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Effectiveness of Critical Discourse Analysis on Environmental Sustainability and Achievement in English among Secondary School Students

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Abstract: *This study investigates the effectiveness of Critical Discourse Analysis (CDA) as a pedagogical strategy for enhancing environmental sustainability awareness and achievement in English among secondary school students. A quasi-experimental pre-test post-test non-equivalent group design was employed with a sample of 98 ninth-grade students from a school in Ernakulam, Kerala. The experimental group (n=48) was taught using CDA-based lessons, while the control group (n=48) received instruction through a traditional discourse-oriented pedagogy. Pre-test and post-test scores for environmental sustainability and English achievement were compared using t-tests and ANCOVA. The results revealed a significant positive impact of the CDA strategy on both environmental sustainability understanding and achievement in English, with the experimental group demonstrating significantly higher mean scores and gain scores compared to the control group. The findings suggest that CDA is a more effective approach than traditional methods for promoting critical thinking about environmental issues and improving English language proficiency.*
Keywords*: Critical Discourse Analysis, Environmental Sustainability, English Achievement, Secondary School Students, Pedagogical Strategy*

1. INTRODUCTION

Environmental sustainability has become a critical global concern, necessitating the development of environmentally literate and responsible citizens. Simultaneously, proficiency in the English language remains crucial for academic and professional success in an increasingly interconnected world. This study aims to explore the potential of integrating these two vital areas through innovative pedagogical approaches. Critical Discourse Analysis (CDA), a research method that examines language in its social context to understand how power relations, ideologies, and values are constructed and maintained through discourse, holds promise for fostering both critical thinking about environmental issues and enhancing English language skills. This study investigates the effectiveness of a Critical Discourse Analysis-based strategy on environmental sustainability awareness and achievement in English among secondary school students in Kerala, India.

1.1 Statement of the Problem

The present study addresses the need for effective pedagogical strategies that simultaneously promote environmental sustainability and enhance English language proficiency among secondary school students. The study seeks to determine if a teaching approach based on Critical Discourse Analysis can lead to significant improvements in both these domains compared to traditional discourse-oriented pedagogy.

1.2 Operational Definitions of Key Terms

- **Effectiveness:** The degree to which the Critical Discourse Analysis strategy successfully produces the desired results of enhanced environmental sustainability and improved achievement in English.
- **Critical Discourse Analysis (CDA):** In this study, CDA refers to a pedagogic strategy for teaching English discourse at the secondary school level, focusing on analyzing written and spoken language in relation to its social context to understand underlying power structures and ideologies.
- **Environmental Sustainability:** The competency developed among secondary school students to understand and support the maintenance of ecological balance and the conservation of natural resources for current and future generations, as demonstrated by scores on the Environmental Sustainability Scale developed by the investigator.

- **Achievement in English:** The level of knowledge and skills attained in the English language as measured by the total scores obtained on the Achievement Test in English constructed by the investigator for ninth-grade students.
- **Secondary School Students:** Students studying in the ninth standard in schools recognized by the Government of Kerala following the State syllabus.

1.3 Objectives of the Study

1. To develop a Critical Discourse Analysis-based strategy in English to enhance Environmental Sustainability and Achievement in English of Secondary School Students.
2. To analyze the level of Environmental Sustainability of Secondary School Students before and after the intervention.
3. To determine the effectiveness of the Critical Discourse Analysis-based strategy in enhancing Environmental Sustainability of Secondary School Students compared to Discourse Oriented Pedagogy.
4. To analyze the level of Achievement in English of Secondary School Students before and after the intervention.
5. To compare the Achievement in English of Secondary School Students taught using the Critical Discourse Analysis-based strategy and prevailing Discourse Oriented Pedagogy.

1.4 Hypotheses of the Study

1. There will be a significant difference in Environmental Sustainability of Secondary school students taught using a Critical Discourse Analysis-based strategy and Discourse Oriented Pedagogy.
2. There will be a significant difference in Achievement in English of Secondary School Students taught using a Critical Discourse Analysis-based strategy and Discourse Oriented Pedagogy.

