Techno-Pedagogical Skills Among B.Ed. Teacher Educators with Respect to Gender and Teaching Experience

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ABSTRACT

The present research work was specifically undertaken to study the techno-pedagogical skills among B.Ed. teacher educators with respect to gender, teaching experience. Survey technique under descriptive method of research was adopted in this present investigation. By employing convenient sampling technique a sample of 449 B.Ed. College teacher educators were selected from six districts of Himachal Pradesh. For data collection Techno Pedagogical Assessment Scale developed by researcher herself was used in the present investigation. The collected data were analyzed by employing Analysis of Variance (Two ways).The major findings of the study revealed that male and female B.Ed. teacher educators possessed similar level of techno-pedagogical skills. There exists no significance difference in techno-pedagogical skills among B.Ed. teacher educator with respect to their teaching experience. Therefore, it may be interpreted that B.Ed. teacher educators with different level of teaching experience (length of services) possessed nearly similar level of techno-pedagogical skills. In addition to this, the results of the study also revealed that gender and teaching experience (in combination with each other) influence techno-pedagogical skills among B.Ed. teacher educators significantly. The end of the paper discussion on the results and implications of the findings of the investigation have been discussed in detail.

Keywords: *Techno Pedagogical Skills, Gender, Teaching Experience, B.Ed. Teacher Educators*

INTRODUCTION

All human-created tools and methods that help to reach particular goals represent the broader definition of technology. The educational setting defines technology as the combination of scientific knowledge and digital resources and tools which improve teaching and learning processes. Teachers employ analogue and digital instruments to assist their professional growth in delivering improved instruction that reinforces student engagement and develops suitable learning spaces. Traditional educational tools, which educators previously used extensively in classrooms, form the basis of analogue technologies. These instructional devices served as an initial structure in delivering educational content by helping instructors deliver information effectively and

students participate in their instructed activities. Digital tools empower educators to apply traditional instruments including whiteboards and chalkboards in their educational practice. Whiteboards and chalkboards remain indispensable educational tools which help present information alongside concept illustration during interactive classroom discussions especially when schools have no digital resources available. Education depends on pencils and paper as vital classroom materials for its operations. Handwriting enables better memory retrieval as well as improves mental development which confirms the value of traditional educational tools. The educational community supports paper-based learning materials as the optimal method to help students understand better and participate more actively In the evolving landscape of 21st-century education, the integration of technology into teaching and learning processes has become not only necessary but also transformative. Techno-pedagogical skills refer to the ability to effectively integrate technological tools with pedagogical approaches to enhance teaching and learning outcomes. For B.Ed. teacher educators, who are responsible for preparing future teachers, the development and application of such skills is crucial to ensure that teacher trainees are equipped for modern classrooms.

The concept of techno-pedagogy combines three essential domains: **technological knowledge (TK)**, **pedagogical knowledge (PK)**, and **content knowledge (CK)**—forming the widely accepted **TPACK (Technological Pedagogical Content Knowledge)** framework. This framework underscores the importance of blending content expertise with sound teaching strategies and appropriate technological tools. B.Ed. teacher educators must not only possess these competencies but also model their effective use to inspire and guide pre-service teachers. The shift toward digital education, particularly accelerated by the COVID-19 pandemic, has highlighted the urgency of enhancing techno-pedagogical competencies in teacher education institutions. With the increased use of learning management systems (LMS), digital assessment tools, virtual classrooms, and interactive multimedia content, teacher educators are expected to move beyond traditional methods and adopt more dynamic, student-centered approaches supported by technology.

However, the integration of techno-pedagogical skills is often challenged by factors such as limited infrastructure, lack of training, resistance to change, and inadequate institutional support. Therefore, capacity-building programs, workshops, and continuous professional development initiatives are essential to empower teacher educators in effectively using technology to foster critical thinking, creativity, and collaboration among their students.

In conclusion, techno-pedagogical skills are indispensable for B.Ed. teacher educators in today's digital age. Their ability to blend pedagogy with technology not only enhances their instructional practices but also prepares future teachers to meet the demands of diverse and technology-rich learning environments.

