



Impact of Educational Technology–Supported Instruction on the Reading Outcomes of Girl Students in Government Primary Schools: An Experimental Study

¹Chandni Khyalia, ²Dr. Yashpal Singh

¹Research Scholar, Education, Kalinga University, Raipur

²Supervisor, Education, Kalinga University, Raipur

Abstract

Reading is the foundation of learning at the primary stage, as it supports academic achievement across all subjects. However, many girl students in government primary schools face persistent difficulties in reading fluency, comprehension, vocabulary development, and overall reading performance when instruction relies mainly on traditional textbook-based teaching methods. Educational technology offers new possibilities for improving literacy through interactive, multisensory, and engaging learning experiences. The present study investigates the effectiveness of Educational Technology–Supported Instruction on the reading outcomes of girl students. A pre-test–post-test control group quasi-experimental design was employed. The sample consisted of 100 girl students of Class V selected from two government primary schools of Raipur district, Chhattisgarh, through purposive sampling. Fifty students formed the experimental group, and fifty formed the control group. The ASER Reading Assessment Tool was used to assess reading abilities before and after the intervention. The experimental group received technology-supported reading instruction using digital storybooks, audio-visual lessons, multimedia presentations, and interactive reading applications, whereas the control group received conventional classroom instruction. Statistical analysis using mean, standard deviation, and independent t-test revealed a significant improvement in the reading outcomes of girl students in the experimental group compared to the control group. The findings demonstrate that educational technology can play a vital role in enhancing reading skills and engagement among girl students at the primary level. The study suggests that integrating technology into reading instruction can support equitable learning opportunities and strengthen foundational literacy in government schools.

Keywords: Educational Technology, Reading Outcomes, Girl Students, Primary Education, Reading Fluency, Reading Comprehension, Vocabulary Development, Digital Learning

1. Introduction

Reading is one of the most essential skills acquired during the early years of schooling. It enables children to understand written information, communicate ideas, and succeed academically. At the primary level, students are expected to develop basic reading competencies such as fluency, comprehension, vocabulary knowledge, and confidence in reading. However, in many government schools, students continue to struggle with these skills due to limited learning resources, large class sizes, and dependence on traditional teaching approaches.

Girl students often face additional challenges that may affect their academic performance. Socio-cultural factors, lack of exposure to enriched learning environments, and limited access to educational support outside school may hinder the development of strong reading skills. Improving literacy among girl students is therefore essential for promoting gender equity in education and empowering future generations.



Educational technology has emerged as a powerful tool for enhancing teaching and learning processes. Digital resources such as audio-supported storybooks, animated texts, interactive applications, and multimedia presentations can make reading more engaging and accessible. These tools provide visual and auditory support, help improve pronunciation, sustain attention, and encourage active participation. Technology also allows learners to progress at their own pace, which is particularly beneficial for students who require additional support.

Despite the increasing availability of digital tools in schools, empirical evidence on their effectiveness for improving reading outcomes among girl students in government primary schools remains limited. Therefore, the present study aims to examine whether Educational Technology–Supported Instruction can significantly enhance the reading abilities of girl students compared to traditional classroom teaching methods.

2. Review of Literature

Several educational studies have highlighted the importance of technology integration in language learning. Multimedia learning theory suggests that combining text, images, and audio enhances understanding by engaging multiple sensory channels. Research indicates that students exposed to digital reading materials demonstrate improved comprehension and retention compared to those using printed texts alone.

Interactive learning environments have also been found to increase motivation and engagement. Digital tools allow students to receive immediate feedback, repeat learning activities, and practice reading skills independently. Studies focusing on primary education report that audio-assisted reading improves fluency by helping students follow correct pronunciation and rhythm.

Research on gender differences in literacy suggests that girls often respond positively to collaborative and supportive learning environments. Technology-based instruction, when designed appropriately, can provide such environments by encouraging exploration, creativity, and self-paced learning.

However, most previous studies have examined general student populations without specifically focusing on girl students in government school contexts. This gap highlights the need for experimental studies that investigate the effectiveness of educational technology for improving literacy among girls at the primary level.

3. Objective of the Study

To study the impact of educational technology on the reading outcomes of girl students in the experimental and control groups.

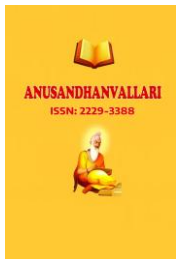
4. Hypothesis

H₀₂: There will be no significant difference in the reading outcomes of girl students in the experimental group and control group after the use of educational technology.

5. Methodology

5.1 Research Design

The study adopted a Pre-Test Post-Test Control Group Quasi-Experimental Design, which allows comparison of learning outcomes before and after an intervention.



5.2 Population

The population consisted of girl students studying in Class V in government primary schools of Raipur district, Chhattisgarh.

5.3 Sample

A total of 100 girl students were selected from two government primary schools:

- Experimental Group: 50 girls
- Control Group: 50 girls

5.4 Sampling Technique

Purposive sampling was used to select schools with similar academic environments.

