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Fostering Critical Thinking in Vocational Accounting Education: A Quasi-Experimental Study of Guided Inquiry Learning

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Abstract: This study aims to investigate the influence of a guided inquiry learning model on students' critical thinking skills in accounting at a vocational high school. This study adopted a quantitative approach using a quasi-experimental pretest–posttest control-group design. The participants consisted of Grade X accounting students at SMKN Grati Pasuruan, Indonesia, that is divided into an experimental and a control group. The experimental group received instruction through guided inquiry learning, while the control group received conventional teaching and learning activities. The data were gathered using a structured written test consisting of case-based essays and short analytical response items designed to assess selected indicators of critical thinking in accounting contexts. Furthermore, the data were analyzed for normality and homogeneity, followed by an ANCOVA test. The results indicate a significant difference in critical thinking between the two groups. Students in the experimental group achieved higher post-test scores (M = 81.74) than those in the control group (M = 77.09). The ANCOVA analysis remarked that the learning model had a significant effect on students' critical thinking skills after controlling for pre-test scores ($F = 7.28$; $p = 0.009$). In addition, the pre-test covariate influenced post-test outcomes ($F = 5.67$; $p = 0.020$). The findings indicate that students who participated in inquiry-oriented instruction showed greater engagement in several activities than those in conventional learning. The study finds that guided inquiry learning is closely associated with students' critical thinking ability in accounting compared to conventional instruction. Students who participated in guided inquiry had improved post-test outcomes, indicating better performance on the assessed analytical and reasoning-based test components. This remark suggests that inquiry-oriented training fosters analytical reasoning and evidence-based problem-solving.

Keywords: critical thinking, guided inquiry learning, vocational high school, accounting students.

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INTRODUCTION

Vocational education is the primary means in Indonesia, as it plays a key role in preparing the younger generation for employment through practical, applicable competencies (Indrawati & Kuncoro, 2021). Vocational high school, also known as SMK, focuses on aligning learning outcomes with workplace requirements. A prior study stated that SMK aims to equip students with relevant skills for industry and the workplace (Pambudi & Harjanto, 2020). Among vocational subjects, accounting is essential because accounting competence applies across multiple employment sectors (Rafiq et al., 2023). Practice-based accounting learning simulates real work situations, so students become accustomed to facing actual problems and making data-based decisions (Al-Dmour et al., 2023; Jimerson & Myers, 2024).

Despite its importance, learning outcomes in accounting education remain inconsistent, and many students obtain procedural knowledge without adequate analytical depth, raising concerns about graduates' preparedness for the

workforce (Giang, 2024). According to the Indonesian National Assessment report, several SMK students have not reached the minimum level of proficiency in reading, writing, and mathematics, which are part of higher-order and analytical thinking skills (Kemendikbudristek, 2023). In addition, a study by Utomo et al. (2022) remarked that the initial analytical skills of accounting vocational school students are indeed low, primarily in transaction analysis and financial statement interpretation.

There is evidence that critical thinking is a key competency for individuals in decision-making and data interpretation (Plummer et al., 2022). A study found that critical thinking is essential in vocational education to support the application of knowledge in specific contexts (Korotaj & Buchberger, 2025). Moreover, Rafiq et al. (2023) stated that accounting education requires analytical reasoning, given the need to interpret financial data and evaluate alternative treatments (Rafiq et al., 2023). Accounting tasks involve either routine calculations or logical reasoning required for problem-solving (Wolcott & Sargent, 2021).

Preliminary studies have stated that inquiry-based learning is associated with the development of analytical reasoning and critical skills (e.g., Ramadani et al., 2021; Arifin et al., 2025). This is because the model centers on student engagement, such as questioning and evidence-based reasoning (Arifin et al., 2025). Compared to the traditional teaching and learning approach, inquiry-based learning provides better development of the analytical and decision-making skills needed in accounting courses (Khasawneh et al., 2023; Thomas et al., 2025). Later, prior investigations also highlighted the advantages of inquiry-based learning, including higher student engagement in the classroom (e.g., Gillies, 2023; Sam, 2024). Indeed, active participation and confidence during classroom teaching and learning activities also increase when inquiry-based learning is elaborated (Kožuchová et al., 2023; Wen et al., 2023).

