SCIENTIFIC CULTURE
www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 12, No. 4, (2026), pp. 4273-4279
Open Access. Online & Print

DOI: 10.5281/zenodo.12426476

EFFICIENCY OF TEACHING STRATEGIES ON READING COMPREHENSION SKILLS AND VOCABULARY KNOWLEDGE AMONG DYSLEXIA SCHOOL STUDENTS

Ms. Gayathiri M[1], Dr. Bhimappa Rangannavar[2]

[1]Research Scholar, Dept. of Education, Central University of Tamil Nadu, Thiruvarur.
[2]Associate Professor, Dept. of Education, Central University of Tamil Nadu, Thiruvarur.

Received: 27/11/2025
Accepted: 25/02/2026

Corresponding author: Ms. Gayathiri M (Email)

ABSTRACT

A learning disability known as dyslexia has a significant impact on students' reading comprehension and vocabulary development. Effective teaching techniques are crucial for supporting dyslexic students in regular classrooms within inclusive education systems. The current study examined how well-structured teaching methods helped dyslexic students in improve their vocabulary and reading comprehension. The pretest–post-test control-group design was quasi-experimental. Eighty dyslexic students from schools were included in the sample; they were randomly assigned to experimental and control groups. While the control group was taught using traditional methods, the experimental group received instruction through structured English-language teaching strategies, including phonics, multisensory learning, and contextual vocabulary instruction. The data were analysed using Analysis of Covariance (ANCOVA), with pre-test scores included as covariates. The results showed that the adjusted post-test scores for vocabulary knowledge and reading comprehension differed significantly between the experimental and control groups. The experimental group outperformed the control group by a significant margin, demonstrating the efficacy of the instructional techniques. The findings underscore the importance of implementing evidence-based teaching strategies to improve dyslexic students' literacy skills in classrooms.

KEYWORDS: Dyslexia, Multisensory Instruction, Vocabulary Knowledge, Reading Comprehension, Teaching Strategies, Inclusive Education.

1. INTRODUCTION

For both academic success and lifelong learning, reading is an essential skill. It involves a number of cognitive functions, such as comprehension, vocabulary knowledge, and word recognition. However, because they struggle with phonological processing, decoding, and language comprehension, dyslexic students have a very difficult time learning these skills. One of the most prevalent specific learning disabilities affecting school-age children is dyslexia. Dyslexic students frequently have difficulty learning new vocabulary, comprehending written material, and reading fluently. These difficulties could result in subpar academic achievement and decreased learning motivation. The idea of inclusive education, which guarantees that students with special educational needs are taught in regular classrooms, has become more popular in India in recent years. However, the unique learning challenges faced by dyslexic students are frequently ignored by conventional teaching approaches. As a result, educators need to use specialised teaching techniques that emphasise contextual understanding, multisensory learning, and methodical instruction. Research indicates that phonics-based instruction, structured literacy instruction, and vocabulary enrichment techniques substantially improve reading outcomes among students with dyslexia. As a result, it is crucial to assess these tactics' efficacy in the context of the schools.

1.1. Need for the study

Many school-age children around the world suffer from dyslexia. Many dyslexic students in India go undiagnosed or receive little educational assistance. The specialised teaching techniques required to support these students are often not taught in mainstream schools. Reading comprehension and vocabulary acquisition, which are crucial for comprehending academic texts, are particularly challenging for students with dyslexia. These issues could lead to long-term academic difficulties if appropriate intervention is not provided. There is little research on effective teaching methods for dyslexic students. Thus, it is necessary to examine teaching strategies to improve these students' vocabulary and reading comprehension.

1.2. Rationale of the Study

The study's justification stems from the growing understanding that dyslexic students need specific teaching strategies to get past their reading challenges. Research from around the world shows that structured teaching methods like multisensory learning, phonics-based instruction, and contextual vocabulary instruction greatly enhance reading results. However, there is little empirical data on how successful these tactics are in schools. By experimentally analyzing the effects of instructional strategies on dyslexic students' vocabulary knowledge and reading comprehension, this study aims to close this gap.