5.5 Research Tool

The ASER Reading Assessment Tool was used to measure reading ability at different levels, including letter recognition, word reading, paragraph reading, and story reading.

5.6 Intervention

Experimental Group:

Received Educational Technology–Supported Instruction, including:

- Digital storybooks
- Audio-visual lessons
- Multimedia presentations
- Interactive reading applications
- Audio-supported reading activities

Control Group:

Received traditional teaching methods, including:

- Textbook reading
- Blackboard explanation
- Oral reading practice
- Written exercises

5.7 Procedure

1. Pre-test administered to both groups
2. Implementation of instructional intervention
3. Post-test administered using the same tool
4. Data analyzed statistically

6. Analysis and Interpretation

Pre-Test Analysis

The pre-test results indicated that both groups had nearly equal reading ability before the intervention. The mean scores were very close, and the standard deviation values suggested a similar distribution of scores. This confirmed that the two groups were comparable at the beginning of the experiment.

Table 1

Comparison of Pre-Test Reading Scores of Experimental and Control Groups

Group	N	Mean	Standard Deviation
Experimental Group	100	1.92	0.62
Control Group	100	1.89	0.65

Interpretation

Table 1 shows that the pre-test mean score of the experimental group was 1.92, while the mean score of the control group was 1.89. The standard deviation values (0.62 and 0.65) indicate a similar spread of scores in both groups. The very small difference between the mean scores suggests that students in both groups possessed almost equal reading ability before the instructional intervention. Hence, the two groups were considered equivalent at the initial stage of the study.

Post-Test Analysis

After the intervention, the experimental group showed a substantial improvement in reading outcomes compared to the control group. The higher mean score of the experimental group indicated that technology-supported instruction had a strong positive effect on reading performance.

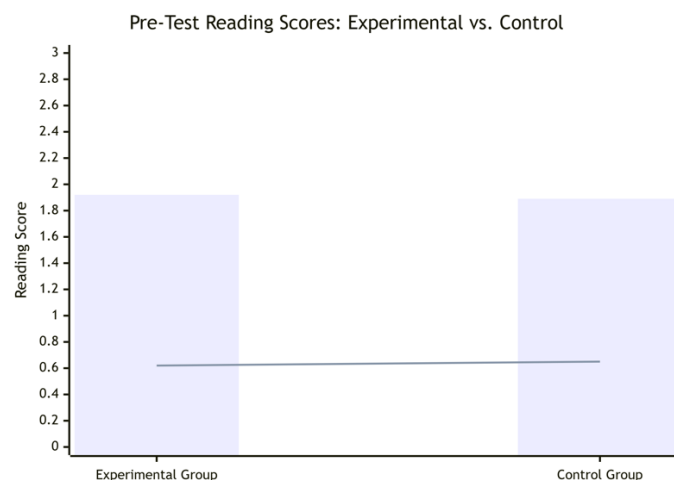


Figure 1

Comparison of Pre-Test Reading Scores of Experimental and Control Groups

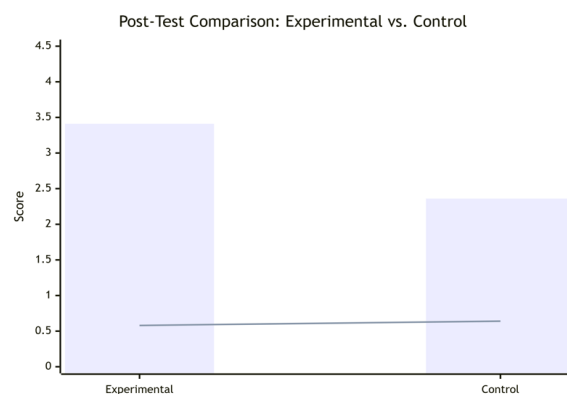
Table 2

Comparison of Post-Test Reading Scores of Experimental and Control Groups

Group	N	Mean	Standard Deviation
Experimental Group	100	3.41	0.58
Control Group	100	2.36	0.64

Interpretation

Table 2 reveals that the experimental group achieved a mean score of 3.41 in the post-test, whereas the control group obtained a mean score of 2.36. The higher mean score of the experimental group indicates a marked improvement in reading outcomes after receiving Educational Technology–Supported Instruction. Although the control group also showed some improvement, the gain was comparatively lower. This suggests that technology-supported teaching was more effective in enhancing reading performance.



t-Test Analysis

The independent t-test was used to determine whether the difference between the two groups was statistically significant.

Table 3

t-Test Showing Difference in Post-Test Reading Scores

Group	N	Mean	SD	df	t-value	Level of Significance
Experimental Group	100	3.41	0.58	198	12.47	Significant at 0.05 level
Control Group	100	2.36	0.64			

(Critical t-value at 0.05 level = 1.97)

Interpretation

Table 3 shows that the calculated t-value (12.47) is much higher than the critical value (1.97) at the 0.05 level of significance. This indicates that the difference between the post-test mean scores of the experimental and control groups is statistically significant. Therefore, the improvement observed in the experimental group cannot be attributed to chance alone.