Sathya and Venkateswaran (2017) conducted a study to examine techno pedagogical skills of teachers and comparing their results between gender groups. The result revealed that techno-pedagogical skills had

difference between male and female teachers. The professional training of teachers formed part of teacher education while worldwide educational institutions experienced quick changes in their concept. **Senturk (2019)** evaluated the technology based development of teacher educators that affected the way teachers teach and the ways in which people maintain their learning habits across their lifetimes. The results showed that no meaningful differences between genders regarding Techno-pedagogical education competency but female candidates demonstrated stronger lifelong learning habits. The study concluded a moderate relationship between learning tendencies. **Setua (2020)** conducted to survey the level of techno-pedagogical skills among secondary teacher educators during COVID-19 pandemic. The result showed that there was a significant level of techno-pedagogical skills among secondary teacher educators, there was a significant difference among secondary teacher educators according to the variable; area of discipline in relation to the level of their techno-pedagogical skills and there was no significant difference between / among secondary teacher educators according to the variables; computer training, teaching experience and professional qualification in relation to the level of their techno-pedagogical skills. **Bhuyan and Tripathy (2021)** examined the techno-pedagogical abilities of B.Ed. students. Study revealed that B.Ed. students possessed strong positive techno-pedagogical competencies for learning and instructional methods and evaluation practices. Data analysis also showed that no statistical differences between male and female participants as well as between male-arts and female-arts students. The study investigation established that technology teaching skills differ depending on the educational focus of students. **Kumar and Praveena (2022)** conducted a study to evaluate the essential role of technology in their professional life during the 21st century for technological developments of teachers. The result showed that the transformation brought major changes to curriculum transaction procedures and demanded teachers to develop new educational methods for their instruction. The hybrid teaching approach called techno-pedagogy enabled teachers to use ICT resources in their classrooms for delivering curricula more effectively. The study also showed that educators needed to understand and develop their techno-pedagogical skills because these abilities directly affected curriculum delivery and modern teaching requirements**. Chauhan (2024)** assessed the Techno-Pedagogical Competency and teaching attitude of teachers working at different colleges. The study employed a normative survey method. The research results demonstrated that teachers displayed strong techno-pedagogical competency and positive attitudes when it comes to teaching. The research established that techno-pedagogical competency aligns positively with teaching attitude scores It can be observed that there was a significant positive correlation between techno pedagogical competency and attitude towards teaching. **Omini (2025)** conducted a study on techno pedagogical competency of secondary school teachers. In the present study descriptive survey method was used. The result revealed that there was no significant difference in techno pedagogical competencies between the male and female teachers. The study explored that techno pedagogical competency of secondary school teachers how effectively they use technology in their teaching learning process and also enhance instruction and student engagement. **Santosh (2025**) conducted a study to know techno pedagogical skills of college teachers. The descriptive survey method was used. The result showed that there was no significant difference

in the techno pedagogical skills of college teachers with respect to gender age and stream. It also revealed that techno pedagogical skills of college teacher are at an average level.

OBJECTIVES OF THE STUDY

1. To study the difference in techno-pedagogical skills among B.Ed. teacher educators with regard to their gender.
2. To study the difference in techno-pedagogical skills among B.Ed. teacher educators with regard to their teaching experience.
3. To study the interactional effect of gender and teaching experience with respect to techno-pedagogical skills among B.Ed. teacher educators.

HYPOTHESES OF THE STUDY

1. There will be no significant difference in techno-pedagogical skills among B.Ed. teacher educators with respect to their gender.
2. There will be no significant difference in techno-pedagogical skills among B.Ed. teacher educators with respect to their teaching experience.
3. There will be no significant interactional effect between gender and teaching experience with respect to techno-pedagogical skills of B.Ed. teacher educators.

METHODOLOGY

In the present study, survey technique under descriptive method was employed for achieving the objectives of the study.

