



# Enhancing Critical Thinking Skills Through Innovative Accounting Transaction Simulation-Based Learning Methods

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Received: 15 March 2024 | Revised: 20 April 2024 | Published: 29 May 2024

## Abstract

**Purpose:** This study investigates the effectiveness of Accounting Transaction Simulations (AccTranS) in enhancing critical thinking skills among accounting students.

**Research Methodology:** This study employed a quantitative research approach, gathering data from accounting students through a Likert scale survey to assess the effectiveness of AccTrans.

**Results:** Most students rated the simulation positively in terms of improving their critical thinking skills and considered it a valuable addition to their class. However, a small percentage of students expressed neutral or negative views, highlighting potential areas for improvement in the program.

**Conclusions:** The study concludes that AccTrans is a beneficial tool for enhancing critical thinking, despite its effectiveness varying based on individual learning preferences.

**Limitations:** This study is limited to accounting students at a single university and relies on self-reported survey data, which may limit generalizability and introduce bias.

**Contributions:** The study provides evidence that Accounting Transaction Simulations enhance students' critical thinking and support the integration of digital learning tools in accounting education.

**Keywords:** *Accounting, Critical Thinking Skills, Simulation, Transaction*

**How to Cite:** Jaffar, R., Mustafa, N. H., Fadhil, N. F.M., Jusop, M., Zain, F. A. M., & Shaharuddin, S. (2024). Enhancing Critical Thinking Skills Through Innovative Accounting Transaction Simulation-Based Learning Methods. *Journal of Economics, Management, Entrepreneurship, and Business (JEMEB)*, 4(1), 10–20.  
<https://doi.org/10.52909/jemeb.v4i2.160>

## 1. Introduction

The evolution of educational methodologies has become increasingly important in accounting education due to the rapid transformation of the accounting profession and the growing demand for higher-order thinking skills (HOTS) (Amin et al., 2020). In the modern business environment, accountants are not only expected to record financial transactions accurately but also to analyze complex financial information, solve problems, and make strategic decisions (Al-Hashimy et al., 2023; Anggraeni et al., 2023). Consequently, educational institutions are required to adopt innovative teaching approaches that can effectively develop students' analytical and critical thinking abilities (Amin et al., 2020; Arifin et al., 2022; Arviani et al., 2023). Traditional learning methods, such as lectures, note-taking, and textbook-based exercises, are often considered insufficient to prepare students for the challenges of real-world accounting practices because they tend to focus more on memorization than on analytical reasoning and problem-solving abilities (Lucena-Anton et al., 2022). Therefore, educators need to integrate more interactive and student-centered learning strategies into accounting education.

One innovative approach that has gained attention in recent years is the use of simulation-based learning. Simulations provide students with opportunities to engage directly in practical learning experiences that resemble actual workplace situations (Jamil & Isiaq, 2019). In accounting education, Accounting Transaction Simulations (AccTranS) have emerged as a promising instructional tool that allows students to process and analyze realistic financial transactions in a controlled learning environment (Cheng & Zhou, 2024; Irianti et al., 2022). Through these simulations, students can practice identifying transactions, preparing journal entries, analyzing financial impacts, and making decisions based on accounting data (Joshi & Koirala, 2023). This approach not only enhances students' technical accounting competencies but also encourages active learning and deeper conceptual understanding. According to Amin et al. (2020), simulation-based learning can improve student engagement and provide meaningful learning experiences by connecting theoretical concepts with practical applications. Similarly, Anggraeni et al. (2023) and Sari et al. (2021) emphasized that interactive learning media and digital simulations contribute positively to students' cognitive development and learning motivation.

Critical thinking is recognized as one of the most essential competencies in higher education and professional development (Lionenko & Huzar, 2023). In accounting, critical thinking enables students to evaluate financial information objectively, identify potential errors or inconsistencies, and formulate logical solutions to accounting problems (Madsgaard et al., 2022; McBane et al., 2023). The ability to think critically is particularly important in an era characterized by rapid technological advancement and increasingly complex financial systems. However, fostering critical thinking skills among accounting students remains a significant challenge (Mohd Khalil et al., 2024). Conventional teaching methods often place students in passive learning roles, where they receive information from instructors without actively participating in the learning process (Meirbekov et al., 2022). As a result, students may struggle to apply theoretical knowledge in practical contexts or to develop the reasoning skills necessary for professional decision-making. Previous studies have highlighted the importance of integrating active learning strategies to enhance students' critical thinking abilities (van Peppen et al., 2018).