2. METHODOLOGY

2.1 Research Design

The study employed a quasi-experimental pre-test post-test non-equivalent group design. This design involved two groups of students: an experimental group that received instruction using the Critical Discourse Analysis strategy and a control group that was taught using the prevailing discourse-oriented pedagogy. Both groups were administered pre-tests and post-tests to measure their levels of environmental sustainability and achievement in English.

2.2 Population and Sample

The population for this study comprised ninth-standard students following the State syllabus in Kerala. A sample of 98 students from two divisions of the ninth standard at St. Mary's CGHSS, Ernakulam, was selected for the study. The experimental group consisted of 48 students, and the control group also had 48 students.

2.3 Variables of the Study

- **Independent Variables:**
  - Critical Discourse Analysis strategy (for the experimental group)
  - Exposure to Discourse Oriented Pedagogy (for the control group)
- **Dependent Variables:**
  - Environmental Sustainability (measured by the Environmental Sustainability Scale)
  - Achievement in English (measured by the Achievement Test in English)

2.4 Tools and Materials Used

- **Materials:**
  - Lesson transcripts based on the Critical Discourse Analysis strategy, focusing on environmental themes.
  - Lesson transcripts based on the Discourse Oriented Pedagogy used in the control group.
- **Tools:**
  - Environmental Sustainability Scale: A tool developed and standardized by the investigator to measure students' understanding and attitudes towards environmental sustainability.

- Achievement Test in English: A test developed by the investigator specifically for ninth-grade students to assess their achievement in English language skills relevant to the curriculum.

2.5 Data Collection and Analysis

Prior to the intervention, both the experimental and control groups were administered the Environmental Sustainability Scale and the Achievement Test in English as pre-tests. The experimental group then received instruction using the Critical Discourse Analysis strategy, while the control group was taught using the regular discourse-oriented pedagogy for a specified duration. Following the intervention, both groups were administered the same instruments as post-tests. The collected data were analyzed using descriptive statistics (mean, standard deviation) and inferential statistics, including t-tests to compare the means of pre-test, post-test, and gain scores between the groups, and ANCOVA to control for any initial differences between the groups.

3. ANALYSIS AND INTERPRETATION

3.1 PRE-test Analysis

Descriptive statistics of pre-test scores for Environmental Sustainability are presented in Table 1. The independent samples t-test revealed no significant difference between the experimental and control groups' pre-test scores in Environmental Sustainability ($t=0.19$, $p>0.05$). Similarly, no significant difference was found in the pre-test scores for Achievement in English between the groups.

Table 1: Descriptive Statistics of Pre-test Scores for Environmental Sustainability

Group	Mean	Standard Deviation
Control Group	68.4	7.4
Experimental	67	9

Percentage analysis of pre-test scores for Environmental Sustainability in the control group showed that 27% had low, 56% average, and 18% high sustainability. In the experimental group, 82% demonstrated low, 6% average, and 12% high sustainability.

3.2 Post-test Analysis

Descriptive statistics of post-test scores for Environmental Sustainability are presented in Table 2. The experimental group showed a higher mean score ($M=77$, $SD=9.14$) compared to the control group ($M=75$, $SD=8.2$). An independent samples t-test revealed a significant difference between the post-test scores of the two groups ($t=3.20$, $p<0.01$).

Table 2: Descriptive Statistics of Post-test Scores for Environmental Sustainability

Group	Mean	Standard Deviation
Control Group	75	8.2
Experimental	77	9.14

Percentage analysis of post-test scores for Environmental Sustainability in the control group indicated that 79% had low, 5% average, and 16% high sustainability. In the experimental group, 20% demonstrated low, 32% average, and 48% high sustainability.

3.3 Achievement in English

Descriptive statistics for pre-test scores in Achievement in English showed a mean of 14.4 ($SD=3.14$) for the control group and 17.12 ($SD=3.5$) for the experimental group (refer to user's original text for the exact table numbers). Percentage analysis indicated that in the control group, 12% had low, 70% average, and 18% high awareness of achievement in English. In the experimental group, 12% had low, 65% average, and 23% high awareness.

The post-test scores for Achievement in English revealed a higher mean for the experimental group ($M=17.1$, $SD=3.5$) compared to the control group ($M=14.4$, $SD=3.14$). An independent samples t-test showed a statistically significant difference ($t=5.97$, $p<0.01$).

