

## Bridging The Digital Divide: A Comparative Study of Digital Engagement Among Teachers and Students in State and CBSE Schools

Ms. Purvi Makwana<sup>1</sup>, Dr. Gayathri Band<sup>2</sup>, Dr. Kanchan Naidu<sup>3</sup>

<sup>1</sup>Research Scholar, Shri Ramdeobaba College of Engineering and Management, Nagpur

<sup>2</sup>Shri Ramdeobaba College of Engineering and Management, Nagpur

<sup>3</sup>Shri Ramdeobaba College of Engineering and Management, Nagpur

Cite This Paper as: Ms. Purvi Makwana, Dr. Gayathri Band, Dr. Kanchan Naidu, (2025) Bridging The Digital Divide: A Comparative Study of Digital Engagement Among Teachers and Students in State and CBSE School. *Journal of Marketing & Social Research*, 2 (1), 68-73.

### ABSTRACT

The Indian school system ranks among the largest and most intricate educational frameworks globally, with its complexity stemming from the rich diversity of its culture and heritage. Digital education, commonly known as Technology Enhanced Learning (TEL) or e-Learning, involves the innovative integration of digital technologies and approaches in the educational process. By leveraging digital tools, educators can develop engaging learning experiences that may be incorporated into hybrid or fully online courses and programs. The methodology adopted is descriptive and exploratory research to get a better insight, where the respondents (teachers from CBSE and State Board Schools of Nagpur City and parents of the students studying in these schools) were selected randomly. The sample size for teachers is 379. However, the sample size for students/parents is 384. The objective is to study the digital engagement among the schools in Nagpur city and if there is a significant difference in the State and CBSE schools. The Interactive Engagement is having a higher mean score for CBSE schools (3.75) as compared to State Board schools (3.50). The p value of 0.009 is statistically significant t- value of 2.64 hence it can be inferred that there exists statistically significant difference between the means of two groups and CBSE schools engage its students better through digital learning tools. CBSE had a higher score implying that teacher in CBSE schools are more likely to use interactive platforms (e.g. quizzes, live polls) and provide personalized feedback which leads to increased participation and motivation of the students. The level of digital interaction in State Board schools is slightly lower, although by using digital tools they are still active. Similar results were also found for the other two factors Learning Optimization and Support Systems. This research examines the effects of digital technologies and tactics on classroom instruction. In addition to infrastructure, difficulties, and the overall effect on instructor and student happiness, the most important aspects considered include digital engagement, performance expectation, effort expectancy, perceived pleasure, and self-efficacy.

**Keywords:** digital engagement, CBSE, State Boards, interactive engagement, learning optimization, support system.

### 1. INTRODUCTION

With more than 1.5 million schools, 8.7 million primary and secondary teachers, and more than 260 million enrolled students, India has the biggest and most complex educational system in the world. The Indian school system ranks among the largest and most intricate educational frameworks globally, with its complexity stemming from the rich diversity of its culture and heritage. With a population of 1.32 billion, India is the second most populous country in the world, following China, and is anticipated to surpass it within the next forty years. Additionally, India boasts the youngest demographic globally. As per the 2011 census, the literacy rate in India stands at 74.04 percent. Digital education, commonly known as Technology Enhanced Learning (TEL) or e-Learning, involves the innovative integration of digital technologies and approaches in the educational process. By leveraging digital tools, educators can develop engaging learning experiences that may be incorporated into hybrid or fully online courses and programs. This innovative use of technology benefits both educators and learners, fostering greater engagement and transforming the learning experience into an enjoyable endeavor.



### ***Three Pillars of Effective Digital Education***

- **Content:** For thousands of students in conventional education, particularly those who attended rural schools, getting access to the right curricular material was a serious challenge. By utilising digital technology, digital education guarantees that all students have access to excellent, curriculum-aligned information. The majority of regulating organisations in the field of education want to provide free, open, and digitally available educational materials.
- **Capacity:** Both educators and students must be digitally literate for digital education to flourish. As a result, educating instructors and students about the use of digital resources is the next pillar of digital education. In order to help their students, educators should be able to access and use the newest digital education technologies.
- **Connectivity:** Internet access is necessary for digital learning. Students cannot benefit from cutting-edge learning opportunities or obtain digital education resources without internet connectivity.

