



# Association Between Techno-Pedagogical Competence And Critical Mindedness Among The Prospective Teachers Of Tripura

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## Abstract

The study titled “Association Between Techno-pedagogical Competence and Critical Mindedness among the Prospective Teachers of Tripura” investigates the association between techno-pedagogical competence and critical-mindedness among prospective teachers in Tripura. The research employs a descriptive survey design, with a sample size of 328 participants, determined using Slovin’s formula. The study focuses on two primary variables: Techno-pedagogical Competence, assessed using the “Teacher’s Techno Pedagogical Competence Scale” developed by Rajashekar and Sathiyaraj (2013), and Critical Mindedness, evaluated using a self-developed questionnaire. The Chi-square test was employed to ascertain the association between these two variables. The findings reveal a significant association between techno-pedagogical competence and critical-mindedness among prospective teachers in Tripura. This association underscores the importance of integrating technology into pedagogy and the role of critical thinking in this process. The study affirms the need for teacher education programs to place a strong emphasis on developing both techno-pedagogical competence and critical-mindedness among prospective teachers, ensuring they are well-prepared to educate the digital natives of the 21st century.

**Keywords:** Techno-pedagogical Competence, Critical-mindedness and Prospective Teachers

## Introduction

Prospective teachers, the vanguards of future pedagogy, are poised to instruct a generation often termed as ‘digital natives’ in an increasingly digitalized world. With Artificial Intelligence’s advent, educational methodologies must be synergized with digital technologies. The quintessential 21st-century educator must be well-versed in subject matter and pedagogical techniques and adept at amalgamating these domains with technological tools. Digital platforms empower educators to reach expansive student cohorts, disseminate information instantaneously, transcend geographical limitations, and archive educational content for on-demand access. In this context, the educator’s critical acumen becomes paramount to prevent the dissemination of fallacies, pseudoscience, and superstitions to impressionable minds.

Critical thinking stands as an indispensable faculty for educators with techno-pedagogical acumen. It bolsters their capacity for discernment, enabling informed decisions regarding the judicious application of technology within their instructional repertoire. Educators can assess the merits and demerits of diverse technological resources and select those that resonate with their instructional objectives.

Amidst the dynamic technological milieu, a critical mindset allows educators to adopt novel technologies and weave them seamlessly into their pedagogical practices. It also confers the ability to troubleshoot and resolve technological impediments effectively, thus ensuring continuity in the educational experience.

Critical thinking is vital for the comprehension and impartation of digital literacy. It equips educators to mentor students in the responsible and secure utilization of technology. It also incites innovation, prompting educators to conceive and implement original techno-pedagogical strategies that elevate learning outcomes.

The vast digital landscape is replete with information of varying veracity, making critical thinking essential for appraising the legitimacy of online content. In essence, the amalgamation of critical thinking with techno-pedagogical proficiency culminates in enhanced instructional methodologies and superior educational results for students. It capacitates educators to harness technology with greater efficacy, adapt to technological advancements, resolve challenges, advocate digital literacy, foster innovation, and critically evaluate digital information. Therefore, a significant Association is posited between techno-pedagogical competence and the critical thinking abilities of aspiring educators.

### **Objective of the study**

To study the Association Between Techno-pedagogical Competence and critical-mindedness of the Prospective Teachers of Tripura

### **Hypothesis of the Study**

H<sub>01</sub>: There is no significant association between Techno-pedagogical Competence and Critical Mindedness of the Prospective Teachers.

### **Related Literature**

Yildiz carried out a research in 2017 titled “The Factors Affecting Techno-Pedagogical Competencies and Critical Thinking Skills of Preservice Mathematics Teachers”. The study revealed that with the surge in the use of technology integration and the modern theoretical shift in teaching-learning methodologies, the importance of equipping teachers with techno-pedagogical competencies and critical thinking skills has become more pronounced than ever before. The analysis of the research data highlighted a noteworthy Association between the critical thinking abilities and techno-pedagogical competencies of pre-service elementary mathematics teachers.

In their 2022 study, Meirbekov, Maslova, and Gallyamova delved into the role of ‘Digital education tools’ in enhancing critical thinking. They acknowledged the profound transformation brought about by the ‘industrial or digital revolution’ in the realm of education, particularly through the advent of online learning technologies. The research emphasized the imperative of nurturing critical thinking competencies in aspiring educators and legal professionals via digital tools. The findings of their study lent credence to the proposition that digital tools can effectively foster critical thinking skills in students.

In 2023, Nurhikmayati and Darhim undertook a comprehensive review of literature, focusing on the evolving role of Information and Communication Technology (ICT) in education, particularly in fostering critical thinking skills. Their research findings suggest that ICT is gaining recognition as a powerful tool to improve learning outcomes for both educators and learners, by making the learning process more engaging and efficient. The study further emphasizes the significance of ICT in developing critical thinking abilities, a skill set deemed crucial in the 21st century. The review also highlights the potential of techno-pedagogical proficiency in shaping the scientific mindset of future educators through the effective use of ICT tools and techniques.

