



Research Article

MAPPING MEANING: ELEVATING LITERARY ANALYSIS WITH COGGLE'S VISUAL TECHNIQUES AMONG GRADE 10 LEARNERS

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Abstract

This action research explored the effectiveness of Coggle's Visual Mapping Technique in enhancing Grade 10 students' analytical skills in critiquing literary selections. The study was conducted in a public secondary high school in Compostela, Davao de Oro, Philippines, and involved 80 students divided into experimental and control groups using cluster sampling. The experimental group was taught using the Coggle Visual Mapping Technique, while the control group received traditional instruction. Pre- and post-tests assessed students' levels of critical thinking, interpretation, and evaluation. Findings revealed that both groups improved their analytical skills after the intervention. Statistical analysis, including t-tests and Cohen's *d*, indicated a large effect size, validating the impact of visual mapping on enhancing students' literary analytical skills. The experimental group showed a significant change ($t = -14.71, p < .001$) with a very large effect size (Cohen's $d = 2.64$). Similarly, the control group also demonstrated a significant change ($t = -14.80, p < .001$), with a very large effect size (Cohen's $d = 2.21$). The findings support integrating visual learning tools, such as Coggle, into literature instruction to foster critical thinking, interpretation, and evaluation. This research contributes to pedagogical strategies aligned with 21st-century learning, promoting creativity, collaboration, and critical analysis in the English classroom. To extend its impact, the study recommends orientation on the use of Coggle in enhancing reading analysis, training workshop, pilot integration in reading lessons, monitoring and student feedback, evaluation of impact on analytical skills, and institutionalization and expansion.

Keywords: *Coggle, Critical Thinking, Literary Analysis, Literary Criticism, Visual Mapping*

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INTRODUCTION

In contemporary language education, developing students' literary analysis skills is a key objective, as analytical thinking significantly enhances semantic reading and the understanding of literary texts. Nevertheless, students often encounter challenges in literary interpretation, particularly in recognizing literary devices and authors' techniques (Podavets & Gerok-Yerzhanova, 2021). As a result, a lack of strong analytical skills can hinder effective appreciation of literature (Erniwati et al., 2023). Moreover, engaging with characters, plots, and themes fosters critical and interpretative abilities and lays the foundation for academic success and lifelong learning. Therefore, teachers play a fundamental role in addressing these challenges by creating active learning environments and implementing strategies encouraging analytical engagement with texts (Kovpik, 2023).

In Indonesia, large English classes face challenges such as making inferences, identifying main ideas, retaining details, understanding vocabulary, and locating references (Istiqomah et al., 2023). Similarly, students struggle with text analysis in Arabic-language education, which affects understanding and engagement (Hadi et al., 2023). Furthermore, Safura and Helmanda (2020) highlight similar issues among students, noting analytical difficulties, vocabulary limitations, and ineffective reading strategies.

The study by Idulog et al. (2023) identifies significant challenges in Filipino students' reading abilities, particularly in analytical skills, underscoring the need for targeted interventions to improve literacy. Correspondingly, Cabural and Infantado (2023) report low analytical skills, especially in inferential and evaluative skills, among high school students, reflecting broader literacy issues. Adorador (2024) notes that the Philippine education system continues to struggle with ongoing issues and requires reform, as highlighted by the PISA outcomes and the established assessment framework.

Gulo and Deloy (2022) highlight the struggles of high school students with literary criticism in Davao del Norte, noting difficulties in applying critical approaches effectively. Similarly, Colegado (2024) reports challenges in critical analysis among students in Davao Oriental. Deluao et al. (2022) further reveal that high school students in Davao City face issues with literary interpretation and information retention, hindering academic progress.

Developing students' literary analysis abilities remains difficult, as many students struggle to identify literary devices, comprehend themes, and apply critical approaches to reading texts. Visual mapping tools like Coggle are a viable method because they help students organize ideas, visualize relationships between literary themes, and increase analytical thinking. Given the continuous challenges experienced by students in literary interpretation and critical analysis, there is an urgent need to investigate novel, technology-supported ways that can increase students' involvement and competency in literary analysis.

This research addressed a significant gap in current educational methodologies by integrating visual mapping tools to enhance students' text analysis. While existing studies focus on traditional text-based approaches, they lack research on tools like Coggle. This study explored how Coggle's Visual Mapping Technique can help students connect and synthesize ideas, potentially developing their analytical skills and their ability to interpret relationships and meanings in literature.

The current study examined the effectiveness of the Coggle Visual Mapping Technique in enhancing secondary students' literary analysis and critique skills. Additionally, it compared Coggle's Visual Mapping Technique with standard teaching strategies to assess its relative impact on student learning. This research endeavor aligned with national educational policies and standards emphasizing the integration of technology and the development of 21st-century competencies, such as critical thinking, problem-solving, and digital literacy.

METHODS

Research Design

This study examined how well Coggle's Visual Mapping Technique helped Grade 10 students develop analytical skills in literary criticism. Using a quasi-experimental design, students were tested before and after the technique was implemented, with one group using the visual mapping method and another serving as a control group. This approach helped determine if the visual mapping strategy effectively enhanced students' ability to read critically and analyze literary works. Quasi-experimental designs were used more frequently to balance internal and external validity when implementing interventions (Handley et al., 2018). In this study, two pre-existing groups of students were identified as experimental and control groups. The experimental group participated in an intervention using Coggle for visual mapping to enhance their analytical skills. In contrast, the control group continued their standard learning activities without the Coggle intervention.