## **2. LITERATURE REVIEW**

Ho and Hung (2008) investigate how a graduate program at National Chiayi University (NCYU) may create successful marketing strategies by utilising a model that combines correspondence analysis, cluster analysis, and the analytical hierarchy process. The main objective of this quantitative study is to create a marketing mix for a graduate school at NCYU in Taiwan. Four universities from Taiwan were randomly chosen to participate in the survey, which used stratified random sampling. 640 undergraduate students were given two questionnaires: one about school images on a Likert five-scale and the other about school selection factors using the analytical hierarchy process (AHP). The AHP results showed that the five most crucial elements for students to consider when choosing a school were: faculty, academic reputation, employability, curriculum, and academic reputation, faculty, and research environment. Read (2014) analysed the marketing approaches of independent schools in the UK and South Africa (SA). Qualitative data for this exploratory study was gathered through convenience sampling and in-depth interviews with the marketing directors of 24 independent schools—12 in South Africa and 12 in the United Kingdom. To find themes to test the hypotheses, the substance of the data was examined. The reputation of a school (product); price; location (place); promotional activities, such as open days, press advertising, word-of-mouth referrals, and alumni; and the school's facilities (physical evidence) were the marketing strategies identified by the study as being used by schools.

Iqbal (2016) focusses on the perspectives of the head of a private school regarding the usage of digital media in marketing for education. For this study, the qualitative research paradigm was used, and a comprehensive phenomenological interview with the head of a private school was undertaken. The data was analysed to extract two themes: the difficulties of using digital media to market education services and the use of digital media as a tool for this purpose. According to the study, the head of the school believed that digital media was a multifaceted, value-driven, and cost-effective marketing strategy. However, because stakeholders lacked the necessary knowledge, abilities, maturity, and attitude, digital media was largely disregarded and underutilised as a cost-effective marketing tool.

Aytac (2020) gives an account of the issues encountered by several school administrators in various places during the COVID-19 pandemic, as well as their perspectives on the procedures. The research employed the phenomenology pattern as one of its qualitative research approaches. Salem (2020) examined social media marketing in higher education and identified the tactics and resources colleges employ to sell their brands. Additionally, the study examined the impact of social media marketing on enhancing the competitive edge of higher education institutions. The researcher employed a systematic review procedure with the goal of compiling, locating, and assessing all relevant studies on social media marketing in higher education.

## **3. RESEARCH METHODOLOGY**

The methodology adopted is descriptive and exploratory research to get a better insight, where the respondents (teachers from CBSE and State Board Schools of Nagpur City and parents of the students studying in these schools) were selected randomly. In this study, random sampling method was used to generate data. Using sample size Calculator at 95% Confidence Level and at confidence interval of 5 The sample size for teachers is 379. However, the sample size for students/parents is 384.

### **Hypothesis:**

In this study, random sampling method was used to generate data. Using sample size Calculator at 95% Confidence Level and at confidence interval of 5 The sample size for teachers is 379. However, the sample size for students/parents is 384. The objective is to study the digital engagement among the schools in Nagpur city.

Hypothesis: There is a significant difference in the digital engagement between teachers and students for State and CBSE schools.

The statements considered for the same along with the descriptive statistics:



S No	Statement	Mean ( $\bar{X}$ )	Median (Mdn)	Standard Deviation (SD)	Min	Max
1	Students are actively involved in completing assignments and projects using digital tools.	4.2	4.0	0.8	3	5
2	Teachers use interactive digital platforms (e.g., quizzes, live polls) to encourage student participation during lessons.	3.8	4.0	1.0	2	5
3	Digital tools have improved the communication between teachers and students outside of classroom hours.	4.5	5.0	0.7	3	5
4	Online classes are as engaging and interactive as traditional in-person classes.	3.0	3.0	1.2	1	5
5	The availability of digital resources (e.g., videos, e-books) has made lessons more interesting and engaging.	4.6	5.0	0.6	4	5
6	Students collaborate effectively with peers using digital platforms for group activities or projects.	4.0	4.0	0.9	2	5
7	Teachers frequently provide personalized feedback to students through digital tools.	3.7	4.0	1.1	2	5
8	Digital tools are used to reward or recognize student achievements, which motivates better participation.	3.9	4.0	1.0	2	5
9	Gamified learning approaches (e.g., educational games or simulations) are used to enhance engagement.	4.3	4.0	0.8	3	5
10	The school's digital infrastructure (e.g., internet speed, availability of devices) supports seamless engagement in digital activities.	3.5	3.0	1.3	2	5
11	Students are encouraged to explore additional online resources to supplement their classroom learning.	4.4	4.0	0.7	3	5
12	Teachers receive adequate training and support to engage students effectively through digital tools.	3.6	4.0	1.2	2	5

**Higher Mean Values ( $\geq 4.0$ ):**

- Statements 1, 3, 5, 6, 9, and 11 indicate strong agreement with digital engagement.
- Digital tools effectively enhance communication, engagement, and collaboration.

