Indian Journal of Multidisciplinary Research (IJOMR)
(Yearly, Blind Peer-Reviewed, Multidisciplinary Journal)
Home Page: *https://ijomr.org*

ISSN: 3048-8036 (Online)
July, 2025. Vol. 2, Issue 1
Page No: 86-97

Techno-Pedagogical Competency in Implementing Instructional Strategies among Bengali Medium Rural Secondary Teachers of West Bengal

Dr. Chiranjit Setua** ****Dr. Manvi Yadav
**Assistant Professor, Madhyamgram B.Ed. College, Kolkata*
***Assistant Professor, Department of Education, Central University of Jharkhand*
DOI: https://doi.org/10.70798/IJOMR/020040009
*Email: *csetua@gmail.com ORCID: *0000-0003-2623-8597*
***manaviy2006@gmail.com **0009-0002-6377-4663*

Received
21/06/2025

Accepted
23/06/2025

Published
09/07/2025

Abstract

This study investigates the level of techno-pedagogical competency in implementing instructional strategies among bengali medium rural secondary school teachers of West Bengal. The sample consists 60 secondary teachers. The researcher adopted a descriptive survey design for collecting the data by observing the classroom instruction which were conducted by the teachers in a digital classroom situation. In this purpose, an observation schedule titled "Observation Schedule of Techno-Pedagogical Skills" (OSTPS), standardised by Setua (2023), was used. The results revealed that a that a maximum number of bengali medium rural secondary school teachers showed a low level of techno-pedagogical competency at the time of classroom instruction. Again, it indicates that the area of discipline significantly influences the techno-pedagogical competency but teaching experience has no significant influence on the techno-pedagogical competency secondary teachers. This result recommends to implement ongoing and structured training programs that strengthen teachers' techno-pedagogical competency across all disciplines for enhancing the overall quality of instructional process in rural secondary schools of West Bengal.

Keywords: *Bengali Medium Rural Secondary Teachers, Implementing Instructional Strategies, Techno-Pedagogical Competency*

Introduction

In the current scenario of our metaverse, techno-pedagogical competency is now regarded as a critical skill for teachers or educators who want to navigate digital learning environments effectively. With the expansion of online education, blended learning approaches and advanced digital tools, it has become imperative for teachers to integrate technology strategically into their

*Published by: **Madhyamgram B.Ed. College, Kolkata***

ISSN: 3048-8036 (Online)
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instructional methods. This integration not only enhances student engagement and interactivity but also facilitates more personalized learning experiences, making education more relevant and effective in contemporary contexts.

Techno-Pedagogical Competency primarily refers to teachers' or educators' ability to effectively integrate technology with pedagogical approaches to enhance the teaching-learning process as well as for quality learning outcomes (Bala and Tao, 2018; Bhuyan and Tripathy, 2021; Paul and Thanakachan, 2019; Sharma and Sharma, 2021). As digital advancements reshape education, technology's role has expanded beyond simple instructional aids to become a central aspect of effective teaching. Educators with strong techno-pedagogical skills can design dynamic, engaging, and learner-centered environments that address diverse learning needs. By incorporating digital tools into instructional strategies, they can foster active learning, critical thinking and collaboration among students. Additionally, techno-pedagogical competency helps educators navigate digital platforms, utilize online resources and develop interactive content that aligns with the needs of today's learners. As education continues to evolve, the integration of technology and pedagogy is vital for delivering meaningful and impactful learning experiences.

Techno-pedagogical competency not only supports effective teaching but also enhance student learning in multiple ways. Researchers argue that integrating technology with pedagogy helps students grasp concepts clearly, retain knowledge and develop self-learning abilities (Islam, 2020; Mahendran, 2017; Rao & Jalajakshi, 2021; Vijaya, 2017). It fosters critical thinking, creativity and deeper knowledge exploration while promoting ICT competence. These skills also encourage student engagement, collaboration and interaction inside and beyond the classroom, making learning relevant to the real world. Ultimately, techno-pedagogical competency prepares learners for lifelong learning and future career demands (Islam, 2020).