Research Locale and Respondents

The study was conducted at a public secondary institution in Compostela, Davao de Oro, Philippines. The study used cluster sampling, selecting intact groups from the target population. Cluster randomized trials were ideal when individual randomization was impractical, allowing interventions to be applied to groups while measuring individual effects. A pretest was administered to Grade 10 students, and sections with the lowest mean scores, which showed no significant differences, were designated as the experimental and control groups to ensure comparable baseline knowledge levels.

The final sample included 80 students from the different groups: 47 in the control group and 33 in the experimental group, with a mix of high- and low-performing students in each group to comprehensively evaluate the intervention's effectiveness. Practical considerations, such as classroom capacity and resources, also guided the selection of the sample size, ensuring the effective implementation of Coggle's Visual Mapping Technique in the experimental group.

The study used total enumeration, which included all officially enrolled students in the specified sections. Although the groups had different numbers of participants, the statistical analysis remained valid. Both classrooms were diverse, with a mix of high- and low-performing students in each group, allowing for a more thorough assessment of the intervention's impact across a range of student performance levels.

Research Instrument

To assess Grade 10 students' literary analysis skills and the impact of Coggle's Visual Mapping Technique, a 40-item multiple-choice test was administered (12 items for critical thinking, 17 items for interpretation, and 11 items for evaluation). This test evaluated students' understanding and application of literary analysis concepts, particularly their ability to interpret texts using Coggle's Visual Mapping Technique. The questions were aligned with the Grade 10 curriculum for the third quarter, ensuring they addressed relevant educational standards and learning objectives. The test covered a range of complexity, from foundational knowledge to higher-order critical thinking skills, providing a comprehensive assessment.

The test underwent validation by experienced English educators to ensure its content validity, clarity, and appropriateness. Feedback from the validators guided revisions to refine the instrument and improve its effectiveness for evaluating students' literary analysis skills.

The test scoring procedure awarded 1 point per correct answer, resulting in a total score of 40. The questions were specifically designed to assess students' ability to analyze texts through various literary lenses, including their understanding and application of perspectives such as formalism, feminism, Marxism, historical criticism, and reader-response critical approaches. These questions evaluated various skills, such as identifying literary elements, interpreting themes, analyzing the author's technique, and applying critical lenses to analyze text structures and meanings. The total score was converted into a qualitative assessment using a grading scale tailored to evaluate students' analytical skills through these perspectives.

Data Gathering Procedure

The questionnaire used in this study was designed and developed by the researcher to closely align with the research's unique objectives and requirements. The research instruments underwent rigorous validation procedures. The researcher initiated this process by formally requesting accomplished professionals to serve as expert validators. These experts critically examined the research instruments and provided validation certificates, establishing the questionnaires' content validity and reliability.

The next phase involved obtaining institutional approval through the Research Ethics Committee (REC). The researcher submitted the proposal for review and, upon approval, received a clearance form authorizing the study. Afterward, the researcher distributed and collected informed assent forms from participants' parents or guardians, administered pretest questionnaires to establish baseline data, implemented the intervention, and conducted a post-test assessment. The process concluded with data compilation and analysis, ensuring ethical standards, research integrity, and a thorough evaluation of the intervention's effectiveness.

Pre-intervention. Implementing the Coggle Visual Mapping Technique began with assessing students' needs through classroom observations, diagnostic assessments, and informal interviews to identify their challenges in literary analysis and critical thinking. These preliminary needs assessments provided a strong foundation for the intervention and ensured its relevance to the learners' context. In preparation for the intervention, the researcher also designed and prepared instructional materials, including lesson plans aligned with the curriculum competencies. These lesson plans ensured that both the control and experimental groups received equitable learning experiences, with the experimental group receiving instruction integrated with Coggle Visual Mapping Technique. This alignment ensured that learning objectives were met while assessing the intervention's effectiveness in enhancing students' analytical skills.

During Intervention. The comprehensive two-week intervention was strategically designed to enhance students' reading comprehension and analytical skills in literary critique by systematically using the Coggle Visual Mapping Technique. Each 45-minute session adhered to a structured approach that facilitated effective learning and engagement. The intervention emphasized individual and collaborative activities, in which students worked together to develop their understanding of various literary approaches and to critically analyze texts. Each session incorporated Coggle's Visual Mapping Technique to organize and deepen their analysis.

Students were instructed to write an essay about the Coggle map they created. The map provided an outline of the story's events and assisted readers in better understanding how the text represents viewpoints such as Feminism, Marxism, and other literary lenses. Each group was also asked to explain their map to a team leader who then presented their work. Following the presentation, the students wrote their essays by retelling or summarizing the tale based on the structure provided by their map.

Post-Intervention. The evaluation phase of the intervention used a three-tier assessment approach to measure its effectiveness in enhancing students' literary analysis skills. First, a 40-item post-test questionnaire took 45 minutes to complete, assessing students' visual mapping and literary critique proficiency.