2. REVIEW OF RELATED LITERATURE

Gulati et al. (2024) found that multisensory teaching strategies significantly improve learning outcomes among students with learning disabilities, including dyslexia. The review emphasised that multisensory instruction enhances reading fluency, comprehension, and vocabulary acquisition by strengthening neural connections involved in language processing. **Vaughn & Linan-Thompson (2015)** used a Quasi-experimental design and found that explicit reading instruction improved comprehension skills among students with reading disabilities. **Nicolson & Fawcett (2017)** studied a cognitive intervention study about motor and cognitive training that improved reading fluency and processing speed among dyslexic students. **Joshi et al. (2018)** conducted a study on structured literacy instruction examining how these strategies improved phonological awareness and reading comprehension. **Henry (2019)** conducted an intervention study on morphological instruction that helped dyslexic students expand their vocabulary and reading comprehension.

2.1. Variables of the Study

1. **Independent Variable-** Teaching strategies in English language instruction.
2. **Dependent Variables-** Reading comprehension skills**,** Vocabulary knowledge
3. **Covariate-** Pre-test scores of reading comprehension and vocabulary knowledge.

3. AIMS AND OBJECTIVES OF THE STUDY

1. To evaluate dyslexic students' vocabulary knowledge.
2. To evaluate dyslexic students' reading comprehension abilities.
3. To assess how well teaching methods affect students' vocabulary knowledge.
4. To assess how well teaching methods improve students' reading comprehension abilities.
5. To compare the experimental and control groups' post-intervention achievement levels.

4. OPERATIONAL DEFINITIONS

Dyslexia- Due to deficiencies in phonological processing, dyslexia is a specific type of learning disability marked by challenges with reading comprehension, accuracy, and fluency.

Reading Comprehension- Reading comprehension is the ability of students to comprehend, interpret, and derive meaning from written text.

Vocabulary Knowledge- The comprehension and appropriate application of words in language and reading contexts is referred to as vocabulary knowledge.

Teaching Strategies- Teaching strategies are organised methods used to enhance reading skills, including phonics instruction, multisensory techniques, and contextual vocabulary learning.

Hypotheses of the Study

- The experimental and control groups' adjusted post-test reading comprehension scores do not differ significantly.
- The experimental and control groups' adjusted post-test vocabulary knowledge scores do not differ significantly.

5. METHODOLOGY

Quasi-experimental design with pre-test and post-test control groups. The sample consisted of 80 dyslexic school students studying in Tamil Nadu. An experimental group of 40 students and a control group of 40 students. The classes of sixth, seventh, and eighth dyslexic students. The sampling technique used for the study is purposive sampling. Reading comprehension test and vocabulary knowledge test tools were used. Reading comprehension and vocabulary knowledge were evaluated for both groups in the pre-test. In the intervention stage, the control group was instructed using traditional methods, and the experimental group received structured teaching strategies for a few days. To gauge progress, both groups underwent additional testing in the post-test stage.

6. ANALYSIS & INTERPRETATION

6.1. Testing the Hypothesis Related to the Effectiveness of Teaching Strategies in English on Reading Comprehension Skills among Dyslexic Students Using ANCOVA (Pre-test as Covariate)

Hypothesis-1: There is no significant difference in the adjusted post-test reading comprehension skill scores among Dyslexic students who belong to the control and the experimental group, considering their pre-test reading comprehension skill scores as covariates.

Table 1: Summary of One-way ANCOVA for adjusted post-test reading comprehension skill scores among Dyslexic students belonging to the control and the experimental group, considering their pre-test reading comprehension skill scores as covariate.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	η^2
Pre-test achievement	.553	1	.553	.150	.699	.002
Group	524.897	1	524.897	142.491	.001	.649
Error	283.647	77	3.684			
Total	117870.000	80				
Corrected Total	825.000	79				
a. R Squared = .656 (Adjusted R Squared = .647)						

6.2. Effect of Covariate - Pre-test reading comprehension skill

The F value is .150 and p value is .699 for pre-test reading comprehension skill mean scores as covariate for post-test reading comprehension skill mean scores for Dyslexic students belong to the control and the experimental group. Here, the obtained *p*-value is higher than .05 level of significance. It indicates that pre-test reading comprehension skill not explain a substantial proportion of variance in the post-test reading comprehension skill scores, confirming that pre-test reading comprehension skill mean scores is not a covariate for post-test reading comprehension skill mean scores of Dyslexic students at .05 level of significance, F (1, 79) = .150, *p* = .699.