In this study, inquiry-based learning takes the form of guided inquiry, in which teachers provide structured guidance throughout the learning process. In addition, guided inquiry suits SMK contexts, given variation in prior knowledge and academic readiness (Hamdan et al., 2022). In addition, it is relevant because guided inquiry can help students analyze transaction data, classify information, and draw conclusions through logical reasoning, thereby supporting deep conceptual understanding, which is essential in accounting courses in SMK (Inderanata & Sukardi, 2023; Edeh et al., 2025). Furthermore, a study noted that inquiry-based learning combines structured guidance with active problem-solving, stimulating students to develop both conceptual and practical accounting skills (Spernes & Afdal, 2023).

Despite recognition of the importance of inquiry-based learning and critical thinking, empirical evidence in vocational accounting education remains limited. Studies have reported improvements in critical thinking skills in mathematics and science classrooms through inquiry-oriented instruction (Andrews-Larson et al., 2021; Gómez & Suárez, 2020; Kotsis, 2025). Other investigations examined instructional models that promote engagement and conceptual learning to foster critical thinking (Nguyen et al., 2024; Din, 2020). In addition, the studies concerning accounting education focused on assessment outcomes, learning media, or conceptual mastery rather than instructional approaches (Rafiq et al., 2023). Later, research conducted at the university level dominates the existing literature (e.g., Arifin et al., 2025; Carracedo, 2025; Li & Fwu, 2025), while a paucity of evidence remains in vocational education settings.

In addition, prior investigations have noted that students' initial analytical skills are indeed low, particularly in transaction analysis and financial

statement interpretation (Utomo et al., 2022). Indeed, analysis of higher-order thinking skills test items in financial accounting subjects revealed that a considerable proportion of students performed poorly on analytical-level questions (Leng et al., 2020). Later, studies on vocational accounting education also report that students' competencies and work skills, including problem-solving abilities, still require significant improvement to meet industry expectations (Sudarsono et al., 2024). Furthermore, Rachmawati et al. (2023) also stated that SMK students in East Java are not prepared for inquiry based learning, which makes it challenging. This situation indicates that the learning practices employed are not geared toward developing reasoning skills. Therefore, this study investigates the impact of guided inquiry-based learning on critical thinking skills in accounting education at vocational schools. In detail, this study has a research question (RQ):

RQ: To what extent does guided inquiry learning significantly improve the critical thinking skills of SMK accounting students compared to conventional instructional methods?

In this matter, the study makes several contributions. First, this study aims to address knowledge gaps by providing empirical findings relevant to vocational accounting education and instructional improvement in SMK contexts, where prior investigations have focused on other fields of study (e.g., Gómez & Suárez, 2020; Kotsis, 2025). Second, it presents empirical findings on the influence of guided inquiry on critical thinking skills among accounting students in SMK. Second, the study extends existing research on the development of SMKs, or general senior high schools, to prepare their graduates. Third, the findings provide practical insights for accounting teachers in SMK on the implementation of guided inquiry. Lastly, this research contributes to curriculum development in accounting education in SMK, as the findings support efforts to improve teaching that focuses on developing analytical competencies.

METHOD

Research Design

This study utilized a quantitative approach to investigate the effect of guided inquiry learning on students' critical thinking skills in accounting. A quasi-experimental design was used because the study was conducted in an authentic classroom setting where random assignment of participants was not possible (Thyer, 2012). In educational research, quasi-experimental designs are frequently used to assess learning interventions while maintaining validity (Lam & Wolfe, 2023). The research employed a pretest–posttest control-group design to compare learning outcomes between students who received the guided inquiry intervention and those who received conventional face-to-face instruction. In detail, the hypotheses were formulated as follows.

H : Guided inquiry learning has a significant effect on students' critical thinking skills in accounting at SMK.

Participants and Research Setting

The participants in this study were recruited from the 10th Grade in the accounting program at SMK Negeri 1 Grati in Indonesia. SMK is relevant to the objectives of this study because it is a state vocational school with an established Accounting Department that follows the national curriculum and competency-based learning aligned with industry standards. The Accounting Department consisted of three parallel classes: X Accounting 1, X Accounting 2, and X Accounting 3, with a total of 102 students. From these three classes, two classes were selected as research samples. Selection was based on a comparison of pre-test mean scores to ensure comparable initial levels of critical thinking ability. In detail, both the experimental and control groups were taught by the same accounting teacher to minimize differences in teaching quality and teaching experience. In addition, both groups retrieved the same learning objectives, teaching

time allocation, syllabus coverage, and assessment format, differing only in the teaching strategies applied. The two classes with the closest pre-test means were designated as the experimental and control groups. In this study, the experimental group received instruction through guided inquiry learning, while the control group was taught using conventional methods.

