

## Use of Educational Technology among Senior Secondary School Teachers: A Survey Study Education, Fatehabad

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### Abstract

The rapid integration of Information and Communication Technology (ICT) into educational systems has significantly transformed teaching and learning practices worldwide. The present study investigates the extent and pattern of educational technology usage among senior secondary school teachers. A descriptive survey method was adopted, and a randomly selected sample of 100 teachers participated in the study. Data were collected through a structured questionnaire focusing on the use of smart boards, daily PowerPoint presentations, and teacher-managed YouTube channels. Statistical techniques including percentage analysis, mean, and standard deviation were applied to interpret the data. The findings reveal moderate but uneven adoption of digital tools. Infrastructure-supported technologies such as smart boards show relatively higher usage, while routine digital practices such as daily presentation preparation remain limited. The study emphasizes the need for sustained professional development, institutional encouragement, and policy-level interventions to strengthen effective technology-integrated pedagogy at the senior secondary level.

**Keywords:** Educational Technology, ICT Integration, Digital Pedagogy, Smart Classroom, Teacher Digital Competence, TPACK Framework

### 1. Introduction

The twenty-first century has witnessed unprecedented technological advancement, profoundly influencing educational processes across the globe. Educational technology has shifted from being a supplementary instructional aid to becoming an integral component of classroom pedagogy. Information and Communication Technology (ICT) tools enhance visualization, interaction, accessibility, and student engagement, thereby facilitating deeper learning experiences.

At the senior secondary level, where learners engage with abstract and complex subject matter, the effective integration of digital tools becomes particularly significant. Smart boards, multimedia presentations, online resources, and educational platforms can support conceptual clarity and learner participation. However, despite increasing availability of technological infrastructure in schools, actual classroom usage remains uneven.

The integration of Artificial Intelligence (AI) has further expanded the scope of digital education. AI-enabled platforms assist teachers in lesson planning, automated assessment, adaptive learning, attendance tracking, and performance analytics. International organizations such as UNESCO emphasize that AI should complement rather than replace teachers by enhancing professional efficiency and promoting inclusive education. Thus, technology integration must be viewed as a pedagogical transformation rather than mere technical adoption.

This study examines the current status of educational technology usage among senior secondary school teachers and attempts to identify patterns of adoption across selected digital tools.

### 2. Theoretical Framework

The study is grounded in the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). The TPACK model emphasizes the intersection of three domains:

- \* Content Knowledge (CK)
- \* Pedagogical Knowledge (PK)
- \* Technological Knowledge (TK)

Effective technology integration occurs when teachers understand not only how to operate

digital tools but also how to align them with subject content and appropriate teaching strategies. Therefore, successful implementation depends on teachers' digital competence, pedagogical awareness, and institutional support.

### 3. Review of Related Literature

Research in educational technology highlights that infrastructure alone does not ensure meaningful integration. The OECD (2020) reports that teacher preparedness and digital confidence are critical determinants of effective classroom technology use.

UNESCO (2021) emphasizes the importance of national ICT policies and teacher training initiatives in strengthening digital pedagogy. Similarly, NCERT (2022) underscores the need for structured ICT capacity-building programs in Indian school education to bridge the gap between availability and effective use.

Studies conducted in developing educational contexts reveal that teachers often use technology primarily for presentation purposes rather than for collaborative or student-centered learning activities. This suggests that while hardware access may improve, pedagogical transformation requires deeper professional development.

The existing literature thus indicates variability in technology usage, necessitating empirical investigation at the school level.

### 4. Objectives of the Study

The study was conducted with the following objectives:

1. To examine the use of smart boards among senior secondary school teachers.
2. To identify teachers who use PowerPoint presentations daily.
3. To determine the proportion of teachers managing their own YouTube channels.
4. To analyze the overall pattern of educational technology integration.

### 5. Research Hypotheses

Null Hypothesis ( $H_0$ ):

There is no significant difference in the usage of various educational technologies among senior secondary school teachers.