In the context of the rapidly evolving educational landscape, techno-pedagogical competency has emerged as a crucial factor in enhancing the teaching-learning process. Bansal (2022) defined techno-pedagogical competency as the ability to effectively integrate technology with pedagogical strategies in actual classroom scenarios. He emphasized that possessing basic technological competencies, acquiring information, developing personally through ICT and planning and creating lessons are essential components of techno-pedagogical competency. The researcher also recommended various strategies for fostering these competencies, such as infrastructural improvements, enhancing English language skills and equipping educators with the ability to teach through technology. Additionally, the researcher stressed the need to overcome the shortage of techno-pedagogically competent teachers, encouraging resource sharing and strengthening collaboration between educational institutions and administrations. However, the researcher concluded that no technological system could achieve the desired outcomes without techno-pedagogically adept teachers.

Baregama and Arora (2021) noted that the foundational research in the domain of techno-pedagogy was conducted by Mathew J. Koehler and Punya Mishra in 2005. They observed that, despite the growing relevance of techno-pedagogical skills, there were only 53 research studies in this area until 2020. These studies primarily focused on Mathematics and Hindi, neglecting other subjects. The researchers highlighted a significant gap in the availability of standardized tools post-2013 and emphasized the need for further research, particularly in the Indian context, to develop and validate these tools across diverse subjects and educational levels. They stressed the necessity

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ISSN: 3048-8036 (Online)
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of expanding the scope of research to address the lack of standardized measurement tools for evaluating techno-pedagogical competencies.

Further, Lyonga et al. (2021) explored the impact of techno-pedagogical skills on teachers' performance in HTTTC Kumba, revealing a weak positive correlation between the two. Despite the modest relationship, more than 90% of teachers acknowledged that their techno-pedagogical skills helped them sustain students' attention and 88% believed that these skills enhanced their overall performance. The study underscored the need for continuous improvement of techno-pedagogical skills to adapt to the evolving educational environment and to ensure effective teaching. Meanwhile, Rao and Jalajakshi (2021) stressed the importance of integrating technology and pedagogy, asserting that teachers proficient in this integration could be termed as 'techno-pedagogues.' They highlighted the indispensable role of techno-pedagogues in ensuring a productive and accessible teaching-learning experience.

The study of Setua (2020) indicated a moderate level of techno-pedagogical skills among pre-service secondary trainee teachers, with most exhibiting high to moderate competence. However, no significant differences were observed in terms of gender, educational qualification or discipline, except for computer training, which influenced competency levels. Additionally, the study identified a moderate positive correlation between techno-pedagogical skills and effective online teaching. Another study by Setua (2021) found that pre-service secondary trainee teachers generally had moderate Techno-Pedagogical Skills, with most displaying high levels, followed by moderate, low, and very high levels. No significant differences were observed based on gender, educational qualification, or discipline, but computer training showed a significant impact at the 0.05 level. Sharma and Sharma (2021) found significant differences in techno-pedagogical skills between private and government trainee teachers, with private college trainees demonstrating higher competencies. Similarly, Bhuyan and Tripathy (2020) noted high levels of techno-pedagogical skills among B.Ed. students in Odisha, particularly among female science students. However, disparities were observed between male and female science students, indicating a potential area for focused training.

Research by Parkash and Hooda (2018) and Sindhwani (2019) revealed that private school teachers generally possess higher techno-pedagogical competencies than their government counterparts due to better ICT facilities. The studies also highlighted that science teachers tend to have higher techno-pedagogical competencies compared to arts teachers. Jeyaraj (2018) found that male teacher educators who frequently utilized technology displayed superior techno-pedagogical skills compared to their female counterparts. The need for comprehensive training to develop techno-pedagogical competencies among teachers was echoed in studies by Dharani (2017), Majella (2017), Prabhathkumar (2017), and Kalaiyarasi (2017), who emphasized that such skills are crucial for effective teaching in a technology-driven educational environment.