3.4 Gain Score Analysis

Independent samples t-test on the gain scores for Environmental Sustainability showed a significant difference between the experimental group (Mean Gain=23.62, SD=6.26) and the control group (Mean

Gain=16.42, SD=6.64), with t=4.98 and p<.01 (Table 3). This indicates a greater improvement in environmental sustainability among students taught using CDA.

Table 3: Comparison of Gain Scores for Environmental Sustainability

Group	N	Mean Gain	Standard Deviation	t	Sig. (2-tailed)
Experimental	48	23.62	6.26	4.98	<.01
Control Group	48	16.42	6.64		

3.5 ANCOVA Analysis

ANCOVA results, with pre-test scores as the covariate, indicated a significant effect of the teaching strategy on post-test scores for Environmental Sustainability (F=32.32, p<0.05). The adjusted mean post-test score for environmental sustainability was significantly higher for the experimental group (Myx=15.73) compared to the control group (Myx=11.14).

3.6 Discussion

Comparison of Experimental and Control Groups before Starting the Treatment

Comparing the Pre-test scores of Environmental Sustainability of Control group and Experimental group The analysis carried out under each section is given below;

Comparing the Pre-test scores of Environmental Sustainability of Control group and Experimental group

Using the test of significant difference between means, the researcher attempted to compare the mean pretest scores of environmental sustainability for secondary school students in the experimental and control groups. A summary of the findings is provided in table 4

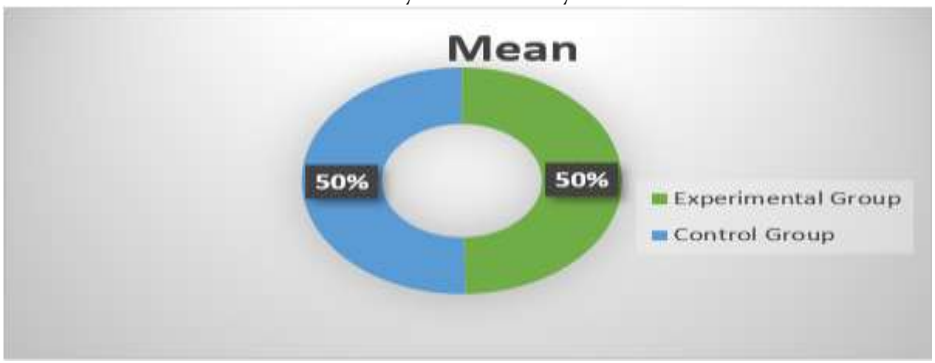
Table 4: comparison of Pretest scores of Experimental and Control groups with respect to Environmental sustainability of Secondary School Students

Descriptive statistics	Experimental Group	Control Group	T score
Mean	67	68	0.19
Standard Deviation	9	7.4	

** Not Significance at 0.05 level

The comparison of the Experimental and Control groups' pretest results for environmental sustainability among secondary school students is shown in Table 4.4. For the test of significance of difference between mean scores of environmental sustainability, the calculated t-value (t=0.19, p>0.05) does not surpass the table value 1.96 at 0.05 level. As a result, at the 0.05 level of significance, t-value 0.19 is not significant. This indicates that there is no discernible difference between the experimental and control groups' mean scores on the pretest for environmental sustainability among secondary school students. This demonstrates that the Experimental and Control groups are equal.

Figure 3.1: Graphical representation of pretest scores of Experimental and Control groups with respect to the Environmental Sustainability of Secondary School Students.



Comparison of Pre- test and Post test scores of Control group of Secondary School Students with respect to Environmental Sustainability.