Instructional Procedure

The guided inquiry learning model provides a structured instructional sequence that provides the critical thinking skills required in accounting education. In this study, students were instructed to examine transaction data and create journal entries. The instructional procedure consisted of several stages implemented during each learning session. The first stage is problem orientation (approximately 15 minutes). At the beginning of the lesson, the teacher presented a brief accounting case on daily financial transactions using presentation slides. For example, students were shown a simple business transaction (e.g., purchasing equipment with cash or receiving revenue from services) and asked to identify its possible effects on the accounting equation. The teacher introduced the problem through guiding questions such as: "What accounts are affected by this transaction?" and "How does this transaction change the accounting equation?" These questions will drive students to begin analyzing the transaction logically.

The next stage is problem Identification and hypothesis Formulation (approximately 15 minutes). Students were organized into small collaborative groups consisting of four to five students. Each group received a structured inquiry worksheet designed to guide students through the inquiry process. The worksheet consisted of several sections: (1) problem identification, (2) initial hypothesis or predicted journal entry, (3) supporting reasoning, and (4) space for evaluating transaction evidence. During this stage, students discussed the accounting problem and proposed initial hypotheses about how the transaction should be recorded.

The third stage is data collection and hypothesis testing, which takes approximately 20 minutes. In this stage, students gathered relevant information from the case materials provided in the worksheet (e.g., transaction details, supporting documents, or simplified financial records). Then, students compared their hypotheses with the available transaction evidence and revised their proposed journal entries when necessary. Guiding questions provided by the teacher during this phase included: "Does the transaction increase or decrease assets?" and "Is there any liability involved?"

The last stage is a discussion that lasts around 15 minutes. After completing the analysis, each group summarized its findings and formulated a conclusion regarding the correct journal entry and its effect on the accounting equation. Students presented their conclusions both orally and in written form, supported by tables or transaction summaries included in the worksheet. The teacher facilitated a short class discussion in which different groups compared their reasoning and corrected any misconceptions. The intervention in both classes was conducted over four learning sessions (2×45 minutes per session) to ensure equal learning time and content coverage. The control group received conventional instruction consisting of teacher explanations, example demonstrations, and individual practice exercises.

Research Instrument

The instrument to assess students' critical thinking skills was a researcher-developed, essay-based written test administered as both a pre-test and a post-test. The instrument was adapted from Facione's (2015) critical thinking framework, which includes interpretation, analysis, evaluation, and inference. The test items

were made based on basic criteria for accounting skills, such as covering the accounting equation and the rules for documenting transactions. The examples of questions used in this research include, "Examine the following transaction evidence and explain what financial event occurred and identify the accounts involved" (interpretation); "A company purchased equipment on credit and analyzed how this transaction affects the accounting equation" (analysis). Moreover, evaluation questions require students to appraise the precision of accounting records, whilst inference questions compel them to draw logical conclusions from the given facts. The instrument covered multiple cognitive levels of Bloom's revised taxonomy (C1–C5) as revised by Krathwohl (2002). A test blueprint was prepared to ensure alignment among content, cognitive levels, and critical-thinking indicators (Table 1).

Table 1. Pre-test and post-test question instrument

Critical Thinking Dimension	Operational Definition in Accounting Context	Example Task in Instrument	Revised Bloom's Taxonomy Level
Interpretation	Understanding and explaining the meaning of accounting information or transaction evidence	Explain the financial event represented in a transaction document	C2 – Understanding
Analysis	Examining relationships among accounting elements and determining how transactions affect the accounting equation	Analyze the impact of a transaction on assets, liabilities, and equity	C4 – Analyzing
Evaluation	Assessing the accuracy, credibility, and appropriateness of accounting records	Identify and justify errors in a journal entry	C5 – Evaluating
Inference	Drawing logical conclusions and formulating reasoned judgments based on accounting data	Conclude the financial condition of a company based on a sequence of transactions and justify the reasoning.	C5–C6 (Evaluating–Creating)

Source: Adapted from Facione (2015)