While the existing literature underscores the relevance of techno-pedagogical skills, there remains a research gap concerning their application among rural secondary school teachers in Bengali medium institutions in West Bengal. Most studies have focused on urban contexts or specific disciplines like science and mathematics, leaving out rural, regional and multidisciplinary perspectives. This research aims to bridge that gap by examining the Techno-Pedagogical Competency in Implementing Instructional Strategies among Bengali Medium Rural Secondary Teachers of West Bengal.

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Objectives of the Study

1. To find out the level of techno-pedagogical competency in implementing instructional strategies of Bengali medium rural secondary teachers.
2. To study the significant difference in techno-pedagogical competency in implementing instructional strategies among Bengali medium rural secondary teachers with respect to their Area of discipline (Language / Social Science / Science) and Teaching Experience (Below 5 years / 5 to 10 Years / Above 10 Years).

Hypotheses of the Study

H_0-1: There is no significant difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to their Area of discipline.

H_0-2: There is no significant difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to their Teaching Experience.

Delimitation of the Study

- This study was delimited to the Paschim Medinipur District only.
- Only 60 (sixty) secondary teachers were selected for their classroom observation.
- Secondary school teachers who work only in the school under the West Bengal Board of Secondary Education were selected.
- The teachers were selected only from Govt. Aided Schools.

Methodology of the Study

Research Method

A Descriptive Survey Research Method was adopted to find out the results of the concerned problem which was quantitative in nature.

Population

All the Bengali medium rural secondary teachers who work in secondary schools under the West Bengal Board of Secondary Education are considered as a population for the present study.

Sample

A total number of 60 (sixty) Bengali medium rural secondary teachers of Paschim Medinipur District, West Bengal were selected Conveniently to collect data.

Tool & Technique used for Data Collection

A Structured Observation Schedule titled "Observation Schedule of Techno-Pedagogical Skills" (OSTPS) was used to find out the level of techno-pedagogical competency in implementing instructional strategies, standardised by Setua, C. (2024) through Content Validity and Inter-Rater Reliability with the Cohen's Kappa Value (k) of 0.804.

This schedule contains a total number of 16 (sixteen) desired activities and each activity has also five (5) alternatives, such as Very Good (VG), Good (G), Average (A), Poor (P) and Very Poor (VP).

The data related to techno-pedagogical competency of secondary school teachers was collected by observing the classroom instruction of the teachers which were conducted by them in a digital classroom situation.

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Statistical Techniques Used

To find out the result of Objective 1, the different levels of techno-pedagogical competency were calculated in 5 (five) level as per the 5 (five) rages of the distribution of raw score. The percentage of teachers were calculated who scored 16 – 28, 29 – 41, 42 – 54, 55 – 67 and 68 – 80 were considered that they have very low, low, moderate, high and very high level of techno-pedagogical competency.

To find out the result of Objective 2, the researchers performed a normality test of the data set by SPSS 20.0 to determine which statistics would be appropriate for analysing the collected data of the present study. The output of SPSS i.e., N- 60, Mean- 34.93, Median- 32.00, Mode- 25, Skewness- 1.41 and Kurtosis- 1.72, clearly indicated that the collected data were not distributed normally.