The summary of Pre- test and Post test scores of Control group with respect to Environmental Sustainability of secondary school students in Table 5

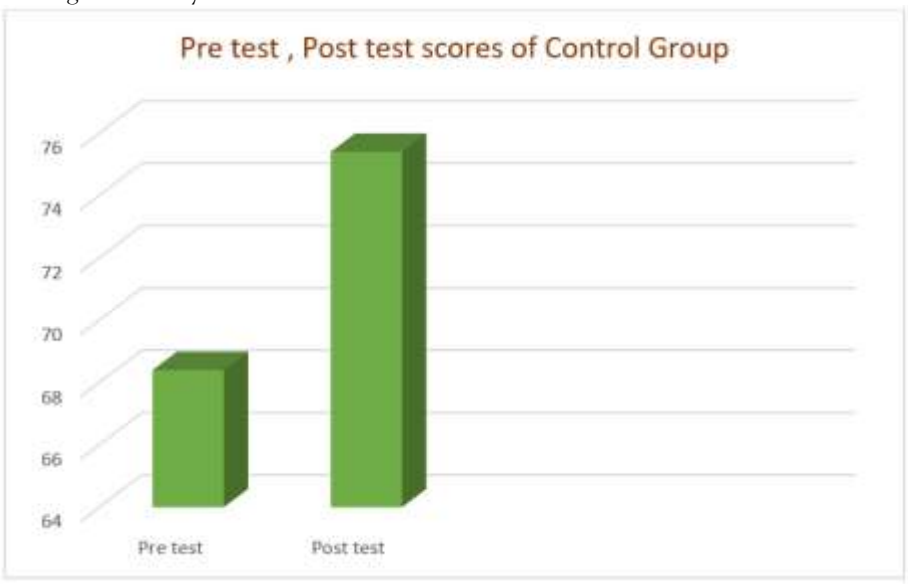
Table 5: Comparison of Pre- test and Post test scores of Control group of Secondary School Students.

Tests	Scores	t-value
Pretest	68.4	
Posttest	75.4	2.1

*Significant at 0.05 level

Table 5 describes the comparison of Pretest Posttest scores of Experimental with respect to Environmental Sustainability of Secondary School Students. The calculated t-value ($t=2.1$, $p<0.05$) for the test of significant difference between the mean of Environmental Sustainability is greater than the table value 1.96 at 0.05 level. As a result, at the 0.05 level of significance, t-value 2.1 is significant. This indicates that there is difference between the Control groups' mean scores on the Pretest Posttest for Environmental Sustainability of Secondary School Students. This shows that there exists significance difference between Pretest Posttest scores of Control groups.

Figure 3.2: Graphical representation of Comparison of Pre- test and post test scores of Control group among secondary school students.



Comparison of Pre-test and Post- test scores of Experimental groups among Secondary School Students.

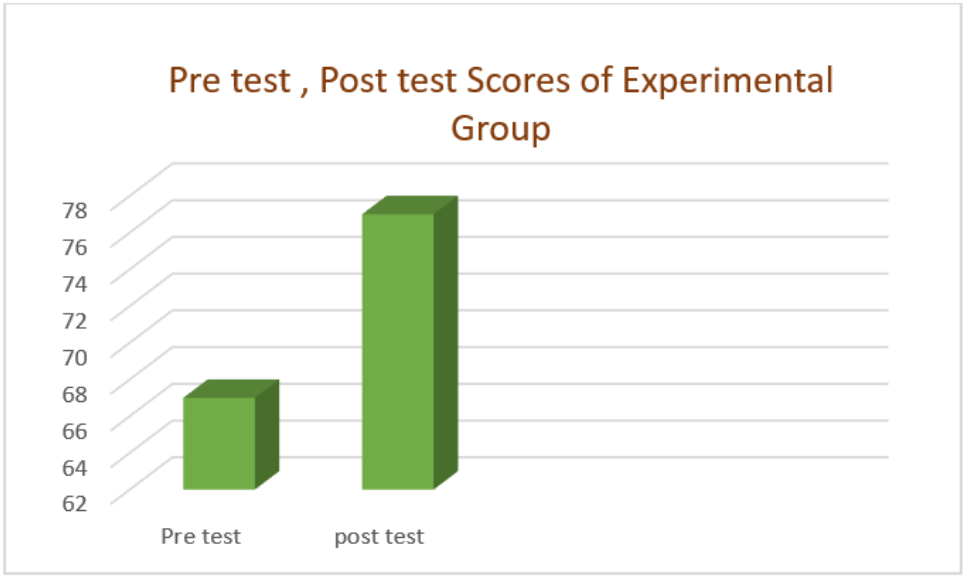
Table 6: Comparison of Pre- test and Post test scores of Experimental groups of Secondary School Students.

