Research Paper

Techno-Pedagogical Integration in English Language Teaching: Assessing Prospective Teachers' Readiness

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ABSTRACT

The integration of digital technologies in education has become increasingly important for enhancing teaching and learning process. It has made techno-pedagogical competence an essential aspect of teacher preparation. This study investigates the techno-pedagogical readiness of prospective English language teachers incorporating the Technological Pedagogical Content Knowledge (TPACK) framework. A descriptive research method was used, and data were collected from 24 prospective English language teachers enrolled in the Bachelor of Education (B.Ed.) programme in Darbhanga district. The findings demonstrated that prospective English language teachers possess moderate to slightly high level of awareness and confidence in techno-pedagogical integration. However, the integration of techno-pedagogical strategies in lesson planning and classroom teaching practice remains severely limited. The findings revealed that there is a gap between theoretical understanding and practical implementation of technology in teaching. The study emphasizes the importance of strengthening teacher education programs through hands-on, practice-oriented techno-pedagogical training, access to improved digital resources and infrastructure to enhance teachers' readiness for technology-enhanced classrooms.

The effectiveness of teachers in a school is closely linked to their training and preparedness of teachers. Effective teacher training plays a key role in improving the quality of school education, as teaching practices are directly influenced by the kind of training teachers receive in teacher education institutions. A well-organized teacher training programme equips the teachers with the necessary knowledge, skills, and attitude that significantly enhance students' learning experiences and outcomes. The incorporation of digital technologies and online platforms has revolutionized education over the past decade. Teachers are increasingly using digital resources and tools to improve students engagement and learning. National Education Policy (NEP) 2020 has also recommended integrating technology into the teaching and learning process and in the preparation of teachers.

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Integrating technology with pedagogy has become an essential aspect of the effective teaching and learning process.

In this context, techno-pedagogical readiness has emerged as a critical area to address the increasing demand for technology integration in education. Over the last decade, the use of technology in education has transformed from basic knowledge of technology and access to using digital literacy frameworks such as Technological Pedagogical Content Knowledge (TPACK). This framework provides a comprehensive approach for incorporating technology into teaching (Singh, 2013; Deb & Pradhan, 2022; Mondal, 2025). The incorporation of technology in education has further accelerated due to the outbreak of COVID-19. During this time, the entire education system shifted to online platforms and digital resources. This transition led to the familiarization of technology-mediated instructions among teachers and the realization of the significant role of digital and online resources in education. This trend persisted due to its usefulness and vitality, leading to the deeper integration of technology in teaching and teacher preparation.

Despite the growing importance of integrating technology in education and increased awareness of its pedagogical value, several challenges and barriers continue to persist in the preparedness of English language teachers in Bihar. One of the major challenges is limited exposure to integrating technology in English language teaching. Many teacher education institutions emphasize theoretical knowledge rather than the integration of technology and digital resources in language teaching. Inadequate infrastructure, such as blacked-out digital devices, technological resources, and unreliable Internet connections, restricts effective technology integration. Furthermore, resistance to change, lack of confidence, and opportunity for hands-on practice with techno-pedagogical integration act as barriers. The challenges demonstrate that the importance of technology integration is well recognized, but a significant gap remains in preparing prospective teachers for techno-pedagogical integration.

THEORETICAL FRAMEWORK

The study aims to examine the following objectives based on the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). The TPACK framework provides A comprehensive model for integrating technology, pedagogy, and content knowledge in teaching. Effective teaching with technology integration requires the teachers to be proficient in Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK). The integration of all three domains is known as Technological Pedagogical Content Knowledge (TPACK). The figure illustrates this concept.
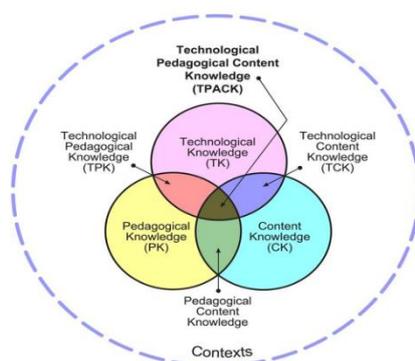

Figure 1, Source: https://educationaltechnology.net

Objectives

1. To examine prospective teachers' awareness of techno-pedagogical integration in English language teaching.
2. To analyse the integration of techno-pedagogy in lesson plans developed by prospective English language teachers.
3. To assess the extent to which prospective English language teachers incorporate techno-pedagogical strategies into classroom teaching activities.

METHODOLOGY

The study adopted a descriptive method to assess the awareness, preparedness, and levels of technology integration in lesson plans and classroom activities of prospective English language teachers.

Sample

The sample for this study consisted of 24 prospective English language teachers enrolled in the Bachelor of Education (B.Ed.) program in Darbhanga District, Bihar. The sample included 16 female and 08 male prospective teachers. Data were collected from these participants during their practicum, the School Internship Training Program. These participants were purposively selected based on their willingness to participate in the study.

Instruments for data collection

This study uses three instruments to collect data from participants on techno-pedagogical readiness and integration.

