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Teachers' Attitude towards Smart Classroom Teaching at the Secondary School Level: A Study of Nayagarh District, Odisha

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Abstract

The integration of digital technology into school education has changed the way teachers plan, present and evaluates classroom learning. Smart Classroom Teaching brings together computers, projectors, interactive boards, multimedia content, internet connectivity and other digital resources to make classroom interaction more visual, flexible and engaging. The present article examines the attitude of secondary school teachers towards Smart Classroom Teaching in Nayagarh district of Odisha, drawing directly on the empirical findings of the study from which this article is prepared. The study adopted a descriptive-cum-survey method. From the selected Smart Classroom schools, 100 secondary school teachers from Nayagarh district constituted the teacher sample. A self-developed 30-item Likert-type Attitude Scale for Teachers towards Smart Classroom Teaching was used. The scale was developed across dimensions including effectiveness, implementation, communication and connectivity, power supply, quality enhancement, infrastructure, technical support, maintenance, educational utility, motivation and perception, and problems and constraints. Female teachers recorded a higher mean score (105.82) than male teachers (104.20), urban teachers recorded a higher mean score than rural teachers, and trained teachers recorded a higher mean score (105.44) than untrained teachers (101.56). However, the differences by gender, location and training were not statistically significant at the 0.05 level. The findings indicate a generally favorable attitude towards Smart Classroom teaching, while also pointing to the need for continued teacher training, technical support, reliable infrastructure and sustained administrative attention.

Keywords: *Smart Classroom, Teachers' Attitude, Secondary Schools, Digital Pedagogy*

1. Introduction

Educational technology has become an important part of contemporary school education. The expansion of digital resources has moved classroom practice beyond the exclusive use of textbooks, chalkboards and verbal explanation. Smart Classroom teaching represents this transition by combining information and communication technology with teaching materials, multimedia, digital displays, internet resources and interactive tools. The study notes that Smart Classroom teaching is intended to make the learning environment more interesting than traditional classroom instruction and to help teachers to access multimedia content and information for more effective teaching.

The relevance of Smart Classrooms has also increased in the context of the National Education Policy (NEP) 2020, which emphasizes technology-enabled education, digital resources, teacher preparation, digital infrastructure and technology-supported teaching-learning processes. The study further describes Smart Classroom teaching as a means of supporting concept development, visualization, interaction, assessment and students' engagement. Thus, the success of technology integration is not determined only by the availability of hardware. Teachers' willingness to use the technology, their confidence, training, experience and perception of its usefulness are equally important.

Nayagarh district provides a meaningful setting for examining teachers' attitudes because Smart Classroom initiatives have been introduced in secondary schools through state-level digital education programmes. The study reports that, among the

schools covered in the broader study, Smart Classroom implementation in Nayagarh increased substantially during the study period, particularly in 2022. It also records that 119 secondary schools in Nayagarh were connected with the e-Vidyalaya network during an earlier phase of the programme.

Against this background, the present article focuses specifically on teachers' attitude in Nayagarh district. Rather than, learning outcomes or the full implementation status in the district, the article concentrates on the teacher-attitude evidence available in the study. This narrower focus makes it possible to understand how teachers responded to the introduction of technology-supported classroom teaching and whether their attitudes varied according to gender, location and Smart Classroom training.

2. Conceptual Background

A Smart Classroom may be understood as a technology-supported teaching-learning environment in which digital devices and resources are deliberately integrated with pedagogy. The study identifies computers, laptops, interactive whiteboards, digital projectors, audio systems, tablets, internet connectivity, document cameras, learning management systems, student response systems, video-conferencing tools and educational software as important components. These facilities can help teachers present diagrams, videos, animations, simulations and digital notes in ways that supplement conventional explanation.

The teacher remains central to this process. Technology does not independently create effective learning; it becomes educationally meaningful when the teacher selects suitable resources, organizes classroom interaction, explains concepts, checks understanding and adapts teaching to learners' needs. For this reason, teacher attitude is an important dimension of technology integration.

The teacher attitude scale developed in the study covered 11 dimensions. The statements addressed the perceived effectiveness and implementation of Smart Classrooms, communication and connectivity, power supply, quality enhancement, infrastructure, technical support, maintenance, educational utility, motivation and perception, and problems or constraints. The preliminary instrument contained 48 items. After language review, expert consultation, initial try-out and item analysis, 30 items were retained for the final scale. Responses were recorded on five alternatives: Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree.

3. Review of Literature

Zaidiyeen et al. (2010) examined teachers' attitudes and levels of technology use in classrooms in Jordanian schools. Although the level of ICT use among teachers was low, teachers demonstrated positive attitudes towards integrating ICT into education. The study also reported a significant positive relationship between teachers' ICT use and their attitudes towards ICT.

