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Effects of critical reading instruction on students' reading performance in EFL class

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Abstract

The main objective of this study was to investigate the effect of teaching critical reading on students' reading performance in an EFL context. A quasi-experimental research design with a non-randomized control group was employed, utilizing pre-tests and post-tests for assessment. The participants were Grade 11 students from Sena Ghimbi Secondary School in Ghimbi Town, Oromia Region, Ethiopia. Data were collected through pre- and post-reading tests developed by adapting standardized critical reading assessment tools. The findings of the study revealed a statistically significant difference between the experimental and control groups. Students in the experimental group, who received instruction in critical reading strategies, demonstrated notably better reading performance compared to those in the control group, who did not receive such instruction. Based on these results, the study recommends that subject area teachers provide students with more opportunities to practice critical reading strategies rather than relying on limited traditional approaches. Finally, it recommended that additional research be conducted on related topics to further explore the role of critical reading in improving students' academic performance.

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INTRODUCTION

The term "critical reading" has become more well-known since the 1970s, when the idea of critical reading first surfaced. This idea was first proposed in the early 1970s in response to the results of an educational survey that suggested the US should pay greater attention to critical thinking. It has not been a major focus within the Ethiopian education curriculum for classroom practice, despite the current roadmap from the Ethiopian Ministry of Education (MoE, 2020) aiming to change students' critical thinking skills in the syllabus for Grades Eleven and Twelve. Nevertheless, critical reading, which has not received adequate attention, is highly significant, as it can foster the development of students' critical thinking and creativity (Al-Jubouri, 2018).

In the twenty-first century, notable scholars such as Exley and Dooley (2015) promote critical literacy as a new fundamental and essential talent that allows students to engage a variety of texts by challenging their claims and analyzing the author's intentions to influence the readers. According to Exley and Dooley (2015), researchers, educators, and theorists contend that reality is exposed because they think that humans socially build reality through language. Additionally, they assert that any writer who uses a variety of expressive systems to convey reality or fact under uncertainty

runs the risk of upsetting the reader's comprehension by leaving them disconnected from social or material reality.

Critical reading and reading performance are intrinsically linked, with the former serving as a complex application of the latter. While reading performance establishes the essential fluency and accuracy required for text decoding, critical reading represents a higher-order skill that assesses, analyzes, and synthesizes information to derive meaning and challenge assumptions (Truscott, 2025). Recent studies frame critical reading not just as an advanced ability but as a crucial integrative process; it depends on solid foundational performance while simultaneously enhancing it through fostering deeper engagement and metacognitive awareness. Research shows that direct instruction in critical reading techniques such as sourcing, corroboration, and argument analysis significantly boosts overall reading performance indicators, particularly in comprehension and retention, especially within digital and information-dense contexts where the ability to evaluate credibility is essential (Baki, 2025). Therefore, critical reading serves both as an objective and a crucial mechanism for attaining strong, transferable reading proficiency.

The observations and experiences of the researcher, specifically regarding the actual teaching and learning process in EFL classes, suggest that the focus is primarily on academic skills, while the critical reading component is overlooked. Many teachers merely instruct students to engage in procedures (reading practice) or to work in pairs or more without assessing their foundational understanding of reading critically prior to these discussions (Mirasol, 2024). Allowing students to participate in pre-while and post activities is not inherently problematic.

The current researchers' aim was to explore the effects of critical reading on learners' reading performance, which is a central aspect of this study, while also examining the students' awareness and attitudes regarding critical reading. Prominently, the researcher asserts that the challenges associated with critical reading at Sena Ghimbi High School have been notably observed through informal and practical experiences accumulated over several years of teaching at this institution. Numerous students encounter difficulties in reading and comprehending the text's message and strive to analyze the assigned genre, yet a considerable number of students struggle to identify the main idea of a text. This suggests that a majority of learners at Sena Ghimb High School experience obstacles with critical reading, which is essential for the educational process.

Statement of the problem

In education, the concept of critical reading is becoming increasingly important, especially when it comes to contemporary technologies. According to Maltepe (2016), critical reading empowers students to evaluate different points of view offered in a book or other written form and to think beyond simply taking the material at face value. During the process of critical reading, readers are encouraged not only to accept or dismiss the arguments made but also to analyze them critically from multiple angles, aiming to identify both their weaknesses and strengths (Maltepe, 2016). Accordingly, it is imperative for discerning readers to possess the capability to go beyond the mere text in order to understand, evaluate, and engage with the ideas presented. By adopting a comprehensive perspective, readers gradually learn to discern what constitutes wisdom and to reject that which is incorrect or misleading. In order for contemporary learners to navigate the vast array of information at their disposal, it is essential for them to cultivate critical reading skills to acquire accurate knowledge. According to Wilson (2016), critical reading is among the most essential academic competencies for learners. Critical reading and critical thinking abilities are essential for both classroom instruction and lifetime learning (Winter, 2018). Students must use their own judgment in order to participate in critical reading regarding the material they encounter, rather than merely accepting the author's arguments at face value. On the other hand, it has become evident that a significant number of secondary school students

struggle with critical reading, which adversely affects their academic performance and their ability to analyze the author's ideas (Hanafi, 2021). Furthermore, teachers have consistently expressed concerns about their students' inadequate skills in reading, which hinders their ability to respond to comprehension questions that require critical reading. Similarly, students encounter challenges in carrying out assignments, conducting analysis, and presenting their work (Hanafi, 2021). This issue has also been widely recognized within Sena Gihimb Secondary School.