Tests	Scores	t-value
Pretest	67	3.20
Posttest	77	

*Significant at 0.01 level

Table 6 describes the comparison of Pretest Posttest scores of Experimental groups with respect to Environmental Sustainability of Secondary School Students. The calculated t-value ($t=3.20$, $p<0.01$) for the test of significant difference between the mean of Environmental Sustainability is greater than the table value 2.58 at 0.01 level. As a result, at the 0.01 level of significance, t-value 3.20 is significant. This indicates that there is difference between the Experimental groups' mean scores on the Pretest Posttest for Environmental Sustainability of Secondary School Students. This shows that there exists significance difference between Pretest Posttest scores of Experimental groups.

Figure 3.3: Graphical representation of Comparison of Pre- test and post test scores of Experimental groups of secondary school students.



Comparing the Post-test scores of Environmental Sustainability of Control group and Experimental group

Using the test of significant difference between means, the researcher attempted to compare the mean Posttest scores of Environmental Sustainability for Secondary School Students in the Experimental and Control groups. A summary of the findings is provided in table 7.

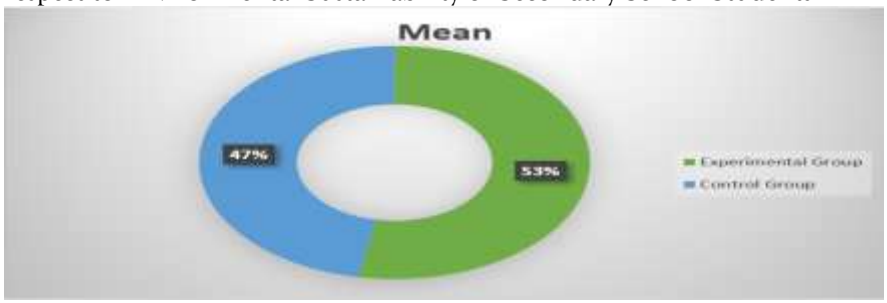
Table 7: Comparison of pretest scores of Experimental and Control groups with respect to Environmental sustainability of Secondary School Students

Descriptive statistics	Experimental Group	Control Group	t test
Mean	79	75	3.20
Standard Deviation	9.14	8.2	

** Significance at 0.01 levels

The comparison of the Experimental and Control groups' pretest results for environmental sustainability among secondary school students is shown in Table 7. For the test of significance of difference between mean scores of environmental sustainability, the calculated t-value ($t=3.20$, $p<0.01$) surpass the table value 2.53 at 0.01 level. As a result, at the 0.01 level of significance, t-value 3.20 is significant. This shows that there exists significant difference between the mean of post- test scores of Experimental and Control groups with respect to the Environmental Sustainability among Secondary School Students. This also shows that the mean scores of post- test scores of Environmental Sustainability of Students at Secondary School Students in Experimental groups ($M=79$) is greater than of Control group ($M=75$).

Figure 3.4: Graphical representation of Post-test scores of Experimental Group and Control Group with respect to Environmental Sustainability of Secondary School Students.



Comparison of Gain scores of Environmental Sustainability of Secondary School Students if Experimental and Control groups

The investigator compared the mean scores of gain scores of Environmental Sustainability of Secondary School Students of Experimental and Control groups by using the t-test of significance of difference between means and the summary of result is given in a Table 8

Table 8: Summary of Gain scores of Environmental Sustainability of Secondary School Students of Experimental and Control groups

Variables	Group	N	Mean	SD	t	Sig.
Environmental Sustainability	Experimental	48	23.62	6.26	4.98	P<.01
	Control	48	16.42	6.64		

** Significant at 0.01 levels

Table 8 describes the comparison of gain scores of Experimental and Control groups with respect to Environmental Sustainability of Secondary School Students. The calculated t-value (t=4.98, p<.01) for the test of significance difference between the means of gain scores of Environmental Sustainability exceed the table value 2.58 at 0.01 level. This means that there exists significant difference between the mean of gain scores of Environmental Sustainability of Secondary School Students of Experimental and Control groups with respect to Environmental Sustainability of Secondary School Students.

