discovered that instructors had a moderate degree of pedagogical competency, with urban teachers demonstrating a higher level of techno-pedagogical competency than their rural counterparts.

Jeyaraj and Ramnath (2018) studied the TPACK levels of B.Ed student teachers in Puducherry using the TPACK scale by Ismail Sahin (2011). The findings showed a moderate level of TPACK among the student teachers. Those with post-graduate degrees demonstrated higher TPACK levels compared to graduates, and students who frequently accessed e-content and used technology in their learning had higher TPACK levels. This indicates that exposure to technology and advanced educational qualifications positively influence TPACK development.

Objectives:

1. To find out the level of technological pedagogical content knowledge of high school teachers.
2. To compare technological pedagogical content knowledge of high school teachers based on gender, locality and type of management of schools.

Hypothesis:

1. There is no significant difference in Technological Pedagogical Content Knowledge between male and female high school teachers.
2. There is no significant difference in Technological Pedagogical Content Knowledge between rural and urban high school teachers.
3. There is no significant difference in Technological Pedagogical Content Knowledge between government and private high school teachers.

Operational Definitions of Terms Used:

1. **High School Teachers:** Refers to graduate teachers teaching students from both classes 9 and 10.
2. **Type of management of School**: Refers to Government or Private School
3. **Locality**: Refers to rural or urban
4. **Gender:** In this study, gender refers to male and female teachers.

Methodology:

The present study was aimed to find the Technological Pedagogical Content Knowledge (TPACK) of high school teachers in Mokokchung District, for which descriptive survey method was adopted.

Population And Sample:

The population of the study was the high school teachers were randomly selected. The sample consists of 118 high school teachers from various schools in Mokokchung District, Nagaland.

Delimitations Of the Study:

1. The data was collected in Mokokchung district only.
2. The study has been restricted with only the demographic variables gender, locality and type of management of the school.

Tools and Techniques:

The tool employed to collect the data was Teachers' Technological Pedagogical and Content Knowledge Scale (TTPACKS) developed by Hemant Lata and Leena Sharma (2017). The tool consisted of 55 items based on 7 dimensions of TPACK. The analysis of the data was done with the help of appropriate statistical technique such as Percentage, Mean and Standard Deviation, t-test.

Analysis And Interpretation:

Objective 1: To find out the level of technological pedagogical content knowledge of high school teachers.

Table:1 Level of technological pedagogical content knowledge of high school teachers

Sl. No.	Frequency	Percentage	TPACK Raw Score Range	z-Score Range	Grade	Level of TTPACKS
1.	23	19.49	232 to 269	+1.26 to + 2.0	B	**High**
2.	52	44.07	195 to 231	+0.51 to +1.25	C	**Above Average**
3.	37	31.36	144 to 194	-0.50 to +0.50	D	**Average**

4.	6	5.08	107 to 143	-1.25 to -0.51	E	**Below Average**
Total	118	100				

Table 1 showed the TTPACK scores of high school teachers of Mokokchung District. It can be observed that out of 118 respondents, 23 respondents i.e. 19.49% of the respondents scored in the high range (232-269), 52 respondents i.e. 44% scored in the above average range (195-231), 37 respondents i.e. 31.36% of the respondents scored in the average level (144-194) and only 6 respondents i.e. 5% scored below average (107-143). This implied that the majority of the High School teachers have an Above Average level of Technological Pedagogical and Content Knowledge.

Objective 2: To compare technological pedagogical content knowledge of high school teachers based on gender, locality and type of management of schools.

To find out the significant difference, the data has been analysed and interpreted using descriptive statistics such as mean, and standard deviation. The hypothesis is tested by employing the "t" test.

H_{01}: *There is no significant difference in Technological Pedagogical Content Knowledge between male and female high school teachers.*

Table:2 Difference between male and female of high school teachers in technological pedagogical content knowledge.

Gender	N	Mean	SD	t value	p value	Level of Significance
Male	32	197.81	36.74	1.1405	.2564	***Not Significant*** at .05 level
Female	86	205.69	32.05			

From Table:2 when the differences in means were tested for significance, we get a t- value of 1.1405 which is less than the tabulated value for .05 levels of significance. Hence, it is inferred that there is no significant difference in Technological Pedagogical Content Knowledge between male and female high school teachers.

H_{02}: *There is no significant difference in Technological Pedagogical Content Knowledge between rural and urban high school teachers.*

Table:3 Difference in technological pedagogical content knowledge of high school teachers based on locality of schools.

Locality of School	N	Mean	SD	t value	p value	Level of Significance
Rural	56	208.07	27.31	1.2458	.2154	***Not Significant*** at .05 level
Urban	62	199.70	43.05			

From Table:3 when the differences in means were tested for significance, we get a t- value of 1.2458 which is less than the tabulated value for .05 levels of significance. Hence, it is inferred that there is no significant difference in Technological Pedagogical Content Knowledge between rural and urban high school teachers.

