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SHAPING STUDENTS' ACADEMIC AND CHARACTER TO FACE THE VUCA ERA THROUGH THE INTEGRATION OF ARTIFICIAL INTELLIGENCE-BASED ACCOUNTING LEARNING

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Abstract
In the era of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA), education must swiftly adapt, particularly within the field of accounting. While traditional methods have focused on equipping students with technical knowledge and skills, these can now be performed efficiently by Artificial Intelligence (AI) tools. This shift presents both a challenge and an opportunity to leverage AI not only to enhance students' academic understanding but also to cultivate the essential character needed for the future. This research addresses how an AI-integrated learning model can shape students for the VUCA era. The objective of this mixed-method study is to explore the impact of integrating an AI-based learning model into accounting education. Using a descriptive quantitative approach, data were collected through questionnaires and interviews with 19 Economics Education students, Satya Wacana Christian University, who took a concentration in accounting. These findings suggest that AI-integrated models can improve students' understanding of complex accounting material. Furthermore, these models also aid students in critical thinking, adaptability, and problem-solving. The research shows that an AI-based approach can successfully prepare students to be both academically competent and professionally resilient when implementation includes explicit AI literacy instruction, theory-practice integration through simulations and case studies, and pedagogical frameworks that position AI as a catalyst for higher-order thinking.

Keywords: accounting education, AI-integrated learning, learning model, student character

Introduction

Contemporary education faces challenges where technological advances intersect with increasingly tangible global uncertainty. The VUCA era (Volatility, Uncertainty, Complexity, and Ambiguity) demands fundamental changes in how we prepare students, especially for disciplines such as accounting that traditionally rely on accuracy, standardization, and procedural expertise (Dewi et al., 2025). As artificial intelligence rapidly automates routine tasks and complex calculations, educators face a profound question: What is the purpose of accounting education when machines can perform technical functions with greater speed and accuracy than humans?

However, this question is not a crisis of threat, but rather an extraordinary opportunity. The integration of AI into learning is not just about utilizing

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technology; it also means a shift in the learning paradigm from teachers simply teaching students what to do to empowering students with ways of thinking, adapting, and leading in response to rapid changes. Although AI excels at finding information and solving cases (Harry & Sayudin, 2023), it cannot replace human capacity for critical reasoning, ethics, empathy, and creative problem-solving. AI can only do this if users command it according to their wishes. This means that AI is still not smarter than humans; it is only a tool that helps us if we want it to. These competencies, often referred to as 21st-century skills or soft skills, are essential for everyone in an era where change is the only certainty.

Indonesian higher education institutions, especially in the field of accounting, must respond to this transformation proactively. Rather than viewing AI as a threat, it should be accepted as a powerful pedagogical tool that can simultaneously deepen academic understanding and foster essential character traits (Nudin et al., 2023). By appropriately integrating AI-based learning models, educators can create a dynamic learning environment where students engage with complex accounting concepts through interactive experiences while developing the adaptability and innovative thinking skills needed to survive and thrive in a volatile workplace (Choi, 2024; Sabuncu, 2022).

The integration of AI in learning presents extraordinary benefits as well as challenges that teachers must carefully address. On the positive side, AI provides learning experiences tailored to each student's needs, gives immediate feedback, and facilitates access to a vast amount of information (Panjabi et al., 2024). This technology can automatically complete student assignments, allowing students to focus on higher-order thinking skills (Kenwright, 2024). However, these benefits are accompanied by teachers' concerns that students may become dependent on AI, leading to a decline in analytical skills if students become passive consumers of AI-generated answers without filtering, critiquing, and verifying the accuracy of each answer provided (Labadze et al., 2023). The issue of digital divide and inequality arises when not all students have equal access to AI, which has the potential to widen educational disparities. Therefore, the pedagogical challenge is not whether we will use AI or not, but how to integrate it carefully (Williamson, 2024) to maximize its benefits while mitigating its risks.