The observations and experiences of the researcher, specifically regarding the actual teaching and learning process in EFL classes, suggest that the focus is primarily on academic skills, while the critical reading component is overlooked. Many teachers merely instruct students to engage in participation in reading without evaluating the students' skills in critical reading. Allowing students to participate in pre-while and post activities is not inherently problematic. However, failing to teach them the essential critical reading strategies appropriate to their level proves ineffective for their reading development. Additionally, the majority of teachers do not provide opportunities for students to practice critical reading by presenting questions that encourage learners to engage in critical reading through various stages. Likewise, when questions that require critical reading are given to students, they often do not respond adequately.

To the best of the researcher's understanding, there has been a lack of local studies at the secondary school level that investigate the effect of critical reading on students' reading performance, their comprehension of the critical reading, and the attitudes they form towards it. The previously mentioned local research focused on the influence of background knowledge, the application of various strategies, and the teaching materials used in English language instruction; however, the students' understanding and attitudes were not given significant attention. Therefore, this study was carried out to investigate the following study inquiries.

Research hypothesis

H_{01}: Does critical reading instruction significantly improve students' reading performance?

H_{02}: Does critical reading instruction significantly enhance students' metacognitive awareness in reading?

H_{03}: Does critical reading instruction significantly improve students' attitudes toward reading?

The study specifically sought to determine whether critical reading instruction enhances students' reading performance.

This study specifically tested the following:

Ho: Critical reading instructions do not significantly improve students' performance in reading.

MATERIALS AND METHODS

A pre-test and post-test inside a non-randomized experimental framework were made possible by the study's quasi-experimental design, which included two participant groups called the control group and the experimental group. Discussions regarding the debate on research paradigms indicate that the argument over the supremacy of a single paradigm is trivial, as every paradigm offers a distinct analysis with its own set of benefits (Nation & Snowling, 2004). Post-positivism represents a philosophical framework in the realm of science that recognizes the constraints of positivism. It highlights the significance of subjectivity, context, and diverse viewpoints in the pursuit of scientific knowledge. It acknowledges that scientific knowledge is inherently flawed and provisional, shaped by elements such as values, beliefs, and social contexts (Usmanova, 2020). It promotes a reflexive and critical methodology in scientific research, emphasizing the importance of incorporating diverse perspectives and acknowledging uncertainties in the quest for knowledge. Post-positivism integrates viewpoints from verifiable, comparable, philosophical, and phenomenological analysis in addition to quantitative research (Usmanova, 2020). The learners were instructed on cognitive strategies for reading comprehension that focus on critical

reading, in line with the guidelines established by Maria (2016). Before the intervention, the researcher conducted a two-day training session for nominated teachers on the implementation of critical reading strategies. Following this training, the researcher assessed the impact of these strategies and students' attitudes towards critical reading. The guidance was based on knowledge gained from different materials related to critical reading for the chosen teacher.

The treatment group established instruction using critical reading teaching, while the non-experimental group underwent usual reading teaching that did not specifically emphasize critical reading techniques. This traditional approach focused more on comprehension skills. Although the control group may have encountered challenging texts, their instruction likely did not explicitly include methods for critical analysis and evaluation of the material. To ensure the validity of the conclusions, the number of extraneous variables that may influence the outcomes is reduced. Additionally, the teacher meticulously records the teaching methods employed in the experimental group to accurately evaluate the effect of the interventions' critical abilities.

Theoretical and conceptual framework

Research indicates that developing critical reading skills is essential, as reading constitutes a fundamental aspect of language acquisition. In critical reading, students are not merely required to gain knowledge and comprehension from their reading; they are also expected to analyze, assess, and generate meaning (Koray & Çetinkılıç, 2020). To grasp the conceptual framework of this study, it is crucial to understand the perception of reading critically. Aiming to comprehend the dimensions of critical literacy and structural methods, the researcher views critical theory as being intricately linked to critical reading in multiple respects.

In the 21st century, notable scholars such as Mpiti and Busa (2020) have supported critical literacy as a fundamental and essential skill that empowers students to engage with various texts by questioning the claims made within them and analyzing the author's intent to sway the audience. Mpiti and Busa (2020), an educator, theorist, and researcher, posit that reality is revealed. He argues that people use rhetoric to socially construct reality. Additionally, he claims that any author uses a variety of communicative methods to convey reality or facts in the face of uncertainty, which could interfere with the reader's understanding and cause it to become detached from social or material reality.

