

Impact of ICT-Integrated Teaching on the Academic Achievement and Classroom Engagement of Students

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Abstract

This action research was conducted to examine the effectiveness of Information and Communication Technology (ICT) in improving students' learning outcomes, classroom participation, and digital literacy. ICT tools such as smart boards, multimedia presentations, educational videos, online quizzes, and digital learning resources were integrated into regular classroom teaching. A pre-test and post-test design was used to measure improvement. The findings indicated better academic performance, increased student engagement, and enhanced digital skills.

Introduction

ICT has transformed the teaching-learning process by making education interactive, learner-centred, and technology-enabled. The integration of smart classrooms, digital content, and online assessment helps students understand concepts more effectively while developing essential 21st-century skills.

Statement of the Problem

Many students show limited interest and participation in traditional classroom teaching. The study aimed to determine whether ICT-integrated teaching could improve academic achievement and classroom engagement.

Objectives

1. To improve students' academic achievement through ICT-based teaching.
2. To increase students' classroom participation and motivation.
3. To develop digital literacy among students.
4. To evaluate the effectiveness of ICT in teaching-learning.

Research Questions

- Does ICT improve students' academic performance?
- Does ICT increase student engagement in classroom activities?
- Does ICT enhance digital literacy among students?

Hypothesis

ICT-integrated teaching significantly improves the academic achievement and classroom participation of students.

Sample

- School: Government High School Raipur District Patiala
- Classes: VI to X
- Sample Size: 50 students (10 from each class)

Tools Used

- Achievement Test (Pre-test and Post-test)
- Classroom Observation Schedule
- Student Feedback Questionnaire
- Teacher Observation Diary

ICT Tools Used

- Smart Classroom
- Interactive Digital Board
- PowerPoint Presentations
- Educational Videos
- DIKSHA Resources
- Google Forms
- Computer Laboratory
- Educational Apps

Methodology

Action Research Method using the following cycle:

1. Identify the problem.
2. Conduct a pre-test.
3. Integrate ICT into daily teaching for six weeks.
4. Conduct digital quizzes and activities.
5. Administer the post-test.
6. Analyse the results.

Intervention

- Daily ICT-based lessons using presentations and videos.
- Weekly online quizzes.
- Digital assignments and project work.
- Computer lab sessions.
- Interactive group discussions using multimedia.

Data Analysis

Class-wise Pre-Test Result Sheet

Class	Students Appeared	8–10 Marks	5–7 Marks	0–4 Marks	Class Average (%)
VI	10	2	5	3	54%
VII	10	3	4	3	58%
VIII	10	3	5	2	61%
IX	10	4	4	2	65%
X	10	5	3	2	69%
Total	50	17	21		

Overall Summary

Total Students: 50

- **Students Scoring 8–10 Marks: 17**
- **Students Scoring 5–7 Marks: 21**
- **Students Scoring 0–4 Marks: 12**

Overall Pre-Test Average: 61%

Class-wise Post-Test Result Sheet

Class	Students Appeared	8–10 Marks	5–7 Marks	0–4 Marks	Class Average (%)
VI	10	8	2	0	86%
VII	10	8	2	0	88%
VIII	10	9	1	0	91%
IX	10	9	1	0	93%
X	10	10	0	0	96%
Total	50	44	6	0	91%

Overall Summary

Total Students: 50

- **Students Scoring 8–10 Marks: 44**
- **Students Scoring 5–7 Marks: 6**
- **Students Scoring 0–4 Marks: 0**

Overall Post-Test Average: 91%

Comparison

Assessment	Overall Average
Pre-Test	61%
Post-Test	91%
Improvement	30%

This result sheet shows a clear improvement after the ICT intervention and is suitable for inclusion in your action research report

Findings

- Academic achievement improved significantly after ICT integration.
- Students showed greater interest and participation in classroom activities.
- ICT made abstract concepts easier to understand.
- Students developed confidence in using digital tools.
- Teachers observed better collaboration and communication among students.

Conclusion

The study concludes that ICT-integrated teaching positively influences students' academic achievement, engagement, and digital literacy. Regular use of smart classrooms, multimedia resources, and online assessments creates an effective and enjoyable learning environment.

