Preprints.org

Article

Comparing the Impact of Traditional and Digital Teaching-Learning Materials on Class 6 Student Learning Outcomes: A Case Study from Little Andaman, Andaman and Nicobar Islands

PRODEEP KUMAR MONDAL *

Article

Comparing the Impact of Traditional and Digital Teaching-Learning Materials on Class 6 Student Learning Outcomes: A Case Study from Little Andaman, Andaman and Nicobar Islands

Prodeep Kumar Mondal

Master of Education (M.Ed.) Student, Department of Education, Central University of Punjab, Bathinda**.** prodeepkrmondal@gmail.com; Orcid id: https://orcid.org/0009-0006-8101-5774

Abstract: This case study investigates the comparative effectiveness of traditional and digital teaching-learning materials (TLM) on the academic performance of class 6 students of Ramakrishna Pur, Little Andaman. A total of 10 students were selected using the convenience sampling method and divided into two groups (A and B) 5 students taught using traditional TLM, and 5 students taught using digital TLM over two months. A pre-test was administered to assess the baseline knowledge, followed by a two-month instruction. After the teaching period, a post-test was conducted to examine and measure the learning outcomes. The findings indicate significant differences in learning outcomes between the two groups, highlighting the role of digital TLM in enhancing the student's engagement and comprehension. The results are analyzed to determine the impact of the teaching medium on students' learning outcomes, with implications for future educational strategies in resource-limited and remote areas.

Keywords: traditional TLM; digital TLM; learning outcome; case study; class 6 students

1. Introduction

In today's rapidly increasing educational landscape, the use of technology in the classroom has become growing daily. Teaching learning material plays an important role in facilitating students' understanding of the complex concepts of their subject. Traditional TLM such as textbooks, charts, physical models, worksheets, and chalkboard instructions are the older versions that were used previously for teaching students, but now, in the era of digitalisation, many schools have begun incorporating digital teaching learning materials such as e-books, educational applications, interactive software, and multimedia resources for the improvement of students' academic performance.

Previous studies highlight the success of digital tools, such as the Digital Equalizer program in Odisha (Sarkar et al., 2015) and blended learning approaches (Nazarenko, 2015; Halasa et al., 2020), which increase student engagement and outcomes. However, concerns about the effectiveness of online learning compared to face-to-face instruction remain (Darkwa & Antwi, 2021; Kirtman, 2009). Innovative models integrating digital methods have shown promise in improving contextual learning (Juniwati et al., 2020; Suleimanova, 2020). Despite these advancements, access to effective TLM, particularly in under-resourced areas, remains a challenge (Frimpong, 2021). To address this issue, the research conducted a case study that aims to explore the effectiveness of both traditional and digital TLM in increasing the learning outcome of students in a remote location—Ramakrishna Pur, Little Andaman.

2. Research Questions

The purpose of this research is to answer the following questions
a) How do traditional TLM influence students learning outcomes?
b) How do digital TLM influence students learning outcomes?
c) Which teaching method has better result in terms of student performance?

3. Methods

a) Research Design

In this study the researcher adopt a case-study research design to compare the effectiveness of two different instructional methods.

b) Sampling and Participants

The participants of this study are ten class 6 students from Ramakrishna Pur Little Andaman were selected by using convenience sampling. The students were divided into two groups

Group A (Traditional TLM) - 5 Students

Group B (Digital TLM) - 5 Students

c) Data Collection Tools

Pre Test: A written test was taken by the researcher to assessing the students' knowledge in subject such as Maths, Science, English, Social-Science and Science administered to all students before the intervention.

Post Test: After Two month teaching a similar test was administered by the researcher to know the students improvement in their subjects and also know to assess the improvement in learning outcomes.

d) Teaching Approach

Group A (Traditional TLM) – Taught using textbook, chart, physical model. Worksheets and chalk board instructions.

Group B (Digital TLM) – Taught using e-book, educational application, interactive software, multimedia resources and educational videos.

4. Analysis and Interpretation

The analysis focuses on comparing the pre-test and post-test scores of the two groups Group-A and Group-B to assess the impact of traditional vs. digital TLM on students Learning.

a) Pre- Test

Group A

Students / Subject	1	2	3	4	5
Maths	10	11	10	11	8
Hindi	12	12	11	12	10
English	11	10	9	13	12
Social Science	9	13	8	10	11
Science	13	10	10	11	12

Group B

Students / Subject	1	2	3	4	5
Maths	10	13	9	12	11
Hindi	12	14	10	13	10
English	12	12	8	14	12
Social Science	11	11	11	10	12
Science	10	10	10	11	11

Group A: 53%
Group B: 55%

After this pre-test, the researcher started giving interventions. The researcher taught Group A with the help of traditional TLM and taught Group B by using digital TLM. After two months of successful teaching to both groups, the researcher once again took a test from both groups as a post-test.