### **Method**

This research employs a descriptive survey design to investigate the relationship between Techno-pedagogical Competence and Critical Mindedness among prospective teachers in Tripura. The target population comprises 1,400 prospective teachers currently enrolled in the B.Ed program across eight Teacher Education Institutions (TEIs) within the state.

The sample size, determined to be 328 participants, was calculated using Slovin’s formula. A stratified random sampling method was utilized to ensure a representative sample from the population.

The study focuses on two primary variables: Techno-pedagogical Competence and Critical Mindedness. Techno-pedagogical competence was assessed using the “Teacher’s Techno Pedagogical Competence Scale” developed by Rajashekar and Sathiyaraj (2013). In contrast, Critical Mindedness was evaluated using a self-developed questionnaire. To ascertain the association between Techno-pedagogical Competence and critical-mindedness among prospective teachers, the Chi-square test was employed as the inferential statistical technique, facilitated by the use of SPSS software.

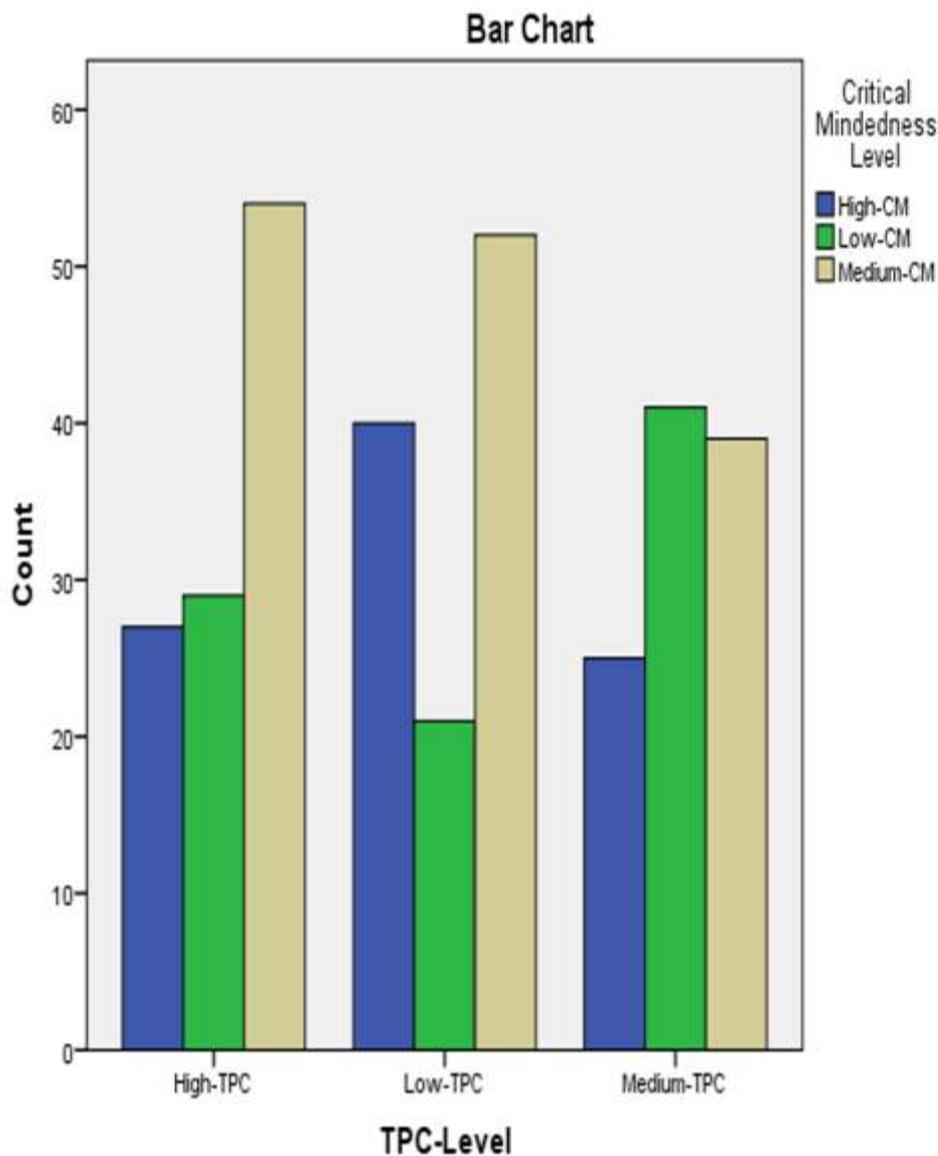
## Analysis and Interpretation

Techno-Pedagogical Competence ( TPC)- Level	Critical Mindedness (CM) - Level			
	High-CM	Low-CM	Medium-CM	Total
High-TPC	27	29	54	110
Low-TPC	40	21	52	113
Medium-TPC	25	41	39	105
Total	92	91	145	328