This quantitative data was compared with pre-test scores to measure the direct impact of the Coggle Visual Mapping Technique. Next, reflective class discussions were held, during which students shared their insights on the intervention's effectiveness. This qualitative feedback provided valuable data on the learning process.

Subsequently, the intervention's success was evaluated through pre- and post-test comparisons, observations of student engagement, and qualitative feedback. Improvements in analytical skills, as shown in presentations and positive reflections, confirmed the intervention's effectiveness in enhancing students' literary analysis abilities.

Data Analysis

This section outlined the statistical methods employed to analyze the collected data. It aimed to provide a clear understanding of the effectiveness of Coggle’s Visual Mapping Technique on students’ analytical skills in literary criticism. Various statistical techniques were used to evaluate pre-test and post-test scores and assess data variability.

Mean. It was used to determine pre- and post-test scores, providing insights into the overall effectiveness of the intervention on students’ analytical skills in literary criticism.

Standard Deviation. This assessed how closely individual scores clustered around the mean by calculating the SD of the pre-test and post-test scores. A smaller SD after the intervention indicated improved consistency in students’ analytical skills in literary criticism.

Paired t-test. This test determined whether there was a statistically significant difference in the scores within each group, allowing the study to assess the effectiveness of the inquiry-based learning intervention in enhancing students’ analytical skills.

Independent t-test. This was employed to determine whether a statistically significant difference existed in students’ analytical skills, specifically in interpretation, evaluation, and critical thinking, between two groups exposed to different teaching strategies.

Cohen’s d. This was used to measure the effect size, providing insight into the practical significance of the difference in analytical skills between the two groups exposed to different teaching strategies. This helped determine if a difference existed and how much the teaching approach impacted student performance.

Ethical Considerations

This research adhered to the highest ethical standards, prioritizing non-maleficence, justice, and respect for persons. The ethical conduct of this study ensured that participants’ rights were safeguarded throughout the research process and that the study maintained academic and moral integrity.

The study protocol received expedited ethics review upon submission to the Research Ethics Committee of Davao de Oro State College (DDOSC-REC), a PHREB Level II-accredited body. Following a favorable evaluation, the committee granted formal approval (REC Protocol Code: 377-02-2025). Data collection commenced only after this approval was obtained.

RESULTS AND DISCUSSION

Pre-Intervention Level of Analytical Skills

Table 1 below presents the analytical skills of Grade 10 students in critical thinking, interpretation, and evaluation, along with the overall results for both the control and experimental groups prior to the intervention.

Table 1. Pre-Intervention Level of Analytical Skills

| | Experimental Group | | | Control Group | | |
|-------------------|--------------------|-------------|--------------------------|---------------|-------------|--------------------------|
| | Mean | SD | Descriptive | Mean | SD | Descriptive |
| Critical Thinking | 5.29 | 2.61 | Needs Improvement | 5.56 | 2.61 | Needs Improvement |
| Interpretation | 7.42 | 2.64 | Needs Improvement | 7.71 | 3.07 | Needs Improvement |
| Evaluation | 5.42 | 1.73 | Needs Improvement | 5.40 | 1.73 | Needs Improvement |
| Overall | 18.00 | 5.53 | Needs Improvement | 18.71 | 5.53 | Needs Improvement |

The pre-test results reveal that both the experimental and control groups scored within the Needs Improvement category across all assessed areas: critical thinking, evaluation, and interpretation. In critical thinking, the control group slightly outperformed the experimental group ($M = 5.56$ vs. 5.29 ; $SD = 2.61$ for both), though both showed only basic engagement with content. For evaluation, both groups had nearly identical scores ($M = 5.42$ and 5.40 ; $SD = 1.73$), indicating limited ability to

assess literary elements with depth. In interpretation, the control group again had a marginally higher mean ($M = 7.71$ vs. 7.42), but also greater variability ($SD = 3.07$ vs. 2.64), suggesting inconsistent understanding. Overall, the experimental and control groups scored 18.00 ($SD = 5.53$) and 18.71 ($SD = 5.53$), respectively, reinforcing that both had similar baseline abilities and struggled with analytical skills prior to the intervention.

The results show that while both groups struggled with critical thinking, there were differences in how individuals approached problems and reasoning tasks in analyzing a text. Neither group demonstrated advanced or consistent critical thinking skills before the intervention. Research by Verhovtsova et al. (2022) shows that incorporating literary texts in foreign language courses can enhance analytical reading. Literature education also promotes the de-automatized (re)construction of meaning, challenging preconceived notions and fostering critical thinking (Koek et al., 2019).

The pre-test results indicate that the experimental and control groups had similar analytical skills before the intervention, with both falling within the lowest category across variables. This suggests that both groups were still developing higher-order thinking skills necessary for deep literary analysis. In critical thinking, students struggled to formulate well-reasoned judgments or question assumptions within a text, showing limited ability to draw logical inferences or identify patterns in critical analysis. Logic, which focuses on reasoning patterns and their application, is crucial in shaping clear and valid arguments (Peregrin, 2024). Developing these skills helps students organize and express their thoughts more clearly and coherently (Hafidz et al., 2022).