H_{03}: ***There is no significant difference in Technological Pedagogical Content Knowledge between government and private high school teachers***

Table:4 Difference in technological pedagogical content knowledge of high school teachers based on type of management of schools.

Type of Management	N	Mean	SD	t value	p value	Level of Significance
Government	55	208.2	27.44	1.5603	0.1214	***Not Significant*** at .05 level
Private	63	198.51	38.25			

From Table:3 when the differences in means were tested for significance, we get a t- value of 1.5603 which is less than the tabulated value for .05 levels of significance. Hence, it is inferred that there is no significant difference in Technological Pedagogical Content Knowledge between government and private high school teachers.

Discussions:

The study provides insight into the Technological Pedagogical Content Knowledge (TPACK) proficiency of Mokokchung District high school teachers. The fact that most respondents received scores in the "Above Average" range suggests that a sizable portion of educators are well-versed in incorporating technology, pedagogy, and content into their lesson plans. In particular, 19.49% of teachers received high scores, while 44.07% of teachers had above-average scores. This implies that although a large number of educators are proficient in incorporating technology into their lesson plans, some of the educators who received "Average" or "Below Average" scores still have space for development.

The study also looked at how TPACK varied by gender, location, and school management style. Gender was not observed to have a significant impact on TPACK levels. This is consistent with earlier research that found that gender disparities in technological proficiency were not always apparent (Koehler et al., 2013). In Mokokchung District, TPACK levels were comparable for male and female instructors, indicating that there is no gender difference in the effectiveness of integrating technology into the classroom.

Similarly, there were no discernible changes in TPACK levels between teachers in rural and urban areas. The results imply that teachers' technological proficiency is not much impacted by their location, whether it be rural or urban. This result contrasts with other research that contends that metropolitan teachers typically have easier access to infrastructure, resources, and professional development opportunities, all of which can improve their TPACK (Ertmer, 1999). Nonetheless, this study suggests that Mokokchung District's rural teachers might have access to comparable resources or adequate assistance, which would explain their comparable TPACK results.

The study also looked into the distinctions between teachers in public and private schools. Once more, there were no discernible changes in the two groups' TPACK. The findings imply that both groups encounter comparable difficulties or receive comparable assistance when incorporating technology into their teaching practices, despite the common belief that private school teachers may have greater access to resources and professional development than their government counterparts.

Conclusion:

To sum up, most high school instructors in Mokokchung District have technological pedagogical content knowledge that is above average. This implies that even while a lot of instructors are making progress in successfully incorporating technology into their lessons, ongoing professional development is still required to improve their TPACK and close the gaps for students who received lower scores. Additionally, the study discovered that TPACK is not greatly impacted by gender, location, or school administration style. This suggests that a teacher's technical competency may be more determined by resources, training accessibility, and prior teaching experience. These results emphasise how crucial it is to offer focused professional development opportunities that promote the fusion of technology, pedagogy, and content—especially in areas with limited resources. Future studies could explore specific training programs and strategies for improving TPACK, particularly for teachers who score in the "Average" or "Below Average" ranges.

References:

1. Bhuyan, S., & Kumar, M. (2020). Techno-pedagogical skills of educational students. *Scholarly Research Journals for Interdisciplinary Studies, 8*(62), 14554–14564. https://doi.org/2278-8808
2. Guru, N., & Beura, M. K. (2019). Techno-pedagogical competency of higher secondary school teachers in relation to students' academic achievement in science. *International Journal of Applied Research, 5*(12), 362–370. https://www.allresearchjournal.com/archives/2019/vol5issue12/PartF/5-10-60-608.pdf
3. Kalaimani, K., & Stephen, L. G. (2022). A study on technological pedagogical content knowledge of high school teachers in Chennai. *Journal of Positive School Psychology, 6*(2), 6303–6308. https://journalppw.com/index.php/jpsp/article/view/7386
4. Koehler, M., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education, 9*(1), 60–70.
5. Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of Education, 193*(3), 13–19. https://doi.org/10.1177/002205741319300303
6. Koyuncuoglu, S. (2021). Graduate students' technological pedagogical and content knowledge (TPACK). *International Journal of Education and Development, 15*(4), 255–270. https://doi.org/10.1007/ijed2021
7. Santos, A. P., & Castro, P. M. (2021). Technological pedagogical content knowledge (TPACK) in action: Application of learning in the classroom by pre-service teachers (PST). *Journal of Educational Technology, 18*(3), 202–215. https://doi.org/10.1080/10494820.2021.1960622