Figure 3.5: Graphical representation of Gain scores of Environmental Sustainability of Secondary School Students if Experimental and Control groups

DISCUSSION OF RESULT

The mean post-test scores and gain scores on Environmental Sustainability of students in the Experimental and Control groups were compared using 't' test. The result revealed that the two groups have significant difference after the treatment. Also, the mean scores on Environmental Sustainability of experimental group is higher than the control group. The result of scores and gain scores reveled that there is significant difference between Experimental and Control Groups.

From the analysis, it can be inferred that the Critical Discourse analysis strategy is more effective than Discourse Pedagogy method for Achievement in English.

Comparison of Pre-Test and post-test scores Environmental Sustainability of Experimental and Control groups (ANCOVA)

Before proceeding to ANCOVA, ANOVA was done and the F ratio for the pre-test and post test scores was computed the summary of Analysis of Variance of pre-test and post test scores is given in Table 9

Table 9: Summary of ANOVA of pre-test and post test scores of Environmental Sustainability of Secondary School Students

Group	N	M_x	M_y	$M_{yx(Adjusted)}$	SE_M	T
Experimental	48	9.03	15.37	15.37	0.98	5.68**
Control	48	10.21	11.5	11.5		

**Significant at 0.01 levels

The mean adjusted posttest Environmental Sustainability are 15.73 and 11.4 respectively of Experimental and Control group. The computed t- value is 16.95, which is greater than the table value 1.96 for 0.05 levels of significance. It means that the mean scores of Environmental Sustainability of Secondary School Students differ significantly.

Tabie 9 also shows that the mean score of adjusted posttest scores of Environmental Sustainability of Secondary School Students of Experimental group (Myx-15.73) is greater than that of Control group (Myx-11.14). It means that, the average adjusted Environmental Sustainability of students from Experimental group is significantly higher as compared to Control group. Thus, it can be concluded that Critical Discourse Analysis is more effective than Discourse oriented Pedagogy method for enhancing Environmental Sustainability among secondary school students.

Comparison of post-test scores of Environmental Sustainability Experimental and Control groups (ANCOVA)

The adjusted sum of squares for Post-test was computed and the F ratio was calculated. The summary of ANCOVA of Pre-test and post test scores of students in experimental and control groups is given in Table 10

Table 10: Summary of ANCOVA of Post test scores of Environmental Sustainability of Secondary School Students

Source of variation	df	SSyx	MSyx	Fyx
Among group	1	324.13	324.13	32.32*
Within groups	61	611.16	10.03	

*Significant at 0.05 levels

The obtained Fyx (Fyx=32.32, df (1,61) $p<0.05$) is significant at 0.05 level of significance. Hence it can be inferred that the posttest scores of comparisons of posttest scores Experimental and Control groups with respect to Environmental Sustainability of Secondary School Students differ significantly. Since Fyx is significant, it is necessary to compare the adjusted mean scores.

Comparison of Experimental and Control Groups with Respect to Achievement in English.

The critical Discourse Analysis Strategy was developed to enhance the Achievement in English of Secondary School Students. An achievement test in English was prepared and administrated as both groups. The total scores this obtained for the experimental and control groups were then compared and is given under the following sub-sections;

4.4.1 Comparison of the scores of Experimental and control groups with respect to achievement in English among secondary school students

The analysis carried out under each section is given below;

Comparison of the scores of Experimental and control groups with respect to Achievement in English of Secondary School Students

The summary of the comparison of scores of Experimental and Control with respect to Achievement in English of Secondary School Students is given in Table 11

Table 11: Comparison of the scores of Experimental and Control groups with respected to Achievement in English of Secondary School Students

Descriptive statistics	Experimental Group	Control Group	t-value
Mean	17.1	14.4	5.97
Standard Deviation	3.5	3.14	

** Significant at 0.01 levels

The comparison of the experimental and control groups' results for English accomplishment among secondary school students is also detailed in Table 4.17. For the test of significant difference between the mean achievement in English, the estimated t-value ($t=5.97$, $p<.01$) is greater than the table value of 2.56 at 0.01 levels of significance. This demonstrates that there is a noteworthy distinction in the average scores of the experimental and control groups concerning secondary school students' English achievement. This

demonstrates that the experimental group's mean accomplishment scores (M=17.1) for English secondary school pupils are higher than those of the control group (M=14.4). Figure 4.6