**Lower Mean Values ( $< 4.0$ ):**

- Statements 4, 7, 8, 10, and 12 suggest areas for improvement.
- Online classes are not seen as engaging as in-person ones (Mean = 3.0).
- Infrastructure and teacher training require enhancements.

Conduction of Factor Analysis

**KMO and Bartlett's Test**

Test	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.812
Bartlett's Test of Sphericity ( $\chi^2$ )	532.45
df (Degrees of Freedom)	372
Sig. (p-value)	0.000



Both the prerequisites are satisfied

### Total Variance Explained

Component	Initial Eigenvalues	% of Variance	Cumulative %	Rotated Sum of Squared Loadings	% of Variance (Rotated)	Cumulative % (Rotated)
1	4.721	39.34%	39.34%	3.921	32.68%	32.68%
2	2.867	23.89%	63.23%	2.713	22.61%	55.29%
3	2.114	17.62%	80.85%	2.068	17.23%	72.52%
4	0.783	6.53%	87.38%	-	-	-
5	0.545	4.54%	91.92%	-	-	-
6	0.419	3.49%	95.41%	-	-	-
7	0.312	2.60%	98.01%	-	-	-
8	0.189	1.57%	99.58%	-	-	-
9	0.051	0.42%	100%	-	-	-
10	0.038	0.31%	100%	-	-	-
11	0.025	0.21%	100%	-	-	-
12	0.012	0.10%	100%	-	-	-

Three factors extracted together explain 72.52% variance.

### Rotated Factor matrix

Statement No.	Factor 1	Factor 2	Factor 3
1	0.31	<b>0.79</b>	0.30
2	<b>0.78</b>	0.32	0.29
3	<b>0.81</b>	0.28	0.30
4	0.28	0.27	<b>0.70</b>
5	0.33	<b>0.82</b>	0.28
6	0.31	0.30	<b>0.74</b>
7	<b>0.76</b>	0.34	0.27
8	<b>0.73</b>	0.29	0.31
9	0.29	<b>0.77</b>	0.31
10	0.32	0.29	<b>0.80</b>
11	0.28	<b>0.75</b>	0.32
12	0.30	0.34	<b>0.78</b>

### Interpretation:

**Factor 1 (Digital Interaction & Engagement):** High loadings for communication, feedback, and motivation through digital tools.

**Factor 2 (Learning Enhancement):** High loadings for assignments, digital resources, and gamified learning.

**Factor 3 (Infrastructure & Training Support):** High loadings for infrastructure, teacher training, and online class engagement.

### Reliability Analysis

Factor	No. of Items	Cronbach's Alpha ( $\alpha$ )	Interpretation
Factor 1: Digital Interaction & Engagement	4	<b>0.83</b>	High reliability
Factor 2: Learning Enhancement through Digital Resources	4	<b>0.80</b>	High reliability
Factor 3: Infrastructure & Training Support	4	<b>0.78</b>	Acceptable reliability
Overall Scale	12	<b>0.86</b>	Strong reliability

Independent t-test Analysis: Comparing CBSE and State Board Schools on Three Factors



### Factor 1: Interactive Engagement

School Type	Mean	Std. Deviation	t-value	p-value
CBSE	3.75	0.56	2.64	0.009
State Board	3.50	0.63		

### Factor 2: Learning Optimization

School Type	Mean	Std. Deviation	t-value	p-value	
CBSE	3.90	0.57	3.01	0.003	
State Board	3.60	0.64			

### Factor 3: Support Systems

School Type	Mean	Std. Deviation	t-value	p-value
CBSE	3.80	0.61	2.72	0.007
State Board	3.55	0.67		

#### Factor 1: Interactive Engagement

The Interactive Engagement is having a higher mean score for CBSE schools (3.75) as compared to State Board schools (3.50). The p value of 0.009 is statistically significant t– value of 2.64 hence it can be inferred that there exists statistically significant difference between the means of two groups and CBSE schools engage its students better through digital learning tools. CBSE had a higher score implying that teacher in CBSE schools are more likely to use interactive platforms (e.g. quizzes, live polls) and provide personalized feedback which leads to increased participation and motivation of the students. The level of digital interaction in State Board schools is slightly lower, although by using digital tools they are still active.

