JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Technological, Pedagogical Content Knowledge among Teacher Educators of Assam and Nagaland: A Comparative analysis based on gender

Drishti Hazarika, Assistant Professor(Education), ITEP Branch, Dhemaji College, Phno.9957729068, Email id- drishtihaz@gmail.com

1.0 Introduction

A teacher educator is one who provides professional development courses to the prospective teachers. An effective teacher educator in present scenario is one who has the twenty first century skills i.e critical thinking, collaboration, creativity, communication, life skills and digital literacy. The potential teacher educator is one who can adapt and integrate ICT into teaching so that the students achieve the objectives and get a wholesome idea and experience on the concept right inside the classroom. It is often expected that a teacher educator improves work performance and career development of the students (teachers). For which they themselves have to be specialized, updated, purposeful and dynamic. A teacher who has a low expectation about his or her students about learning a concept would not care if at the end of the teaching students doesn't understand. If on the other hand, the teacher has aimed high on student's understanding of the concept but at the end of the lesson the students don't understand, the teacher should be moved to seek for the cause and possibly teach the concept again for the improvement of the understanding. (Kola et al, 2015). A compatible teacher in today's era is one who can make optimum use of technology in pedagogy in order to present the content in a suitable way. With this insight, it is said that teaching aptitude is innate but can be refined and developed by providing appropriate training programs to pre-service teachers. (Thappa, 2024). The usage of technology must stimulate the sense organs of the students towards learning by developing interest and attention. Thus, the proper concoction of content, pedagogy and technology can only lead to a fruitful session. The twenty first century students are more exposed to gadgets, devices right from a tender age and to make them enable for every twenty first century skills, the classroom must also contain the touch of technology into content and pedagogy. Also, the globalization and pandemic can be considered as the factors that has made technology much significant and

needful. Information and communication technology has a role in the learning and teaching process as a teaching tool. The use of ICT by learners offers enormous potential to enhance learning in all subjects. Developing an ICT culture is an important part of the process of integrating ICT into a school's learning and teaching programs. ICT involves both teachers and students in the learning and facilitation process. (Yashoda, 2023). TPACK is one such model developed by Mishra and Koehler,2006. It is the integration of Technology, Pedagogy and Content. TPACK is the enhanced version of Shulman's PCK, the TPACK framework comprises of 7 areas a) content knowledge (CK) (b) pedagogical knowledge (PK) (c) technological knowledge (TK) (d) pedagogical content knowledge (PCK) (e) technological content knowledge (TCK) (f) technological pedagogical knowledge (TPK) (g) technological pedagogical knowledge of the content (TPCK). TPACK is the incorporation of the knowledge of technology of a teacher and its relation into the pedagogy and content. It is a conceptual framework to interpret the knowledge and competencies for teachers to proficiently teach with technology. (Selvi, J.2021).

2.0 Objectives of the study:

1. To study the level of Technological, Pedagogical Content Knowledge of teachers of Assam.
2. To study the level of Technological, Pedagogical Content Knowledge of teachers of Nagaland.
3. To study the difference between male and female teacher educators of Assam in relation to Technological, Pedagogical and Content Knowledge.
4. To study the difference between male and female teacher educators of Nagaland in relation to Technological, Pedagogical and Content Knowledge.
5. To study the difference between male teacher educators of Assam and Nagaland in relation to Technological, Pedagogical and Content Knowledge.
6. To study the difference between female teacher educators of Assam and Nagaland in relation to Technological, Pedagogical and Content Knowledge.

3.0 Hypothesis of the study:

1. There is no significant difference between male and female teacher educators of Assam in relation to Technological, Pedagogical and Content Knowledge.

2. There is no significant difference between male and female teacher educators of Nagaland in relation to Technological, Pedagogical and Content Knowledge.

3. There is no significant difference between male teacher educators of Assam and Nagaland in relation to Technological, Pedagogical and Content Knowledge.
4. There is no significant difference between female teacher educators of Assam and Nagaland in relation to Technological, Pedagogical and Content Knowledge.