Validity and Reliability

Content validity was performed through expert judgment, incorporating three experts in accounting education and educational assessment. The panel consisted of two university lecturers holding doctoral degrees in accounting education with more than five years of teaching and research experience, and one senior vocational accounting teacher with over ten years of professional teaching experience in accounting subjects. These experts reviewed the instrument to evaluate (1) the alignment of each test item with the critical thinking indicators proposed by Facione (2015), (2) the relevance of the accounting context presented in the questions, (3) the clarity and appropriateness of the language used in the items, and (4) the suitability of the cognitive level according to the revised Bloom's taxonomy. The experts' evaluations indicated agreement regarding the alignment of the items with the critical thinking indicators, the relevance of the accounting context, the clarity of language, and the suitability of the cognitive level. The instrument's reliability was assessed through a pilot study conducted with a specific class not involved in the research. The statistical output shows a value of 0.745 (>0.60), indicating an internal consistency coefficient, and the instrument was reliable for measuring students' critical thinking skills.

Data Collection Procedure and Data Analysis

The data collection was provided in three phases. First, both the experimental and control groups took a pre-test to assess their critical thinking skills before the start. Second, the instructional treatment was carried out in accordance with the designated learning models. Third, a post-test was administered to assess changes in students' critical thinking skills after instruction. To ensure that all groups were the same, all tests were given in the same way in the classroom. Descriptive statistics summarized students' results, whereas inferential analyses investigated group differences and score variation over time. To evaluate the effect of the instructional model on students' critical thinking skills, Analysis of Covariance (ANCOVA) was employed. In this analysis, the post-test score was treated as the dependent variable, the learning model (guided inquiry learning vs. conventional learning) was provided as the independent variable, and the pre-test score was included as a covariate to control for initial differences in students' critical thinking ability.

■ RESULT AND DISCUSSION

Descriptive Results

Table 2 presents descriptive statistics for critical thinking skills among SMK students in both the conventional learning and guided inquiry learning groups. In detail, the conventional learning group obtained a mean pre-test score of 72.82, while the guided inquiry learning group received a slightly higher mean score of 75.26. The median values also show a similar pattern, with 72.00 for the conventional group and 75.00 for the guided inquiry group. The standard deviation (SD) shows moderate variation in student performance within each group. The conventional learning group had a higher pre-test standard deviation (SD = 13.10) than the guided inquiry group (SD = 11.02), indicating that students in the conventional class exhibited greater variation in initial critical thinking scores. The range of scores confirmed that the conventional group scores varied from 50 to 94, while the guided inquiry group ranged from 56 to 94.

After the learning intervention, both groups showed increased critical thinking scores. The mean score of the conventional learning group increased from 72.82 in the pre-test to 77.09 in the post-test. In comparison, the guided inquiry learning group experienced a greater increase, from 75.26 in the pre-test to 81.74 in the post-test. This difference indicates that the instructional treatment produced a better improvement in the guided inquiry group. The median score also rose from 75.00 to 83.00 in the guided inquiry group, while the conventional group median increased from 72.00 to 78.00. To obtain a comparison of enhancement, this study also included n-gain, and the results showed that the guided inquiry learning group achieved a higher n-gain (0.262) than the conventional learning group (0.157).

The improvement observed in the experimental group can be explained through the instructional structure of guided inquiry learning. In this approach, students analyze information and construct explanations with guidance from the teacher. Cognitive processes (e.g., interpretation, analysis, evaluation, and inference) shape the core components of critical thinking, and inquiry-oriented learning tasks require students to practice during classroom activities. Recent educational research reported that guided inquiry promotes higher-order reasoning because students engage with problems through exploration, discussion, and evidence-based explanation (e.g., Wale & Bishaw, 2020; Arifin et al., 2025).

In addition to presenting the composite result, we also provide the statistical analysis for

Table 2. Descriptive statistics

Variable	Group	N	Mean	Median	SD	Variance	Min	Max
Pre-test	Conventional Learning	34	72.82	72.00	13.10	171.73	50	94
	Guided Inquiry Learning	34	75.26	75.00	11.02	121.53	56	94
Post-test	Conventional Learning	34	77.09	78.00	8.89	79.11	61	94
	Guided Inquiry Learning	34	81.74	83.00	8.26	68.20	61	94

each dimension of critical thinking skills. As shown in Table 3, the results indicate that groups (conventional and guided inquiry learning) experienced improvements in all dimensions from pre-test to post-test. However, the guided inquiry learning group achieved higher mean scores across all dimensions compared to the conventional learning group.