Consequently, fostering critical literacy offers essential opportunities for engaging with and understanding inquiries such as how language, text discourse, and information affect change. As illustrated in Figure 1, it is evident that critical reading facilitates the analysis of the text, encompassing all relevant notions and concepts, thereby allowing for a comprehension of the author's analysis (which includes examining the text's aesthetic design) intended to persuade the audience. Furthermore, the context in which the author composed the text can be scrutinized (by analyzing the text's aesthetic representation) and assessed comprehensively.

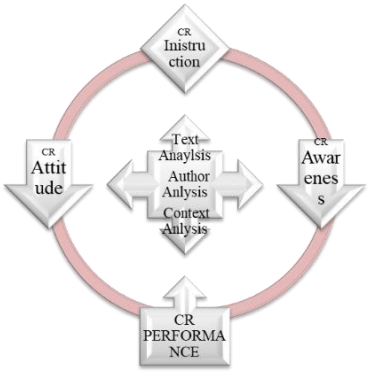

Figure 1. *Critical reading is related to reading performance, attitude, and awareness.*

Figure 1 illustrates that performance and aspects through which a critical reader can analyze a text can be identified using three techniques. In the initial stage, the critical reader examines the content of the text, focusing on the message that the text conveys. Following this content analysis, a detailed evaluation of the author's concept and the aesthetic design of the text is conducted. The motivations behind the author's writing and intent to persuade are also assessed. Finally, it is essential to address the author's writing context. Critical readers should be strict in understanding the author's circumstances, cultural background, and temperament at the time of writing the piece. This approach emphasizes the testing of hypotheses and the application of systematic measurement to derive conclusions. Therefore, post-positivism is the most accepted and suitable theoretical base for this study.

Sampling of students

The subjects involved in the main study consisted of Grade 11 students from Sena Ghimbi High School. A purposive sampling method was employed to choose these students for the study. Specifically, two sections were intentionally selected from Sena Ghimbi High School for this investigation. The samples for the main research were drawn from the Grade 11 students of the academic year 2024/2025. Conversely, a random sampling technique was utilized to select sections from the Grade 11 cohort, followed by the random selection of two students from each of the four sections to form the experimental and control groups.

Data collection method

The primary objective of this study was to examine how students' reading performance, awareness, and attitudes were affected by critical reading-based instruction. It basically aimed to assess how critical reading instruction (CRI) affected learners' reading performance. It also recognizes that students' literal and inferential reading skills are evaluated through reading pre-tests and post-tests in a variety of forms. In order to ascertain baseline reading performance, a pre-test was first given to the chosen student sample. The instructive treatment was then put into practice, and a post-test was carried out. The researcher used a variety of resources to determine suitable test formats for evaluating critical reading in order to prepare for the intervention. Theoretical and methodological insights from a variety of scholarly sources explored throughout the critical reading assessments' design phase were then used to construct test items.

Data analysis method

Ahead of doing the pilot data analysis using the independent sample t-test, ANOVA, and MANOVA, the unprocessed categorical data were converted from an Excel spreadsheet into continuous data. The use of parametric inferential statistics was made possible by the establishment of all necessary assumptions to verify that the scores followed a normal distribution and were assessed on an equal interval scale. Consequently, before performing the main parametric statistical tests for data analysis, it was essential to examine the normality of the data through skewness, histograms, and stem and leaf plots, which are parametric measuring tools. Specifically, skewness and kurtosis serve as critical statistical indicators for assessing the normal distribution of scores; hence, they were employed to evaluate the normality of the data prior to any analysis in this study.

The assessment of critical reading performance and sub-skills employs an analytical methodology, where comprehension, analysis, inference, and evaluation are systematically examined. Through the application of the normality assumption and corresponding statistical tests, the cumulative outcome of these critical reading components is systematically evaluated and interpreted.

Instructional materials

The teaching material, which includes activities, tasks, and content, was adapted from Wang et al. (2022) and designed to support critical reading instruction. It proved effective for academic purposes, as it encourages the use of critical reading strategies, aiding students in practicing their knowledge and enhancing their engagement with texts and various materials. While the control group utilized a traditional method, the experimental

group used a set of teaching materials that concentrated on a critical reading instruction strategy. The critical reading activities were selected from a range of standard materials, with the strategy component drawing on Wang et al. (2022). In addition to the researcher advisor's input, two senior TEFL PhD students from Wollega University evaluated the content to ensure authenticity by providing helpful criticism on its organization, clarity, and degree of difficulty. The content was then updated in light of the comments that were received.

Procedure of intervention

A pre-test was given to the experimental and control groups at the start of the trial. After that, starting on March 29, 2025, the experimental group received instruction in critical reading strategies for 10 weeks. At the conclusion of this period, a post-test was administered. The post-test, which was identical to the pre-test and adapted from materials sourced in New York, NY 1006, served two purposes: to assess whether each group's performance improved relative to their pre-test scores and to evaluate any significant differences between the experimental and control groups' post-test outcomes. This design, involving the repeated use of an identical assessment instrument, aligns with established methodological practices. Prior studies have demonstrated that a minimum interval of three weeks between test administrations is appropriate; therefore, conducting the post-test at the tenth week ensured compliance with this standard.

