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The Effect of The In-Depth Learning Model and Learning Motivation On Accounting Comprehension, With Digital Literacy As A Moderating Variable

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The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

This study aims to analyze the effect of deep learning models and learning motivation on the accounting comprehension of vocational high school students, as well as to examine the role of digital literacy as a moderating variable in this relationship. Deep learning is considered relevant because it emphasizes meaningful conceptual understanding through cognitive, reflective, and contextual engagement which is in line with the characteristics of accounting learning. This study uses a quantitative approach with an explanatory research design. Data were collected by distributing Likert scale questionnaires to students majoring in accounting in grades X, XI, and XII at vocational high schools. The sampling technique used proportionate stratified random sampling. The research instrument was developed based on indicators of deep learning, learning motivation, accounting comprehension, and digital literacy adapted from previous studies. Data analysis was performed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) to test the direct influence and moderating effects between variables. The findings show that deep learning has a strong positive and significant effect on accounting comprehension ($\beta = 0.506$; $p < 0.001$), followed by learning motivation which also demonstrates a positive and significant influence ($\beta = 0.288$; $p = 0.001$). Digital literacy is found to have a positive direct effect on accounting comprehension ($\beta = 0.181$; $p < 0.015$). However, the moderating effects of digital literacy on the relationship between deep learning and accounting comprehension ($p = 0.184$) as well as learning motivation and accounting comprehension ($p = 0.496$) are not statistically significant, indicating that digital literacy does not strengthen these relationships. Collectively, the variables explain 80.2% ($R^2 = 0.802$) of the variance in accounting comprehension, highlighting the dominant role of deep learning and learning motivation in improving students understanding. Overall, the results emphasize the importance of implementing meaningful and reflective learning approaches alongside strengthening students learning motivation to enhance accounting comprehension. The findings also suggest that digital literacy plays a supportive role rather than a moderating factor in vocational accounting education.

Introduction

Accounting education at the vocational high school level requires students to not only master recording procedures, but also have a deep conceptual understanding of accounting principles and applications (Benu & Nugroho, 2021; Wi et al., 2021). Accounting comprehension is an important learning outcome because it is related to students ability to understand basic concepts, analyze financial transactions, and systematically solve accounting problems (Leunupun et al., 2021). However, various studies show that students understanding of accounting is still not at an optimal level. This condition is caused by a learning process that still focuses on procedural delivery of material and does not encourage cognitive and reflective engagement of students in understanding accounting concepts comprehensively (Wi et al., 2021).

One learning approach that is considered relevant to improve students conceptual understanding is deep learning (Nafi'ah & Faruq, 2025). Deep learning emphasizes a meaningful learning process through active student involvement, awareness of learning objective, reflection, and the ability to relate knowledge to real-world contexts (Rachma et al., 2025). This approach is not only oriented towards short-term learning outcomes but also towards the formation of sustainable understanding (Mystakidis, 2021).

Deep learning is a learning approach that emphasizes meaningful, reflective, and contextual understanding, enabling students to actively construct knowledge and connect new concepts with prior experiences (Mystakidis, 2021). In the context of accounting education, this approach is particularly important as it supports students in developing analytical thinking and the ability to interpret financial information rather than relying solely on memorization (Mahardika & Jaya, 2025). Previous studies in accounting education highlight that the implementation of active learning models, such as project-based learning, can enhance students' understanding and engagement in accounting subjects (Jatmika & Alviantoro, 2025). Therefore, it can be assumed that the implementation of deep learning positively influences students accounting comprehension. Based on the literature review and previous research findings, the following hypothesis can be formulated:

H1: Deep learning has a positive effect on accounting comprehension.

Learning motivation is an important factor that influences students' engagement and achievement in the learning process, as it reflects the internal drive that encourages students to actively participate in learning activities and participate in learning activities and persist in achieving academic goals. Student with higher motivation tend to demonstrate greater effort, persistence, and interest in learning, which contributes to better academic performance and deeper understanding of accounting material (Leunupun et al., 2021).

Furthermore, learning motivation is closely related to students' level understanding, as motivated students are more likely to engage in meaningful learning processes, such as exploring concepts, practicing problem-solving, and integrating knowledge. Previous studies have shown that learning motivation has a significant influence on students' level of accounting comprehension, indicating that students with strong motivation achieve higher levels of understanding compared to those with lower motivation (Leunupun et al., 2021). Therefore, it can be assumed that learning motivation plays an important role in improving students' accounting comprehension. Based on the literature review and previous research findings, the following hypothesis is proposed:

H2: Learning motivation has a positive effect on accounting comprehension.

