# Evaluation of the Effect of Accessibility of Smart Classroom on Learning Outcomes and Academic Achievement Among Students

## Harshdeep Kaur[1], Dr. Hardeep Kaur Saini[2]

[1]M. Ed, Govt. (State) College of Education, Patiala
[2]Assistant Professor, Govt. (State) College of Education, Patiala

**ABSTRACT**

Technology is integrated into education to increase accessibility and convenience for all individuals. Technology has been integrated into education to enhance the traditional classroom teaching and learning process. To evaluate the effect of accessibility of smart classrooms on learning outcomes and academic achievement among students. The study was conducted by involving a sample of 140 students. Data was collected by using a random sampling technique. A self-prepared research tool is used to collect the data for the present study. The calculated value between the accessibility of smart classrooms on learning outcomes and academic achievement is 51.09 at 0.01 level. The calculated values between government schools and private schools in the effect of accessibility of smart classrooms on the learning outcomes is 3.10 at 0.01 level. The calculated values between rural and urban schools in effect of accessibility of smart classrooms on the learning outcomes is 2.26 at 0.05 level. As per the result, we reject the null hypothesis. There is a significant difference between the accessibility of smart classrooms on learning outcomes and academic achievement, government schools and private schools in effect of accessibility of smart classroom on the learning outcomes and, rural and urban schools in effect of accessibility of smart classrooms on learning outcomes of middle class students.

**KEYWORDS:** Technology, Information and Communication Technology, Smart Classroom

## INTRODUCTION

In this global era, technology has dominated our daily lives. Technology has brought the world nearer and closer. Technology is integrated into education to increase accessibility and convenience for all individuals. Technology has been integrated into education to enhance the traditional classroom teaching and learning process. Technology is an aid in acquiring and developing knowledge and understanding to demonstrate and positively influence learners' behaviour.

**Technology is defined as "the making, usage and Knowledge of tools, machines, techniques, crafts, systems or methods of organization in order to solve a problem or perform a specific function".**

The development of the information society and the widespread dissemination of Information and Communication Technology (ICT) give rise to new opportunities for learning and acquiring new digital skills and competencies. Technology is very important in today's world, providing students with numerous tools for acquiring knowledge (Anu, 2021). The availability of new technology reflects on how the relevant processes should be performed in the digital era. This leads to adopting a variety of smart solutions

in educational environments to enhance the quality and improve the performance of students and teachers. The present pedagogy is the digital classroom. The meaningful and innovative use of technology is renovating the methods and approaches of teaching as well as learning in institutions (Amin & Jan, 2018). Information and Communication Technology (ICT) has walked in every aspect of our life, including classrooms. ICT creates a dynamic interaction between students and teachers. National Policy of Education 1986, Computerized is promoted. Children are getting exposed to smartphones, Smart T.V and a variety of technologies as part of their life routine therefore our school system must incorporate technology in their classrooms (Malik & Shanwal, 2015). In the present era, technology played a vital role in the class room situation. The teachers employ different hardware and software for facilitating his/her teaching. Smart class is a blend of traditional classroom with modern technologies which makes teaching-learning more interesting, effective and enjoyable and improves learning outcomes.

## OBJECTIVES OF THE STUDY

- To compare the difference between the accessibility of smart classroom on learning outcomes and academic achievement among middle class students.
- To find out difference in effect of smart classroom learning outcomes between government school and private school of middle school students.
- To find out the difference between middle class students of rural and urban students in effect of accessibility of smart classroom on the learning outcomes.

## HYPOTHESIS OF THE STUDY

1. There is no significant difference between the accessibility of smart classrooms on learning outcomes and academic achievement among middle class students.
2. There is no significant difference between middle-class students of government schools and private schools in effect of accessibility of smart classroom on learning outcomes.
3. There is no significant difference between middle class students of rural and urban students in effect of accessibility of smart classroom on the learning Outcomes.

## DELIMITATIONS

The delimitations of this study were

1. The study was delimited to Patiala district only.
2. The study was delimited to government and private schools only.
3. The study was delimited to middle school students only.
4. The sample of the study comprised of 140 students only.

## SAMPLE OF STUDY

The study was conducted by involving a sample of 140 students. Data was collected by using random sampling technique. Sample was selected from both government and private schools of Patiala district. 140 students from middle schools across patiala district were selected, including boys and girls from school affiliated with PSEB, CBSE and ICSE from urban and rural areas.