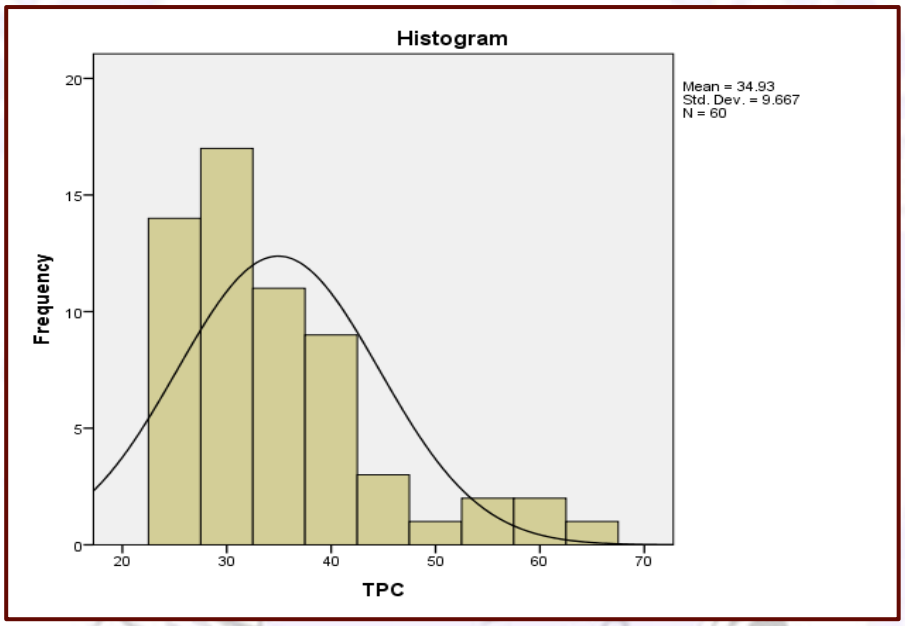

Figure 1: Normality of Data Set

Therefore, the researchers applied a non-parametric test i.e., Kruskal-Wallis Test by SPSS 20.0 to study the significant difference in techno-pedagogical competency in implementing instructional strategies among Bengali medium rural secondary teachers with respect to their Area of discipline and Teaching Experience.

Data Analysis and Interpretation

The collected data were analysed as per objectives and hypotheses.

Objective 1:

To find out the level of techno-pedagogical competency of Bengali medium rural secondary teachers.

As per Table 1, there are no secondary teachers with a very high level of techno-pedagogical competency, 4 numbers of secondary teachers i.e., 6.67% of secondary teachers have a high level of techno-pedagogical competency, 6 numbers of secondary teachers i.e., 10.00% of secondary teachers have moderate level of techno-pedagogical competency, 33 numbers of secondary teachers i.e., 55.00% of secondary teachers have low level of techno-pedagogical

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competency, 17 numbers of secondary teachers i.e., 23.33% of secondary teachers have low level of techno-pedagogical competency.

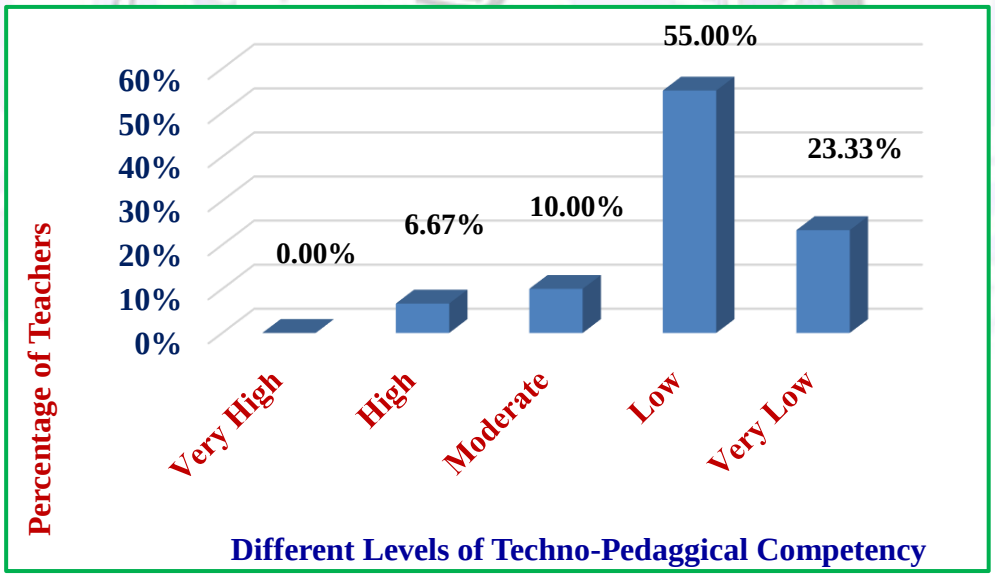
Table 1: Level of Techno-Pedagogical Competency among Secondary School Teachers

Variable	Different Levels	No of Teachers (N)	Percentage of Teachers	Remarks
Techno-Pedagogical Competency	Very High	0	0.00%	Maximum Number of Teachers are at Low Level
	High	4	6.67%	
	Moderate	6	10.00%	
	Low	33	55.00%	
	Very Low	17	23.33%	

So, this result makes it clear that a maximum number of secondary teachers have a low level of techno-pedagogical competency which is also shown in Figure 2.