Moreover, both groups struggled to move beyond surface-level comprehension of texts, finding it challenging to identify themes, symbols, and deeper meanings and connect literary elements to broader contexts. This highlights that students were still developing the ability to construct meaning and draw deeper insights, indicating a clear need for targeted instructional support. According to Zachova (2021), while students can classify texts, they often struggle to articulate deeper interpretations, revealing a gap in their analytical skills. Similarly, McDowall (2022) notes that although literary interpretation can be difficult at the primary and intermediate levels, students can enhance their understanding with consistent teacher guidance.

Post-Intervention Level of Analytical Skills

Table 2 presents the post-intervention results, providing a comparison with the pre-intervention data and serving as a basis for evaluating changes in students' analytical abilities, critical thinking, and overall academic performance.

Table 2. Post-Intervention Level of Analytical Skills

| | Experimental Group | | | Control Group | | |
|-------------------|--------------------|-------------|------------------|---------------|-------------|------------------|
| | Mean | SD | Descriptive | Mean | SD | Descriptive |
| Critical Thinking | 10.13 | 1.26 | Very Good | 9.38 | 1.40 | Very Good |
| Interpretation | 13.61 | 1.76 | Very Good | 12.71 | 1.63 | Very Good |
| Evaluation | 8.65 | 1.23 | Very Good | 8.09 | 1.36 | Very Good |
| Overall | 32.55 | 2.38 | Very Good | 29.80 | 3.39 | Very Good |

The results show that the experimental group outperformed the control group across all areas of analytical skills. In the critical thinking task, the experimental group scored higher ($M = 10.13$, $SD = 1.26$) than the control group ($M = 9.38$, $SD = 1.40$), indicating enhanced reasoning and evaluation abilities. For interpretation, both groups fell into the Very Good range, but the experimental group scored higher ($M = 13.61$ vs. 12.71), suggesting improved ability to draw meaningful insights. In evaluation, the experimental group again led ($M = 8.65$ vs. 8.09), both in the Very Good range, highlighting better judgment and assessment skills. Overall, the experimental group achieved a total mean score of 32.55 ($SD = 2.38$), surpassing the control group's 29.80 ($SD = 3.39$), demonstrating the effectiveness of the Coggle Visual Mapping Technique in significantly enhancing students' analytical performance.

This result underscores the intervention's effectiveness in enhancing students' critical thinking, interpretation, and evaluation abilities compared to the traditional methods used by the control group. Technological tools used in teaching and learning are generally more effective than conventional methods, as they enhance interaction between teachers and students (Shahid et al., 2019). This mapping technique aids students with difficulty in analytical skills. These visual aids support collaborative learning, adapt to individual styles, and promote deeper engagement with content (Maghfirah et al., 2024). Reading is an active, communicative, and interactive skill that fosters understanding, analytical thinking, and personal growth (Pandey, 2023).

The post-test results show that the experimental group significantly outperformed the control group in analytical skills, with marked improvements in critical thinking, interpretation, and evaluation. The Coggle Visual Mapping Technique played a key role by helping students organize ideas, engage in deeper analysis, and evaluate information more effectively. Research supports the role of classroom technology in enhancing reading comprehension and analytical skills (Agasi, 2024), with tools like concept maps fostering analytical and reflective thinking (Teo et al., 2023). Although the control group showed some gains, their progress was less noticeable, emphasizing the effectiveness of the intervention. These findings underscore the importance of differentiated instruction, offering structured support for struggling learners while challenging advanced students with higher-order tasks (Omar & Mohamed, 2025).

The impact of the intervention extended beyond just test scores. Students in the experimental group became more engaged in class discussions, participating with greater confidence, reflecting growth in their analytical skills. As Dogani (2023) noted, active learning boosts motivation. Through the Coggle Visual Mapping Technique, students demonstrated an improved ability to assess information from different angles, critically analyze arguments, and offer more thoughtful, structured responses. According to Nurmala et al. (2023), technology also aids learners by enhancing their ability to process and understand content, leading to deeper learning and quicker comprehension. This shift in behavior indicates that the technique effectively promoted academic skill development and a more active learning process. Furthermore, modern technologies like interactive software and online tools have been shown to increase student engagement and improve learning more effectively than traditional methods (Qizi, 2024).

Difference of Students' Analytical Skills Before and After the Intervention

Table 3 compares students' analytical skills before and after the intervention, highlighting their performance in critical thinking, interpretation, and evaluation. It provides a detailed statistical foundation for analyzing the effects of the implemented teaching strategy on students' analytical development.

Table 3. Difference of Students' Analytical Skills Before and After the Intervention

| | <i>t</i> | <i>df</i> | <i>p</i> | Cohen's <i>d</i> | Interpretation |
|--------------|----------|-----------|----------|------------------|----------------|
| Experimental | -14.71 | 30 | <.001 | 2.64 | Large Effect |
| Control | -14.80 | 44 | <.001 | 2.21 | Large Effect |

This reveals differences in the students' analytical skills between the experimental and control groups before and after the intervention. The results, including the *t*-values, *p*-values, and Cohen's *d*, suggest that both groups substantially improved their analytical skills. However, the extent of improvement varied across groups.