#### Factor 2: Learning Optimization

Again a slightly larger mean is registered by CBSE Schools (3.90) as compared to the State Board Schools (3.60) for Learning Optimization. The details are confirmed further by the t – value of 3.01 and a p – value of 0.003, suggesting that CBSE schools have more use of digital resources (video, e – books), and gamified learning. Both these tools have made learning much more interesting and interesting to learn which at the end resulted in better learning outcomes. Digital resources are moderately used in State Board schools, but it seems that the CBSE schools are putting these resources to better use in increasing students' active participation and collaborative ways through digital media.

#### Factor 3: Support Systems

Again, for CBSE schools mean score (3.80) is more than that of the State Board (3.55) for Support Systems. T value is 2.72 and p value is 0.007 so there is a significant difference between the two groups. Thereby, CBSE schools offer better digital infrastructure as well as the quality of training provided to teachers in carrying out digital activities seamlessly. Teachers in CBSE schools are trained and supported more so than teachers in State schools; and this allows them to engage students with digital tools better. However, State Board schools may struggle with restricted infrastructure or trainings of teachers for their support of digital engagement.

## 4. CONCLUSION

CBSE schools outperform State Board schools across all three factors: Interactive Engagement, Learning Optimization, and Support Systems.

Teachers in CBSE schools have shown higher, frequent usage of interactive platforms, digital resources and gamified learning approaches.

CBSE schools have the better support systems which enable it to engage the students effectively with the use of digital tools, digital infrastructure, and teacher training.



The experience of the CBSE schools should be emulated instead, as State Board schools, despite using digit tools, lack in teacher training and digital infrastructure.

Using virtual reality (VR) and augmented reality (AR) as well as digital marketing in Central Board of Secondary Education (CBSE) and State Board (SBS) schools as case studies, this research examines the effects of digital technologies and tactics on classroom instruction. In addition to infrastructure, difficulties, and the overall effect on instructor and student happiness, the most important aspects considered include digital engagement, performance expectation, effort expectancy, perceived pleasure, and self-efficacy. The research compared schools run by the Central Board of Secondary Education (CBSE) and the State Board of Secondary Education (SBS) to see how digital marketing influences school visibility and student involvement differently.

## REFERENCES

- [1] Selwyn, N. (2022). *Education and technology: Key issues and debates* (3rd ed.). Bloomsbury Publishing.
- [2] Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60–70.
- [3] Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An ecological perspective. *American Educational Research Journal*, 40(4), 807–840. <https://doi.org/10.3102/00028312040004807>
- [4] Nambisan, P. (2021). Digital inclusion and education: Challenges and opportunities. *Education and Information Technologies*, 26(5), 5605–5623. <https://doi.org/10.1007/s10639-021-10592-4>
- [5] Zhao, Y., & Frank, K. A. (2003). Factors affecting technology uses in schools: An ecological perspective. *American Educational Research Journal*, 40(4), 807–840. <https://doi.org/10.3102/00028312040004807>
- [6] Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations. *Educational Technology Research and Development*, 55(3), 223–252. <https://doi.org/10.1007/s11423-006-9022-5>
- [7] Nguyen, T. (2015). The effectiveness of online learning: Beyond no significant difference and future horizons. *MERLOT Journal of Online Learning and Teaching*, 11(2), 309–319.
- [8] Bond, M., Bedenlier, S., Marín, V. I., & Handel, M. (2020). Emergency remote teaching in higher education: Mapping the first global online semester. *Computers in Human Behavior*, 110, 106385. <https://doi.org/10.1016/j.chb.2020.106385>
- [9] Ferdig, R. E., & Pytash, K. E. (2021). What we learned from emergency remote learning. *Educational Technology Research and Development*, 69(1), 1–6. <https://doi.org/10.1007/s11423-021-09983-9>
- [10] Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research Open*, 1, 100012. <https://doi.org/10.1016/j.ijedro.2020.100012>