The findings indicate that most secondary teachers lack the necessary techno-pedagogical competencies essential for effective and technology-driven teaching and learning. The absence of advanced competency may impede the seamless integration of digital tools in the educational process, potentially reducing student engagement and learning outcomes. With technology playing an increasingly vital role in modern education, it is crucial to implement targeted professional development initiatives to enhance teachers' digital teaching capabilities.

Figure 2: Percentage of Teachers in Different Levels of Techno-Pedagogical Competency



The distribution of teachers across different competency levels highlights a significant gap in technology-integrated pedagogy.

This result emphasizes the urgent need for capacity-building programs, digital literacy training and curriculum modifications that prioritize technology integration. Bridging these gaps will not only elevate instructional quality but also empower teachers to efficiently navigate digital learning environments, ultimately benefiting both students and the education system as a whole.

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Objective 2:

To study the significant difference in techno-pedagogical competency in implementing instructional strategies among Bengali medium rural secondary teachers with respect to their Area of discipline and Teaching Experience.

H_0-1: There is no significant difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to their Area of discipline.

Table 2: Difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to Area of discipline

Variables			N	Mean	SD	x^2-value	p-value	Remarks
Independent		Dependent						
Area of Discipline	Language	Techno-Pedagogical Competency	15	29.87	5.22	6.687	0.035	Significant at 0.05 level
	Social Science		24	36.08	11.02			
	Science		21	36.00	8.20			
(The critical value of 'x^2' is 5.991 at 0.05 level of significance with df = 2)								

Table 2 clearly indicates that the calculated mean values (M) of the techno-pedagogical competency of 15 language, 24 social science and 21 science teachers are 29.87, 36.08 and 36.00 with SD of 5.22, 11.02 and 8.20 respectively. The calculated 'x^2-value' is 6.687 with df 2. It is greater than the critical value and significant at 0.05 level of significance. So, the null hypothesis, H_0-1, is rejected. The p-value of 0.035 also indicates the same. That is, the mean values of techno-pedagogical competency differ significantly among language, social science and science secondary teachers.

Hence, the outcomes interpret that the techno-pedagogical competency differs significantly among language, social science and science secondary teachers. It indicates that the area of discipline significantly influences the techno-pedagogical competency or area of discipline has a significant impact on the techno-pedagogical competency of secondary teachers.

Notably, language teachers exhibited lower competency levels compared to their counterparts in social sciences and sciences. This disparity may stem from differences in subject-specific pedagogical approaches, access to digital resources, or opportunities for professional development. The rejection of the null hypothesis (H_0-1) emphasizes the necessity for targeted training programs and capacity-building initiatives to enhance techno-pedagogical skills, particularly in subject areas where competency levels are comparatively lower.

H_0-2: There is no significant difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to their Teaching Experience.

Table 3 clearly indicates that the calculated mean values (M) of the techno-pedagogical

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competency of 13 teachers with below 5 years of teaching experience, 7 teachers with 5 to 10 years of teaching experience and 40 teachers with above 10 years of teaching experience are 36.61, 38.00 and 33.85 with SD of 10.10, 12.38 and 9.08 respectively. The calculated 'x^2-value' is 2.135 with df 2. It is less than the critical value and not significant at 0.05 level of significance. So, the null hypothesis, H_0-2, is accepted. The p-value of 0.344 also indicates the same. That is, the mean values of the techno-pedagogical competency do not differ significantly among secondary teachers who have teaching experience of below 5 years, 5 to 10 years and above 10 years.