For the experimental group, the t-test yielded a result of $t(30) = -14.71$, $p < .001$, with a large effect size of Cohen's $d = 2.64$. The negative t-value indicates that the post-intervention mean score was significantly higher than the pre-intervention mean score. This suggests that implementing the Coggle Visual Mapping Technique had a substantial impact on students' analytical skills. The large effect size ($d = 2.64$) further underscores the strength of the intervention, showing that the Coggle technique significantly improved the student's ability to think critically, interpret, and evaluate the material they engaged with. The intervention led to a noticeable improvement in the student's performance, particularly in organizing and understanding complex information through visual

mapping.

Conversely, the control group also exhibited significant improvements, with a t-test result of $t(44) = -14.80, p < .001$, and a large effect size of Cohen's $d = 2.21$. Similarly, the negative t-value indicates that the post-intervention mean score was higher than the pre-intervention mean score, suggesting that the control group also experienced a notable increase in their analytical skills. The students in the control group followed the traditional method, which, while effective, may not have had the same targeted impact as the Coggle Visual Mapping intervention. Nevertheless, the large effect size ($d = 2.21$) indicates that traditional teaching methods substantially enhanced students' critical thinking, interpretation, and evaluation skills. The decision to reject the null hypothesis for this group also confirms the effectiveness of traditional approaches. However, the smaller effect size suggests a less impactful outcome than the experimental group.

The experimental group demonstrated a marked improvement in their analytical skills after the implementation of the Coggle Visual Mapping Technique. The significant results and large effect size indicate that the students' ability to organize, interpret, and critically analyze literary texts was strengthened after the intervention. The Coggle Visual Mapping Technique helped students structure their thoughts more clearly, identify relationships between key ideas, and engage more deeply with complex information. Its visual and organizational approach supported a clearer understanding of concepts and fostered the development of higher-order thinking skills.

Fostering critical thinking in students requires integrating it into the curriculum, transforming teaching methods, innovating assessments, and optimizing learning environments. Curriculum integration ensures critical thinking is practiced across subjects, while teacher transformation equips educators to guide deeper inquiry and reflective thinking. Assessment innovation evaluates students' ability to analyze, evaluate, and apply information beyond content knowledge. Hazaymeh and Alomery (2021) found that visual mind-mapping strategies enhance critical thinking and reading comprehension, while digital mind-mapping software improves productivity and information organization (Bhattacharya & Mohalik, 2020). Additionally, optimized learning environments, both physical and digital, support cognitive development and foster analytical skills (Xie, 2024).

The results indicate that both the Coggle Visual Mapping intervention and traditional methods effectively enhanced students' analytical skills. However, the Coggle group demonstrated greater improvement, suggesting that visual mapping offers distinct advantages for deeper analytical thinking. Aparicio et al. (2023) highlight how graph visualization can uncover complex textual patterns that are often missed in conventional reading. This supports the value of Coggle in encouraging critical engagement with content. Additionally, digital mind mapping tools improve productivity, organization, and information retrieval in educational settings (Bhattacharya & Mohalik, 2020).

Post-Intervention Comparison of Students' Level of Analytical Skills Between Experimental and Control Groups

Table 4 presents the post-intervention comparison of students' analytical skills between the experimental and control groups. It outlines the statistical values used to assess the difference between the two groups, including the t-value, degrees of freedom, p-value, and effect size, providing a basis for interpreting the intervention's impact on students' analytical performance.

Table 4. Post-Intervention Comparison of Students' Level of Analytical Skills Between Experimental and Control Groups

| | <i>t</i> | <i>df</i> | <i>p</i> | Cohen's <i>d</i> | Interpretation |
|--------------------------|----------|-----------|----------|------------------|----------------|
| Post-test | | | | | |
| Experimental- Control | 3.90 | 74 | <.001 | 0.91 | Large Effect |

The comparison of post-test results presented in Table 4 reveals a statistically significant difference in students' analytical skills, with a t-value of 3.90, $df = 74$, and $p < .001$, indicating the intervention's positive impact. The large effect size (Cohen's $d = 0.91$) confirms that students exposed

to the Coggle Visual Mapping Technique performed significantly better than those who received traditional instruction. The higher mean score of the experimental group suggests that visual mapping helped students think more critically, interpret information more deeply, and evaluate their ideas more effectively. These results align with Bustamante's (2022) emphasis on critical lenses for deeper analysis and Vodyakha et al.'s (2020) findings on the role of visual-spatial tools in enhancing literary analytical skills.

Students in the experimental group, who were exposed to the Coggle Visual Mapping Technique, achieved higher scores in analytical skills than those in the control group who received traditional instruction. The findings of this study support existing research on the effectiveness of mind mapping in education. Luangkrajang (2022) emphasized the need to enhance analytical, organizational, and creative thinking in English classrooms. These skills are crucial for engaging with complex texts.

Students often struggled to evaluate literary techniques such as symbolism, metaphor, and narrative structure, demonstrating limited insight into how these elements shape a text's meaning. Their responses frequently lacked strong textual evidence, relying on vague generalizations or unsupported opinions. Without well-reasoned justifications, their evaluations appeared incomplete and unconvincing. Judgment and assessment in literature are conveyed through characters' language and commentary, often reflecting the author's unique perspective (Sukalenko, 2021). Additionally, their ability to interpret the author's intent, such as theme, style, or character development choices, was underdeveloped. Reader response theory builds on this by encouraging students to voice their interpretations, creating a dialogue between reader and text that strengthens critical evaluation skills (McIntyre, 2019).