In recent years, digital technology has transformed educational practices by enabling more flexible, interactive, and engaging learning environments. The integration of technology into accounting education has become increasingly relevant, especially after the widespread adoption of online and blended learning models (Rafiq et al., 2024; Sanchez et al., 2023). Simulation tools, virtual learning environments, and educational software have demonstrated significant potential for improving learning outcomes and promoting student participation (Sari et al., 2021; Sasson et al., 2018). Digital simulations, in particular, provide opportunities for experiential learning by allowing students to interact with realistic scenarios and receive immediate feedback on their performance. Joshi and Koirala (2023) argued that digital simulation-based learning environments can facilitate knowledge construction, improve problem-solving skills, and support deeper learning processes. Despite these advantages, there is still limited empirical evidence regarding the effectiveness of accounting transaction simulations in specifically enhancing critical thinking skills among accounting students. Most previous studies have focused on learning motivation, academic achievement, or technology acceptance rather than on higher-order cognitive skills (Sierra, 2020).

Another important issue in accounting education is the gap between academic learning and professional practice. Employers increasingly demand graduates who possess not only technical accounting knowledge but also soft skills such as analytical thinking, communication, collaboration, and decision-making abilities (van Peppen et al., 2018). This expectation requires universities to redesign their curricula and teaching methods to ensure that students are adequately prepared for workplace challenges. Simulation-based learning offers a potential solution to this issue because it allows students to experience authentic accounting activities and practice making decisions in realistic situations (Wong et al., 2021; Yeo et al., 2022). Through repeated interaction with accounting cases and transaction scenarios, students may

develop stronger analytical reasoning and become more confident in applying accounting concepts in professional contexts. Therefore, investigating the effectiveness of AccTranS in improving critical thinking skills is highly relevant to current educational and professional needs.

Based on these considerations, this study aims to examine the role of Accounting Transaction Simulations (AccTranS) in enhancing students' critical thinking skills in accounting education (Ayuningtyas & Iلمان, 2021; Wahyuningsih et al., 2021). By integrating simulation-based learning into the teaching and learning process, this research seeks to evaluate whether students can better understand complex accounting concepts, analyze financial information more effectively, and apply critical thinking in solving accounting-related problems. Furthermore, this study aims to compare students' perceptions of AccTranS with conventional teaching methods to determine whether simulation-based learning provides a more engaging and meaningful educational experience. The findings of this study are expected to contribute to the development of innovative accounting education practices and provide insights for educators regarding the implementation of simulation-based learning strategies in higher education.

This research is guided by the following research questions: first, to what extent does the use of Accounting Transaction Simulations (AccTranS) improve students' critical thinking skills in accounting education? Second, how do students perceive the effectiveness of AccTranS compared with conventional teaching methods? The answers to these questions are expected to provide empirical evidence regarding the effectiveness of simulation-based learning in accounting education and to identify both the benefits and potential limitations of integrating AccTranS into classroom instruction.

## 2. Literature Review

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### 2.1 Innovative Learning in Accounting Education

Innovative learning methods have become critical in accounting education to bridge the gap between theoretical knowledge and practical application (Berlian Rms & Wahyuningsih, 2021; Syahrial & Sudono, 2021). Traditional teaching methods, such as lectures and textbook exercises, often fail to engage students actively and do not adequately develop higher-order thinking skills (Amin et al., 2020; Lucena-Anton et al., 2022; Saputro & Soleha, 2021). Incorporating interactive methods, such as simulations, enables students to experience realistic accounting scenarios in a controlled learning environment, promoting analytical thinking, problem-solving, and decision-making skills (Parmenas, 2021; Ricardianto et al., 2021).

Simulations provide students with opportunities to apply accounting principles in a risk-free setting (Setyawati et al., 2021; Susanto et al., 2021). By actively managing virtual transactions, students can explore the consequences of decisions without real-world repercussions. Anggraeni et al. (2023) and Susanto and Parmenas (2021) emphasizes that these experiences enhance learning retention, encourage active participation, and allow students to practice professional skills that are essential for career readiness.

Moreover, innovative learning approaches increase student engagement and motivation. Students who participate in simulation-based learning are more likely to take ownership of their learning process and demonstrate curiosity and persistence when facing complex problems (Setyawati & Aristiyanto, 2021). Studies indicate that such interactive methods foster collaboration, peer learning, and reflective thinking, which are vital for developing critical thinking competencies in accounting students (Sari et al., 2021).

### 2.2 Accounting Transaction Simulations (AccTranS)

Accounting Transaction Simulations (AccTranS) are educational tools that replicate real-world accounting processes in a virtual environment. They allow students to experience the workflow of recording, analyzing, and reporting financial transactions, providing an immersive learning experience (Agusinta et al., 2021). According to Anggraeni et al. (2023), AccTranS can bridge the gap between classroom

theory and practical accounting applications, improving both technical competence and analytical skills. These simulations also enhance students' problem-solving capabilities (Kuncoro & Harahap, 2021). Students must identify errors, adjust entries, and ensure financial statements are accurate, which mirrors the responsibilities of professional accountants. Anggraini (2021) and Sari et al. (2021) highlights that students who engage with AccTranS demonstrate greater attention to detail, improved judgment, and enhanced ability to handle complex scenarios compared to students using traditional methods (Heriyanto, 2021).