**Table 1. Cross-tabulation of Techno-Pedagogical Competence and Critical-Mindedness Levels**

The given contingency table provides a distribution of individuals across different levels of Techno-Pedagogical Competence (TPC) and Critical Mindedness (CM). In the high TPC category, there are 110 individuals. These are further divided based on CM levels: 27 individuals have high CM, 29 have low CM, and 54 have medium CM. Similarly, in the low TPC category, there are 113 individuals. Among them, 40 individuals have high CM, 21 have low CM, and 52 have medium CM. The medium TPC category comprises 105 individuals, with 25 having high CM, 41 having low CM, and 39 having medium CM. Looking at the distribution from the perspective of CM, there are 92 individuals with high CM. These individuals are distributed across high (27), low (40), and medium (25) TPC. The low CM category includes 91 individuals, distributed across high (29), low (21), and medium (41) TPC. The medium CM category is the largest with 145 individuals, distributed across high (54), low (52), and medium (39) TPC. The total number of individuals in the study is 328.





**Figure.1. Techno-Pedagogical Competence Levels and Critical-Mindedness Levels** [Source: IBM Corp. (2020). IBM SPSS Statistics for Windows (Version 27.0)]

### Testing of the Hypothesis

$H_{01}$ : There is no significant association between Techno-pedagogical Competence and Critical Mindedness of the Prospective Teachers

N	$\chi^2$ -Value	df	p-Value
328	3.521	4	0.009

**Table 2. Chi-Square Test Results: Association between Techno-pedagogical Competence and Critical Mindedness of Prospective Teachers**

In the conducted statistical analysis, the Pearson Chi-Square value was found to be 13.521 with a degree of freedom of 4. The asymptotic significance, also known as the two-sided p-value, was calculated to be .009. The p-value is a statistical measure that helps in determining the significance of the results. It represents the probability of obtaining the observed data if the null hypothesis were true. In this context, the null hypothesis posits that there is no significant association between Techno-pedagogical competence and critical-mindedness among prospective teachers.

Given that the calculated p-value (.009) is less than the conventional alpha level of .05, which is typically used for statistical significance tests, the null hypothesis is rejected. This implies that the results of the analysis are statistically significant. Therefore, it can be concluded that there is a statistically

significant association between Techno-pedagogical competence and critical-mindedness among prospective teachers.

## Findings

There exists a significant association between Techno-pedagogical Competence and Critical-mindedness among Prospective Teachers of Tripura.

## Discussion

The study uncovers a significant association between techno-pedagogical competence and critical-mindedness among prospective teachers in Tripura, echoing the findings of Yildiz (2017). This correlation highlights the necessity of integrating technology into pedagogy and the pivotal role of critical thinking in this integration.

Techno-pedagogical competence, as defined in the study, is the educators' capacity to effectively integrate technology into their teaching methods. The findings suggest that prospective teachers with high techno-pedagogical competence are also likely to exhibit strong critical-mindedness. This aligns with Yildiz (2017), which found a notable association between the critical thinking abilities and techno-pedagogical competencies of pre-service elementary mathematics teachers.

Critical-mindedness, as per the study, enables prospective teachers to discern the most effective ways to integrate technology into their teaching, evaluate the merits and demerits of various technological resources, and troubleshoot technological issues that may arise during instruction. This is further supported by the research of Meirbekov, Maslova, and Gallyamova (2022), which emphasized the importance of nurturing critical thinking competencies in aspiring educators via digital tools.

The study also highlights the role of critical thinking in promoting digital literacy and navigating the vast digital landscape. Prospective teachers with strong critical thinking skills are better equipped to guide students in the responsible and secure use of technology, evaluate digital information, and prevent the dissemination of fallacies, pseudoscience, and superstitions. This is in line with the findings of Nurhikmayati and Darhim (2023), who suggested that Information and Communication Technology (ICT) is a powerful tool to improve learning outcomes and develop critical thinking abilities.

The study underscores the importance of techno-pedagogical competence and critical-mindedness in the 21st-century education landscape, a sentiment echoed in the referenced literature. It suggests that prospective teachers equipped with these skills are better prepared to navigate the challenges and opportunities presented by the digital revolution in education.

## Conclusion

The study affirms the significant association between techno-pedagogical competence and critical thinking abilities among prospective teachers in Tripura. This association underscores the importance of fostering both these skills in teacher education programs. By enhancing techno-pedagogical competence and critical-mindedness, prospective teachers can be better prepared to navigate the increasingly digitalized world of education. They will be equipped to harness technology effectively, adapt to technological advancements, resolve challenges, advocate for digital literacy, foster innovation, and critically evaluate digital information. Ultimately, this will lead to enhanced instructional methodologies and superior educational outcomes for students. Therefore, teacher education programs should place a strong emphasis on developing both techno-pedagogical competence and critical-mindedness among prospective teachers. This will ensure that they are well-prepared to educate the digital natives of the 21st century.

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