Furthermore, teaching practices that integrate critical thinking frameworks have been shown to significantly enhance students' ability to evaluate and analyze literary texts. Rahayu et al. (2024) emphasized that mind mapping in English Language Teaching enhances vocabulary, reading comprehension, and writing skills by helping students visualize relationships and recall information more effectively. These findings support the effectiveness and pedagogical soundness of the Coggle Visual Mapping intervention. Moreover, Magner (2021) emphasizes their role in linking texts to personal experiences, enabling creative expression beyond traditional analysis. However, Dong et al. (2021) challenge this, finding no clear advantage in using mind maps during searches, with participants preferring sessions without them.

The comparison of analytical skills between the experimental and control groups after the intervention revealed significant differences in performance. The experimental group showed notable improvement, demonstrating stronger analytical skills, particularly in critical thinking, interpretation, and evaluation. This improvement highlights the positive impact of the Coggle Visual Mapping Technique on fostering critical thinking and a deeper understanding of literary texts. On the other hand, the control group showed more modest progress, reinforcing the effectiveness of visual mapping tools in enhancing students' analytical abilities. Analytical approaches in literature enhance reading comprehension and support the advancement of literary education. These skills are essential for academic success, as they deepen critical thinking and enable analysis of complex texts (Permana et al., 2019).

The intervention was well-aligned with the instructional curriculum, supporting key learning goals. According to Onasanya et al. (2024), technology-based assessment tools can reduce teacher workload and boost student participation when aligned with curriculum objectives. By integrating the Coggle Visual Mapping Technique, the teaching approach reinforced critical thinking, interpretation, and evaluation skills, aligning with curriculum standards. As noted by Fakhri (2020), technology in education helps reduce cognitive load, enabling students to focus on higher-level thinking. This alignment ensured students mastered the content and met essential academic competencies, improving their overall performance.

CONCLUSION

This action research concludes that the large effect size and significant post-test difference highlight the intervention's effectiveness in improving analytical reading skills. Coggle Visual Mapping Technique proved valuable in helping students analyze texts, connect ideas, and enhance comprehension. This result is further supported by Cognitive Load Theory, which explains how visual mapping reduces mental overload by organizing complex information into manageable structures. The Dual Coding Theory of Allan Paivio also supports this approach, emphasizing the integration of visual and verbal inputs to improve learning retention and comprehension. Additionally, Reader Response Theory encourages personal engagement with texts, allowing students to interpret and evaluate content through active participation skills reinforced through mind mapping. Given these theoretical foundations and their practical benefits, integrating visual mapping like Coggle into classroom instruction is strongly recommended.

Given these theoretical foundations and practical benefits, including visual mapping tools like Coggle into classroom training is highly recommended. Coggle mapping strategies can be used into teachers' instructional resources to help students improve their analytical reading and comprehension skills. Furthermore, its regular use, in conjunction with other mapping tools, can improve students' capacity to organize ideas, evaluate texts, and build deeper knowledge.

However, the findings should be evaluated in light of potential confounding factors, such as teacher influence, exposure length, or testing familiarity, which could have contributed to the observed score improvement in both groups.

A limitation of the current study is that the researcher-created and validated test did not go through pilot testing before being administered. Without pilot testing, the instrument's dependability could not be determined by early analyses. Future study could overcome this restriction by conducting pilot tests to investigate and improve the test's dependability.

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Conflict of Interest

The authors declare that there are no potential conflicts of interest—financial, professional, or personal—that influenced the study or its interpretation.

Ethical Statement

The authors declare that approval was obtained from a PHREB Level II-accredited Research Ethics Committee, with REC Protocol Code 377-02-2025.

REFERENCES

- Adorador, S. (2024). The leaning tower of PISA: A critique to the institutionalized concept of assessment. *PUP Education Review (Formerly Education Review)*, 12(1). <https://doi.org/10.70922/zyzxbk69>
- Agasi, K. (2024). Improving critical thinking by using technology in the learning process. *Interdisciplinary Journal of Research and Development*, 11(1 S1), 76. <https://doi.org/10.56345/ijrdv11n1s112>
- Aparicio, J. T., Karatsolis, A., & Costa, C. J. (2023). Network visualization techniques for story charting: The case of a book in Portuguese. In *2023 18th Iberian Conference on Information Systems and Technologies (CISTI)*, 1-6. <https://doi.org/10.23919/cisti58278.2023.10211864>
- Bhattacharya, D., & Mohalik, R. (2020). Digital Mind Mapping Software: A new horizon in the Modern Teaching-Learning Strategy. *Journal of Advances in Education and Philosophy*, 4(10), 400–406. <https://doi.org/10.36348/jaep.2020.v04i10.001>