## RESEARCH TOOL USED FOR THE STUDY

A research tool is used to collect the data for the present study. The researcher used a self-prepared structured, close-ended questionnaire after reviewing various studies from the literature review.

## TOOLS

A research tool is used to collect the data for the present study. The researcher used a self-prepared questionnaire after reviewing various studies from the literature review. To gauge how smart classes affect middle class students' grasp of concepts and academic performance, the following tools were used:

- Smart Classroom Evaluation Questionnaire  (Self-Prepared)
- Detailed marks certificate of the students of classes VI, VII and VIII.

### Smart class Evaluation Questionnaire

"The present questionnaire is a useful tool to understand how smart boards are utilized in middle class for the students. The questionnaire contains 26 carefully selected items designed to measure the presence and usage of smart boards in the school."

### Academic Performance

In order to check Academic Performance of students the marks of their previous class i.e. $6^{th}$ , $7^{th}$ and $8^{th}$ were taken from the students .

## DATA ANALYSIS AND INTERPRETATION

- **DIFFERENCE BETWEEN THE ACCESSIBILITY OF SMART CLASSROOMS ON LEARNING OUTCOMES AND ACADEMIC ACHIEVEMENT AMONG MIDDLE CLASS STUDENTS**

Tables 2 & 3 show the values of mean, SD and t-value between accessibility of smart classrooms on learning outcomes and academic achievement among middle class Students.

**Table-2 Comparison of Paired Samples Statistics between Accessibility of Smart Classrooms on Learning Outcomes and Academic Achievement among Middle Class Students**

| | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| **Accessibility of Smart Classrooms on Learning Outcomes** | 19.0429 | 140 | 9.56453 | .80835 |
| **Academic Achievement** | 73.6357 | 140 | 10.66036 | .90097 |

**Table-3 Paired Samples Test between Accessibility of Smart Classrooms on Learning Outcomes and Academic Achievement among Middle Class Students**

| | Mean | S.D. | Std. Error Mean | 95% Confidence Interval of the Difference | | t | df | Sig (2-tailed) |
|---|---|---|---|---|---|---|---|---|
| | | | | Lower | upper | | | |
| **Accessibility of Smart Classrooms on Learning Outcomes** | | | | -56.71 | **-52.48** | **-51.099** | 139 | 0.001 |
| **Academic Achievement** | -54.59 | 12.64 | 1.06837 | | | | | |

Tables 2 & 3 show the mean, SD and t-value between accessibility of smart classrooms on learning outcomes and academic achievement among middle class Students depict that Mean and SD of smart classrooms on learning outcomes are $19.04 \pm 9.56$ and Academic Achievement is $73.64 \pm 10.66$.

However, the t-ratio is 51.099, which is significant at 0.01 level. The calculated values between accessibility of smart classrooms on learning outcomes and academic achievement more than the table value hence we reject the null hypothesis. There is a significant difference between accessibility of smart classrooms on learning outcomes and academic achievement among middle class Students.

Thus the hypothesis, *"There will be no significant difference between* **accessibility of smart classrooms on learning outcomes and academic achievement among middle class students***"* **is rejected.**

- **DIFFERENCE BETWEEN MIDDLE CLASS STUDENTS OF GOVERNMENT SCHOOLS AND PRIVATE SCHOOLS IN EFFECT OF ACCESSIBILITY OF SMART CLASSROOMS ON THE LEARNING OUTCOMES**

Tables 4 & 5 show the values of mean, SD and t-value between middle class students of government schools and private schools in effect of accessibility of smart Classroom on the learning outcomes.

**Table-4 Comparison of Statistical Values between Middle-Class Students of Government Schools and Private Schools in Effect of Accessibility of Smart Classroom on the Learning Outcomes**

| Schools | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| **Government** | 87 | 17.1379 | 10.12385 | 1.08539 |
| **Private** | 53 | 22.1509 | 7.67212 | 1.05385 |

**Table-5 Independent Sample Test between Middle Class Students of Government Schools and Private Schools in Effect of Accessibility of Smart Classroom on the Learning Outcomes**