Table 3. Descriptive statistics for each dimension

Dimension	Test	Group	N	Mean	SD
Interpretation	Pre-test	Conventional Learning	34	73.10	12.85
	Pre-test	Guided Inquiry Learning	34	75.90	11.20
	Post-test	Conventional Learning	34	77.80	8.75
	Post-test	Guided Inquiry Learning	34	82.60	8.10
Analysis	Pre-test	Conventional Learning	34	72.50	13.20
	Pre-test	Guided Inquiry Learning	34	75.10	11.40
	Post-test	Conventional Learning	34	76.90	9.00
	Post-test	Guided Inquiry Learning	34	81.90	8.30
Evaluation	Pre-test	Conventional Learning	34	72.30	13.00
	Pre-test	Guided Inquiry Learning	34	74.80	11.10
	Post-test	Conventional Learning	34	77.00	8.60
	Post-test	Guided Inquiry Learning	34	81.50	8.20
Inference	Pre-test	Conventional Learning	34	73.40	13.10
	Pre-test	Guided Inquiry Learning	34	75.20	11.30
	Post-test	Conventional Learning	34	76.70	9.20
	Post-test	Guided Inquiry Learning	34	80.90	8.40

In addition, we performed a normality test, and the results are presented in Table 4. This assessment was performed to determine whether the pre-test and post-test data for both the control and experimental groups are normally distributed. We used IBM SPSS version 27 to test for normality, considering the Shapiro–Wilk tests with a significance level of 0.05. For the control group, both pre-test and post-test significance values exceed 0.05, indicating that the score distributions do not deviate significantly from normality. Similarly, the experimental group shows significance values above 0.05 for both pre-test and post-test scores. Since the assumption of normality is satisfied, data meet the requirements for subsequent parametric statistical analyses.

Table 4. Normality test result

Variable	Group	N	Statistic (W)	Sig. (p)	Interpretation
Pre-test	Conventional Learning	34	0.964	0.312	Acceptable
Pre-test	Guided Inquiry	34	0.971	0.455	Acceptable
Post-test	Conventional Learning	34	0.968	0.381	Acceptable
Post-test	Guided Inquiry	34	0.975	0.512	Acceptable

Furthermore, this study also performed Levene's test to check the assumption of homogeneity of variance between the control and experimental groups prior to hypothesis testing. The test was performed using several criteria, including the mean, median, adjusted median, and trimmed mean. As shown in Table 5, the significance values for all four criteria exceed the 0.05 threshold (O'Neill & Mathews, 2000). In more detail, the significance value based on the mean is 0.497, while the values based on the median and adjusted median are also 0.497. The trimmed mean criterion yields a significance value of 0.477, indicating no difference in variance between the two groups. Consequently, the assumption of homogeneity of variances is met, thereby validating the data for subsequent parametric analysis. Therefore, the data satisfy the homogeneity assumption required for the ANCOVA analysis.

Table 5. Homogeneity test

Test Type	Levene Statistic	df1	df2	Sig.
Based on Mean	0.467	1	66	0.497
Based on Median	0.466	1	66	0.497
Based on Median (Adjusted df)	0.466	1	65.912	0.497
Based on the Trimmed Mean	0.511	1	66	0.477

Differences in Critical Thinking Skills Between Experimental and Control Groups

This section presents the results of an investigation into the effect of the guided inquiry learning model on critical thinking skills among accounting students. Before performing ANCOVA, preliminary tests were conducted, and the statistical output (Tables 4 and 5) showed that the assumptions of normality and homogeneity of variances were met, indicating that the data met the requirements for the ANCOVA analysis.

Table 6. ANCOVA test

Effect	F	Sig.	Partial Eta Squared	Conclusion
Pre-test (Covariate)	5.67	0.020	0.081	Significant
Learning Model (Group)	7.28	0.009	0.102	Significant

This study confirmed that the pre-test score significantly influenced students' post-test critical thinking outcomes. As illustrated in Table 6, the pre-test score had a significant effect on students' post-test critical thinking outcomes, with an F value of 5.67 and a significance level of $p = 0.020$. Hence, the null hypothesis was rejected, indicating that students' initial critical thinking ability contributed to their post-test performance. Later, the partial eta squared value of 0.081 indicates a moderate contribution of students' initial critical thinking ability to SMK students' performance. After controlling for the pre-test scores, the group factor remained significant. The learning model produced an F value of 7.28 ($p = 0.009$) and a partial eta squared of 0.102. Hence, it can be concluded that SMK students who engaged in guided inquiry learning achieved higher post-test scores in critical thinking.