- Bustamante, J. A. (2022). The teaching of literature: Voices and lenses. *International Journal of Learning Teaching and Educational Research*, 21(4), 205–219. <https://doi.org/10.26803/ijlter.21.4.12>
- Cabural, A. B., & Infantado, E. J. S. (2023). The difficulty of reading comprehension and the proficiency of the grade 10 students of Aloran Trade High School, Philippines. *Journal of Tertiary Education and Learning*, 1(2), 23-29. <https://doi.org/10.54536/jtel.v1i2.1814>
- Colegado, L. R. (2024). Reading difficulties and cognitive development of junior high school learners. *Nexus International Journal of Science and Education*, 1(1). <http://nijse.org/index.php/home/article/view/26>
- Deluao, C. J., Bernal, D. J. E., Padillo, J. B. F., & Lim, R. A. (2022). Improving the reading comprehension of grade 8 learners using 4Rs (read, retell, react, reflect) strategy. *International Journal of Humanities, Art and Social Studies (IJHAS)*, 7(1), 43. Retrieved from <https://tinyurl.com/2te4pwuw>
- Dogani, B. (2023). Active learning and effective teaching strategies. *International Journal of Advanced Natural Sciences and Engineering Researches*, 7(4), 136–142. <https://doi.org/10.59287/ijanser.578>
- Dong, Y., Zhu, S., & Li, W. (2021). Promoting sustainable creativity: An empirical study on the application of mind mapping tools in graphic design education. *Sustainability*, 13(10), 5373. <https://doi.org/10.3390/su13105373>
- Erniwati, E., Mertosono, S. R., & Maghfira, M. (2023). Reading comprehension and literary appreciation: An analysis of students difficulties. *Interference Journal of Language Literature and Linguistics*, 4(2), 254. <https://doi.org/10.26858/interference.v4i2.51863>
- Fakih, H. M. (2020). The relationship between artificial intelligence and reducing the cognitive load of learners. *Zanco Journal of Humanity Sciences*, 24(s5), 481-488. <https://doi.org/10.21271/zjhs.24.s5.34>
- Gulo, J. E., & Deloy, E. D. (2022). Discourse analysis on the critiques of grade 10–world literature students: Approaches to literary criticism in focus. *International Journal of Research Publications*, 110(1), 86-119. <https://doi.org/10.47119/IJRP10011011020223952>
- Hadi, A., Kareem, A., & Al-Abadi, M. (2023). The effectiveness of a proposed strategy based on deconstructive theory in developing the skills of analyzing the literary text in the Department of Arabic Language in the faculties of education. *Journal for Educators, Teachers and Trainers*, 14(2). <https://doi.org/10.47750/jett.2023.14.02.016>
- Hafidz, M., Retnaningdyah, P., Mustofa, A., Setiawan, S., & Purwati, O. (2022). The students' mental process of critical thinking skill analyzing literary work. *JEELL (Journal of English Education Linguistics and Literature) English Departement of STKIP PGRI Jombang*, 8(2), 104-118. <https://doi.org/10.32682/jeell.v8i2.2175>
- Handley, M. A., Lyles, C. R., McCulloch, C., & Cattamanchi, A. (2018). Selecting and improving Quasi-Experimental Designs in Effectiveness and Implementation research. *Annual Review of Public Health*, 39(1), 5–25. <https://doi.org/10.1146/annurev-publhealth-040617-014128>
- Hazaymeh, W. A., & Alomery, M. K. (2021). The effectiveness of visual mind mapping strategy for improving English language learners' critical thinking skills and reading ability. *European Journal of Educational Research*, 11(1), 141–150. <https://doi.org/10.12973/eu-jer.11.1.141>