Kumar and Rani (2016) studied teachers' attitudes towards the use of technology and innovation in classroom teaching. The study involved 200 teachers from 10 autonomous degree colleges in Bangalore. The findings indicated that teachers were using educational technology in teaching and expressed the view that future classrooms should incorporate multimedia and modern technological devices to make teaching more effective.

Chow (2015) investigated teachers' attitudes towards technology in classrooms in the Toronto and York region. The study found that teachers' age did not determine their perception of technology. However, their level of comfort in using technology directly influenced classroom teaching.

Kukul et al. (2015) examined pre-service teachers' attitudes towards mobile learning at Gazi University. The findings indicated that there were no significant differences in teachers' attitudes based on demographic characteristics such as gender and computer ownership.

Philomia and Amutha (2016) investigated ICT awareness among teacher educators in Tiruchirappalli. The study found differences in attitudes between science and arts teachers towards ICT, with science teachers showing higher awareness than their arts counterparts.

Suri and Sharma (2017) conducted an exploratory study on teachers' attitudes towards computers and e-learning at Punjab University, Chandigarh. The study reported positive changes in both faculty and student attitudes towards computer-based e-learning, indicating interest in virtual learning environments.

4. Objectives of the Study

I. To assess the attitude of secondary school teachers towards Smart Classroom teaching in Nayagarh district of Odisha.
II. To examine the difference in teachers' attitude towards Smart Classroom teaching in relation to gender.
III. To examine the difference in teachers' attitude towards Smart Classroom teaching in relation to rural and urban location.
IV. To examine the difference in teachers' attitude towards Smart Classroom teaching in relation to Smart Classroom training.

5. Methodology

The study used a descriptive-cum-survey method, which identifies as an important method in educational and social research for studying the status of a phenomenon and examining teachers' and students' attitudes. The broader study covered Nayagarh district; this article is deliberately confined to the Nayagarh teacher-attitude data.

The broader sample frame comprised, with 20 schools selected from148 secondary schools. The total teacher sample was 1252, taking 100 teachers from Nayagarh. Stratified random sampling was employed. For the present article, only the 100 teachers from Nayagarh are considered.

The principal instrument was the self-developed attitude scale for teachers towards smart classroom teaching. The scale was based on a Likert approach and included 30 final items. Content validity was established through consultation with content experts, while language issues were reviewed with language experts

The study used mean, standard deviation, t-test and graphical representation for analysis. In Nayagarh teacher-attitude analysis, comparisons were made for gender, location and training. The critical 't' value used at the 0.05 level with 98 degrees of freedom was 1.96.

6. Results and Analysis

6.1 Gender-wise Attitude in Nayagarh

Gender	N	Mean	SD	't' Value	df	Remark
Male	45	104.20	8.12	1.07	98	Not significant
Female	55	105.82	6.91			

(Table no-01 Gender-wise Attitude in Nayagarh)

The gender-wise analysis (Table no-01) shows a difference in mean scores, with female teachers recording a mean attitude score of 105.82 and male teachers recording 104.20. The calculated 't' value was 1.07, which was below the critical value of 1.96 at the 0.05 level of significance with 98 degrees of freedom. Therefore, the observed difference was not statistically significant. The result indicates that gender was not associated with a statistically significant difference in teachers' attitude in the sample.

6.2 Location-wise Attitude in Nayagarh

Location	N	Mean	SD	't' Value	df	Remark
Rural	65	104.74	7.52	0.63	98	Not significant
Urban	35	105.74	7.48			

(Table no-02 Location-wise Attitude in Nayagarh)

The location wise analysis (Table no -02) shows that the teachers working in urban schools recorded a higher mean attitude score than teachers working in rural schools. The mean for rural teachers was 104.74 (SD = 7.52), whereas the mean for urban teachers was 105.74 (SD = 7.48). The calculated 't' value was 0.63, below the critical value of 1.96. Hence, the difference was not statistically significant.

6.3 Training-wise Attitude in Nayagarh

Training status	N	Mean	SD	't' Value	df	Remark
Trained	91	105.44	7.35	1.49	98	Not significant
Untrained	9	101.56	8.33			

(Table no-03 Training-wise Attitude in Nayagarh)

The analysis based on training (Table no-03) shows that training produced the largest descriptive difference among the three teacher characteristics examined. Trained teachers recorded a mean attitude score of 105.44 (SD = 7.35), whereas untrained teachers recorded 101.56 (SD = 8.33). The calculated 't' value was 1.49, which remained below the critical value of 1.96. Thus, although trained teachers had a higher mean attitude score, the difference did not reach statistical significance at the 0.05 level.