6.3. Main Effect of Intervention/Treatment:

The F value is 142.491 and *p*-value is .001 for adjusted mean scores of reading comprehension skill scores of Dyslexic students belong to the control and the experimental group. Hence, the null hypothesis is rejected, and the research hypothesis is accepted. It means, there is a significant difference in the adjusted post-test reading comprehension skill scores among Dyslexic students belong to the control and the experimental group by considering their pre-test reading comprehension skill scores as covariate at .05 level of significance (1, 97) = 142.491, p = .001, η^2 = .649. The partial eta-squared i.e., η^2 = .649 indicate large effect size.

Further, the adjusted mean scores of reading comprehension skill scores of the control group are 35.662 and the adjusted mean scores of reading comprehension skill of the experimental group are 40.838. The adjusted mean scores of reading comprehension skill scores of the experimental

group is significantly higher than that of the control group. It may therefore, be said that the students of the experimental group taught through the English language teaching strategy accomplished significantly higher reading comprehension skill compare to the students of the control group taught through the conventional method. The details of pre-test reading comprehension skill, post-test reading comprehension skill and adjusted mean scores are reported in the following table.

Table 2: Descriptive Statistics for pre-test, post-test, and adjusted reading comprehension skill mean scores of the experimental group and the control group

Group	N	Reading comprehension skill					
		Pre		Post		Adjusted Mean Scores	
		Mean	SD	Mean	SD	Mean	SD
Control Group	40	18.2750	3.02119	35.6500	2.04501	35.662	.305
Experimental Group	40	19.1250	2.94555	40.8500	1.76214	40.838	.305

The above table presents the pre-test and post-test reading comprehension skill scores of the control and experimental groups. The adjusted mean scores represent the post-test mean values after controlling for the covariate, namely pre-test reading comprehension skill scores for both groups. The mean comparison indicates that, adjusted mean achievement scores of the experimental group (M = 40.838) are significantly higher than those of the control group (M = 35.662). Thus, findings of the study revealed that the English language teaching strategy was more effective in enhancing the reading comprehension skill of Dyslexic students of the experimental group than the conventional method used in the control group. The data also reported dint he falling figure.

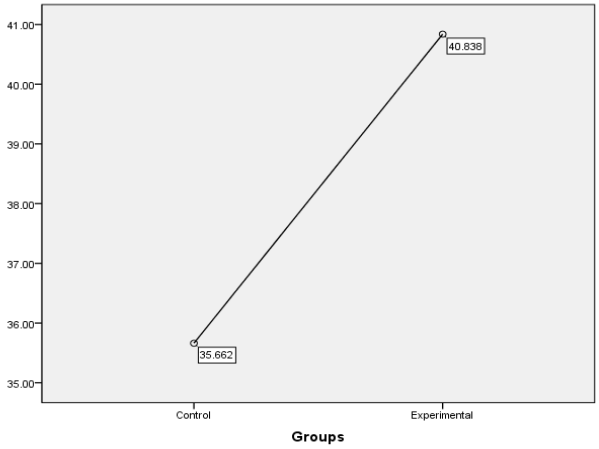

Figure 1: Comparison of adjusted reading comprehension skill scores of Dyslexic students belong to the control and the experimental group