- Idulog, M., Gadiano, R., Toledo, E., Hermosada, M., Casaldon, H., Mariposa, M., Geron, C., Dequito, E., Genanda, J., Malipot, M., Pentang, J., & Bautista, R. (2023). Filipino students' reading abilities: A note on the challenges and potential areas for improvement. *International Journal of Education and Teaching Zone*, 2(2), 233–242. <https://doi.org/10.57092/ijetz.v2i2.128>
- Istiqomah, S., Indah, R. N., & Aziz, E. N. A. (2023). Difficulties and strategies of learning English reading skills in large classes: A systematic literature review. *Journal of English Language Teaching and Learning (JETLE)*, 4(2), 70–83. <https://doi.org/10.18860/jetle.v4i2.20362>
- Koek, M., Janssen, T., Hakemulder, F., & Rijlaarsdam, G. (2019). Literature education as a school for thinking: Students' learning experiences in secondary literature education. L1 *Educational Studies in Language and Literature*, 19(1), 1-33. <https://doi.org/10.17239/1lesl-2019.19.01.01>
- Kovpik, S. (2023). Development of students' critical thinking abilities through active literary analysis approaches. *Ukrainian Journal of Educational Studies and Information Technology*, 11(1), 26–37. <https://doi.org/10.32919/uesit.2023.01.03>
- Luangkrajang, M. S. (2022). Use of mind-mapping in language learning: A Cognitive approach. *Theory and Practice in Language Studies*, 12(8), 1616–1621. <https://doi.org/10.17507/tpls.1208.18>
- Maghfirah, A. R., Safira, S., & Sabaruddin, S. (2024). Analytical thinking siswa dengan teknologi digital. *Intelektualita: Journal of Education Sciences and Teacher Training*, 13(1). <https://doi.org/10.22373/ji.v13i1.24764>
- Magner, B. (2021). Messy mapping: Activating student lifeworlds through the handmade visual analysis of a literary text. *Journal of Geography in Higher Education*, 46(3), 403–426. <https://doi.org/10.1080/03098265.2021.1926939>
- McDowall, S. (2022). Reading deeply: Interpreting literary texts in primary and intermediate school. *Set: Research Information for Teachers*, 1, 38–45. <https://doi.org/10.18296/set.0216>
- McIntyre, C. J. (2019). The reader, the text, the interpretation: Using reader response to develop critical literacy skills. In *Critical Literacy Initiatives for Civic Engagement* (pp. 29-46). IGI Global. <https://doi.org/10.4018/978-1-5225-8082-9.ch002>
- Nurmala, I., Irianto, S., Franchisca, S., Amsa, H., & Susanti, R. (2023). Technology-enhanced language learning: A meta-analysis study on English language teaching tools. *Journal on Education*, 6(1), 2188–2195. <https://doi.org/10.31004/joe.v6i1.3221>
- Omar, S., & Mohamed, W. N. W. (2025). Exploring cognitive, emotional and psychomotor processes of critical reading skills: A comparative analysis of fluent and novice readers. *International Journal of Research and Innovation in Social Science*, 8(3s), 6150–6164. <https://doi.org/10.47772/ijriss.2024.803459s>
- Onasanya, S. A., Danyaro, A., & Attah, J. O. (2024). Demystifying classroom assessment: unleashing the power of technology tools. *Tunas Jurnal Pendidikan Guru Sekolah Dasar*, 9(2), 124–128. <https://doi.org/10.33084/tunas.v9i2.7328>
- Pandey, S. R. (2023). Reading: An active language learning skill. *Pragyaratna*, 5(1), 99–107. <https://doi.org/10.3126/pragyaratna.v5i1.59276>
- Peregrin, J. (2024). Logic as a science of patterns? *The Journal of Philosophy*, 121(1), 5–25. <https://doi.org/10.5840/jphil202412111>

- Permana, T. I., Hindun, I., Rofi'ah, N. L., & Azizah, A. S. N. (2019). Critical thinking skills: The academic ability, mastering concepts, and analytical skill of undergraduate students. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, 5(1), 1–8. <https://doi.org/10.22219/jpbi.v5i1.7626>
- Podavets, O., & Gerok-Yerzhanova, O. (2021). How to teach students to make complex interpretation of a text. *Тенденции Развития Науки И Образования*, (72-5), 109-112. <https://doi.org/10.18411/lj-04-2021-202>
- Qizi, G. B. B. (2024). Use of modern technologies and their effectiveness in teaching foreign languages. *Journal of Higher Education and Academic Advancement*, 1(9), 60–63. <https://doi.org/10.61796/ejheaa.v1i9.965>
- Rahayu, A., Apriani, R. N., Permata, M. S. A., Ramadhanti, P., & Tarihoran, N. (2024). The use of mindmaps and its effectiveness in ELT: A systematic review. *Formosa Journal of Sustainable Research*, 3(5), 927–944. <https://doi.org/10.55927/fjsr.v3i5.9011>
- Safura, S., & Helmanda, C. M. (2020). The analysis of English Department students' difficulties in Mastering reading text at Muhammadiyah Aceh University. *International Journal for Educational and Vocational Studies*, 2(4). <https://doi.org/10.29103/ijevs.v2i4.2200>
- Shahid, F., Aleem, M., Islam, M. A., Iqbal, M. A., & Yousaf, M. M. (2019). A review of technological tools in teaching and learning computer science. *Eurasia Journal of Mathematics, Science and Technology Education*, 15(11). <https://doi.org/10.29333/ejmste/109611>
- Sukalenko, T. (2021). Verbalization of evaluation in prose and dramatic genres. *The Journal of VN Karazin Kharkiv National University Series Philology*, 89, 59–65. <https://doi.org/10.26565/2227-1864-2021-89-10>
- Teo, C., Wang, X., Tan, S. C., & Lee, J. W. Y. (2023). Enhancing critical thinking in operations management education: a framework with visual-based mapping for interdisciplinary and systems thinking. *Higher Education Pedagogies*, 8(1), 2216388. <https://doi.org/10.1080/23752696.2023.2216388>
- Verhovtsova, O., Ishchenko, O., Kalay, D., & Tikan, Y. (2022). Analytical reading for students-philologists in the english class. *Advanced Education*, 20, 132–142. <https://doi.org/10.20535/2410-8286.259803>
- Vodyakha, S., Vodyakha, Y., & Pogadaeva, D. (2020). Features of the intelligence structure of future digital technology professionals. In *2nd International Scientific and Practical Conference "Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth" (MTDE 2020) (pp. 853-858)*. Atlantis Press. <https://doi.org/10.2991/aebmr.k.200502.139>
- Xie, Q. (2024). Research on strategies for cultivating students' critical thinking skills. *Advances in Social Behavior Research*, 14(1), 15–18. <https://doi.org/10.54254/2753-7102/2024.19127>
- Zachova, A. (2021). The interpretation of literary texts at secondary schools. *European Proceedings of International Conference on Education and Educational Psychology*. 179-184. <https://doi.org/10.15405/epicepsy.21101.16>