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | | | | Sig. (2-tailed ) | Mean Differenc e | Std. Error Differen ce | 95% Confidence Interval of the Difference | |
| | F | Sig. | t | df | | | | Lower | Upper |
|---|---|---|---|---|---|---|---|---|---|
| Equal varianc es assume d | 20.37 | .001 | -3.101 | 138 | .002 | -5.01301 | 1.61639 | -8.20911 | -1.81692 |
| Equal varianc es not assume d | | | -3.314 | 131.4 18 | .001 | -5.01301 | 1.51283 | -8.00567 | -2.02036 |

Tables 4 & 5 show the mean, SD and t-value between middle-class students of government schools and private schools in effect of accessibility of smart Classrooms on the learning outcomes depict that Mean and SD of middle-class students of government schools are $17.14 \pm 10.12$ and private schools are $22.15 \pm 7.67$.

However, the t-ratio is 3.10, which is significant at 0.01 level. The calculated values between government schools and private schools in effect of accessibility of smart classrooms on the learning outcomes more than the table value (2.63), hence we reject the null hypothesis. There is a significant difference between middle-class students of government schools and private schools.

**Thus the hypothesis, "*There will be no significant difference between middle class students of government schools and private schools in effect of accessibility of smart classroom on the learning outcomes*" is rejected.**

- **DIFFERENCE BETWEEN MIDDLE CLASS STUDENTS OF RURAL AND URBAN SCHOOLS IN EFFECT OF ACCESSIBILITY OF SMART CLASSROOM ON THE LEARNING OUTCOMES**

Tables 6 & 7 show the values of mean, SD and t-value between middle class students of rural and urban Schools in effect of accessibility of smart Classroom on the learning outcomes.

**Table-6 Comparison of Statistical Values between Middle Class Students of Rural and Urban Schools in Effect of Accessibility of Smart Classroom on the Learning Outcomes**

| Area | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| Rural | 103 | 17.9126 | 9.99030 | .98437 |
| Urban | 37 | 22.1622 | 7.51115 | 1.23483 |

**Table-7 Independent Sample Test between Middle Class Students of Rural and Urban Schools in Effect of Accessibility of Smart Classroom on the Learning Outcomes**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | F | Sig. | t | df | Sig. (2-tailed) | | | Lower | Upper |
| | Equal variances assumed | 14.966 | .000 | -2.357 | 138 | .020 | -4.24954 | 1.80296 | -7.81453 | -.68455 |
| | Equal variances not assumed | | | -2.691 | 84.281 | .009 | -4.24954 | 1.57917 | -7.38975 | -1.10934 |

Table 4.7 & 4.8 show the mean, SD and t-value between middle class students of rural and urban Schools in effect of accessibility of smart Classroom on the learning outcomes depict that Mean and SD of middle class students of rural school is 17.91 $\pm$ 9.99 and urban school is 22.16 $\pm$ 7.51.

However, the t-ratio is 2.26, which is significant at 0.05 level. The calculated values between rural and urban schools in effect of accessibility of smart classroom on the learning outcomes more than the table value (1.98), hence we reject the null hypothesis. There is a significant difference between middle class students of rural and urban schools.

**Thus the hypothesis, "*There will be no significant difference between middle class students of rural and urban schools in effect of accessibility of smart classroom on the learning outcomes*" is rejected**

**CONCLUSION**

In the present study, the investigator has explored the effect of accessibility to smart classes on learning outcomes and academic achievement among students. After the analysis and interpretation of data, the following conclusions are drawn:

1. There is a significant difference between accessibility of smart classrooms on learning outcomes and academic achievement among middle class students.
2. There is a significant difference between middle class students of government schools and private schools in effect of accessibility of smart classroom on the learning outcomes.
3. There is a significant difference between middle class students of rural and urban school in effect of accessibility of smart classrooms on learning outcomes.

**EDUCATIONAL IMPLICATIONS**

Keeping in view the focus of the study, the following suggestions may be laid down for the educational implications:

• This research is of great importance because it investigated the effect of accessibility of smart classes

on learning outcomes and academic achievement among students in selected senior secondary schools.

- The study particularly examined the students' utilization of smart classes, the patterns they employed in accessing these classes, and how it affected their general academic performance.
- The findings of the study revealed that accessibility to smart classes can be rewarding and can enhance the chances of students performing excellently.
- This research will encourage students to actively engage with smart classes to enhance their academic performance.
- This research will also encourage school authorities as well as parents to be involved in the efforts to develop, monitor, and optimize the use of smart classes and their content in such a way that it would enhance students' academic performance.