Table 3: Difference in techno-pedagogical competency among Bengali medium rural secondary teachers with respect to Teaching Experience

Variables			**N**	**Mean**	**SD**	***x*²-value**	**p-value**	**Remarks**
Independent		**Dependent**						
Teaching Experience	Below 5 Years	Techno-Pedagogical Competency	13	36.61	10.10	2.135	0.344	Not Significant at 0.05 level
	5 to 10 Years		7	38.00	12.38			
	Above 10 Years		40	33.85	9.08			
(The critical value of 'x^2' is 5.991 at 0.05 level of significance with df = 2)								

Hence, the outcomes interpret that the techno-pedagogical competency does not differ significantly among secondary school teachers who have teaching experience of below 5 years, 5 to 10 years and above 10 years. It indicates that teaching experience does not influence the techno-pedagogical competency or teaching experience has no significant impact on the techno-pedagogical competency of secondary teachers.

Although mean scores vary across different experience groups, the absence of statistical significance suggests that techno-pedagogical competency is not solely determined by years of experience. These results highlight the importance of ongoing professional development and technology integration training for teachers at all career stages to ensure sustained proficiency in utilizing digital tools for effective instructional practices.

Discussion of the Results

The results of this study provide valuable insights into the techno-pedagogical competencies of secondary teachers. It was observed that most teachers exhibit limited proficiency in effectively integrating technology into their instructional practices. This finding supports the study of Guru and Beura (2019) and Sathiyaraj (2013) but does not support the study of Bala and Tao (2018) and Setua (2022) in which the results revealed that most of the teachers have satisfactory level of techno-pedagogical competency. This gap between the anticipated standards of technology-enhanced education and the actual digital skills of educators suggests potential obstacles in implementing technology-driven pedagogy effectively. The lack of competency may result in reduced student engagement and hinder the effective delivery of technology-integrated lessons.

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Therefore, it is essential to establish structured and continuous professional development programs that focus on enhancing teachers' digital competencies to prepare them for technology-rich classrooms.

Additionally, the study highlights that teachers' subject areas significantly impact their techno-pedagogical competencies. This finding is in agreement with the study of Sindhwani (2019). Language teachers, in particular, experience more challenges in integrating technology compared to their counterparts in social sciences and sciences. These disparities could be attributed to differences in access to digital resources, training opportunities, and pedagogical practices. Addressing these issues requires targeted, discipline-specific training to ensure equitable development of digital competencies across all subject areas.

Moreover, the findings suggest that teaching experience does not significantly influence teachers' techno-pedagogical competency. This finding does not conform to the study of Sindhwani (2019). Regardless of experience, teachers displayed similar levels of digital proficiency, emphasizing the need for ongoing, targeted training for all educators. Institutions should focus on sustained professional development to help educators adapt to technological advancements in education.

Recommendations as per Findings

Based on the findings and interpretations, the following recommendations can help enhance the techno-pedagogical competency of secondary teachers:

- ***Enhance Professional Development:*** Organize regular and structured training sessions to develop techno-pedagogical skills for all teachers, regardless of their teaching experience.
- ***Tailored Training Programs:*** Create subject-specific digital competency training to address the unique needs of language, social science, and science teachers.
- ***Promote Collaborative Learning:*** Facilitate peer mentoring and collaborative learning opportunities to share effective digital teaching practices.
- ***Integrate in Teacher Education:*** Incorporate comprehensive techno-pedagogical training in pre-service teacher education to prepare future educators for technology-integrated classrooms.
- ***Improve Resource Accessibility:*** Ensure teachers have access to digital tools, resources, and technical support to support seamless technology use.
- ***Continuous Assessment:*** Regularly evaluate teachers' techno-pedagogical competencies to identify gaps and tailor training programs accordingly.
- ***Encourage Skill Development:*** Recognize and reward effective technology integration to motivate teachers to develop their digital skills.
- ***Administrative Support:*** School leaders should actively promote technology use by organizing workshops and creating a supportive environment for digital learning.
- ***Strengthen Digital Literacy:*** Improve teachers' digital literacy to build confidence and effectiveness in using technology for instructional purposes.
- ***Policy Initiatives:*** Work with educational authorities to develop policies that prioritize technology integration and allocate resources for ongoing teacher training.