Digital literacy is increasingly recognized as an essential competency in modern education, particularly in supporting students' ability to access, evaluate, and utilize information effectively in the digital environment (Rahayu et al., 2025). In the context of accounting education, digital literacy enables students to use various digital tools, analyze financial data, and interpret information more efficiently, which supports the development of higher-order thinking skills (Mahardika & Jaya, 2025). As learning increasingly integrates technology, students with higher levels of digital literacy are better equipped to engage in complex learning processes and adapt to technology-based learning environments (Feriyanto & Anjariyah, 2024).

In addition, digital literacy can enhance the effectiveness of deep learning by enabling students to access, process, and utilize information more efficiently in the learning process. Deep learning emphasize meaningful and reflective engagement, which can be enhanced when students are able to utilize digital resources effectively to support their learning process (Mystakidis, 2021). Students with strong digital literacy are more likely to benefit from deep learning approaches, as they can access diverse learning materials, engage in interactive learning activities, and develop a deeper understanding of accounting concepts (Nafi'ah & Faruq, 2025). Thus, it can be argued that digital literacy plays a role in strengthening the relationship between deep learning and accounting comprehension. Therefore, the following hypothesis is proposed:

H3: Digital literacy moderates the effect of deep learning on accounting comprehension.

Learning motivation plays an important role in encouraging students to actively engage in the learning process and achieve better academic outcomes, particularly in subjects that require analytical thinking such as accounting (Leunupun et al., 2021). In addition, motivated students are

more likely participate in meaningful learning activities and sustain their effort in achieving learning objectives.

In this context, digital literacy can strengthen the role of learning motivation by enabling students to utilize digital tools and learning resources more effectively in supporting their learning activities (Rahayu et al., 2025). Students with high levels of digital literacy are better able to transform their motivation into productive learning behaviors, such as exploring digital materials, engaging in interactive learning environments, and applying knowledge in various contexts (Feriyanto & Anjariyah, 2024). Accordingly, digital literacy does not only support learning activities but also amplifies the impact of learning motivation on students' accounting comprehension (Mahardika & Jaya, 2025). Accordingly, it can be inferred that digital literacy strengthens the influence of learning motivation on students' accounting comprehension. Based on the literature review and previous research findings, the following hypothesis is proposed:

H4: Digital literacy moderates the influence of learning motivation on accounting comprehension.

Therefore, this study aims to analyze the effect of deep learning on accounting comprehension, the effect of learning motivation on accounting comprehension, the direct effect of digital literacy on accounting comprehension, and the moderating role of digital literacy in the relationship between deep learning, learning motivation, and accounting comprehension.

The findings are expected to contribute theoretically to the integration of deep learning and motivational frameworks within digital educational contexts and practically to the development of more effective instructional strategies in vocational accounting education.

Research Design and Methodology

This study uses a quantitative approach with an explanatory research type, which aims to explain the influence between variables and test the casual relationship between deep learning and learning motivation on accounting comprehension, with digital literacy as a moderating variable. This approach was chosen because it is suitable for testing the relationship model between variables empirically and measurably.

Research Design and Participants

The research was conducted on vocational high school students majoring in accounting. The research population included all Accounting 1 and Accounting 2 students in grades X, XI, and XII. The sampling technique used was proportionate stratified random sampling, with strata based on class and study group, so that each subgroup in the population had a proportional chance of being represented as a research sample. Prior to the main data collection, a pilot test was conducted involving 30 respondents to evaluate the validity and reliability of the research instrument. After ensuring the instrument meet the required criteria, the main data collection was carried out involving 122 respondents for hypothesis testing.

Data Collection Technique

Research data were collected using a closed questionnaire design in the form of five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Prior to data collection, formal research permission was obtained from the Regional Office of the Education Department. The researcher submitted an official assignment letter issued by the university to obtain the research permit. After receiving approval from the education authority, coordination was conducted with the school management to schedule the distribution of questionnaires.

Before administering the main survey, a pilot test was conducted to evaluate the validity and reliability of the research instrument. The pilot test was carried out among Grade XII accounting students, as they were considered to have a more comprehensive understanding of accounting concepts. The sampling technique applied in this study was proportionate stratified random sampling to ensure proportional representation across grade levels.