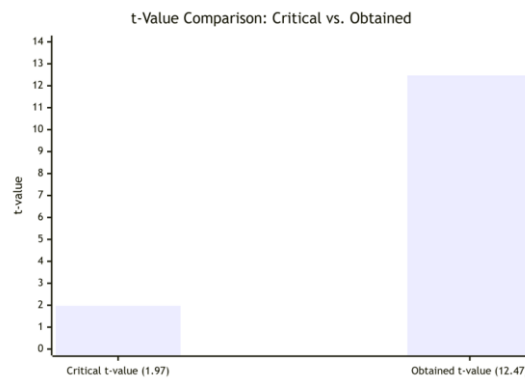


Figure 3

t-Test Showing Difference in Post-Test Reading Scores

Decision on Hypothesis

Since the calculated t-value exceeded the critical value at the 0.05 level of significance, the null hypothesis was rejected. This indicates that Educational Technology–Supported Instruction had a significant positive effect on the reading outcomes of primary school students.

7. Conclusion

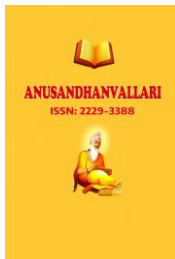
The study clearly demonstrates that Educational Technology–Supported Instruction significantly improves the reading outcomes of girl students. Digital tools enhance engagement, motivation, and understanding, leading to better fluency, comprehension, vocabulary development, and overall reading achievement. The results highlight the importance of integrating technology into primary classrooms to support effective literacy development among girls.

8. Educational Implications

- Teachers should integrate digital reading tools into daily classroom instruction.
- Schools should provide basic technological infrastructure.
- Technology-supported learning can help reduce gender gaps in literacy.
- Interactive materials can support diverse learning styles.
- Teacher training programmes should include digital pedagogy.

9. Suggestions for Future Research

1. Similar studies may be conducted in rural and tribal areas.
2. Research may include different grade levels.
3. Longitudinal studies may examine long-term impact.



4. Comparative studies of various digital tools may be undertaken.
5. Research may explore technology use for other language skills.
6. Studies may examine the role of home digital environment.

10. References

- [1] Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of reading comprehension. *Educational Psychologist*, 19(4), 255–291.
- [2] Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). Cambridge University Press.
- [3] National Reading Panel. (2000). *Teaching children to read*. National Institute of Child Health and Human Development.
- [4] Pratham Education Foundation. (2022). *ASER annual report*.
- [5] Vygotsky, L. S. (1978). *Mind in society*. Harvard University Press.
- [6] Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.
- [7] Bialystok, E. (2001). *Bilingualism in development: Language, literacy, and cognition*. Cambridge University Press.
- [8] Brophy, J. (2010). *Motivating students to learn* (3rd ed.). Routledge.
- [9] Bruner, J. S. (1966). *Toward a theory of instruction*. Harvard University Press.
- [10] Clark, R. C., & Mayer, R. E. (2016). *E-learning and the science of instruction* (4th ed.). Wiley.
- [11] Cuban, L. (2001). *Oversold and underused: Computers in the classroom*. Harvard University Press.
- [12] Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. Palgrave Macmillan.
- [13] Guthrie, J. T., & Wigfield, A. (2000). Engagement and motivation in reading. In M. L. Kamil et al. (Eds.), *Handbook of reading research* (Vol. 3, pp. 403–422). Erlbaum.
- [14] International Reading Association. (2012). *Standards for reading professionals*. IRA.
- [15] Kintsch, W. (1998). *Comprehension: A paradigm for cognition*. Cambridge University Press.
- [16] Leu, D. J., Kinzer, C. K., Coiro, J., & Cammack, D. (2004). Toward a theory of new literacies. In R. B. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1570–1613). International Reading Association.
- [17] Organisation for Economic Co-operation and Development. (2015). *Students, computers and learning: Making the connection*. OECD Publishing.
- [18] Papert, S. (1993). *Mindstorms: Children, computers, and powerful ideas*. Basic Books.
- [19] Pressley, M. (2006). *Reading instruction that works: The case for balanced teaching* (3rd ed.). Guilford Press.
- [20] Snow, C. E., Burns, M. S., & Griffin, P. (1998). *Preventing reading difficulties in young children*. National Academy Press.
- [21] Stanovich, K. E. (1986). Matthew effects in reading. *Reading Research Quarterly*, 21(4), 360–407.
- [22] Topping, K. J. (2005). Trends in peer learning. *Educational Psychology*, 25(6), 631–645.
- [23] UNESCO. (2017). *Reading the past, writing the future: Fifty years of promoting literacy*. UNESCO Publishing.
- [24] World Bank. (2018). *World development report 2018: Learning to realize education's promise*. World Bank Publications.
- [25] Zhao, Y. (2009). *Catch up or lead the way: American education in the age of globalization*. ASCD.