Implementing these recommendations can help bridge the identified gaps in techno-pedagogical competencies, ultimately creating a more effective, technology-driven learning

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environment for educators and students.

Conclusion

The study provides valuable insights into the techno-pedagogical competency of secondary teachers in Bengali medium rural schools of West Bengal, highlighting the state of digital integration in their instructional practices. The results show that most teachers struggle to effectively incorporate technology into their teaching methods, creating a gap between the desired standards of technology-driven education and actual classroom practices. This limited digital proficiency may hinder effective student engagement and reduce the potential for creating dynamic and interactive learning experiences.

The findings also reveal significant differences in competency levels based on the subject area, with language teachers facing more difficulties in integrating technology compared to their peers in social sciences and sciences. These disparities may be due to differences in access to resources, training opportunities, and subject-specific teaching methods, underscoring the need for discipline-specific professional development.

Interestingly, the study suggests that teaching experience does not significantly influence techno-pedagogical competency, indicating that digital skills are more reliant on consistent exposure to technology and targeted training rather than years of service. To address these challenges, it is crucial to implement ongoing, structured training programs that strengthen teachers' digital capabilities across all disciplines and career stages. Bridging these competency gaps will enhance the overall quality of education in rural secondary schools of West Bengal.

References

Bala, P., & Tao, I. (2018). An Examination of Techno-Pedagogical Competence and Anxiety towards the Use of Instructional Aids in Teaching among Senior Secondary School Teachers. *Chetana*, *3*, 95-114. https://echetana.com/wp-content/uploads/2018/10/14.-Preeti-Bala.pdf

Bansal, S. (2022). Role of Techno-Pedagogical Skills for Enhancing Teaching and Learning. *Journal of Positive School Psychology*, *6*(2), 3785-3793. https://journalppw.com/index.php/jpsp/article/view/2471

Baregama, S., & Arora, R. (2021). A Review of Studies on Techno-Pedagogical and Content Competencies. *Elementary Education Online*, *20*(5), 1128-1130. http://dx.doi.org/10.17051/ilkonline.2021.05.122

Bhuyan, S., & Tripathy, M. K. (2020). Techno Pedagogical Skills of Bachelor of Educationstudents of Odisha. English Language. *Scholarly Research Journal for Interdisciplinary Studies*, *8*(62), 14554-14564. https://www.researchgate.net/publication/348807247_TECHNO_PEDAGOGICAL_SKILLS_OF_BACHELOR_OF_EDUCATION_STUDENTS_OF_ODISHA

Dharani, N. (2017). Techno Pedagogy in Teaching and Learning. *Shanlax International Journal of Education*, *5*(1), 49-50. https://www.shanlaxjournals.in/pdf/spl_issue/Thiagarajar-College-Volume-2.pdf

Guru, D. N., & Beura, M. K. (n.d.). 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.

Published by: ***Madhyamgram B.Ed. College, Kolkata***

https://www.allresearchjournal.com/archives/2019/vol5issue12/PartF/5-10-60-608.pdf

Islam, S. M. (2020). Infusion of Techno-Pedagogy during Covid-19: Teachers' perspective. *International Journal of Creative Research Thoughts, 8*(11), 3660-3670. https://www.researchgate.net/publication/350846208_Infusion_of_Techno-Pedagogy_during_Covid-19_Teachers'_perspective

Jeyaraj, I. (2018). *Techno Pedagogical Skills among the Secondary Level Teacher Educators* [Doctoral Thesis, Alagappa University]. http://hdl.handle.net/10603/288622

Kalaiyarasi, R. (2017). Techno-Pedagogy in Teaching Learning. *Shanlax International Journal of Education, 5*(1), 168-169. https://www.shanlaxjournals.in/pdf/spl_issue/Thiagarajar-College-Volume-2.pdf