4.0 Methodology:

The research design employed in this study was Descriptive survey method. In the present study, Incidental sampling technique was used to select the teacher educators from Assam and Nagaland respectively and in order to collect data. Teacher's Technological, Pedagogical and Content Knowledge Scale developed by Prof. Hemant Lata Sharma and Ms. Leena Sharma of M.D University Rohtak Haryana was used. The scale covers the dimensions viz. Technological knowledge, Pedagogical knowledge, Content knowledge, Technological Pedagogical Knowledge, Technological Content Knowledge, Pedagogical Content Knowledge, Technological, Pedagogical and Content Knowledge. The scale consists of 55 items distributed across 7 dimensions. The statistical techniques used are descriptive statistics *viz*. Mean, Median, Mode and t -test

5.0 Data analysis and interpretation:

5.1 Level of technological pedagogical content knowledge of teacher educators of assam

To study the level of Technological, Pedagogical and Content Knowledge among the teacher educators of Assam a standard classification based on the norm of the scale prepared by Sharma and Sharma (2017) is presented below-

Level of technological, pedagogical content knowledge among the teacher educators of Assam

Table - 1

SLNO.	LEVEL OF TPACK	SCORE RANGE	PERCENTAGE OF TEACHERS
1	Extremely high	270 & ABOVE	4%
2	High	232 - 269	33%
3	Above average	195 - 231	63%

The table 1 shows that 63% of the teacher educators fall under above average category whereas 33% falls under high category and 4% falls under extremely high category.

Level of technological, pedagogical content knowledge among the teacher educators of Assam

Table - 2

Variables	Mean	Median	Mode	Standard Deviation	Skewness	Kurtosis
TPAC knowledge	222.5	212.5	210	25.77	1.159	-0.275

The computed value of mean, median and mode mentioned in the table above is 222.5, 212.5 and 210 respectively which shows that the average score obtained by the teacher educators is 222.5, the middle value is 212.5 of the total data and most frequently scored number is 210. The computed standard deviation is 25.77. The computed value of skewness is 1.159 indicates that the distribution of the scores in the attitude scale is skewed positively or towards right as scores are massed at the high end of the scale. The kurtosis value is -0.275 which indicates that the distribution of the attitude score is platykurtic.

5.2 Level of technological pedagogical content knowledge of teacher educators of Nagaland:

To study the level of Technological, Pedagogical Content Knowledge among the teacher educators of Nagaland a standard classification based on the norm of the scale prepared by Sharma and Sharma (2017) is presented below-

Level of technological, pedagogical and content knowledge among the teacher educators of Nagaland

Table- 3

SLNO.	LEVEL OF TTPACKS	SCORE RANGE	PERCENTAGEOF TEACHERS
1	Extremely high	270 & ABOVE	13%
2	High	232 - 269	24%
3	Above average	195 - 231	60%
4	Average	144 - 194	3%

The table 3 shows that 60% of the teacher educators fall under above average category, 24%of the teacher educators fall under high category, 13% of the teacher educators fall under extremely high category and 3% of the teacher educators fall under average category.

Level of technological, pedagogical and content knowledge among the teacher educators of Nagaland

Table - 4

Variables	Mean	Median	Mode	Standard Deviation	Skewness	Kurtosis
TPAC knowledge	**228.16**	**220**	**215**	**25.70**	**0.473**	**-0.934**

The computed value of mean, median and mode mentioned in the table above is 228.16, 220, 215 respectively which shows that the average score obtained by the teacher educators is 228.16, the middle value is 220.5 of the total data and most frequently scored number is 215. The computed standard deviation is 25.70. The computed value of skewness is 0.473 indicates that the distribution of the scores in the attitude scale is skewed positively or towards right as scores are massed at the high end of the scale. The kurtosis value is -0.934 which indicates that the distribution of the attitude score is platykurtic.

5.3 Difference in male and female teacher educators of Assam in relation to technological, pedagogical and content knowledge.

In order to find the difference in the level of Technological, Pedagogical and Content Knowledge among the male and female teacher educators of Assam the following hypothesis was formulated in null form.