The pilot test data were analyzed using Partial Least Squares Equation Modeling (PLS-SEM) to assess the measurement model. Convergent validity was evaluated through outer loadings and Average Variance Extracted (AVE), while reliability was assessed using Cronbach's alpha and composite reliability criteria, demonstrating that the instrument was appropriate for the main data collection.

Research Instrument

The research instrument was developed based on the indicators of each variable, namely deep learning, learning motivation, accounting comprehension, and digital literacy. Each indicator was measured using two statements to increase measurement reliability and anticipate the possibility of invalid items. The formulation of indicators and statements referred to theories and previous research relevant to each variable. To ensure the quality of the research, a pilot test was conducted to evaluate its validity and reliability. The results of the pilot test are presented.

Table 1. Pilot Test Reliability and Validity Results.

	Cronbach's Alpha	***rho_A***	***Composite Reliability***	***Average Variance Extracted (AVE)***
Digital Literacy (Z)	0,955	0,959	0,963	0,765
Learning Motivation (X_2)	0,880	0,906	0,905	0,550
Accounting Comprehension (Y)	0,963	0,964	0,969	0,797
Deep Learning (X_1)	0,898	0,923	0,922	0,606

***Source**: SmartPLS Software, 2026*

Based on the results presented, all variables meet the required criteria for reliability and validity. The Cronbach's Alpha values for all constructs are above 0.70, indicating good internal consistency. Similarly, the Composite Reliability values exceed the threshold of 0.70, confirming that the construct are reliable. Furthermore, the Average Variance Extracted (AVE) values for all variables are above 0.50, indicating that the indicators have adequate convergent validity. Therefore, it can be concluded that all measurement instrument used in this study are valid and reliable for further analysis.

The dimensions and indicators of each research variable are presented in Table 2. Each variable in this study was measured using multiple indicators, with each indicator represented by two measurement items. Specifically, the deep learning variable (X1) consists of four indicators with a total of 8 items, learning motivation (X2) consists of four indicators with a total of 8 items, accounting comprehension (Y) consists of four indicators with a total 8 items, and digital literacy (Z) consists of four indicators with a total of 8 items.

Table 2. Dimensions and Indicators of Research Variables.

Variable	**Dimension**	**Indicator**	**Source**
Deep Learning (X_1)	1. Mindful Learning	1. Student awareness in the learning process	(Nafi'ah & Faruq, 2025)
	2. Meaningful Learning	2. The relevance of the material to real life	(Feriyanto & Anjariyah, 2024)
	3. Joyful Learning	3. Comfort and enjoyment of learning	(Nafi'ah & Faruq, 2025)
	4. Reflective	4. Ability to reflect on learning	(Nafi'ah & Faruq, 2025)
Learning Motivation (X_2)	1. Intrinsic Motivation	1. Internal Motivation	(Leunupun et al., 2021)
	2. Extrinsic Motivation	2. External Motivation	(Benu & Nugroho, 2021)
	3. Perseverance	3. Consistency in learning	(Leunupun et al., 2021)
	4. Tenacity	4. Not giving up easily	(Benu & Nugroho, 2021)
Accounting Comprehension (Y)	1. Conceptual Understanding	1. Understanding accounting principles	(Leunupun et al., 2021)
	2. Application	2. Application of concepts	(Benu & Nugroho, 2021)
	3. Analysis	3. Transaction Analysis	(Leunupun et al., 2021)
	4. Problem Solving	4. Case Resolution	(Benu & Nugroho, 2021)

Variable	Dimension	Indicator	Source
Digital Literacy (Z)	1. Operational	1. Use of Technology	(Wahjusaputri & Nastiti, 2022)
	2. Informational	2. Accessing and evaluating information	(Tinmaz et al., 2022)
	3. Digital Communication	3. Use of Digital Media	(Wahjusaputri & Nastiti, 2022)
	4. Digital Ethics	4. Awareness and Responsibility	(Tinmaz et al., 2022)

Data Analysis Technique

Data analysis was performed using Structural Equation Modeling-Partial Least Squares (SEM—PLS) with the use SmartPLS software. This technique was chosen because it is capable of analyzing the relationships between latent variables simultaneously and is suitable for use in studies with complex structural models and data that do not have to be normally distributed. The analysis stages included evaluation of the measurement model (convergent validity, discriminant validity, and construct reliability tests) and evaluation of the structural model to test the research hypotheses and the moderating effect of digital literacy. Overall, the research methodology was designed to ensure systematic data collection and rigorous analysis, thereby enabling the study to be replicated and providing valid and reliable evidence to address the research objectives.