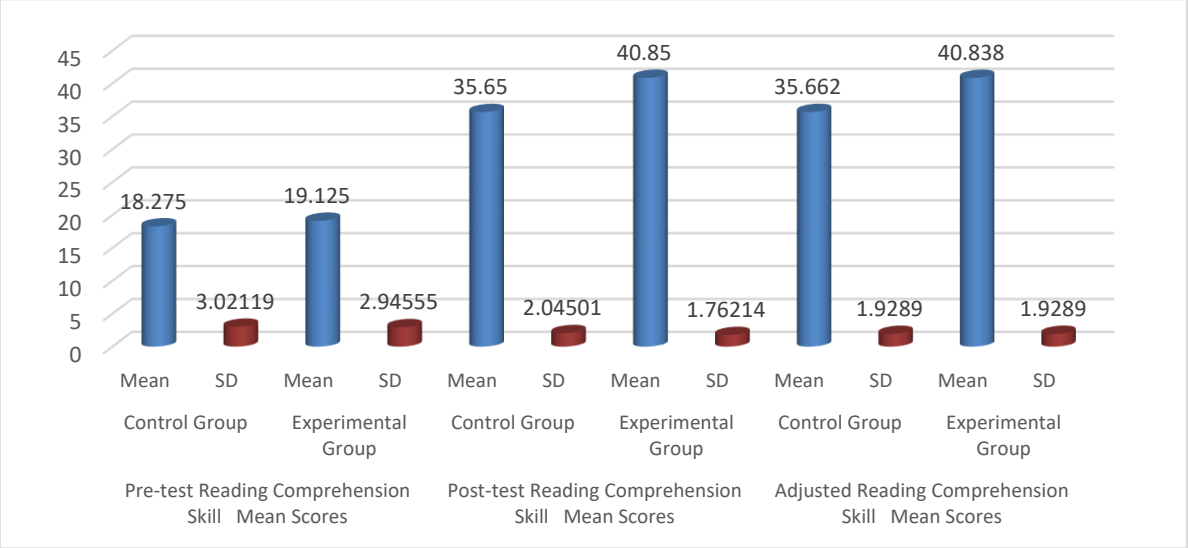

Figure 2: Comparison of pre-test, post-test, and adjusted comprehension skill mean scores of the experimental group and control group

Hypothesis-2: There is no significant difference in the adjusted post-test vocabulary knowledge scores among Dyslexic students belong to the control and the experimental group by considering their pre-test vocabulary knowledge scores as covariates.

Table 3: Summary of One-way ANCOVA for adjusted post-test vocabulary knowledge scores among Dyslexic students belong to the control and the experimental group, considering their pre-test vocabulary knowledge scores as covariate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	η^2
Pre-test achievement	.352	1	.352	.288	.593	.004
Group	121.347	1	121.347	99.192	.001	.563
Error	94.198	77	1.223			
Total	19876.000	80				
Corrected Total	219.550	79				
a. R Squared = .571 (Adjusted R Squared = .560)						

6.4. Effect of Covariate - Pre-test vocabulary knowledge:

The F value is .288 and p value is .593 for pre-test vocabulary knowledge mean scores as covariate for post-test vocabulary knowledge mean scores for Dyslexic students belong to the control and the experimental group. Here, obtained *p*-value is higher than .05 level of significance. It indicates that pre-test vocabulary knowledge does not explain a substantial proportion of variance in the post-test vocabulary knowledge scores, confirming that pre-test vocabulary knowledge mean scores are not a covariate for post-test vocabulary knowledge mean scores of Dyslexic students at .05 level of significance, F (1, 79) = .288, *p* = .593.

6.5. Main Effect of Intervention/Treatment

The F value is 99.192, and *p*-value is .001 for adjusted mean scores of vocabulary knowledge scores of Dyslexic students belong to the control and the experimental group. Hence, the null hypothesis is rejected, and the research hypothesis is accepted. It means, there is a significant difference in the adjusted post-test vocabulary knowledge scores among Dyslexic students belong to the control and the experimental group by considering their pre-test vocabulary knowledge scores as covariate at the .05 level of significance (1, 97) = 99.192, p = .001, η^2 = .563. The partial eta-squared, i.e., η^2 = .563 indicate large effect size.

Further, the adjusted mean scores of vocabulary knowledge scores of the control group are 14.433, and the adjusted mean scores of vocabulary knowledge of the experimental group are 16.917. The adjusted mean scores of vocabulary knowledge scores of the experimental group are significantly higher than those of the control group. It may therefore be said that the students of the experimental group taught through the English language teaching strategy accomplished significantly higher vocabulary knowledge compared to the students of the control group taught through the conventional method. The details of pre-test vocabulary knowledge, post-test vocabulary knowledge and adjusted mean scores are reported in the following table.