SAMPLING

The data were gathered from the six districts of Himachal Pradesh i.e.Shimla, Solan, Mandi, Bilaspur, Hamirpur and Kangra. Total sample of 449 B.Ed. teacher educators were comprised in the present study.

RESEARCH TOOLS USED

For the data collection research instruments i.e. Techno-Pedagogical Assessment scale was used which is developed by researcher herself. The collected data were analyzed using the statistical method of analysis of variance (Two Way).

ANALYSIS OF DATA

In order to study the main effect of level of gender and teaching experience on techno-pedagogical skills among B.Ed. teacher educators with their interactional effect, two way analysis of variance (2x3factor design) involving two types of gender i.e. male and female, three level of teaching experience highly, moderately and less experience was applied on the mean scores of techno-pedagogical skills. The means and standard deviations of techno-pedagogical skills scores with respect to gender and level of teaching experience are given Table 1.

TABLE 1

MEANS AND STANDARD DEVIATIONS OF TECHNO PEDAGOGICAL SKILLS SCORES WITH REGARD TO GENDER AND TEACHING EXPERIENCE

Sr. No.	Level of teaching experience / Gender		Mean of Techno pedagogical skills			
			High Level	Moderate Level	Less Level	Total
I	Male	Mean	135.82	140.41	149.56	143.47
		S.D.	29.408	20.757	27.015	26.509
		N	38	44	70	152
II	Female	Mean	141.74	141.77	138.04	140.19
		S.D.	29.540	28.815	30.642	29.792
		N	73	99	125	297
III	Total	Mean	140.09	141.26	142.17	141.30
		S.D.	29.515	25.990	29.839	28.735
		N	137	117	195	449

Afterwards, the statistical technique of Two Way Analysis of Variance (ANOVA) was applied on mean techno-pedagogical skills scores of B.Ed. teacher educators possessing highly, moderately and less level of teaching experience and two types of gender. The F-values were computed and the results so obtained are given in Table 2.

TABLE 2

SUMMARY OF RESULTS OF ANALYSIS OF VARIANCE FOR TECHNO-PEDAGOGICAL SKILLS AMONG B.Ed. TEACHER EDUCATORS WITH REGARD TO GENDER AND TEACHING EXPERIENCE

Sr. No.	Source of Variation	Sum of Squares	d_f	Mean Square	'F' Ratio
1	Gender (A)	11.208	1	11.208	0.019^{NS}
3	Teaching Experience (C)	2872.929	2	1436.465	2.43^{NS}
5	Gender and Teaching Experience (AXC)	5288.659	2	2644.329	4.47*
8	Error Variance	258383.743	437	591.267	
9	Total	8949871.000	449		

NS…….Not Significant

Main effects

(a) Gender (A)

The calculated value of 'F-Ratio' for the main effect of gender on techno-pedagogical skills of B.Ed. teacher educators, for a degree of freedom 1 and 437, was found to be 0.019 which is much below the F-table value (3.86) even at 0.05 level of significance. Hence, the Hypothesis No. 1 that, "There will be no significant difference in techno-pedagogical skills among B.Ed. Teacher educator with regard to gender" was accepted. Therefore, it may be interpreted that male and female B.Ed. teacher educator possessed nearly similar level of techno-pedagogical skills. The male B.Ed. teacher educator had shown mean techno-pedagogical skills score of 143.47 and female B.Ed. teacher educator shown mean techno-pedagogical skills score of 140.19. On the basis of mean score, it can be concluded that male B.Ed. teacher educator have reflective good techno-pedagogical skills as compared to female B.Ed. teacher educators.

(b) Teaching Experience (B)

The calculated value of 'F' for the main effect of teaching experience on techno pedagogical skills of B.Ed. teacher educator, irrespective of their gender and teaching experience, for d_f 2 and 437 came out to be 2.43 which is below to table value (3.01) even at 0.05 level of significance. Hence, the Hypothesis No. 2 that "There will be no significance difference in techno-pedagogical skills among B.Ed. teacher educator with respect to their teaching experience" was accepted. Therefore, it may be interpreted that B.Ed. teacher educators with different level of teaching experience (length of services) possessed nearly similar level of techno-pedagogical skills. This is also evident from weighted mean techno-pedagogical score of highly experienced, moderately experienced and less experienced B.Ed. teacher educators which came out to be 140.09, 141.26 and 142.17 respectively. However less experienced B.Ed. teacher educator have shown higher mean (142.17) techno-pedagogical skill score as compared to moderately experienced B.Ed. teacher educators (141.26) and highly experienced B.Ed. teacher educators (140.09) and respectively.