b) Post- Test Score

Group A

Students / Subject	1	2	3	4	5
Maths	15	13	14	15	15
Hindi	12	15	15	16	14
English	14	15	14	12	15
Social Science	13	12	14	12	11
Science	10	10	11	10	10

Group B

Students / Subject	1	2	3	4	5
Maths	15	18	15	16	18
Hindi	16	16	17	18	17
English	15	18	18	16	15
Social Science	16	19	19	14	16
Science	17	18	16	16	12

Group A: 63%
Group B: 82%

c) Interpretation of the Collected Data

Group	Pre-Test Score	Group	Pre-Test Score
A	53%	A (Traditional TLM)	63%
B	55%	B (Digital TLM)	82%
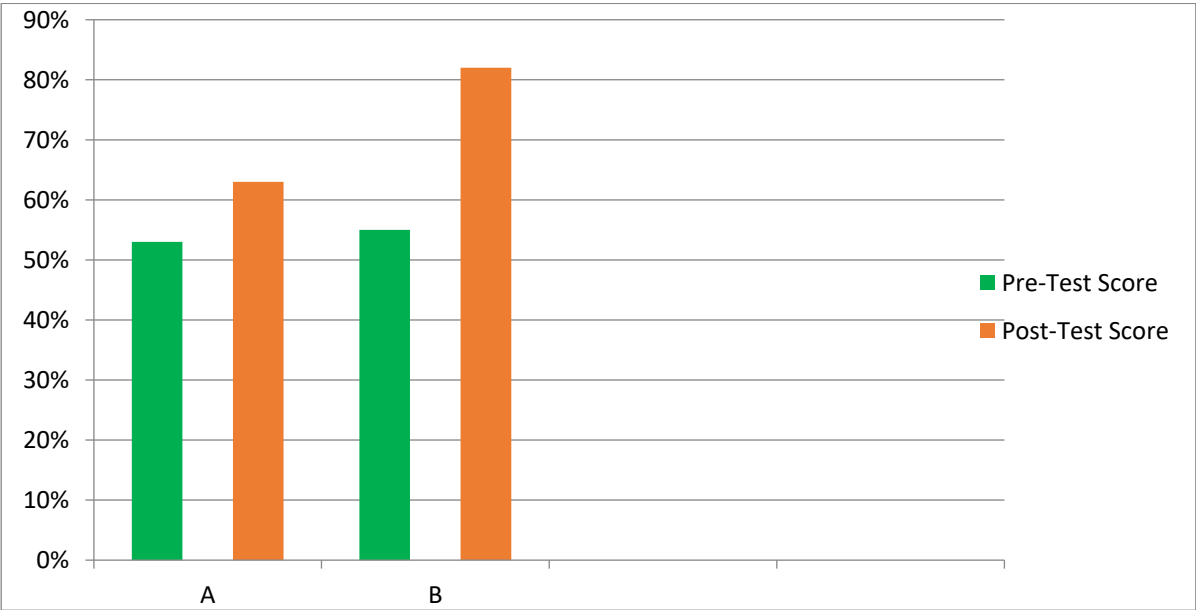
In this study, the researcher first divides 10 students into two groups, A and B, each having 5 students. After this, a written test was taken by the researcher to assess the student's knowledge in subjects such as Maths, Science, English, Social-Science and Science administered to all students before the intervention the result of this test was Group A students scored 53% and Group B students scored 55% almost similar result comes from both the group. The pre-test results showed that the academic performance of both the group students was comparable, with minor variations in score.

After taking the test, the researcher now decides to teach group A (5 students) by using traditional TLM (textbook, chart, physical model). Worksheets and chalkboard instructions.) and teach group B (5 students) using digital TLM (e-book, educational application, interactive software, multimedia resources and educational videos). After two months of dedicated teaching to both groups, the researcher decided to take a post-test. After taking the post-test, Group A scored 63% and Group B scored 82%.

The post-test score indicated a noticeable improvement in the academic performance of students in both groups. Group A showed a moderate improvement, with an average post-test score. However, Group B which was taught using digital TLM exhibited a larger improvement with an average post-test score. This suggested that digital TLM may have a more significant positive impact on learning outcomes, especially in remote or resource-constrained environments.

5. Result

The study's findings indicate that both traditional and digital teaching methods employing TLM have benefitted students' performance, yet digital TLM proved significantly more effective in enhancing academic results. Beyond improved content retention, students in the digital group were also more active participants in the learning process. These results imply that integrating digital tools into educational settings could greatly benefit students in remote regions like Little Andaman.

6. Discussion

This case study underscores the potential advantages of incorporating digital TLM into classroom instruction. While traditional TLM remains a valuable resource, the interactive and engaging nature of digital materials seems to create a more stimulating learning environment. These outcomes align with existing literature advocating for the effectiveness of technology-enhanced education. However, it is crucial to recognize that the success of digital TLM is influenced by various factors, including students' familiarity with technology, the quality of digital resources, and the teacher's skill in using these tools effectively. Additionally, the limitations of this study, such as the small sample size and reliance on convenience sampling, highlight the need for further research with larger, more diverse groups for more generalized findings.