The World Economic Forum projects that by 2027, AI and automation will transform approximately 23% of jobs globally, with accounting and finance being the most affected sectors. In this context, students must understand not only how to use AI tools but also how to collaborate with them, critically interpret their outputs, and validate them if they are used as a basis for policy (Leitner-Hanetseder et al., 2021). The ability to utilize AI for data analysis is a basic competency that must be possessed, while competencies such as ethical reasoning, good client relations, and strategic thinking will be the distinguishing characteristics between AI and humans (Boddapati et al, 2024). Therefore, integrating AI into accounting education is not merely about keeping up with technological developments, but about preparing students to excel in their field of work, not just being passive consumers of technological disruption, equipping them with the technical fluency and adaptive thinking patterns needed in an AI-supported world (Winokan et al., 2025).

The purpose of this study is to investigate how accounting learning integrated with AI can achieve these dual objectives: improving academic competence and shaping students' character so that they are not only able to survive but also excel

in the VUCA era. By examining the learning experiences of students in the Economics Education program who major in accounting at Satya Wacana Christian University, we can determine whether the AI-based learning that has been implemented so far can shape them into future accountants or teachers who are technically competent, ethical, and ready to face the uncertainties of the future.

Method

This study is a mixed study using a quantitative descriptive approach to reveal whether AI-integrated accounting learning can shape students' academics and character in the VUCA era. A total of 19 students from the Economics Education study program with a concentration in accounting at Satya Wacana Christian University were the respondents in this study. Data were collected using questionnaires and interviews. The questions in the questionnaire referred to the research conducted by Minciu et al (2025). The questions in the questionnaire use two measurement methods, namely the Likert scale for questions 1, 2, 3, 4, 9, 10, 11, and 12, and open-ended questions for questions 5, 6, 7, 8, 13, 14, 15, 16, 17, 18, and 19. This is so that researchers can obtain more detailed and complete information. Below is a list of questions in the questionnaire:

Table 1. List of Questions

Element	Number	Questions
Learning needs in the AI era.	1	How important is it for you to have a strong knowledge of AI.
	2	AI-based tools can help you better understand complex accounting concepts.
	3	Your level of proficiency in using AI for academic purposes.
	4	Accounting education needs to focus more on technology.
	5	The biggest challenge in learning accounting in the digital age.
	6	Courses/topics/materials that are highly suitable for using AI in the learning process.
Hard and soft skills to face the VUCA era.	7	The most important hard skills for future success.
	8	The most important soft skills for future success.
	9	How important is it for the current curriculum to focus on developing soft skillss.
	10	Readiness to enter the workforce with current competencies.
Accounting learning process.	11	The intensity of AI use in learning.
	12	The suitability of current learning methods in line with future needs.
	13	Things that are still not optimal in accounting education today.
	14	Readiness to face the challenges posed by AI.

AI integration for academic and character development.	15	AI-based learning helps in understanding complex accounting concepts.
	16	The use of AI in learning to develop soft skills.
	17	Integrating AI to enhance adaptability.
	18	AI integration encourages students to collaborate and work together.
	19	AI integration makes it easier to apply knowledge and skills.

Quantitative data was processed and analyzed qualitatively using the following data conversion guidelines:

Table 2. Guidelines for Converting Quantitative Data to Qualitative Data

Score Range	Interpretation
4.5 – 5.0	Strong Agreement
3.5 – 4.4	Moderate Agreement
2.5 – 3.4	Uncertain/Mixed
1.5 – 2.4	Disagreement
1.0 – 1.4	Strong Disagreement

Findings and Discussion

Findings

The research results are presented separately, namely the quantitative data analysis and the qualitative data analysis. The following is the data collected in the field.