(c) Gender and Teaching Experience (AXC)

The calculated value of 'F' for the interactional effect of gender and teaching experience on techno-pedagogical skills among B.Ed. teacher educators, for the d_f 2 and 437 came out to be 4.47 which is higher than the table value of 'F'(3.01) at 0.05 level of significance but not significant at 'F' 0.01 level of significance. Hence, the Hypothesis no. 3 that, "There will be no significant interactional between gender and teaching experience with respect to techno-pedagogical skills of B.Ed. teacher educators" was not retained. Therefore, it may be said that gender and teaching experience (in combination with each other) influence techno-pedagogical skills among B.Ed. teacher educators significantly. Therefore, it may be interpreted that the magnitude of difference in the mean techno-pedagogical skills score of B.Ed. teacher educators is not the same within the limits of random variation at the different level of teaching experience i.e. highly, moderately

and less. The significant interaction of gender and teaching experience with respect to techno-pedagogical skills combined influence on B.Ed. teacher educators.

DISCUSSION OF FINDINGS AND IMPLICATIONS

The present investigation was undertaken to study the techno pedagogical skills of B.Ed. teacher educators with respect to gender and teaching experience. After analyzing the study's findings, it was revealed that to ensure that B.Ed. teachers educators in both male and female gender possess similar levels of techno-pedagogical skills. There exists no significance difference in techno-pedagogical skills among B.Ed. teacher educator with respect to their teaching experience. In addition to this, the results of the study also revealed that gender and teaching experience (in combination with each other) influence techno-pedagogical skills among B.Ed. teacher educators significantly. Therefore, it is essential that educational institutions should implement standardized training programs focusing on techno-pedagogical technical skills, problem-solving, tools handling, confidence level and competence. Encouraging cross-disciplinary collaboration through, joint projects, and interactive workshops can help bridge skill gaps, continuous professional development, and equal access to teacher support systems, and integrating techno-pedagogical skills into teaching learning process. Additionally, it enables them to effectively integrate digital tools and technology into teaching and learning processes. This integration enhances the quality of teacher education by promoting student-centered pedagogies such as flipped classrooms, blended learning, and project-based learning. It also necessitates curriculum reforms to include ICT components, continuous professional development programs, and strong institutional support in terms of infrastructure and digital resources. Equipping teacher educators with these skills fosters innovation, inclusive education, and the ability to assess and engage learners more effectively through technology-driven methods. Moreover, it aligns with national educational policies like NEP 2020 and initiatives such as Digital India and SWAYAM, ensuring that future teachers are prepared for the demands of a modern, technology-rich classroom environment. With proper techno-pedagogical training, teacher educators can utilize digital tools such as smart boards, learning management systems, online assessment platforms, and educational apps to improve the effectiveness and accessibility of education. This shift calls for a revision in the B.Ed. curriculum to incorporate ICT-related competencies and for institutions to invest in digital infrastructure and continuous faculty development programs. Techno-pedagogically skilled educators can better support pre-service teachers in developing 21st-century skills, including digital literacy, critical thinking, and collaborative learning. Additionally, these skills enable the creation of inclusive learning environments that cater to diverse learners through differentiated instruction and assistive technologies. The approach also encourages reflective practices, action research, and professional collaboration through digital networks, contributing to the overall quality and modernization of teacher education. Furthermore, strengthening techno-pedagogical capacities ensures alignment with national priorities such as NEP 2020, Digital India, and NISHTHA, ultimately preparing teacher educators and their trainees for technology-integrated classrooms of the future.

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