Figure 3.6: Graphical representation of scores of Experimental group and Control group with respect to Achievement in English of Secondary School Students

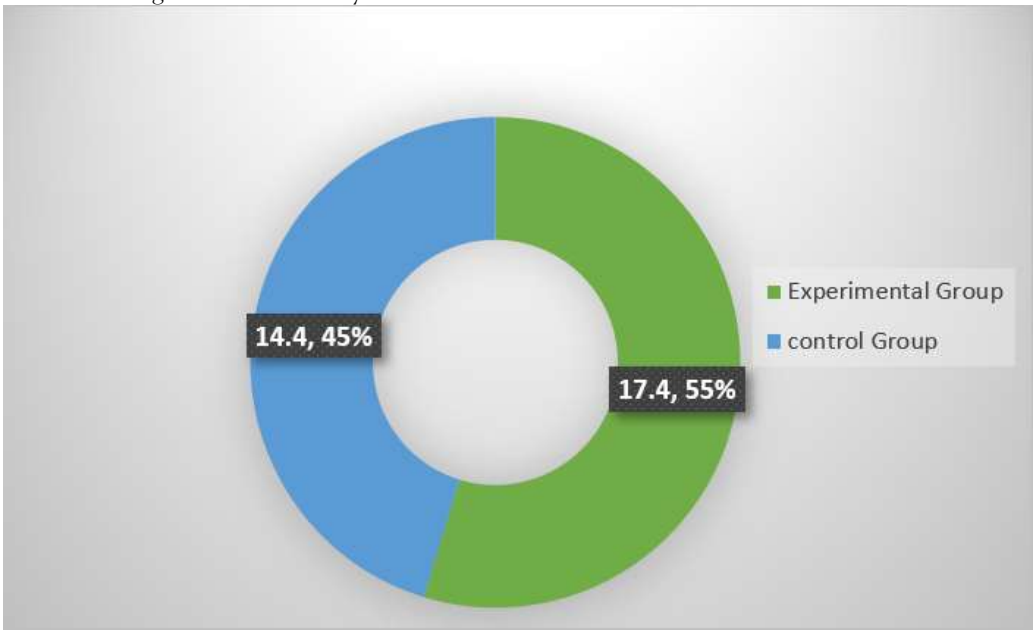


Figure 3.6 shows that the percentage of Experimental group and Control group with respect to achievement in English among Secondary School Students. Experimental group have 55% Achievement in English and in Control group have 45% Achievement in English.

Discussion of Results

The mean post-test scores and gain scores on Achievement test in English of students in the Experimental and Control groups were compare using 't' test. The result revealed that the two groups have significant difference after the treatment. Also, the mean scores on Achievement test in English of experimental group is higher than the control group. The result of scores and gain scores reveled that there is significant difference between Experimental and Control Groups.

From the analysis, it can be inferred that the Critical Discourse analysis strategy is more effective than Discourse Pedagogy method for Achievement in English.

4. RESULTS

4.1 Pre-test Analysis

Descriptive statistics of pre-test scores indicated that both the control and experimental groups had similar levels of environmental sustainability and achievement in English before the intervention. The t-test results for the pre-test scores of environmental sustainability ($t=0.19$, $p>0.05$) and achievement in English did not reveal any significant differences between the two groups, confirming their initial equivalence.

4.2 Post-test Analysis

The post-test scores revealed significant differences between the experimental and control groups in both environmental sustainability and achievement in English. The experimental group showed higher mean scores in both the post-test for environmental sustainability (M=79, SD=9.14) compared to the control group (M=75, SD=8.2), and the post-test for achievement in English (M=17.1, SD=3.5) compared to the control group (M=14.4, SD=3.14).

4.3 Comparison of Gain Scores

The analysis of gain scores (post-test score minus pre-test score) further supported the effectiveness of the CDA strategy. The experimental group exhibited significantly higher mean gain scores in environmental sustainability (M=23.62, SD=6.26) compared to the control group (M=16.42, SD=6.64), with a statistically

significant t-value (t=4.98, p<.01). Similarly, the experimental group showed significantly higher mean gain scores in achievement in English.

