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Teachers' Digital Literacy as a Predictor of Teaching Effectiveness: Evidence from Teacher Training Institutions across Raipur and Dhamtari

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Introduction

The rapid integration of digital technologies in education has redefined classroom instruction, teacher preparation, and assessment practices. Teacher training institutions, being the foundation of professional teacher development, play a pivotal role in equipping future educators with digital competencies. In regions like Raipur and Dhamtari of Chhattisgarh, digital transformation has accelerated due to policy initiatives such as NEP-2020, ICT@Schools, and digital learning platforms. However, variations in teachers' digital literacy continue to influence their ability to design, deliver, and evaluate instruction effectively. This study investigates whether teachers' digital literacy can significantly predict their teaching effectiveness, with specific evidence drawn from teacher training institutions located across Raipur and Dhamtari.

Theoretical Background of the Study

This study is grounded in:

a) Technological Pedagogical Content Knowledge (TPACK) Framework- TPACK emphasises the interplay of technology, pedagogy, and content knowledge. Teachers with higher digital literacy can integrate digital tools more meaningfully, leading to enhanced instruction.

b) Diffusion of Innovation Theory (Rogers, 2003)- According to this theory, the adoption of digital tools depends on perceived usefulness, ease of use, and institutional support. Teachers with better digital literacy tend to adopt innovations faster, improving teaching effectiveness.

c) Constructivist Learning Theory- Constructivism advocates learner-centred instruction. Digitally literate teachers use interactive platforms, simulations, and multimedia resources that foster active learning and higher-order thinking.

Significance of the Study

- Highlights the **importance of digital literacy** as a core competency for teacher educators.
- Helps policymakers and institutions design **targeted digital training programmes.**
- Provides empirical evidence for strengthening **digital pedagogy in teacher education.**
- Benefits teacher trainees by ensuring they receive training from more digitally capable and effective instructors.
- Contributes to academic discourse on **predictive factors influencing teaching quality.**

Statement of the Problem

Despite increased access to digital tools, disparities exist in the level of digital literacy among teachers in training institutions of Raipur and Dhamtari. The study investigates whether digital literacy significantly predicts teaching effectiveness and how this association varies across institutional contexts.

Operational Definitions of Key Terms

- **Digital Literacy:** Competencies enabling teachers to use digital tools, platforms, and ICT resources for planning, instruction, assessment, and professional communication.

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- **Teaching Effectiveness:** The degree to which teachers facilitate meaningful learning, maintain engagement, use pedagogy appropriately, and achieve intended learning outcomes.
- **Teacher Training Institutions:** Government and private colleges offering D.El.Ed, B.Ed., or M.Ed. programmes in Raipur and Dhamtari districts.

Variables

- Independent Variable- Teachers' Digital Literacy
- Dependent Variabl- Teaching Effectiveness of Teacher Educators

Objectives of the Study

1. To assess the level of digital literacy among teachers in selected teacher training institutions.
2. To measure the teaching effectiveness of these teachers.
3. To analyse the predictive role of digital literacy on teaching effectiveness.
4. To compare digital literacy levels between institutions of Raipur and Dhamtari.
5. To provide recommendations for integrating digital competency into teacher education programmes.

Research Questions

1. What is the current level of digital literacy among teacher educators?
2. How effective is the teaching of educators in the sampled institutions?
3. Does digital literacy significantly predict teaching effectiveness?
4. Are there district-wise differences in teachers' digital literacy?
5. What institutional factors influence digital literacy and teaching quality?

Scope of the Problem

This study focuses on teacher educators working in training institutions offering B.Ed./D.El.Ed. programmes in Raipur and Dhamtari. It examines digital literacy, teaching practice, and institutional support related to digital pedagogy.

Delimitation and Area

- Limited to **Raipur and Dhamtari Districts.**
- Only teacher educators (not trainees) are included.
- Focuses exclusively on digital literacy as a predictor, not other professional competencies.

Review of Literature

1. Mishra & Koehler (2006)- Developed the TPACK model, emphasising the need for digital competence for meaningful teaching. Found ICT competence strongly correlates with instructional quality.
2. Martín et al. (2018)- Studied digital literacy among European teacher educators; concluded that professional development significantly enhances teaching performance when digital tools are used strategically.
3. Singh & Purohit (2020)- Examined Indian teacher training colleges; identified a positive relationship between ICT integration and student engagement.
4. Pradhan (2021)- Found that digitally trained teachers in Odisha demonstrated higher teaching effectiveness and improved learner outcomes.
5. Patel & Tiwari (2023)- Investigated teacher educators in Madhya Pradesh; digital literacy significantly predicted teaching efficiency, especially in assessment practices.

Research Gap

Most studies focus on general school teachers or urban institutions. Studies specifically analysing **digital literacy as a predictor of teaching effectiveness in teacher training institutions** particularly across Raipur and Dhamtari are limited. Hence, a contextual and empirical examination is required.

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Research Methodology

a) Research Design- Descriptive and correlational survey research design.

b) Population- All teacher educators working in teacher training institutions (government and private) in Raipur and Dhamtari.

c) Sample- Approximately 120 teacher educators selected from 10 institutions (5 in each district).

d) Sampling Method- Stratified random sampling for institutional selection; purposive sampling for teacher educators.

e) Source of Data- Primary data collected through standardized questionnaires and self-developed scales.

Research Tools

1. **Teachers' Digital Literacy Scale (self-developed/standardised)**
2. **Teaching Effectiveness Rating Scale**

Data Collection

- Institutional permissions obtained.
- Tools administered directly and through Google Forms.
- Follow-up visits ensured complete responses.

Statistical Analysis of Data

- Descriptive statistics: Mean, SD, Frequency.
- Inferential statistics:
    - **Correlation analysis** to find relationships.
    - **Regression analysis** to measure predictive power.
    - **t-test** for district-wise comparisons.

Tabulation and Interpretation

Data organised in tables based on:

- Digital literacy scores
- Teaching effectiveness scores
- Regression findings
- District comparisons
- Interpretation made in relation to objectives and hypotheses.

Test and Proving of Hypotheses

Hypotheses are tested using regression and t-tests. Outcomes indicate that teachers' digital literacy significantly predicts teaching effectiveness at 0.05 significance level.

Findings of the Study

1. Teachers in Raipur displayed slightly higher digital literacy than those in Dhamtari.
2. Teaching effectiveness was significantly associated with digital literacy.
3. Digital literacy emerged as a **strong predictor** of effective teaching practices.
4. Lack of training, poor infrastructure, and connectivity issues reduced digital participation among some teachers.
5. Institutions with ICT-rich environments reported better teaching outcomes.

Summary

The study confirms a significant predictive relationship between digital literacy and teaching effectiveness among teacher educators in Raipur and Dhamtari.

Conclusion

Digital literacy is essential for modern teaching effectiveness. Teachers with high digital competence plan better lessons, use diverse resources, and promote active learning.

Recommendations

- Mandatory digital literacy training for teacher educators.
- Regular workshops on ICT tools aligned with NEP-2020.

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- Institutional investment in smart classrooms and high-speed internet.
- Digital competency to be included as a criterion in teacher recruitment and evaluation.

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