The pre-test was constructed around two reading passages and included 25 questions designed to measure distinct critical reading sub-skills. The question distribution was as follows: seven items assessed the ability to analyze concepts, five measured textual comprehension, seven required inferential skills, and six prompted evaluation from multiple viewpoints. To ascertain whether the critical reading approach teaching resulted in a statistically significant difference in mean scores between the experimental and control groups for each sub-skill, a post-test with the same structure was given.

Normality and validity of tests

The data presented in Table 1 reveal that the median and mode for each core component of reading performance closely approximated the corresponding mean values. Bryman and Cramer (2014) posit that such convergence among measures of central tendency suggests a potentially normal distribution, thereby enabling researchers to contemplate employing inferential statistics for data analysis.

Table 1

Parametric testing statistics for skewness and kurtosis for critical reading ability before and after tests

Group	Statistical Measure	CR sub-skills							
		Comprehension		Analysis		Inferences		Evaluation	
		Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Experimental	N	41.00	41.00	41.00	41.00	41.00	41.00	41.00	41.00
	Mean	2.81	3.41	4.54	3.62	3.57	6.44	1.76	4.14
	Std. Devia	0.92	1.07	0.90	1.04	0.93	1.29	0.9	1.05
	Kurtosis	-0.41	0.18	-0.45	0.61	-0.31	0.42	0.23	0.52
	Skewness	-0.35	-0.26	-0.18	-0.49	0.38	-014	0.51	-0.59
Control	N	39.00	39.00	39.00	39.00	39.00	39.00	39.00	39.00
	Mean	2.66	2.80	4.66	4.03	3.54	3.69	1.57	1.74
	Std. Devia	0.68	0.58	0.64	0.82	0.95	0.96	0.74	0.70
	Kurtosis	-0.05	-0.22	0.19	-0.61	0.81	0.09	-0.48	0.78
	Skewness	-0.13	0.08	-0.31	-0.08	0.32	-0.23	0.76	0.81

It is imperative, however, that the assumption of normal or symmetrical distribution defined by the highest frequency of scores being located at the center be satisfied prior to conducting any inferential statistical test (Pallant, 2016). Accordingly, the researcher in this study examined skewness and kurtosis values as indicators to determine whether the data fulfilled this essential criterion.

An examination of central tendency revealed that the median and mode values were closely aligned with the mean scores across all measures of reading performance. According to Bryman and Carmer (2014), such alignments suggest a distribution that approximates normality, thereby warranting the application of inferential statistical techniques. Pallant (2016) further corroborates this perspective, noting that a symmetrical or normal distribution is characterized by the highest frequency of scores clustering at the center, which permits the use of parametric tests. To formally assess normality, the researcher calculated skewness and kurtosis values for both groups for each dimension of reading performance. Following the criteria established by Cohen et al. (2018), which stipulate that skewness and kurtosis values must fall within the range of -1 to +1 to indicate a normal distribution, all obtained values were found to lie within this acceptable range. These results confirm that the score distributions for both groups satisfied the assumptions of normality. As suggested by Cohen et al. (2018). Skewness and kurtosis values within the range of -1 to +1 are indicative of a reasonably normal distribution, thereby satisfying the assumptions for conducting inferential statistics. The normality diagnostics for the current dataset confirmed that all values fell within this acceptable threshold. For the comprehension component, skewness and kurtosis were -0.41 and 0.18 for the pre-test and -0.5 and 0.61 for the post-test. For the inference component, the corresponding values were -0.31 and 0.41 for the pre-test and post-test, respectively. These results, summarized in Table 1, confirm that the data derived from the target samples exhibited the necessary symmetry for subsequent parametric testing.

Prior to analysis, the normality of score distributions was confirmed, enabling the researcher to confidently apply the designed parametric inferential statistics to the data. This validation underscores the reliability of the pre-test data related to critical reading performance. Given that sample sizes exceeding 30 generally yield normally distributed data, the current study meets this condition, as both the control group (CG) and the experimental group (EG) comprise more than 35 participants. Accordingly, the sample size prerequisites for this investigation have been adequately satisfied.

The main study issue, which aims to ascertain whether there is a statistically significant difference between the control and experimental groups' pre-test mean scores in reading performance, was investigated through an examination of the quantitative data from the critical reading test. Both descriptive and inferential statistics were used to analyze the data. In particular, an independent-sample t-test was utilized to gauge the impact of the intervention on the reading comprehension results of the experimental group, and a paired-sample t-test was utilized to evaluate within-group differences after the intervention. In parallel, SPSS was used to process and analyze the questionnaire data while maintaining a standard analytical methodology.