The robust effect of the pre-test indicates that the initial critical thinking ability contributed to the students' performance. The statistical output indicates that students with analytical skills were better prepared to interpret information, evaluate arguments, and construct logical explanations during classroom activities. Prior knowledge and initial reasoning ability, therefore, contribute to differences in students' learning

progress (Thurn et al., 2022). Previous studies have shown that students' prior knowledge and cognitive readiness influence how they engage with learning tasks and their ability to apply critical thinking skills (Chen & Yang, 2022; Lazonder et al., 2020).

At the same time, the significant group effect indicates that guided inquiry learning enhanced critical thinking. In this study, guided inquiry learning involves a structured investigation in which students explore problems and analyze evidence through guided questioning and collaborative discussion with peers and teachers. Research in this theme also indicates that instructional approaches involving problem investigation and guided inquiry learning promote cognitive engagement and analytical skills compared with teacher-centered instruction (Furtak et al., 2021; Dobber et al., 2021; Woods & Copur-Gencturk, 2024). Hence, while students' pre-existing critical thinking ability influenced their performance, guided inquiry learning further enhanced students' critical thinking skills compared conventional learning.

In addition, it also presents the n-gain comparison between control and experimental groups (Figure 1). In general, the experimental group shows greater and more consistent positive gains. In contrast, the control group exhibits greater dispersion and several extreme negative values, indicating uneven progress and possible declines in performance. Also, the linear trend lines in the figure indicate a slightly upward pattern for both groups.

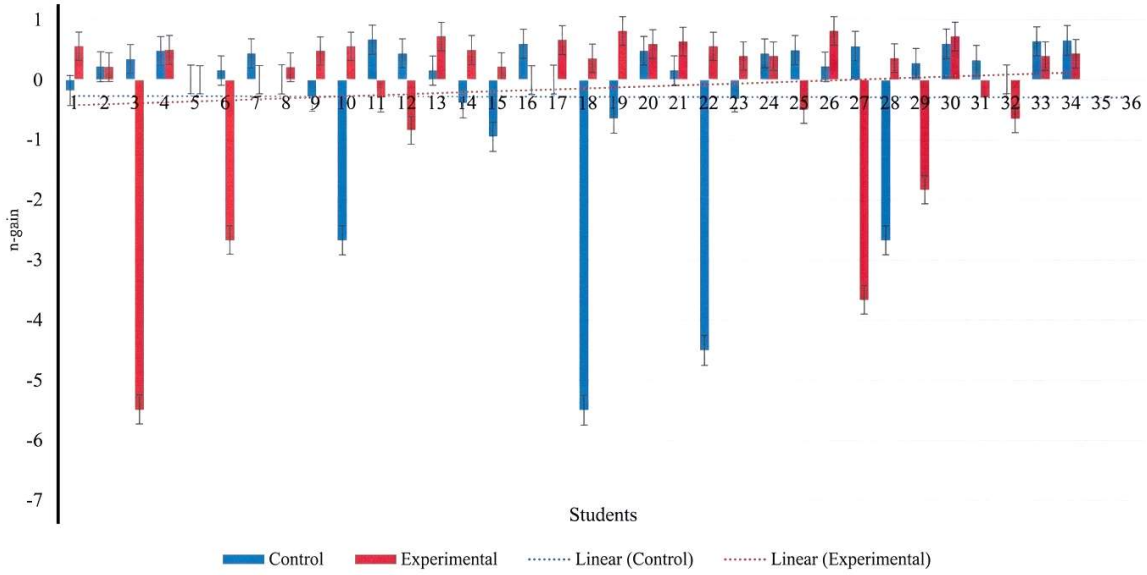

Figure 1. N-gain control and experimental

Furthermore, we also perform ANCOVA analysis for each dimension of critical thinking. As shown in Table 7, the learning model had a statistically significant effect on all dimensions, with significance values below 0.05. The partial eta squared values ranged from 0.093 to 0.102, indicating a moderate effect size.