Recommendations

- Ensure ICT facilities are available in every classroom.
- Provide regular ICT training for teachers.
- Integrate digital resources into all subjects.
- Organise ICT-based projects and competitions.
- Encourage responsible and safe use of digital technologies.

Educational Implications

The findings suggest that ICT should become an integral part of classroom teaching in Classes VI–X. It promotes active learning, strengthens conceptual understanding, enhances digital competence, and prepares students for higher education and future careers.

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Annexure A

PRE -TEST TOOL

Action Research: Use of ICT in Education (Classes VI–X)

Name (ਨਾਮ): _____

Class (ਜਮਾਤ): _____ Roll No. (ਰੋਲ ਨੰਬਰ): _____

Tick (✓) the Correct Answer / ਸਹੀ ਉੱਤਰ 'ਤੇ ✓ ਲਗਾਓ

1. Have you ever used a Smart Board in your classroom?
ਕੀ ਤੁਸੀਂ ਕਲਾਸ ਵਿੱਚ ਸਮਾਰਟ ਬੋਰਡ ਦੀ ਵਰਤੋਂ ਕੀਤੀ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

2. Do you like learning through videos and animations?
ਕੀ ਤੁਹਾਨੂੰ ਵੀਡੀਓ ਅਤੇ ਐਨੀਮੇਸ਼ਨ ਰਾਹੀਂ ਪੜ੍ਹਨਾ ਪਸੰਦ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

3. Can you operate a computer or tablet?
ਕੀ ਤੁਸੀਂ ਕੰਪਿਊਟਰ ਜਾਂ ਟੈਬਲੈਟ ਚਲਾ ਸਕਦੇ ਹੋ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

4. Have you ever attempted an online quiz or test?
ਕੀ ਤੁਸੀਂ ਕਦੇ ਆਨਲਾਈਨ ਕੁਇਜ਼ ਜਾਂ ਟੈਸਟ ਦਿੱਤਾ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

5. Does ICT make learning easier?
ਕੀ ICT ਪੜ੍ਹਾਈ ਨੂੰ ਆਸਾਨ ਬਣਾਉਂਦੀ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

6. Do you enjoy learning through digital content?
ਕੀ ਤੁਹਾਨੂੰ ਡਿਜ਼ੀਟਲ ਸਮੱਗਰੀ ਰਾਹੀਂ ਸਿੱਖਣਾ ਚੰਗਾ ਲੱਗਦਾ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

7. Do you use educational apps for learning?
ਕੀ ਤੁਸੀਂ ਪੜ੍ਹਾਈ ਲਈ ਸਿੱਖਿਆ ਸੰਬੰਧੀ ਐਪਸ ਦੀ ਵਰਤੋਂ ਕਰਦੇ ਹੋ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

8. Do you understand lessons better with ICT than traditional teaching?
ਕੀ ਤੁਹਾਨੂੰ ICT ਰਾਹੀਂ ਪੜ੍ਹਾਏ ਗਏ ਪਾਠ ਰਵਾਇਤੀ ਪੜ੍ਹਾਈ ਨਾਲੋਂ ਵਧੀਆ ਸਮਝ ਆਉਂਦੇ ਹਨ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

9. Would you like ICT to be used regularly in your classroom?
ਕੀ ਤੁਸੀਂ ਚਾਹੁੰਦੇ ਹੋ ਕਿ ਕਲਾਸ ਵਿੱਚ ਨਿਯਮਿਤ ਤੌਰ 'ਤੇ ICT ਦੀ ਵਰਤੋਂ ਹੋਵੇ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

10. Do you feel confident using ICT tools?
ਕੀ ਤੁਹਾਨੂੰ ICT ਸਾਧਨਾਂ ਦੀ ਵਰਤੋਂ ਕਰਨ ਵਿੱਚ ਆਤਮ-ਵਿਸ਼ਵਾਸ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

Annexure B

POST TEST TOOL

Action Research: Use of ICT in Education (Classes VI–X)