RESULTS AND DISCUSSION

Results

An analysis of the quantitative information gathered via surveys and tests is presented in this section. Regarding the study question, is there a statistically significant difference between the experimental groups and the control groups' mean pre-test scores in terms of students' reading proficiency? Both descriptive and inferential statistical analyses were performed on the critical reading test data. An independent-sample t-test assessed the intervention's effect on the experimental group's reading comprehension scores, while a paired-sample t-test evaluated

changes in within-group scores following the intervention. Additionally, SPSS was used to evaluate the questionnaire data using a consistent methodological framework.

Table 2

Descriptive statistics of the experimental and control groups' reading performance on the pre- and post-intervention exam

	Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for mean		Minimum	Maximum
						Lower	Upper		
Pre-test	Experimental	41	12.189	3.20401	0.4673	10.5234	12.9602	6	20
	Control	39	12.211	3.1355	0.52854	10.2345	12.4424	6	18
Post-test	Experimental	41	20.2102	3.66658	0.45053	18.2256	20.5243	11	24
	Control	39	12.4533	2.61737	0.9459	10.8147	12.8211	8	18

The quantitative data analysis in Table 2 involves calculating and interpreting the mean scores and standard deviations of the results. The pre-test outcomes indicated that the non-experimental and experimental groups began the study with comparable critical reading skills, as evidenced by their closely aligned mean score (control: M=12.211; experimental: 12.189). However, the post-intervention descriptive statistics revealed a marked disparity. When compared to the control group (M=12.45), the experimental group's mean score (M=20.21) was noticeably higher, highlighting a substantial difference in their post-intervention critical reading performance. The experimental group outperformed the control group by 7.76 points on the critical reading portion of the test. An examination of the slandered deviations reveals comparable dispersion patterns across both testing phases. On the pre-test, the control group's scores deviated by 2.54 from its mean, while the experimental group showed a deviation of 2.5 for the non-experimental group and 3.2 for the experimental group. These are consistently equal for control groups before and after intervention.

On the other hand, an examination of the descriptive data in Table 2 reveals a considerable difference in critical reading performance after the intervention. The experimental group recorded a significantly greater mean result (M=20.21) than the non-experimental group (M=12.45), a difference of .76 points. The statistical significance of this observed difference between the groups was then assessed using an independent samples t-test.

Table 3

Results of control and experimental groups on pre- and post-test independent sample t-test

	Group	N	Mean	Std. Deviation	Std. E Mean	T	Df	Sig. (2-tailed)	Mean Difference
Pre-test	Experimental	41	12.189	3.21	0.424				
	Control	39	12.211	2.54	0.521	0.232	78	0.712	0.15
Post-test	Experimental	41	20.2102	3.88	0.595				
	Control	37	12.4533	2.51	0.430	-0.287	78	0.00	7.35

An independent samples t-test was used to evaluate the experimental and control groups' critical reading skills prior to the intervention. The control group (M=12.211) and the experimental group (M=12.189) showed similar mean scores, according to the results shown in Table 3. The analysis produced a t-value of 0.232 and a p-value of 0.712, both of which are higher than the

predefined alpha threshold of 0.05. These results verify that there was no statistically significant difference between the groups at the beginning of the trial (t(80)=0.232, p=>.05). Accordingly, the pre-test findings establish that members in both the experimental and non-experimental groups possessed comparable prior knowledge and skills in responding to critical reading questions derived from a passage. With a p-value of .712 well above the conventional significance threshold of .05, the results indicate that the two groups were statistically equivalent before the intervention commenced. An intervention was carried out over a ten-week period to investigate whether explicit training in critical reading skills improves students' reading performance. A detailed account of the t-test results examining the intervention's effect will be provided in the subsequent section.

However, according to the post-test results, which are shown in Table 3, there is a statistically significant difference between the experimental and control groups, with the experimental group scoring much higher on the critical reading assessments. The differences were confirmed by an independent samples t-test (t(71)=0.287, p<0.001), indicating that the intervention had a significant positive effect on students' critical reading performance. These findings suggest that overt instruction in critical reading strategies can effectively enhance students' higher-order thinking skills, thereby accounting for the experimental group's superior post-test performance relative to the control group.

Table 4

Descriptive statistics of reading performance on the control and experimental group students' pre-post tests

Test	Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower	Upper		
Pre-test	Control	39	12.211	3.1355	0.52854	10.2345	12.4424	6	18
Post-test	Control	39	12.4533	2.61737	0.9459	10.8147	12.8211	8	18
Pre-test	Experience	41	12.189	3.21	0.424	10.8236	12.9602	6	19
Post-test	Experience	41	20.2102	3.88	0.595	18.1995	20.6113	11	24

As shown in Table 4, following the intervention, an analysis of the control group's performance showed no discernible difference between their pre-intervention and post-intervention mean scores on the critical reading measure, although the descriptive statistics showed a slight variation in the mean scores (control prior to the intervention: M=12.211; non-treatment subsequent to the intervention; M=12.453). On the other hand, as indicated in Table 4, from the experimental group result, the descriptive statistics after the intervention revealed a substantial difference in mean scores. The group being investigated had a mean of 12.1879 before the intervention and 20.2102 after it.