## REFERENCES

1. Arora, J. S. & Sethi, U. J. (2018). *Emerging Issues in Digital Learning in India: A study with Reference to Smart Classroom.* International Journal of Research and Analytical Reviews. 5(4), 442-445.
2. Bano, N. & Ganaie, M. Y. (2016). *Smart Classroom Learning Environment and Performance of First Grade Students A Study.* International Journal of Scientific Research and Education (LJSRE), 4(2). 4938-4941.
3. Batla, N. & Duran, M. (2015). *Attitudes of Students and Teachers towards the Use of Interactive Whiteboards in Elementary and Secondary School Classrooms.* The Turkish online Journal of Educational Technology. 14(2), 15- 23.
4. Chachra, I. K. (2015). *Effect of Smart Classroom Assisted Teaching on Academic Achievement of Students of Different Intelligence Level in Social Science.* Abhinav National Monthly
5. Refereed Journal of Research in Arts & Education. 4(6), 4-10.
6. Chamundeswari, S. (2014). Developing attitude and learning Mathematics among students Using Interactive Whiteboard in Classroom. The International Journal of Social Sciences and Humanities Invention, 1(7), 550-566.
7. Daisy, B. A., Karthi, R. & Balaishwarya, P. (2018). A Study on Smart Class Services Satisfaction of Anana Edu Solutions in Schools Karaikal. International Journal of Advanced Research (WAR). 6(1), 159-163.
8. Gopinath, S. & Sreeya, B. (2020). *Impact on Smart Class Education System.* International Journal Of Advanced Science and Technology, 29(7), 4171-4176.
9. Jin, *et. al.* (2019). *User Perceptions of Smart Class Services in Teaching and Learning Interactions.* Procedia 11$^{th}$ CIRP Conference on Industrial Product Service System, 785–788.
10. Kurtz, G., *et. al.* (2013). *Teachers' Perceptions of the Use of the Interactive Whiteboard and its Impact on their Self- Perceptions as ICT literature.* Journal of Modern Education Review. 3 (2), 155-161.
11. Malik, Navita & Shanwal, (2017). *A Comparative Study of Traditional and Smart classrooms in Relation to their creativity and academic achievement.* Integrated Journal of Social Science. 4 (1). 15-19.
12. Malik, N. & Shanwal, V. K. (2019). *A study of Relationship between Verbal Creativity and Academic Achievement of Students studying in Smart Classrooms.* Journal of Advances and Scholarly Researches in Allied Education. Contemporary Social Science, 2(16), 1545-1549.

13. Manohari, G. M. & Shenbagavadivu, T. (2018). *A Study on Scope of Smart Classrooms in the Government schools functioning in and around Coimbatore.* A Journal of Nehru Arts and Science College (Autonomous). 6(1), 1-7.

14. Menon, A. (2015). *Effectiveness of Smart Classroom Teaching on the Achievement in Chemistry of Secondary School Students.* American International Journal of Research in Humanities, Arts and Social Sciences. 9(2). 115- 120.

15. Miraoui, M. (2018). *A Context-aware Smart Class room for enhanced Learning Environment.* International Journal on Smart Sensing and Intelligent Systems, 1(11), 1-8.

16. Saini, M. K. & Goel, N. (2021). *How smart are Smart Classrooms? A Review of Smart Classroom Technologies.* ACM Comput. Surveys 1(1).

17. Mushimiyimana, J. (2021). *School Management and Effectiveness use of Smart Classroom in Teaching learning Process.* Voice of Research, 9(4), 4-13.

18. Oz, H. (2014). *Teachers and Students' Perceptions of Interactive Whiteboards in the English as a Foreign Language Classroom.* The Trukish Online Journal of Educational Technology, 13(3), 156-177.

19. Pancholi, A. & Bharwad, A. (2015). *Effectiveness of Smart Class among Secondary School's Students of Ankur Vidyalay, Ahmendabad.* International Journal for Research in Education, 4(7), 9-13.

20. Sevindik, T. (2009). *Future's learning environments in health education: The effects of smart classrooms on the academic achievements of the students at health college.* Telematics and Informatics 27 314-322.

21. Vyas, P. & Tiwari, S. (2021). *Effectiveness of Smart Class Strategy for Developing Basic Skills of English during online class.* Journal of Critical Reviews, 8(3), 237-249.