7. Conclusion

This case study illustrates the potential benefits of digital teaching-learning materials over traditional ones in boosting student performance. Considering the remote setting of Little Andaman, where educational resources are scarce, integrating digital TLM could lead to significant advantages. Moreover, further investigation is necessary to understand the long-term impacts of digital tools on learning, especially in resource-challenged environments. The findings encourage more exploration into the utilization of digital tools in education, particularly with larger and varied participant groups to validate the results. Educators should consider incorporating digital TLM in a blended learning framework to meet diverse learning styles and needs.

References

1. Sarkar, S., Mohapatra, S., & Sundarakrishnan, J. (2015). Assessing impact of technology based digital equalizer programme on improving student learning outcomes. Education and Information Technologies, 22(1), 195–213. https://doi.org/10.1007/s10639-015-9434-0

2. Kirtman, L. (2009). Online versus In-Class Courses: An Examination of Differences in learning Outcomes. Issues in Teacher Education, 18(2), 103–116. http://files.eric.ed.gov/fulltext/EJ858508.pdf

3. Nazarenko, A. L. (2015). Blended Learning vs. Traditional Learning: What Works? (A Case Study Research). Procedia - Social and Behavioural Sciences, 200, 77–82. https://doi.org/10.1016/j.sbspro.2015.08.018

4. Suleimanova, O. A. (2020). Towards synergetic combination of traditional and innovative digital teaching and research practices. Training Language and Culture, 4(4), 39–50. https://doi.org/10.22363/2521-442x-2020-4-4-39-50

5. Gaur, S., Chaudhary, A., & Mittal, M. (2015). A Comparative Study of E-Learning Technique with Traditional Teaching Techniques. IJIREEICE, 3(8), 23–25. https://doi.org/10.17148/ijireeice.2015.3806

6. Adam, S., & Nel, D. (2009). Blended and online learning: student perceptions and performance. Interactive Technology and Smart Education, 6(3), 140–155. https://doi.org/10.1108/17415650911005366

7. Halasa, S., Abusalim, N., Rayyan, M., Constantino, R. E., Nassar, O., Amre, H., Sharab, M., & Qadri, I. (2020). Comparing student achievement in traditional learning with a combination of blended and flipped learning. Nursing Open, 7(4), 1129–1138. https://doi.org/10.1002/nop2.492

8. Stone, M. T., & Perumean-Chaney, S. (2011). The Benefits of Online Teaching for Traditional Classroom Pedagogy: A Case Study for Improving Face-to-Face Instruction. MERLOT Journal of Online Learning and Teaching. https://jolt.merlot.org/vol7no3/stone_0911.pdf

9. Darkwa, B. F., & Antwi, S. (2021). From Classroom to Online: Comparing the effectiveness and student academic performance of classroom learning and online learning. OALib, 08(07), 1–22. https://doi.org/10.4236/oalib.1107597

10. Juniwati, N., Yusrizal, N., & Khaldun, I. (2020). Influence of the contextual teaching and learning model against student learning outcome. Journal of Physics Conference Series, 1460(1), 012128. https://doi.org/10.1088/1742-6596/1460/1/012128

11. Dewi, A. a. S. S. S. (2016). Teaching learning materials: the reviews coursebooks, games, worksheets, audio video files. Lingual Journal of Language and Culture, 2(2). https://doi.org/10.24843/ljlc.2016.v02.i02.p01

12. Osei-Himah, V., & Adu-Gyamfi, K. (2022). Teachers' perspective of effective use of teaching and learning materials in basic School Integrated science lessons. Asian Journal of University Education, 18(1), 256. https://doi.org/10.24191/ajue.v18i1.17195

13. Lucy, S., Emmideme, G. N., & Sylvester, A. (2022). Social Studies Student-Teachers' preparation for Effective use of teaching and learning materials: The case of Northern Colleges of Education in Ghana. Open Journal of Social Sciences, 10(06), 379–395. https://doi.org/10.4236/jss.2022.106027

14. Frimpong, S. O. (2021). The role of teaching and learning materials and interaction as a tool to quality early childhood education in Agona East District of the Central Region of Ghana. African Educational Research Journal, 9(1), 168–178. https://doi.org/10.30918/aerj.91.20.112

15. Ayerteye, E. A., Kpeyibor, P. F., & Boye-Laryea, J. L. (2019). Examining the use of Teaching and Learning Materials (TLM) methods in Basic School Level by Socials Studies teachers in Ghana: A tracer study. Journal of African Studies and Ethnographic Research, 1(1), 54–65. https://royalliteglobal.com/african-studies/article/download/28/20