1. **TPACK Survey:** The TPACK survey, adapted from Schmidt, Baran, Thompson, Koehler, Mishra, and Shin (2009), was administered to all prospective English language teachers participating in the study.
2. **Technology Integration Assessment Rubric:** The Technology Integration Assessment Rubric developed by Harris, Grandgenett, & Hofer (2010) was adapted to analyse the techno-pedagogical integration in lesson plans prepared by prospective English language teachers.
3. **Classroom Observations:** An observation checklist, adapted from Schmidt, Baran, Thompson, Koehler, Mishra, & Shin (2009), was used to observe the prospective teachers during their practicum internship.

Data Analysis and Findings:

The data collected from the TPACK survey, lesson plans, and classroom observations were analysed and presented below.

1. TPACK Survey:

The TPACK Survey aimed to assess prospective teachers' awareness of techno-pedagogical integration in English language teaching across different domains of TPAC and its intersections among these domains.

Table 1: TPACK Survey

TPACK-Dimensions	Mean Score	Standard Deviation
Technological Knowledge (TK)	3.42	1.00
Pedagogical Knowledge (PK)	3.83	0.93
Content Knowledge (CK)	3.67	0.96

TPACK-Dimensions	Mean Score	Standard Deviation
Pedagogical Content Knowledge (PCK)	3.88	0.92
Technological Pedagogical Knowledge (TPK)	3.25	1.01
Technological Content Knowledge (TCK)	3.21	1.02
Technological Pedagogical Content Knowledge (TPACK)	3.21	1.02

Findings from Table 1:
The analysis of the TPACK Survey demonstrated moderate to slightly high levels of techno-pedagogical readiness among prospective English language teachers. This indicates that prospective English language teachers possess an average awareness and understanding of technology-integrated language teaching. This suggests that teachers felt, to some extent, prepared to integrate technology in the teaching of language. However, these scores also indicate sufficient scope for the development of techno-pedagogy and language-teaching competency among prospective teachers.

2. Lesson Plan Assessment
The Technology Integration Assessment Rubric was used to analyze the integration of techno-pedagogy in lesson plans developed by prospective English language teachers.

Table 2: Lesson Plan Assessment

Assessment Criteria	Mean Score	Standard Deviation
Curriculum Goals & Technology (TCK)	2.83	0.75
Instructional Strategies & Technologies (TPK)	2.38	0.76
Technology Selection(s) (TPACK)	2.21	0.75
Fit (TPACK)	2.12	0.74

Findings from Table 2:
The analysis of lesson plans demonstrated a moderate to low level of integration of technology in overall lesson planning. This implies that prospective teachers possess some awareness of incorporating technology lesson plans and teaching strategies. The analysis of technology selection and fit demonstrated a low mean score. This indicates that technology may be occasionally included in lesson plans, but its selection and alignment with the content and pedagogy may not always be appropriate and purposeful. Prospective teachers might face difficulties in making decisions about which technology to use and how to use it to achieve a specific learning objective. This may be due to limited access to technological resources, training, and inadequate exposure to technology-integrated English language teaching.

3. Classroom Observation
Classroom observations were administered to examine how effectively prospective English language teachers integrate techno-pedagogical strategies during their teaching practice.

Table 3: Classroom Observations

Observation Criteria	Mean Score	Standard Deviation
Technological Knowledge (TK)	1.96	0.69
Pedagogical Knowledge (PK)	1.88	0.68
Content Knowledge (CK)	2.08	0.88

Observation Criteria	Mean Score	Standard Deviation
Pedagogical Content Knowledge (PCK)	1.88	0.85
Technological Pedagogical Knowledge (TPK)	1.83	0.64
Technological Content Knowledge (TCK)	1.96	0.62
Technological Pedagogical Content Knowledge (TPACK)	1.96	0.69

Findings from Table 3:

The analysis of the classroom observation demonstrates that overall integration of techno-pedagogical strategies in their practice teaching is very limited. The low mean score indicates that prospective teachers face challenges in meaningfully and effectively integrating Content, Pedagogy, and Technology during their practice teaching. The finding highlights a gap between theory and practice. Though teachers are aware of the techno-pedagogical integration in language teaching, its implementation in the practical classroom is very limited. Such limitations may stem from inadequate access to digital resources, limited infrastructure, and a lack of opportunities for practicing technology-supported English language teaching.

CONCLUSION

The analysis and findings of the study reveal a gap between awareness and practical integration of techno-pedagogical strategies among prospective English language teachers. The TPACK survey result showed moderate to high levels of awareness and readiness; the analysis of lesson plans and classroom observation revealed low levels of techno-pedagogical integration. This suggests that prospective English language teachers demonstrate Considerable understanding of the use of technology in the teaching and learning of the English language, but their ability to effectively and meaningfully integrate techno-pedagogical strategies and subjects in a real classroom remains limited and underprepared. Therefore, the study recommends strengthening teacher education programs by providing more practice-oriented techno-pedagogical training, improving infrastructure and access to digital resources, and providing opportunities for prospective teachers to practice techno-pedagogical strategies in simulated and authentic classroom settings. This ensures that future English language teachers are adequately prepared to meet the evolving demands of technology-enhanced teaching and learning in the 21st century.

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Conflict of Interest
The author(s) declared no conflict of interest.

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