In addition, AccTranS promotes active learning and self-directed study. Students can repeat simulations multiple times, experimenting with different strategies and learning from mistakes (Aprillita & Perkasa, 2021; Keke et al., 2021). This iterative process fosters reflective thinking, enabling students to internalize accounting principles deeply and develop strategic thinking skills applicable in professional contexts (Joshi & Koirala, 2023).

### **2.3 Critical Thinking and Digital Tools**

Critical thinking is essential in accounting education as it equips students to evaluate, synthesize, and interpret financial information accurately (Abdullah, 2021). According to Satria (2021), critical thinking enables students to make informed decisions, anticipate potential problems, and provide solutions in complex financial scenarios. Integrating digital tools, such as simulations, strengthens these cognitive skills by providing interactive and practical learning experiences.

Digital tools encourage students to analyze data, identify patterns, and justify decisions, rather than merely memorizing procedures. Meirbekov et al. (2022) notes that students engaged in simulation-based learning exhibit higher-order thinking skills, including evaluation, reasoning, and problem-solving, which are necessary for adapting to real-world accounting challenges (Hernawan et al., 2023; Solihin, 2021).

Furthermore, digital simulations enhance collaborative learning. Students often work in teams within virtual simulations, discussing solutions, challenging assumptions, and validating decisions collectively. This collaborative environment mirrors professional accounting practice, preparing students to work effectively in team-based and multidisciplinary settings (Joshi & Koirala, 2023; Meirbekov et al., 2022; Valentin et al., 2023).

### **2.4 Pedagogical Implications**

The integration of AccTranS and other digital learning tools in accounting curricula has significant pedagogical implications. Simulations provide experiential learning opportunities, fostering critical thinking, problem-solving, and decision-making skills. Mohd Khalil et al. (2024) and Rizkita et al. (2023) emphasizes that simulation-based learning also enhances student engagement, satisfaction, and retention, making learning more effective and enjoyable.

These tools support competency-based education by allowing students to practice real-world scenarios repeatedly, which helps in mastering complex accounting procedures. Furthermore, instructors can use simulation data to assess student performance more objectively and provide targeted feedback to improve learning outcomes (Purnamasari & Riyadi, 2023; Sanchez et al., 2023).

Finally, simulation-based learning aligns with modern educational trends that prioritize active and experiential learning over passive instruction. By combining technology with pedagogical strategies, accounting education can produce graduates who are better prepared for professional challenges, demonstrating both technical expertise and critical thinking capabilities (Lucena-Anton et al., 2022; Maheswara et al., 2023).

### 3. Methodology

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This study adopts a quantitative methodology to investigate the effectiveness of AccTrans in teaching accounting students. The study was conducted at a public university, where 56 undergraduate accounting students who had used AccTrans in their coursework were selected as the participants. Data were collected through an online survey consisting of structured questions designed to gauge students' perceptions of AccTranS. The survey focused on two key areas: whether students perceived the simulation as a valuable addition to the class and whether the simulation helped students think critically. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Data for this study was analyzed using SPSS software, employing descriptive statistics (Pandey & Gilmour, 2024; Zhang et al., 2024)

### 4. Results and Discussion

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#### 4.1 Results

The first question of this study aimed to assess whether students considered the simulation a valuable addition to their classes.

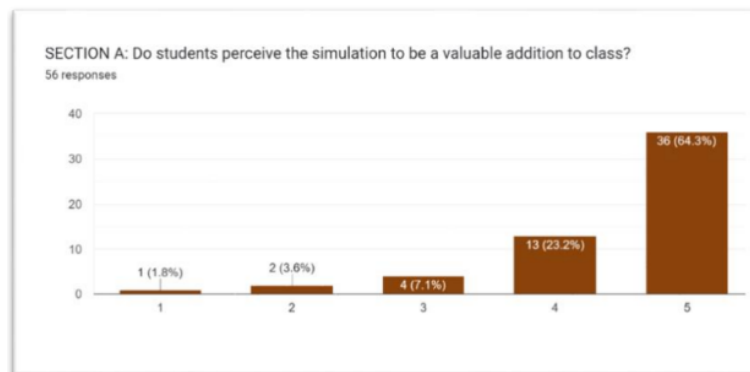


Figure 1. Valuation Addition to Class

Based on Figure 1, a significant majority of the students provided positive feedback. Of the 56 respondents, 64% strongly agreed (5) when using the simulation, indicating that they found it highly beneficial. Meanwhile, 23% of the students rated it as 4, suggesting a favorable but slightly less enthusiastic view of the program. A smaller number of students, four (7%), rated it as neutral with a score of 3, while only two students (4%) assigned a score of 2, and one student (2%) gave it the lowest score of 1. These findings show that most respondents had a favorable opinion of the simulation tool and strongly supported its use in their educational process.