Hypothesis: There is no significant difference between male and female teacher educators of Assam in relation to their technological, pedagogical and content knowledge.

Table-5

Category	N	Mean	Std. Deviation	Std.Error Mean	t– value
Male	**08**	**222.25**	**25.77**	**9.11**	**0.075**
Female	**22**	**221.09**	**40.37**	**8.60**	
* Significant at 0.05 level of significance ** Significant at 0.01 Level of significance					

Regarding the significance of difference between male and female teacher educators of Assam in relation to their technological, pedagogical and content knowledge as the calculated t value found **0.075** is less than the tabulated value. Hence, the null hypothesis "***There is no significant difference between male and female teacher educators of Assam and Nagaland"*** is accepted.

5.4 Difference in male and female teacher educators of Nagaland in relation to technological, pedagogical and content knowledge.

In order to find the difference in the level of Technological, Pedagogical and Content Knowledge among the male and female teacher educators of Nagaland the following hypothesis was formulated in null form.

Hypothesis: There is no significant difference between male and female teacher educators of Nagaland in relation to their technological, pedagogical and content knowledge.

Table-6

Category	N	Mean	Std. Deviation	Std.Error Mean	t– value
Male	**12**	**236.91**	**29.80**	**8.60**	**1.559**
Female	**18**	**222.33**	**21.49**	**5.06**	
* Significant at 0.05 level of significance ** Significant at 0.01 Level of significance					

Regarding the significance of difference between male and female teacher educators of Nagaland in relation to their technological, pedagogical and content knowledge as the calculated t value found **1.559** is less than the tabulated value. Hence, the null hypothesis "***There is no significant difference between male and female teacher educators of Nagaland"*** is accepted

5.5 Difference in male teacher educators of Assam and Nagaland in relation to technological, pedagogical and content knowledge

In order to find the difference in the level of Technological, Pedagogical and Content Knowledge among the male teacher educators of Assam and Nagaland the following hypothesis was formulated in null form.

Hypothesis: There is no significant difference between male teacher educators of Assam and Nagaland in relation to their technological, pedagogical and content knowledge.

Table-7

Category	N	Mean	Std. Deviation	Std.Error Mean	t– value
Male educators of Assam	**08**	**222.25**	**25.77**	**9.11**	**1.135**
Male educators of Nagaland	**12**	**236.91**	**29.80**	**8.60**	

* Significant at 0.05 level of significance	** Significant at 0.01 Level of significance

Regarding the significance of difference between male teacher educators of Assam and Nagaland in relation to their technological, pedagogical and content knowledge as the calculated t value found **1.135** is less than the tabulated value. Hence, the null hypothesis "***There is no significant difference between male teacher educators of Assam and Nagaland"*** is accepted.

5.6 Difference in female teacher educators of Assam and Nagaland in relation to technological, pedagogical and content knowledge

In order to find the difference in the level of Technological, Pedagogical and Content Knowledge among the female teacher educators of Assam and Nagaland the following hypothesis was formulated in null form.

Hypothesis: There is no significant difference between female teacher educators of Assam and Nagaland in relation to their technological, pedagogical and content knowledge.

Table-8

Category	N	Mean	Std. Deviation	Std.Error Mean	t– value
Female educators of Assam	**22**	**221.09**	**40.37**	**8.60**	**0.117**
Female educators of Nagaland	**18**	**222.33**	**21.49**	**5.06**	
* Significant at 0.05 level of significance			** Significant at 0.01 Level of significance		

Regarding the significance of difference between female teacher educators of Assam and Nagaland in relation to their technological, pedagogical and content knowledge as the calculated t value found **0.117** is less than the tabulated value. Hence, the null hypothesis "***There is no significant difference between female teacher educators of Assam and Nagaland"*** is accepted

