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Effectiveness of Techno-Scaffolding in Teaching English among IX Standard Students

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The present study investigated the effectiveness of a techno-scaffolding instructional package in enhancing English achievement among IX standard students. A quasi-experimental design with a single experimental group was adopted. The sample comprised 60 IX standard students selected from government and aided schools. The achievement in English writing was measured using a standardized achievement test administered at the pre-test, post-test, and retention stages. Data were analysed using paired samples t-tests. The results revealed a statistically significant improvement in students' English achievement from pre-test to post-test ($t(59) = 47.405$, $p < .01$), indicating the effectiveness of techno-scaffolding. Further analysis showed no significant difference between post-test and retention test scores ($t(59) = 0.405$, $p > .05$), demonstrating that the learning gains were retained over time. The findings confirm that techno-scaffolding is an effective instructional strategy for improving and sustaining English achievement among secondary school students.

Keywords: *Techno-Scaffolding, English Achievement, Secondary School Students, Instructional Package, Retention.*

1. Introduction

The integration of technology in education has transformed traditional teaching–learning processes by promoting learner engagement, autonomy, and meaningful interaction. In language education, especially at the secondary level, students often face difficulties in writing skills due to limited exposure, inadequate feedback, and lack of structured support. Instructional scaffolding, when combined with digital tools, offers a powerful pedagogical approach to address these

challenges. Techno-scaffolding refers to the systematic use of technological resources to provide guided support, feedback, and gradual release of responsibility to learners. It enables students to construct knowledge actively while receiving timely assistance through multimedia content, interactive tasks, and self-paced learning modules. Given the growing emphasis on technology-enhanced learning, examining the effectiveness of techno-scaffolding in English language teaching is both timely and relevant.

2. Objectives of the Study

The study was undertaken with the following objectives:

- To determine whether there is a significant difference between the pre-test and post-test achievement in English of IX standard students taught through techno-scaffolding.
- To examine whether the learning gained through techno-scaffolding is retained over time by comparing post-test and retention test scores.

3. Hypotheses

The following null hypotheses were formulated and tested:

H_1: There is no significant difference between the pre-test and post-test achievement in English of the experimental group.

H_2: There is no significant difference between the post-test and retention test achievement in English of the experimental group.

4. Methodology

4.1 Research Design

A quasi-experimental design with a single experimental group using a pre-test, post-test, and retention test was employed.

4.2 Sample

The sample consisted of 60 IX standard students selected from government and aided schools. The students were taught English using a techno-scaffolding instructional package developed by the investigator.

4.3 Tool Used

An Achievement Test in English Writing, constructed and validated by the investigator, was used to measure students' achievement at three stages:

- Pre-test
- Post-test
- Retention test

4.4 Procedure

The pre-test was administered before the treatment. The techno-scaffolding instructional package was implemented over a fixed instructional period. After the completion of the treatment, the post-test was conducted. A retention test was administered after a time gap to assess the durability of learning.

4.5 Statistical Techniques

Paired samples t-test was used to analyse the data.

5. Results and Analysis

5.1 Pre-test and Post-test Comparison

Hypothesis 1: There is no significant difference in Achievement in English between pre-test and post-test scores of the experimental group.

Table1: Comparison of Achievement in English of the Experimental Group at Pre-test and Post-test Stages

Experimental Group	N	Mean	SD	't' value	Level of Significance at 0.01 level
Pre-test	60	9.02	1.490	47.405	<.001 Significant
Post-test		20.22	2.187		

In order to determine whether there is a significant difference between the pre-test and post-test achievement in English scores of IX standard students in the experimental group, the investigator calculated the t value. It is inferred from the above table that the calculated t value is 47.405, which is significant at 0.01 level of significance. Hence, Hypothesis 1 is rejected, and it is concluded that there is a significant difference between the pre-test and post-test scores of the experimental group taught using the techno-scaffolding instructional package.The mean pre-test score of students was 9.02 (SD = 1.490), whereas the mean post-test score was 20.22 (SD = 2.187). The increase in mean score indicates an

improvement in English achievement after the implementation of techno-scaffolding.

The average difference is significant for the paired variables Pretest - Post-test

A paired-samples t-test was conducted to examine the effect of techno-scaffolding on students' achievement in English writing. The results revealed a statistically significant difference between the pre-test and post-test scores, $t(59) = 47.405$, $p < .05$. Hence, the null hypothesis was rejected, indicating that techno-scaffolding had a significant effect on students' achievement in English writing.

Improvement is observed in the post-test achievement in English scores of the experimental group. Therefore, it may be inferred that there is a gain in post-test performance. This finding signifies that the techno-scaffolding instructional package administered to the experimental group has effectively enhanced achievement in English among IX standard students. Thus, the results establish the effectiveness of the techno-scaffolding instructional package developed by the investigator. This improvement is represented in the figure given below.

5.2 Post-test and Retention Test Comparison

Hypothesis 2: There is no significant difference in Achievement in English between the post-test and retention test scores of the experimental group.

Table-2: Comparison of Achievement in English of the Experimental Group at Post-test and Retention Test Stages

Test	N	Mean	Std. Deviation	t	df	Significance
Retension test	60	19.02	2.490	0.405	59	<.701
Post-test		20.22	2.187			

In order to examine the difference between the post-test and retention test scores $t(59) = 0.405$, $p > .701$ of the experimental group in achievement in English, a t-test was conducted. The calculated t value of 0.405 was found to be not significant at the 0.05 level of significance. Hence, the null hypothesis was accepted, and it is concluded that there is no significant difference between the post-test and retention test scores of the experimental group. This indicates that the learning gained through the techno-scaffolding instructional package was effectively retained by the students over time.

6. Discussion

The findings of the study clearly demonstrate that techno-scaffolding significantly enhances students' achievement in English writing. The structured digital support, interactive activities, and guided practice provided through the instructional package contributed to meaningful learning and skill development. The absence of a significant decline between post-test and retention test scores further confirms the sustainability of learning outcomes.These results align with contemporary research emphasizing the role of technology-supported scaffolding in promoting deeper understanding, learner autonomy, and long-term retention.

7. Conclusion

The present study concludes that techno-scaffolding is an effective instructional strategy for improving English achievement among IX standard students. The significant gain in post-test performance and the stability of retention scores establish both the immediate and lasting impact of the instructional package. The study recommends the integration of techno-scaffolding strategies in secondary school English classrooms to enhance learning outcomes.

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