Table 4: Descriptive Statistics for pre-test, post-test, and adjust vocabulary knowledge mean scores of the experimental group and control group

Group	N	Achievement in Science					
		Pre		Post		Adjusted Mean Scores	
		Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Control Group	40	6.9750	1.16548	14.4250	1.12973	14.433	.176
Experimental Group	40	7.2750	1.21924	16.9250	1.07148	16.917	.176

The above table presents the pre-test and post-test vocabulary knowledge scores of the control and experimental groups. The adjusted mean scores represent the post-test mean values after controlling for the covariate, namely pre-test vocabulary knowledge scores for both groups. The mean comparison indicates that the adjusted mean achievement scores of the experimental group (M = 16.917) are significantly higher than those of the control group (M = 14.433). Thus, findings of the study revealed that the English language teaching strategy was more effective in enhancing vocabulary knowledge of Dyslexic students of the experimental group than the conventional method used in the control group. The data also reported dint he falling figure.

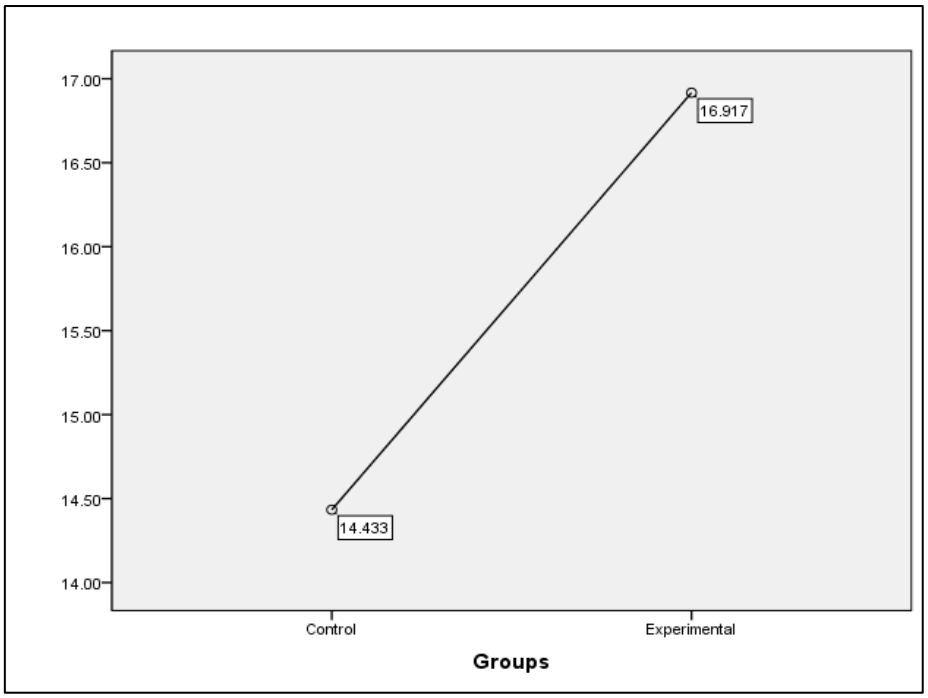

Figure 3: Comparison of adjusted vocabulary knowledge scores of Dyslexic students belong to the control and the experimental group