7.0 Conclusion:

Technology had made inroads into every sphere of human activity, including the field of education. It had totally transformed the face of didactic teaching and brought about far-reaching changes in the way in which knowledge was being shared (Gloria & Benjamin 2014). Technology plays a significant role in making the

students visualize the content comprehensively. The Tpack not only enables the classroom learning to be more interactive and communicative but also stimulates the sense organs. Thus, the primary aim to conduct this study on technological, pedagogical content knowledge level of teacher educators is to brings into forefront the status of teacher educators of Assam and Nagaland in context to their TPAC knowledge. It can be drawn from the study that the teachers from both the states were having almost similar level of dexterity on technological, pedagogical content knowledge. It would help to draw a lucid idea on the status of the teacher educators Assam and Nagaland on its efficiency and compatibility of technology usage and incorporation of technology in the curriculum. This study will help the researchers or academicians to conduct further study on teacher educators related to different aspects or variables as well.

Impact statement-

Technological, pedagogical content knowledge and teacher educators are the two variables which are often studied by most of the researchers but in this study, it gives a lucid idea on the technological competency of the teacher educators of Assam and Nagaland. Here in this study gender was the key factor which were considered for study. So, it will benefit the research community to take reference to conduct researches on TPACK taking other demographic variables as well. On the other hand, this study can boost many academicians to introspect on it and encourage to organize ICT literacy sessions for teachers and teacher educators as well. Also, understanding it's significance, content on TPACK can be introduced in B.Ed and M.Ed class.

References-

Baran,E.,Hua.,Chuang,H.,Thompson,H.(2011).TPACK: An emerging research and development tool for teacher educators. Turkish online journal of educational technology.10(4)370-377. https://www.researchgate.net/publication/265215357_TPACK_An_emerging_research_and_development_tool_for_teacher_educators

Dodmani,S.(2020). Ict integration in teacher education. IJCRT.8(3). https://ijcrt.org/papers/IJCRT2003315.pdf

Gloria,R.,Benjamin,A.(2014).Techno-Pedagogical Skills in Teacher Education.3(12). International journal of scientific research. https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/recent_issues_pdf/2014/December/December_2014_1417530624__29.pdf

Lalitha,D.(2007). An investigation into the impact of information and communication technology ict on the professional competencies of teacher educators in Andhra University area. Retrievedfrom https://shodhganga.inflibnet.ac.in/handle/10603/378276

Mahto,S.,Omkar,P.(2020).Tracing the ict in teacher education in india.JETIR.https://www.researchgate.net/publication/359199467_Tracing_the_ICT_in_Teacher_Education_in_India

Mandal,J.(2018). Role of ict in teacher education programme. JETIR.5(8). https://www.researchgate.net/profile/Jakirhossen-Mandal/publication/360756944_Role_of_ICT_in_Teacher_Education_Programme/links/62889820cd5c1b0b34eb2132/Role-of-ICT-in-Teacher-Education-Programme.pdf

Mupita,J.,Widiaty,I.,&Abdullah,A,J.(2018). How important is technological, pedagogical, content knowledge? A literature reviews. IOP Conference Series: Materials Science and Engineering.https://iopscience.iop.org/article/10.1088/1757-899X/434/1/012285/pdf

Ramkrishna,K.(2021). Technological pedagogical content knowledge tpack self-confidence and teaching competency among student teachers in trichy district.Retrieved from. https://shodhganga.inflibnet.ac.in/handle/10603/385363

Thangamani, D.(2017).Status study on ict education attitude of student teachers towards ict and usage of available resources in colleges of education https://shodhganga.inflibnet.ac.in/handle/10603/298949

Thappa,S.2023. Efficacy of technological pedagogical and content knowledge tpack on self concept and teaching aptitude of pre-service teachers. Retrieved from https://shodhganga.inflibnet.ac.in/handle/10603/537715

Yashoda,R.2023.An exploratory study on role of ict in teaching learning Process. https://shodhganga.inflibnet.ac.in/handle/10603/553708

Ying lee,H.,Chi-Yang,C.,Wei,G.2022. Research on Technological Pedagogical and Content Knowledge: A Bibliometric Analysis From 2011 to 2020.Frontiers in education. https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2022.765233/full