Table 3. Quantitative Data Analysis

Question Number	Mean	Mode	Distribution
1	4.74	5	Score 5 (15 students), score 4 (3 students), score 3 (1 student)
2	4.11	4	Score 5 (8 students), score 4 (7 students), score 3 (3 student), score 2 (1 student)
3	3.78	3	Score 5 (6 students), score 4 (4 students), score 3 (8 student), score 2 (1 student)
4	4.16	5	Score 5 (8 students), score 4 (7 students), score 3 (4 students)
9	4.53	5	Score 5 (11 students), score 4 (5 students), score 3 (3 students)
10	4.16	5	Score 5 (8 students), score 4 (5 students), score 3 (6 students)
11	4.21	4	Score 5 (7 students), score 4 (9 students), score 3 (3 students)
12	3.89	4 and 3	Score 5 (5 students), score 4 (7 students), score 3 (7 students)

Table 4. Qualitative Data Analysis

Question Number	Result
5	• Limited hands-on application opportunities • Understanding balance sheet and formulas • Complex calculations and data entry processes • Technology dependency • Internet connectivity not universally available
6	• Management accounting • Accounting theory • General accounting topics • Mathematical economics • Communication • Entrepreneurship • All courses
7	• Financial planning • Data analysis • Cybersecurity • AI and learning literacy • Learning management system • Content creator
8	• Critical thinking • Adaptability • Problem solving • Communication • Emotional intelligence • Collaboration
13	• Insufficient practical application • Theory-focused or monotonous • Adaptation difficulties
14	• Not sufficient (42%) • Sufficient (37%)
15	• Strong agreement (53%) • Sometimes (26%) • No, AI is very helpful in finding information but not in understanding (16%)
16	• Strong agreement (58%) • Yes, but not completely (21%) • Depends on individual (22%)
17	• Agreement (68%) • Conditional (21%)
18	• Agreement (63%) • Conditional or depends on method (26%) • Not effective (11%)
19	• Strong agreement (74%) • Depends on individual (16%) • Not effective (11%)

Discussion

Based on the above results, it is clear that knowledge of and expertise in using AI are not optional, but rather a necessity for facing the future. This has a positive impact on the learning environment because students are engaged in AI-integrated learning. Most students feel confident about their ability to enter the workforce, suggesting that they have developed core competencies and strong self-efficacy. Current teaching methods provide students with a sound knowledge foundation (Dehbozorgi et al., 2024; Rahayu, 2025).

Students acknowledged the importance of AI (4.74), and its use intensity was high (4.21); however, they were unsure whether AI can truly enhance learning effectiveness. This uncertainty is reflected in their ability to use AI for academic purposes (3.78). Eight students chose a neutral response, indicating that they know how to use the tool but lack conceptual confidence. This creates a paradox: Students may use AI to quickly find answers, yet this does not result in deep, meaningful, or authentic learning (Montag & Elhai, 2025). This creates a gap between their technical skills in using AI and their pedagogical knowledge. Similar observations have been made, showing that a high level of technology use does not necessarily result in improved learning (Granić, 2022; Almaiah, 2022).

Without explicit instruction and guidance on the effective use of AI, students will not be able to think critically (Gerlich, 2025; Özer et al., 2025). Technical proficiency without pedagogical understanding poses a risk of misuse or overreliance, as Özer et al. (2025) and Obaje (2025) suggest. Teachers must assess AI output to ensure it reflects students' true understanding.

This finding aligns with the responses to Question 15, in which several students stated that AI assists in finding information but does not help with understanding. Using AI solely as an answer-generating tool rather than as a discussion partner can hinder the development of critical thinking skills, which are essential for success in the VUCA era (Hassen, 2025; Wiederhold, 2025).

The responses to Question 9 revealed the various challenges that students face when learning accounting in the digital age. The most common challenge is a lack of practical experience. This explains why some students feel unprepared for the workforce despite having adequate academic knowledge. The gap between classroom learning and real-world practice is a weakness that can be addressed through the strategic integration of AI. Other difficulties relate to technical understanding, such as interpreting a balance sheet, performing data entry, and applying economic mathematics. These responses suggest that, despite their familiarity with AI, students still struggle with accounting material. Students also experience challenges related to rapid change and adaptation. One student expressed concern about the rapid development of education. This reflects VUCA characteristics: students experience uncertainty and volatility not only as future conditions but also as current realities.