The second question focused on whether the simulation helped students develop critical thinking skills. The responses indicated a similar favorable outcome.

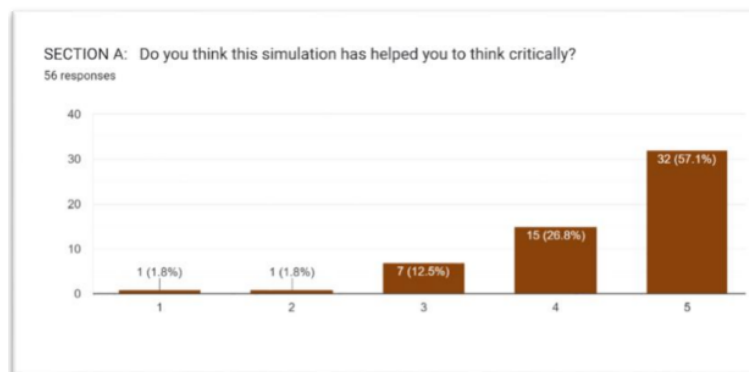


Figure 2. Simulation Help Think Critically

Based on Figure 2, of the 56 students surveyed, 57% (32 students) rated their experience as 5, suggesting that the simulation significantly enhanced their critical thinking abilities. Additionally, 15 students (27%) rated it with a 4, showing that they believed the simulation contributed to their critical thinking, but perhaps not as strongly as the top rating. However, 13% of students rated the simulation's impact on critical thinking with a 3, indicating a neutral stance, while only one student (2%) gave it a score of 2, and another student (2%) rated it with the lowest score of 1. These findings indicate that most students found the simulation to be an effective tool for fostering critical thinking in their learning process.

Thus, by comparing the responses from both questions, it is evident that students generally perceive the simulation as valuable for their overall learning and helpful in improving their critical thinking skills. The high proportion of students who rated the simulation as effective for various purposes learning outcomes (5 and 4) in both categories indicates that this innovation in the teaching process was well received in their education. Thus, it can be said that the simulation can help students in terms of how well it improves their comprehension of the subject matter and how well it improves their critical thinking abilities. The existence of some neutral and lower scores indicates that some students did not think the simulation had the same impact, either because of personal preferences for learning or unfamiliarity with the format of the simulation. However, the results generally indicate that using simulations in accounting classes may be a useful teaching strategy (Pandey & Gilmour, 2024).

## 5. Conclusions

The findings indicate that the simulation was largely regarded as a valuable educational tool, with most students reporting a positive impact on their learning and critical thinking skills. The majority rated the simulation highly, suggesting that it enhanced their understanding of accounting concepts and provided practical and real-world applications. A small number of neutral and lower ratings point to some variability in how students perceive its effectiveness, which may be attributed to individual learning preferences of the students. The simulation played a significant role in developing critical thinking abilities, as evidenced by favorable ratings in this area. The consistently positive feedback in both categories emphasizes the value of integrating simulations into accounting education to foster greater cognitive skills and better prepare students for professional challenges. Despite these generally positive results, some limitations should be considered. The study relied on self-reported data from students, which may have introduced subjectivity or bias into the responses. Furthermore, the use of a single-class sample may limit the generalizability of the findings to other student groups or disciplines. Additional research is needed to explore these limitations and examine how different factors, such as prior knowledge and learning preferences, may influence the effectiveness of simulations in education. Further research could explore the reasons behind the lower ratings to improve the design and implementation of

simulations in future classes.

## **Acknowledgements**

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The authors would like to express their gratitude to all accounting students who participated in the study and to faculty members who facilitated the implementation of AccTranS. Special thanks are extended to colleagues and reviewers for their valuable feedback and support throughout the research process

## **Author Contributions**

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RJ contributed to the conceptualization, methodology, data analysis, and writing of the original draft. NHM was responsible for data curation, formal analysis, supervision, and writing—review and editing. NFMF handled the literature review, validation, and project administration. MJ managed data collection, investigation, and software support. FAMZ contributed to visualization, resources, and editing. SS provided supervision, editing, and funding acquisition.

## **Conflicts of Interest**

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The authors declare that there is no conflict of interest regarding the publication of this study. This research was conducted independently, and no financial or personal relationships influenced the results or interpretation of the findings.

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