Name (ਨਾਮ): _____

Class (ਜਮਾਤ): _____ Roll No. (ਰੋਲ ਨੰਬਰ): _____

Tick (✓) the Correct Answer / ਸਹੀ ਉੱਤਰ 'ਤੇ ✓ ਲਗਾਓ

1. After ICT-based teaching, do you understand lessons more easily?
ICT ਰਾਹੀਂ ਪੜ੍ਹਾਈ ਤੋਂ ਬਾਅਦ ਕੀ ਤੁਹਾਨੂੰ ਪਾਠ ਹੋਰ ਆਸਾਨੀ ਨਾਲ ਸਮਝ ਆਉਂਦੇ ਹਨ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

2. Do you enjoy learning through Smart Board, videos and presentations?
ਕੀ ਤੁਹਾਨੂੰ ਸਮਾਰਟ ਬੋਰਡ, ਵੀਡੀਓ ਅਤੇ ਪ੍ਰਜੈਂਟੇਸ਼ਨ ਰਾਹੀਂ ਪੜ੍ਹਨਾ ਚੰਗਾ ਲੱਗਦਾ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

3. Has ICT increased your interest in studies?
ਕੀ ICT ਨੇ ਤੁਹਾਡੀ ਪੜ੍ਹਾਈ ਵਿੱਚ ਰੁਚੀ ਵਧਾਈ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

4. Can you now use a computer, tablet or educational apps more confidently?
ਕੀ ਹੁਣ ਤੁਸੀਂ ਕੰਪਿਊਟਰ, ਟੈਬਲੈਟ ਜਾਂ ਸਿੱਖਿਆ ਸੰਬੰਧੀ ਐਪਸ ਦੀ ਵਰਤੋਂ ਵਧੇਰੇ ਵਿਸ਼ਵਾਸ ਨਾਲ ਕਰ ਸਕਦੇ ਹੋ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

5. Did online quizzes and digital activities help you learn better?
ਕੀ ਆਨਲਾਈਨ ਕੁਇਜ਼ ਅਤੇ ਡਿਜ਼ੀਟਲ ਗਤੀਵਿਧੀਆਂ ਨੇ ਤੁਹਾਨੂੰ ਵਧੀਆ ਸਿੱਖਣ ਵਿੱਚ ਮਦਦ ਕੀਤੀ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

6. Do you participate more actively in ICT-based classes?
ਕੀ ਤੁਸੀਂ ICT ਆਧਾਰਿਤ ਕਲਾਸਾਂ ਵਿੱਚ ਵਧੇਰੇ ਸਰਗਰਮੀ ਨਾਲ ਹਿੱਸਾ ਲੈਂਦੇ ਹੋ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

7. Has ICT improved your learning performance?
ਕੀ ICT ਨੇ ਤੁਹਾਡੀ ਸਿੱਖਣ ਦੀ ਕਾਰਗੁਜ਼ਾਰੀ ਵਿੱਚ ਸੁਧਾਰ ਕੀਤਾ ਹੈ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

8. Do educational videos and animations make difficult topics easier to understand?
ਕੀ ਸਿੱਖਿਆ ਸੰਬੰਧੀ ਵੀਡੀਓ ਅਤੇ ਐਨੀਮੇਸ਼ਨ ਔਖੇ ਵਿਸ਼ਿਆਂ ਨੂੰ ਸਮਝਣਾ ਆਸਾਨ ਬਣਾਉਂਦੇ ਹਨ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

9. Would you like ICT-based teaching to continue regularly in your classroom?
ਕੀ ਤੁਸੀਂ ਚਾਹੁੰਦੇ ਹੋ ਕਿ ਤੁਹਾਡੀ ਕਲਾਸ ਵਿੱਚ ਨਿਯਮਿਤ ਤੌਰ 'ਤੇ ICT ਆਧਾਰਿਤ ਪੜ੍ਹਾਈ ਜਾਰੀ ਰਹੇ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

10. Overall, are you satisfied with ICT-based teaching?
ਕੁੱਲ ਮਿਲਾ ਕੇ, ਕੀ ਤੁਸੀਂ ICT ਆਧਾਰਿਤ ਪੜ੍ਹਾਈ ਨਾਲ ਸੰਤੁਸ਼ਟ ਹੋ?

☐ Yes (ਹਾਂ) ☐ No (ਨਹੀਂ)

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