The results indicate that students involved in guided inquiry-based learning demonstrated stronger abilities to analyze accounting problems and ask critical questions than students using conventional methods, confirming findings from preliminary studies (e.g., Martinez-Blasco et al., 2025; Pratama, 2024). The findings also align

Table 7. ANCOVA test for each dimension

Dimension	Source	F	Sig. (p)	Partial Eta Squared	Conclusion
Interpretation	Pre-test (Covariate)	5.21	0.026	0.075	Significant
Interpretation	Learning Model	6.89	0.011	0.095	Significant
Analysis	Pre-test (Covariate)	5.48	0.022	0.078	Significant
Analysis	Learning Model	7.35	0.009	0.102	Significant
Evaluation	Pre-test (Covariate)	5.02	0.029	0.071	Significant
Evaluation	Learning Model	6.72	0.012	0.093	Significant
Inference	Pre-test (Covariate)	5.33	0.024	0.076	Significant
Inference	Learning Model	7.10	0.010	0.099	Significant

with constructivist learning theory, which holds that knowledge is constructed through interactions with materials and learning contexts (Vygotsky, 1978). From this finding, guided learning inquiry can create a learning environment that supports problem exploration rather than passively receiving information from educators. In accounting education, decisions must be based on evidence and logical evaluation, and therefore, guided inquiry-based learning is an appropriate approach to developing critical thinking skills (Turner & Tyler, 2023; Martinez-Blasco et al., 2025; Dickins & Reid, 2023). It extends that guided inquiry can support specific dimensions of critical thinking, including interpretation, analysis, evaluation, and inference.

Furthermore, socio-cognitive theory helps explain how guided inquiry-based learning can support learning through scaffolding and mediated interaction (Senisum et al., 2022). In this context, teachers can provide structured instructions and guide questions that are reduced as students' independence in problem-solving increases. In addition, the role of the teacher as a facilitator in providing guided questions and feedback appears to be essential in helping students to independent reasoning (Strat et al., 2024). This instructional support will help students internalize critical thinking processes that help them to analyze accounting problems over time (Terblanche et al., 2025; Dickins & Reid, 2023). This study confirms previous research suggesting that students taught using guided inquiry demonstrate better problem evaluation and decision-making skills than students taught using a conventional face-to-face approach (Antonio & Prudente, 2024; Pratama, 2024; de Jong et al., 2024).

Accordingly, the results provide several interesting implications for vocational accounting education and teaching practices. In detail, at the classroom level, the results indicate that guided inquiry-based learning can be incorporated into accounting instruction to shift learning activities from routine procedures to analytical problem-solving. It is essential because traditional accounting instruction focuses on theoretical procedures (e.g., recording transactions), whereas real-world accounting requires interpretation and judgment. Furthermore, teachers can construct and identify problems relevant to their professional and life experiences. A key policy scholar should therefore plan to provide a framework for prioritizing teaching approaches that develop analytical reasoning alongside technical competencies. The results of this indicate that curriculum design in vocational education should move beyond competency-based training focused on technical skills and incorporate pedagogical models that foster critical thinking.

■ CONCLUSION

This study set out to assess the implementation of the guided inquiry learning

model in promoting critical thinking skills among vocational school students. The findings indicate that students who participated in inquiry-oriented instruction showed greater engagement in several activities than those in conventional learning, such as problem analysis and evidence-based reasoning. In accounting education, guided inquiry offers an advantage in supporting learning processes aligned with subject-specific cognitive demands. However, the findings of this work should be used with some notes. First, the study was conducted within a single institutional setting and relied on a limited sample, which may affect the generalizability of the findings. In addition, the point in Figure 1 overlaps with several others, so a single point represents two or more students' values. Third, the measurement of critical thinking skills was aligned with a specific assessment instrument that primarily captured selected indicators of critical thinking rather than the full, multidimensional construct. Accordingly, the results should not be interpreted as evidence that guided inquiry learning improves all dimensions of critical thinking. Consequently, while guided inquiry learning is a promising instructional approach for vocational accounting education, it does not warrant broad claims about its impact across contexts. For this reason, future work incorporating broader samples and longitudinal designs is required to examine the consistency of these findings across vocational education settings. Lastly, the validity assessment in this study did not include calculating the Content Validity Index (CVI). Future studies are suggested to apply CVI to obtain more rigorous and transparent evidence of content validity.

DECLARATION OF GENERATIVE AI USAGE IN THE WRITING PROCESS

The authors acknowledge the limited use of generative Artificial Intelligence (AI) tools in the preparation of this manuscript. In particular, the QuillBot was utilized solely to refine language clarity, improve sentence structure, and maintain consistency in academic tone and purpose.

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