Table 5

Paired sample t-test of reading achievement on the control group students' pre-post test

Test	Group	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference
Pre-test	Control	39	12.211	3.1355	0.52854				
Post-test	Control	39	12.4533	2.61737	0.9459	0.235	38	0.712	0.23

It indicates that the experimental group's mean scores on the critical reading post-test increased significantly. Additionally, the pre-test standard deviations (std=3.21) and post-test (std=3.88) differ

significantly, despite the fact that the standard errors are very comparable.

A paired sample t-test was used to compare the pre- and post-test results of students in the non-experimental group to determine whether there was a statistically significant difference. Table 5 displays the pre- and post-test mean scores for the control group, and the findings indicate that t(38)=0.235 and p=0.712, which is higher than the 0.05 significance level. This suggests that there is no statistically significant difference between the control group's mean pre- and post-test scores. The absence of difference may be explained by the fact that students in the control group had previously completed reading sessions employing a consistent learning strategy. During the pre-reading, while-reading, and post-reading stages after the intervention, the control group was not permitted to engage in critical reading activities. Consequently, there was no improvement in their post-test performance on critical reading questions. The pre-test and post-test mean scores barely differed, as indicated by the tiny effect size of 0.05. This implies that because the control group was not exposed to the targeted educational technique, their critical reading skills did not grow.

Table 6

Paired sample t-test of reading performance outcomes of the experimental pre-post test

	Group	N	Mean	Std. Deviation	Std. Error Mean	T	Df	Sig. (2-tailed)	Mean Difference
Experimental Group	Pre-test	41	12.189	3.21	0.424	-0.353	40	0.00	7.756
	Post-test	41	20.2102	3.88	0.595				

A paired sample t-test was performed to evaluate how effectively the instruction in critical reading strategies improved students' performance in critical reading. The paired sample t-test results displayed in Table 6 demonstrate t(40)=0.353, p=0.000 with p<0.05. This effect shows a statistically significant variation between the pre-test and post-test scores, which can be linked to the applied involvement. Consequently, it can be inferred that instruction in critical reading strategies contributes to students achieving higher scores in reading comprehension assessments related to critical reading.

According to Cohen (2018), it is also reasonable to interpret the results of the partial eta squared concerning the achievements of participants in the critical reading instruction group. The improvement in critical reading achievement scores was substantially greater for learners in the treatment group compared to those in the non-treatment group. Furthermore, these findings appear to corroborate the principles of reading instruction theory, which posits that learners who actively participate in reading activities are better prepared to comprehend a given text, as they learn to identify which strategies to employ, how to apply them, when to use them, and the rationale behind their use. This suggests that when learners are engaged in reading activities through critical reading instruction, they are likely to appreciate the reading materials appropriate for their grade level, which may serve as an indication for the observed improvements in the post-test results of participants in the experimental group.

Critical reading sub-skills analysis

An analysis of the general critical reading pre-test and post-test was presented in the initial section. These assessments required students to engage with a reading passage and answer questions that were specifically constructed to measure their proficiency in various critical reading sub-skills. These questions were designed according to the manner in which students process their answers, specifically targeting those that necessitate higher-order thinking skills. In order to determine if there

was a statistically significant difference in the performance of students in the treatment and control groups with regard to critical reading tasks that require higher-level thinking, a total of twenty-five questions covering several sub-skills of critical reading were created, both prior to and following the intervention. Among these seven questions, which prompted students to utilize their analytical skills, five questions assessed their comprehension of the text; of the total questions, seven required students to draw inferences from the text, while a further six assessed their capacity to critique the author's arguments and ideas presented in the passage.

Table 7

Mean scores of the control and experimental groups' descriptive statistics for reading performance

Sub skills	No. of items	Experimental				Control			
		Before treatment		After treatment		Before treatment		After treatment	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev	Mean	Std. Dev.
Comprehend	5	2.82	0.87	3.36	1.05	2.68	0.63	2.81	0.61
Analysis	7	3.47	0.77	5.5	1.03	3.57	0.68	4.12	0.88
Inferences	7	3.58	0.94	6.48	1.31	3.54	0.89	3.73	0.87
Evaluation	6	1.69	0.76	4.21	0.59	1.1	1.11	1.68	0.74

A comparison of the experimental and group scores on questions demanding higher-order thinking is shown in Table 7. The four critical reading sub-skills that are meant to promote advanced cognitive involvement are compared in the table. The experimental group's pre-intervention average score for all four themes (MBIT: Mean before Intervention for Treatment) was 3.21, which was quite similar to the control group's pre-intervention average of 3.25 (MBINT: Mean before Intervention for Control).

Table 8

Independent Samples Test of reading performance results on CR sub-skills of the treatment and control groups.

