



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Beyond a Single Verdict: Student Attitudes and Teachers' Dual Perception of Benefits and Risks of ICT in CBSE and State Board Schools of Indore District

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Abstract

This study offers a comparative, mixed-methods examination of ICT attitudes among students and ICT perceptions among teachers in CBSE and State Board high schools of Indore district, India. Quantitative data were collected from 409 students and 205 teachers across 18 schools using standardized attitude/perception scales, supplemented by qualitative case-study interviews with 4 principals and 12 teachers across four purposively selected schools. Reliability analysis revealed that the 30-item teacher scale was not unidimensional, resolving instead into two independently reliable subscales — Perceived Benefits ($\alpha = 0.802$) and Perceived Risks ($\alpha = 0.568$) — a finding with methodological implications beyond this study. Results showed no significant difference in student ICT attitude by board ($p = .081$) but a significant difference by school management type, with private-school students scoring higher ($p < .001$). Teachers showed a more complex pattern: State Board teachers scored significantly higher than CBSE teachers on both perceived benefits ($p = .0006$) and perceived risks ($p = .0045$) — suggesting more reflective, actively evaluative engagement with ICT rather than simple enthusiasm or aversion. Qualitative findings corroborate and contextualise these patterns. The study argues that board affiliation is a weaker predictor of ICT-related outcomes in Indian secondary education than school management type and teachers' stage of technology adoption, with direct implications for how ICT policy and teacher training should be targeted.

Keywords: ICT integration, CBSE, State Board, teacher perception, student attitude, mixed-methods research, Indore district

1. Introduction

Information and Communication Technology (ICT) is widely promoted in Indian education policy as a means of transforming teaching from a teacher-centred to a more interactive, student-centred process. Yet its integration across India's diverse school governance structures — most visibly the divide between Central Board of Secondary Education (CBSE) schools and State Board schools — remains unevenly documented. A common assumption in both public discourse and parts of the research literature is that CBSE schools, often better resourced and more urban-oriented, integrate ICT more successfully than State Board schools. This study tests that assumption directly, using both statistical comparison and in-depth qualitative evidence from Indore district, Madhya Pradesh, and finds the picture to be considerably more nuanced than a simple board-wise hierarchy.

2. Review of Related Literature

Several existing studies inform the present investigation. Mangal and Vallabi (2015) reported that CBSE-affiliated teachers demonstrated significantly greater technology proficiency than State Board teachers in Tamil Nadu, a finding often cited in support of a straightforward CBSE advantage. Muthusamy and Thiyaagu (2015), studying higher secondary students in Madurai, found that ICT perception varied significantly by school management type — government-school students held more negative perceptions than those in self-financed schools — pointing to management type, rather than board, as a salient factor. Ekberg and Gao (2018) identified teacher preparation time, attitudes and knowledge, training, and school leadership support as the principal barriers to ICT use among Swedish secondary teachers, a cluster of barriers this study finds echoed in a very different national context. Kumar and Basavaraja (2016) documented substantial gaps in rural Indian students' computer access attributable to infrastructural and support deficits, while Robertson et al. (2006) emphasised that stakeholder interaction, rather than technology provision alone, was the stronger determinant of successful ICT implementation in Tasmanian schools. Taken together, this literature suggests that resourcing, teacher support structures, and institutional relationships — rather than curricular board per se — may be the more powerful explanatory variables, a hypothesis this study examines directly.

3. Objectives and Hypotheses

The study was guided by the following objectives: (i) to compare student ICT attitudes and teacher ICT perceptions between CBSE and State Board schools; (ii) to examine whether school management type (private vs. government/aided) offers additional explanatory power beyond board affiliation; (iii) to explore, through qualitative case studies, the institutional and individual factors shaping ICT integration; and (iv) to integrate quantitative and qualitative findings into a coherent account of the drivers of ICT-related outcomes in this context.

Four null hypotheses were tested: H01 — no significant difference in student ICT attitude by board; H02 — no significant difference in teachers' perceived benefits of ICT by board; H03 — no significant difference in teachers' perceived risks of ICT by board; H04 — no significant difference in student ICT attitude by school management type.

4. Methodology

A comparative, explanatory sequential mixed-methods design was employed. In Stage 1, a two-stage stratified purposive sampling technique was used to select 18 schools (8 CBSE, 10 State Board; stratified further by private and government/aided management) across Indore district, yielding a quantitative sample of 409 students and 205 teachers. Students responded to a 56-item, 3-point Likert ICT Attitude Scale; teachers responded to a 30-item, 5-point Likert ICT Perception Scale. In Stage 2, four schools were purposively selected for in-depth case study — one high- and one average/low-ICT-integration school per board — and semi-structured interviews were conducted with 4 principals and 12 teachers.