Lyonga, N. A. N., Moluayonge, G. E., & Nkeng, A. J. (2021). A Study of Techno-Pedagogical Skills and Teachers' Performance in HTTTC Kumba, Cameroon. *European Journal of Education and Pedagogy*, *2*(1), 46–50. https://doi.org/10.24018/ejedu.2021.2.1.31

Mahendran, T. (2017). Techno-Pedagogy for 21st Century. *Shanlax International Journal of Education, 5*(1), 226-239. https://www.shanlaxjournals.in/pdf/spl_issue/Thiagarajar-College-Volume-2.pdf

Majella, F. G. (2017). Techno-Pedagogy in Teaching and Learning. *Shanlax International Journal of Education, 5*(1), 61-62. https://www.shanlaxjournals.in/pdf/spl_issue/Thiagarajar-College-Volume-2.pdf

Parkash, J., & Hooda, S. R. (2018). A Study of Techno-Pedagogical Competency among Teachers of Government & Private Schools of Haryana State. *International Journal of Current Advanced Research, 7*(1), 2319-6505. http://dx.doi.org/10.24327/ijcar.2018

Paul, A. K., & Thankachan, T. C. (2019). Techno-Pedagogical Skills and Creativity of Student Teachers at Secondary Level. *Educational Extracts, 7*(1), 21-25. http://www.stce-pala.info/

Prabhathkumar, M. (2017). Techno-Pedagogy in Teaching and Learning. *Shanlax International Journal of Education, 5*(1), 156-157. https://www.shanlaxjournals.in/pdf/spl_issue/Thiagarajar-College-Volume-2.pdf

Rao, N. S., & Jalajakshi, B. N. (2021). Techno-Pedagogical Skill; An Indispensable Skill for A 21st Century Classroom Teacher. *International Journal of Creative Research Thoughts, 9*(3), 1264-1267. https://ijcrt.org/papers/IJCRT2103164.pdf

Sathiyaraj, K. (2013). *A Study on Techno-Pedagogical Competencies of Teachers as related to Certain Variables* [Doctoral Thesis, Annamalai University]. http://hdl.handle.net/10603/44793

Setua, C. (2020). Level of Techno-Pedagogical Skills among Secondary Teacher Educators: A Survey during COVID-19 Pandemic. *International Journal of Research and Analytical Reviews, 7*(4), 278-282. https://www.ijrar.org/papers/IJRAR1AA1038.pdf

Setua, C. (2021). Level of Techno-Pedagogical Skills of Pre-service Secondary Trainee Teachers: A Survey. In N. Thakur & S. K. Baskey (Eds.), *Brick to Click: Embracing Change in Education* (1st ed., pp. 153-168). Red'Shine Publication. https://doi.org/10.25215/9198758241

Setua, C. (2022). Effectiveness of Techno-Pedagogical Skills of Secondary School Teachers on Online Teaching During Covid-19 Pandemic. *MIER Journal of Educational Studies Trends & Practices, 12*(1), 171 – 183. http://doi.org/10.52634/mier/2022/v12/i1/1842

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ISSN: 3048-8036 (Online)
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Sharma, M., & Sharma, R. R. (2021). Techno-Pedagogical Skills of Teacher Trainees Belonging to Arts and Science Academic Streams. *Towards Excellence, 13*(2), 907–916. https://doi.org/10.37867/TE130276

Sindhwani, A. (2019). Techno-Pedagogical Competency of Teachers in relation to Gender, Academic Stream and Teaching Experience. *Journal of Emerging Technologies and Innovative Research, 6*(6), 31-38. https://www.jetir.org/papers/JETIR1907Q53.pdf

Vijaya, R. (2017). Techno-Pedagogy in Teaching and Learning. *Shanlax International Journal of Education, 5*(1). https://www.researchgate.net/publication/332037078_Techno-Pedagogy_in_Teaching_and_Learning

Published by: ***Madhyamgram B.Ed. College, Kolkata***