Sub skills	No. of items	Test	t-test for Equality of Means						
			T	Df	Sig. 2-tailed	Mean Difference	Std. Error Difference	95% Confidence Interval	
								Lower	Upper
Comprehension	5	TBI	5.69	78	0.402	0.12664	0.16857	-0.1458	0.6210
	5	TAI	-1.78	78	0.005	0.57838	0.18377	0.1797	0.8775
Analysis	7	TBI	-0.67	78	0.413	-0.14363	0.19382	-0.5419	0.2643
	7	TAI	-1.68	78	0.02	1.56602	0.19154	1.10721	2.1410
Inferences	7	TBI	-.032	78	0.891	-0.0232	0.17407	-0.4734	0.4326
	7	TAI	-0.19	78	0.00	2.7196	0.28723	1.1803	0.2168
Evaluation	6	TBI	0.791	78	0.35	0.1583	0.14877	-0.3197	0.5389
	6	TAI	-2.28	78	0.00	2.36525	0.117823	1.88014	2.0010

However, the experimental group's mean score (MAIT: Mean after Intervention for Treatment) increased significantly after the intervention, reaching 4.97, significantly higher than the control

group's post-intervention mean (MAINT: Mean after Intervention for Control) of 3.31. The calculated mean scores for the control group's four themes were 3.25 (MBINT) on the pre-test and 3.31 (MAINT) on the post-test, suggesting a modest improvement following the intervention. Additionally, the experimental group improved, with mean scores increasing from 3.21 (MBINT) prior to intervention to 4.97 (MAINT) following it. It was still unclear whether the observed difference between the two groups was statistically significant, even though both groups showed progress. To remove this uncertainty, the researcher employed a t-test analysis to determine whether there was a statistically significant difference between the control and experimental groups.

The findings of an independent samples t-test comparing the experimental and control groups' performance on pre-test and post-test measures across a range of reading comprehension sub-skills requiring significant cognitive involvement are shown in Table 8. Four thematic categories corresponding to distinct higher-order reading skills were identified, and corresponding items were developed to assess each sub-skill. This design aimed to determine whether participants in both groups were capable of effectively responding to the questions posed.

Among the items intended to evaluate students' readiness to engage with cognitively demanding tasks through critical reading, a set of comprehension questions was included. These items assessed the ability to understand and interpret the meanings of sentences and concepts within the text (Them1, comprising five multiple-choice questions).

To address the specific research question concerning targeted sub-skills, an independent sample t-test was conducted (Table 8). The results revealed statistically significant differences between the control and treatment groups across several critical reading sub-skills. Specifically, for comprehension questions, the analysis yielded t=1.78, df=78, p= 0.005, for analysis questions, t=1.68, df=78, p= 0.023; and for inferences and evaluation questions, t= 2.28, df=78, p=0.00. These findings indicate a statistically significant divergence in student performance on tasks requiring comprehension, analysis, inference, and evaluation skills integral to critical reading. Further analysis compared pre- and post-treatment performance within each group. For comprehension questions, the results prior to the intervention showed t=5.69, df= 78, p=0.402, while post-intervention results demonstrated t=0.675, df=78, p=0.05. Regarding analysis questions, pre-treatment scores revealed t=0.675, df=78, p= 0.413, compared to post-treatment scores of t=1.68, p=0.02. These outcomes underscore a notable improvement in comprehension and analytical abilities among students in the treatment group relative to the control group, thereby enhancing learners' capacity to understand questions and critically analyze textual information.

Discussion

The findings presented above inform the subsequent discussion, and this discussion interprets the data and explores its implications. Ultimately, this will lead to a set of conclusions and actionable recommendations. To ensure the comprehensive assessment of critical reading competencies, it is essential to examine students' inferential skills, specifically, their capacity to move beyond clearly stated information and formulate reasoned conclusions or predictions based on textual evidence (Table 8). Additionally, students' analytical abilities should be evaluated, focusing on their proficiency in deconstructing a text into its fundamental components and understanding how these elements combine to construct meaning. Furthermore, an examination of textual structure, compositional elements, and specific details is necessary to uncover underlying themes, patterns, and interrelationships within the text. Finally, learners' evaluation skills must be assessed, particularly their ability to determine whether the ideas presented in a passage are substantiated by adequate evidence (six items).

Similarly, pre-test scores were subjected to an independent samples t-test to assess inferential abilities before the intervention (Table 8). The

experimental and control groups did not differ statistically significantly, according to the results ($t(78)=0.032$, $p=0.891$). However, a post-test analysis after the intervention showed a statistically significant difference between the two groups ($t(78)=0.26$, $p<0.001$), indicating that the treatment improved students' capacity to draw conclusions from reading passages. Similarly, pre-test comparisons for evaluative skills showed that the groups were statistically equivalent before the intervention, $t(78) =0.791$, $p =0.35$. In contrast, post-test results demonstrated a statistically significant difference between the experimental and control groups, $t(78) =2.28$,<0.001, indicating that the intervention enhanced students' evaluative abilities in response to reading texts.