4.4 ANCOVA Analysis

To control for any potential influence of the pre-test scores, ANCOVA was conducted. The results of ANCOVA for the post-test scores of environmental sustainability, with pre-test scores as the covariate, showed a significant main effect for the teaching strategy (F=32.32, p<0.05). The adjusted mean post-test score for environmental sustainability was significantly higher for the experimental group (Myx=15.73) compared to the control group (Myx=11.14). Similarly, the comparison of post-test scores for achievement in English using t-test (t=5.97, p<.01) also indicated a significant difference favoring the experimental group.

4.5 DISCUSSION

The findings of this study provide strong evidence for the effectiveness of Critical Discourse Analysis as a pedagogical strategy for enhancing both environmental sustainability and achievement in English among secondary school students. The experimental group, which received instruction through CDA-based lessons, demonstrated significant improvements in their understanding of environmental issues and their English language proficiency compared to the control group, which was taught using traditional methods.

The application of CDA likely fostered critical thinking skills in students, enabling them to analyze texts related to environmental sustainability at a deeper level, going beyond surface-level comprehension. By examining the underlying power structures, ideologies, and values embedded in such texts, students developed a more nuanced understanding of complex environmental issues. This critical engagement with the subject matter may have contributed to a greater sense of environmental literacy and a stronger motivation to act towards a sustainable future.

Furthermore, the study revealed a significant positive impact of CDA on English language achievement. The focus on analyzing how language creates meaning likely enhanced students' critical reading and listening skills. Exposure to new vocabulary related to environmental sustainability expanded their lexical knowledge. Engaging in discussions and written analyses of environmental texts provided opportunities for improving communication and argumentation skills in English.

The results align with previous research suggesting that CDA can be a valuable tool in language education, promoting critical thinking and deeper engagement with learning materials. The integration of environmental themes within the CDA framework proved to be particularly effective in this context, highlighting the potential for interdisciplinary approaches to education.

4.6 CONCLUSION

After analysis the data, the investigators arrived at the following major conclusions as noted below:

The Environmental Sustainability of the students who learned through the Critical Discourse Analysis Strategy was significantly higher than those who studied through present Discourse Oriented Pedagogy. Thus the developed strategy is more effective than present Discourse Oriented Pedagogy in enhancing Environmental Sustainability of students at secondary level.

Achievement in English of the students who learned through the Critical Discourse Analysis Strategy was significantly higher than those who studied through present Discourse Oriented Pedagogy. Thus, the developed strategy is more effective than present Discourse Oriented Pedagogy in enhancing Achievement in English of students at secondary level.

This study concludes that the Critical Discourse Analysis strategy is significantly more effective than the traditional discourse-oriented pedagogy in enhancing both environmental sustainability awareness and achievement in English among secondary school students. The findings underscore the value of incorporating critical analysis of language into the curriculum to promote deeper learning and the development of informed and engaged citizens.

5. Educational Implications

The findings of this study have several important implications for English language education and environmental education at the secondary school level. English teachers should consider incorporating Critical Discourse Analysis into their pedagogical approaches to provide students with opportunities for critical engagement with various texts, including those related to environmental sustainability. This approach can foster critical thinking, improve analytical skills, enhance language proficiency, and promote a greater understanding of important social and environmental issues. Teacher training programs should also emphasize the principles and practical applications of Critical Discourse Analysis. Educational authorities can recognize and promote the value of CDA to ensure its effective implementation in classrooms. Policymakers can consider the benefits of CDA in curriculum development to foster environmentally conscious and linguistically proficient students

6. Suggestions for Further Research

While this study provides valuable insights into the effectiveness of CDA, further research could explore its application in different contexts and with diverse student populations. Longitudinal studies could examine the long-term impact of CDA on students' environmental attitudes and English language development. Investigating the effectiveness of CDA in different subject areas and with diverse student populations would also be valuable. Research could also focus on developing training programs for teachers to effectively implement CDA in their classrooms and on adapting CDA methodologies for various subjects and educational levels. Exploring the use of technology to facilitate the analysis of digital and multimedia discourses within a CDA framework is another promising area for future research. Finally, investigating how CDA can be tailored to address individual learning differences would contribute significantly to its wider applicability.

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