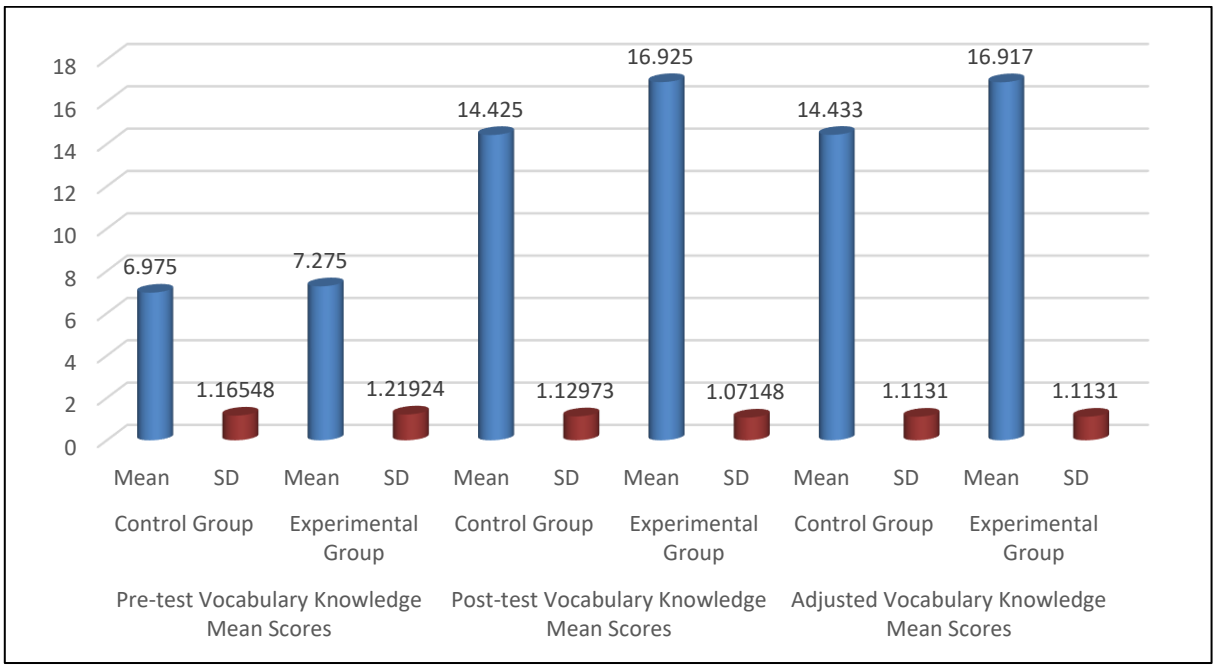

Figure 4: Comparison of pre-test, post-test, and adjust vocabulary knowledge mean scores of the experimental group and the control group

7. DISCUSSION OF FINDINGS

The study's conclusions showed that the experimental group outperformed the control group in both vocabulary knowledge and reading comprehension. The ANCOVA results showed that the effect sizes were large and the difference between the groups was statistically significant. This indicates that the experimental group's literacy skills improved significantly as a result of the teaching methods used. These findings are in line with earlier research that highlights the value of multisensory learning and structured literacy instruction for dyslexic students.

8. CONCLUSION

The study concluded that structured teaching strategies significantly improved reading

comprehension and vocabulary knowledge among dyslexic students. The experimental group performed better than the control group, signifying the effectiveness of the intervention.

The findings highpoint the importance of adopting evidence-based teaching methods in inclusive classrooms. Teachers should receive proper training in specialized instructional strategies to support dyslexic learners in schools effectively.

REFERENCES

[1]Ehri, L. C. (2020). Orthographic mapping in the acquisition of sight word reading. *Scientific Studies of Reading*, 24(1), 5–21.

[2]Hulme, C., & Snowling, M. (2020). *The science of reading: A handbook*. Oxford University Press.

[3]Kirby, J. R., Desrochers, A., Roth, L., & Lai, S. (2021). Longitudinal predictors of word reading development. *Journal of Learning Disabilities*, 54(1), 45–56.

[4]Lyon, G. R., Shaywitz, S. E., & Shaywitz, B. A. (2017). A definition of dyslexia. *Annals of Dyslexia*, 67(1), 3–15.

[5]Moats, L. (2020). Structured literacy: Effective instruction for students with dyslexia. *Perspectives on Language and Literacy*, 46(2), 15–21.

[6]Nicolson, R. I., & Fawcett, A. J. (2019). Developmental dyslexia and learning difficulties. *Nature Reviews Neuroscience*, 20(3), 147–156.

[7]Shaywitz, S. (2020). *Overcoming dyslexia*. Yale University Press.

[8]Snowling, M. J. (2019). *Dyslexia: A very short introduction*. Oxford University Press.

[9]Torgesen, J. K. (2018). Evidence-based interventions for students with reading disabilities. *Journal of Learning Disabilities*, 51(2), 122–132.

[10] Vaughn, S., Wanzek, J., Murray, C., & Roberts, G. (2019). Intensive reading interventions for struggling readers. *Reading Research Quarterly*, 54(2), 171–187.