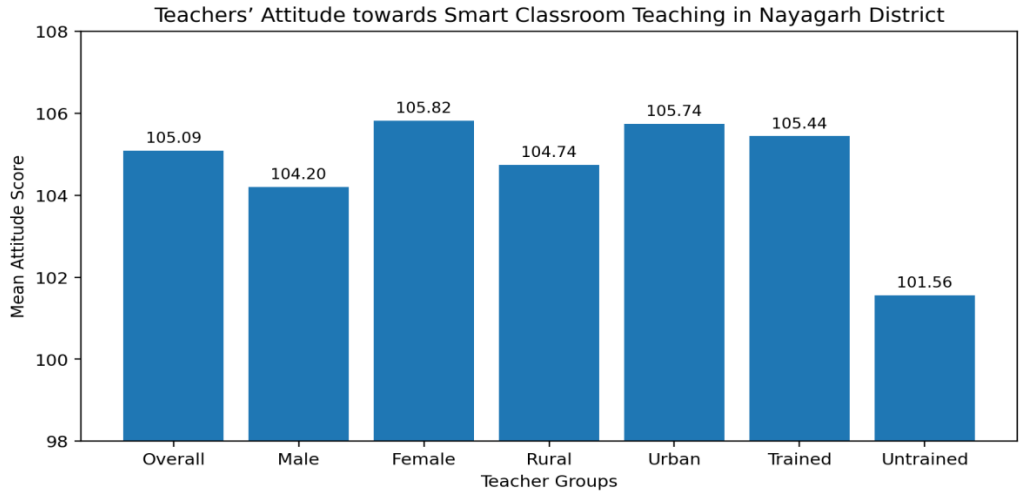

Figure 1. Mean attitude scores of secondary school teachers in Nayagarh by overall sample, gender, location and training.

7. Discussion

The results present a consistent picture of generally favourable attitudes towards Smart Classroom teaching among secondary school teachers in Nayagarh. The overall mean of 105.09 suggests that teachers, on average, responded positively to technology-supported teaching. The result is important because the introduction of digital infrastructure alone does not guarantee classroom use. Teachers must perceive the technology as useful, manageable and relevant to their instructional work.

The gender comparison showed only a small difference in the mean scores. Female teachers had a somewhat higher mean than male teachers, but the t-test did not indicate a significant difference. The study itself notes that such descriptive variation may reflect individual experiences, comfort with technology, teaching styles or exposure to technology.

The location-wise findings were similarly close. Urban teachers had a higher mean than rural teachers, but the difference was not significant. This suggests that teachers' attitudes towards Smart Classroom teaching were not substantially separated by school location in the sampled Nayagarh teachers. The finding is relevant to the equity dimension of digital education: positive orientation towards Smart Classroom teaching was present in both rural and urban groups.

The training comparison deserves particular attention. Trained teachers had a mean score almost four points higher than untrained teachers. Although this difference was not statistically significant, the descriptive pattern is consistent with the practical importance of teacher preparation. The study similarly reports that trained teachers showed higher attitude scores. This does not establish that training caused the higher attitude, because the study was descriptive and the groups were not experimentally assigned. Nevertheless, the result supports the value of maintaining opportunities for hands-on training, orientation and technical support.

The findings also need to be viewed alongside the implementation context described in the study. Smart Classroom environments depend on electricity, internet connectivity, equipment, technical assistance, maintenance and administrative support. The study reports resource and infrastructure differences across the broader study and emphasizes the need for continuous monitoring and targeted intervention.

8. Educational Implications

I. Continuous professional development should be provided so that teachers can move from basic awareness of digital equipment to confident pedagogical use.

II. Training should be practical and classroom-oriented, including lesson planning, multimedia selection, interactive presentation, digital assessment and troubleshooting.

III. Technical support and timely maintenance are important because positive attitudes may not translate into regular classroom use when equipment or connectivity is unreliable.

IV. Rural and urban schools should receive equitable attention so that location does not become a barrier to effective technology integration.

V. School heads and district-level authorities should monitor actual use of Smart Classroom facilities rather than focusing only on installation.

VI. Teachers should be encouraged to combine digital resources with established pedagogical practices rather than treating Smart Classroom teaching as a complete replacement for teacher-led interaction.

9. Limitations

This article is limited to the Nayagarh teacher-attitude component of a larger the study. The sample contains 100 teachers from the selected Smart Classroom schools and therefore should not be interpreted as a complete census of all secondary school teachers in Nayagarh district. The article also relies on self-reported attitude scores. The statistical analysis identifies group differences but does not establish causal relationships between training, infrastructure, location or gender and attitude.

10. Conclusion

The study shows that secondary school teachers in Nayagarh district had a generally favorable attitude towards Smart Classroom teaching. The overall mean attitude score was 105.09. Female teachers, urban teachers and trained teachers recorded higher mean scores than their respective comparison groups, but none of the differences was statistically significant at the 0.05 level. The strongest descriptive difference appeared between trained and untrained teachers, indicating an area that deserves further attention through sustained professional development. Overall, the findings suggest that the foundation for technology-supported teaching is favorable among the sampled teachers, while effective implementation will depend on continued training, reliable infrastructure, technical support, maintenance and supportive school administration. Future studies may examine how teachers' attitudes relate to actual frequency and quality of Smart Classroom use, classroom practices and students' learning experiences.

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