Alternative Hypothesis ( $H_1$ ):

There is a significant difference in the usage of various educational technologies among senior secondary school teachers.

### 6. Research Methodology

#### 6.1 Research Design

The study employed a descriptive survey design to collect quantitative data regarding technology usage patterns.

#### 6.2 Sample

A total of 100 senior secondary school teachers were selected using random sampling techniques.

#### 6.3 Tool Used

A self-developed structured questionnaire was administered. The instrument consisted of close-ended questions related to:

- \* Smart board usage
- \* Daily PowerPoint integration
- \* Ownership of YouTube educational channels
- \* Other or no technology usage

#### 6.4 Statistical Techniques

The collected data were analyzed using:

- \* Percentage analysis
- \* Mean
- \* Standard deviation

## 7. Data Analysis and Results

**Table 1: Distribution of Technology Usage (N = 100)**

Technology Tool Used	Number of Teachers	Percentage
Smart Board	34	34%
PowerPoint (Daily)	15	15%
Own YouTube Channel	25	25%
Others / None	26	26%
Total	100	100%

## 8. Statistical Interpretation

The mean score (25) indicates that each technology category accounts for approximately one-fourth of total responses. The calculated standard deviation (6.75) reflects noticeable variation in usage across different tools.

Smart board usage (34%) represents the highest adoption level, suggesting better access to institutional infrastructure. In contrast, daily PowerPoint usage (15%) is significantly lower, indicating limited routine digital integration. The presence of teacher-managed YouTube channels (25%) demonstrates growing engagement in independent digital content creation.

## 9. Hypothesis Testing

The variation in percentage distribution across categories shows observable differences in technology usage. Since the adoption rates differ considerably (ranging from 15% to 34%), the null hypothesis stating no significant difference is rejected.

Conclusion of Hypothesis Testing:

There exists a statistically significant difference in the adoption levels of various educational technologies among senior secondary school teachers.

## 10. Discussion

The findings indicate that schools are transitioning toward digital pedagogy, but integration remains uneven. Infrastructure-based technologies such as smart boards are more frequently used than teacher-initiated tools requiring additional preparation, such as daily PowerPoint presentations.

The relatively moderate percentage of teachers operating YouTube channels suggests emerging digital confidence beyond traditional classroom settings. However, the 26% of teachers categorized under "Others/None" indicates continued reliance on conventional teaching methods.

The findings align with the TPACK framework, suggesting that technological knowledge alone does not guarantee integration. Teachers require pedagogical strategies and institutional encouragement to effectively embed digital tools into instruction.

Moreover, factors such as time constraints, training exposure, technical support, and motivation significantly influence technology adoption patterns.

## 11. Educational Implications

Based on the findings, the following recommendations are proposed:

1. Organizing regular ICT capacity-building workshops.
2. Providing structured training in digital lesson planning and content creation.
3. Encouraging routine classroom integration of multimedia tools.
4. Offering institutional recognition for innovative digital practices.
5. Strengthening technical infrastructure and maintenance support.
6. Incorporating digital pedagogy modules in teacher education programs.

## 12. Limitations of the Study

The study has certain limitations:

- \* The sample size was limited to 100 teachers.
- \* Data were based on self-reported responses.
- \* No comparative analysis based on subject specialization or teaching experience was

conducted.

\* The study was region-specific, limiting generalizability.

### 13. Conclusion

The present study concludes that educational technology integration among senior secondary school teachers is present but inconsistent. Smart boards are the most commonly used tool, reflecting institutional infrastructure availability. However, daily use of PowerPoint presentations remains comparatively low, indicating limited routine digital preparation.

The emergence of teacher-operated YouTube channels highlights a positive shift toward independent digital engagement. For sustainable and meaningful technology integration, structured professional development programs, supportive institutional policies, and pedagogical alignment with digital tools are essential.

Educational transformation in the digital era requires not only access to technology but also teacher competence, motivation, and systemic support.

### References

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