In response to the challenges students face, they concluded that financial planning and data analysis are essential hard skills. They acknowledged that an understanding of AI—how it works, its capabilities and limitations, and its applications—would be beneficial if students also possessed these skills (Berikol & Killi, 2021; Sabuncu, 2022). Meanwhile, the soft skills deemed crucial were critical thinking (84%), adaptability (68%), and problem solving (63%). These soft skills are all relevant to the VUCA era (Juniardi et al., 2024). Students understand

that static knowledge alone is insufficient and that they must be lifelong learners who can adapt to new situations and solve problems in diverse and creative ways. These results validate the theoretical framework of this study, which asserts that character development and competency building are essential for students (Fülöp et al., 2025).

The response to question 13 indicated that a limitation of current accounting education is the lack of practical experience. This finding aligns with students' concerns about job readiness. Students realize that conceptual knowledge alone is insufficient for preparing them for the workforce (Tavares et al., 2023). They must be equipped with real-world, complex practices (Zainuddin et al., 2022). A second drawback is that learning remains too theoretical and monotonous. Students desire engaging, interactive, and application-oriented learning experiences. These findings underscore the importance of flexible AI integration to enhance learning quality (Bozkurt et al., 2021).

The presence of AI in accounting education addresses the aforementioned limitations. Question 15 revealed that 53% of students strongly agreed that AI aids in their understanding of complex accounting concepts. One of the students stated that AI helps translate theory into practice, suggesting that these students view AI as a pedagogical tool rather than merely a source of information. However, 26% of students said AI's effectiveness depends on cognitive engagement, and 16% said AI is only useful for searching for information, not for understanding.

Regarding the development of soft skills, 58% of students strongly agreed that AI can foster critical, creative, and analytical thinking. One of the students stated that AI shifts the focus from calculations to analysis. However, another student expressed a different view, stating that there is a tendency to use AI to cheat. These responses demonstrate that, while AI can stimulate creative thinking, it can also undermine critical and analytical thinking if used unwisely (Gerlich, 2025; Obaje, 2025). This perspective aligns with learning best practices, which emphasize using AI to support learning rather than replacing cognitive work. The diverse responses to this question indicate that students have different understandings of AI's role and impact on learning. Some view AI as a cognitive tool that develops thinking skills, while others see it as a source of information for thinking, not as an extension of themselves. These differing views underscore the need for an explicit pedagogical framework for the role of AI in learning (Weng et al., 2023; Yang et al., 2024). Questions 17 and 18 examine the impact of AI on adaptability, collaboration, and cooperation. Over 60% of students agreed that integrated AI can enhance these capacities. Therefore, one could argue that AI integration equips students with the essential skills needed in the VUCA era.

Conclusion

Overall, these findings reveal that students have mastered the use of AI, but they also feel uncertain about the role of AI in their learning. They recognize the importance of AI, use it frequently, and are aware of its benefits and risks. However, they are not so sure about its effectiveness in learning. The challenges faced by students, lack of practical experience, complexity of accounting concepts, and rapid changes are challenges that can be overcome by AI if applied appropriately. The key skills students need in the VUCA era are critical thinking, adaptability, and problem-solving, complemented by technical skills in financial planning and data

analysis, which are competencies they feel they lack in AI-integrated learning. However, this development requires more than just tools; it requires structured learning experiences that explicitly teach students to collaborate with AI, not just use it. The existence of pedagogical gaps, such as too much theory and too little practice, as well as monotonous delivery methods, creates both urgency and opportunity for transformation. The integration of AI will have a very positive impact on students' academics and character only if teachers redesign learning activities to involve student activities and learning experiences.

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