In the assessment conducted after the intervention, the learners in the experimental group exhibited improved performance on the critical reading questions, which were designed to foster higher-level thinking skills such as comprehension, inference, analysis, and evaluation of the text. This enhancement can likely be linked to the critical reading instruction that the experimental group received during the intervention, which provided them with essential skills. As a result, they were able to extract answers directly from the reading passage, in contrast to other students who may not have participated in higher-level thinking. Overall, a statistically significant difference was identified between the mean scores of the control and experimental groups in response to questions that required higher-order cognitive processing. These items specifically assessed students' ability to identify main ideas, evaluate textual elements or genre conventions, and generate responses that could only be derived through inferential reasoning. The findings suggest that such tasks demanded more than literal comprehension, engaging learners in deeper analytical and interpretive processes.

The observed disparity in performance indicates that learners in the experimental group performed better than their counterparts in the non-treatment group following the instructional intervention. This improvement reflects the potential efficiency of the treatment in enhancing students' critical reading abilities. By targeting skills such as inference generation and textual evaluation, the intervention appears to have fostered a more sophisticated engagement with reading materials. This finding agrees with the result that critical reading instruction can bring improvement, aligning with a substantial body of recent research. Amoush and Khodair (2025) found that a critical reading instructional approach considerably enhanced students' reading understanding skills compared to the conventional technique.

Consequently, the results underscore the value of incorporating instructional strategies that promote inferential and evaluative thinking in reading comprehension tasks. The enhanced performance of the experimental group suggests that clear attention to these sub-skills can lead to measurable gains in students' ability to interact critically with texts. These findings carry pedagogical implications for curriculum design and instruction practice, particularly in contexts aiming to cultivate advanced literacy skills.

In general, from this study result, while the students were asked to identify primary ideas, assess the text or genre, and provide answers that could only be inferred from the text, there was generally a statistically significant difference in the average mean score generated for experimental groups. This suggests that after the intervention, the students in the experimental group performed better.

CONCLUSIONS

Based on the aforementioned quasi-experimental study, it is possible to draw the following conclusion in relation to the results of the research conducted. In the post-intervention assessment, among the four skills chosen for the inquiries that require higher-order thinking, the participant from the experimental group exhibited enhanced performance on the critical reading questions aimed at facilitating students' abilities to comprehend, infer, analyze, and evaluate the text. This improvement can be attributed to the fact that the students in the treatment group obtained vital skills during the critical reading instruction provided

through the intervention. They were able to obtain answers directly from the reading passage, which the other students might not have been able to achieve through higher-order thinking.

In the post-intervention assessment, which specifically targeted four skills through demanding higher-order thinking, the participants from the treatment group demonstrated marked progress in outcome on critical reading questions. These questions were designed to facilitate and measure advanced abilities: comprehending explicit information, inferring meaning, analyzing textual structure and argument, and evaluating the validity and perspective of the content. This enhanced performance stands in contrast to the outcomes observed in the control group and can be directly attributed to the structured critical reading instruction received during the intervention period.

The intervention equipped the experimental group with vital, transferable skills, such as annotation, sourcing, and logical reasoning, that enabled a more strategic and depth-oriented engagement with the texts. Consequently, these students were often able to efficiently locate and synthesize answers directly from the passage, a task that relied on their newly honed analytical competence. In contrast, students without this specific training appeared less able to navigate the same textual complexity, suggesting that the higher-order thinking required for such tasks was not as readily accessible to them.

In general, a statistically significant difference was observed in the average mean score computed for the two groups when responding to questions that required students to identify main ideas, assess text, and provide answers that could only be derived beyond the text, indicating that the learners in the treatment group revealed improved outcomes compared to the intervention. Thus, the experimental group's success was not merely a matter of improved information retrieval but the result of a developed capacity to interact critically with the text. The intervention provided the necessary framework to transform reading from a passive skill needed to excel in assessments that move beyond basic recall to challenge comprehension, inferences, analysis, and evaluation.

Recommendations

Based on the above results, it is advisable for subject area teachers to offer their students additional opportunities to practice critical reading strategies, rather than relying solely on a limited set of strategies. Broadening the scope of critical reading practice empowers students to think further than surface-level understanding and to cultivate the intellectual flexibility essential for academic success and lifelong learning. It is also helpful to recommend certain areas that need more research. Examining the extent to which secondary school students use critical reading techniques is important. Research in this area is thought to have the potential to enhance reading abilities. Furthermore, it makes sense to support a national survey study to determine how much critical reading techniques can improve learners' reading skills.

CRediT Authorship Contribution Statement

Yonas Emiru: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, and Writing-Original Draft.
Dagne Turunhe: Supervision and Resources. **Eyerusalem Tadesse:** Validation and Writing-Reviewing and Editing.

Declaration of Competing Interest

There was no conflict of interest among the authors.

Ethical Approval

This study received approval from the Graduate Council of Postgraduate Programs (CPGP), Wollega University, in April 2022, and all of the participants understood the objective of the study and took part voluntarily. Participants' consent was obtained prior to data collection; their anonymity and confidentiality were maintained.

Data Availability Statement

The data used in this research are available upon request.

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