Negatively worded items in both scales were identified and reverse-scored prior to analysis. Reliability was assessed via Cronbach's Alpha; descriptive statistics, Shapiro-Wilk and Levene's tests, independent-samples t-tests (with Welch correction where variances were unequal), Mann-Whitney U tests, and Cohen's d were used for quantitative comparison. Qualitative data were analysed thematically, within and across the four case-study schools, and integrated with the quantitative results.

5. Results

Table 1: Reliability of Instruments

Scale	Items	N	Cronbach's α
Student ICT Attitude Scale	56	409	0.816
Teacher Perceived Benefits	20	205	0.802
Teacher Perceived Risks	10	205	0.568

Table 2: Group Comparisons — Students

Comparison	Mean (Grp 1)	Mean (Grp 2)	t	p	Cohen's d
CBSE (n=186) vs. State Board (n=223)	2.392	2.352	1.749	0.081	0.174
Private (n=218) vs. Govt/Aided (n=191)	2.409	2.326	3.669	<0.001	0.364

Table 3: Group Comparisons — Teachers (CBSE n=105, State Board n=100)

Subscale	CBSE Mean	State Board Mean	t	p	Cohen's d
Perceived Benefits	3.985	4.191	-3.508	0.0006	-0.490
Perceived Risks	3.952	4.124	-2.875	0.0045	-0.399

As shown in Table 2, student ICT attitude did not differ significantly by board but differed significantly, with a larger effect size, by school management type. As shown in Table 3, State Board teachers scored significantly higher than CBSE teachers on both the Benefits and Risks subscales.

5.1 Qualitative Findings

Thematic analysis of the sixteen case-study interviews identified several patterns consistent across both boards: a near-universal perception that ICT improves engagement and conceptual understanding; an equally consistent concern regarding distraction, misuse, and over-dependence; a shared perception among teachers on both boards that CBSE schools are generally better resourced; and a uniform, board-independent demand for more frequent and advanced (increasingly AI-related) teacher training. One State Board science teacher offered a notable counter-narrative, arguing that State Board curricula build stronger foundational academic content than CBSE despite CBSE's perceived ICT advantage.

6. Discussion

The absence of a significant board effect for students, contrasted with a significant management-type effect, directly corroborates Muthusamy and Thiyagu's (2015) independent finding in a different Indian state, lending the pattern considerably more credibility than a single study could establish alone. It suggests that popular assumptions equating CBSE affiliation with superior student-level ICT experience are not well supported once school management type is accounted for separately.

The finding that State Board teachers scored higher on both perceived benefits and perceived risks simultaneously is, we argue, the more theoretically interesting result. Because the two subscales were shown to be statistically independent rather than opposite poles of one dimension, this pattern cannot be explained as State Board teachers simply being "more positive" or "more negative" about ICT. Qualitative evidence suggests instead that these teachers are engaged in active, reflective evaluation of ICT's double-edged character — offering specific, detailed accounts of both its instructional value and its capacity to erode independent problem-solving. We propose, as a plausible explanation warranting further longitudinal investigation, that this reflects a difference in adoption stage: teachers for whom ICT has been fully embedded in practice for longer (predominantly in the CBSE sub-sample) may have habituated to routine use, reporting more moderate, less differentiated perceptions on both dimensions, whereas teachers earlier in the adoption process remain more consciously evaluative of both its promise and its pitfalls.

These findings converge with Ekberg and Gao's (2018) Swedish findings on training and preparation-time barriers, and with Robertson et al.'s (2006) emphasis on stakeholder relationships over technology provision per se — in the present data, administrative support was rated positively almost universally, while training adequacy and infrastructural reliability remained the more consistently cited obstacles, suggesting that further gains are more likely to come from sustained training and infrastructure investment than from further relationship-building.

7. Conclusion and Recommendations

This study concludes that the commonly assumed CBSE–State Board "digital divide" is, at the student level, better explained by school management type (private vs. government/aided) than by curricular board, and that teacher-level differences reflect variation in reflective engagement with ICT's trade-offs rather than a simple favourability gradient. We recommend that ICT policy interventions in Indian secondary education be targeted at equitable resourcing across management types and at sustained, iterative teacher training — particularly in emerging AI-based tools — rather than being framed narrowly around board affiliation.

Limitations: the achieved sample (18 of 20 originally targeted schools; 12 of 20 planned qualitative teacher interviews) and the cross-sectional design constrain generalisability and preclude causal claims; findings are specific to Indore district. Future research should test the proposed adoption-stage explanation longitudinally and extend the management-type comparison to other Indian districts.

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