Findings and Discussion

Findings

1. Descriptive Statistics of Respondents

This study involved 122 students as the main respondents from grades X, XI, and XII of the Accounting and Institutional Finance Program. Based on gender distribution, the respondents consisted of 56 male students (45.9%) and 66 female students (54.1%). The table is shown as **Table 3:**

Table 3. Gender Distribution.

Gender	Amount	*Percentage %*
Male	56	45.9%
Female	66	54.1%

This composition shows a relatively balanced distribution between males and females.

Based in grade level, the respondents consisted of 50 tenth-grade students (41.0%), 48 eleventh-grade students (39.3%), and 24 twelfth-grade students (19.7%). This distribution shows that most of the respondents were from the tenth and eleventh grades.

A pilot test was conducted on 30 students before the main study was carried out ensure the validity and reliability of the instrument. The table is shown as **Table 4:**

Table 4. Class Distribution.

Grade Level	Amount	*Percentage %*
Tenth-grade	50	41.0%
Eleventh-grade	48	39.3%
Twelfth-grade	24	19.7%

2. Structural Model Result

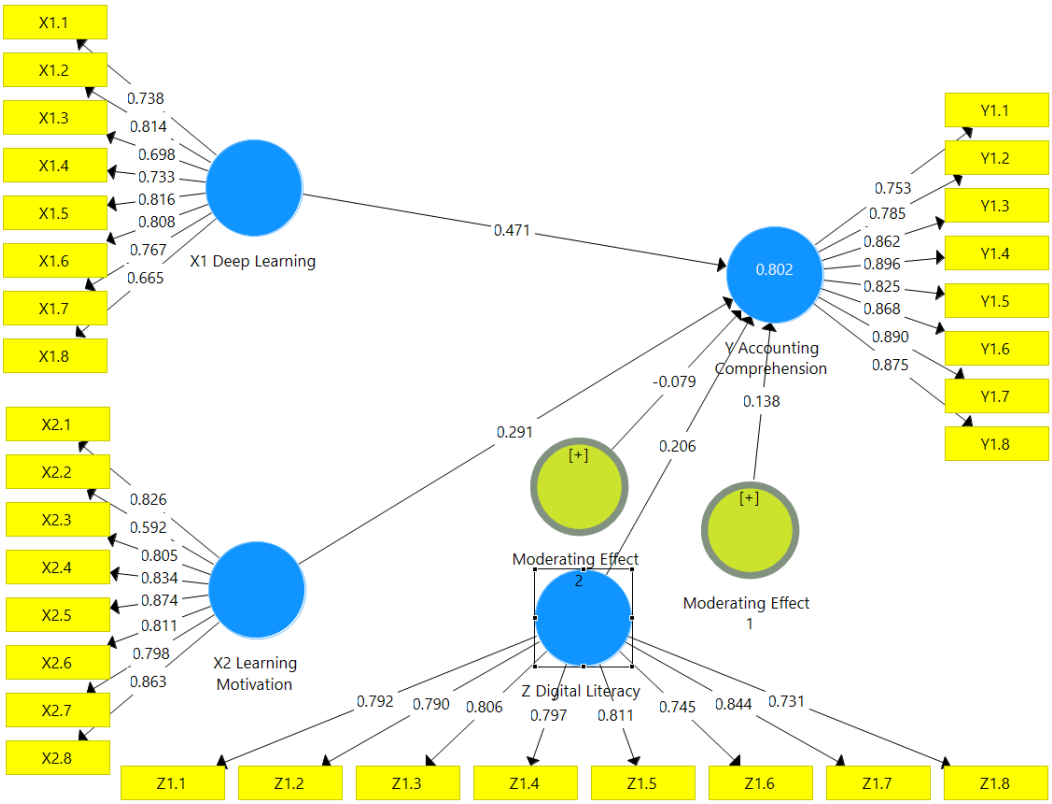
The Figure 1 shown of the outer loading test, most indicators show loading values above 0.70, indicating that they meet the criteria for convergent validity however, several indicators have loading values slightly below the recommended threshold of 0.70. Despite this, these indicators are still retained in the model because their values are close to the acceptable limit and remain above 0.60, which is considered adequate in exploratory research. In addition, the decision to retain these

indicators is supported by the overall construct reliability and validity, as reflected in the Composite Reliability and Average Variance Extracted (AVE) values that meet the required thresholds. Therefore, all indicators used in this study are considered valid and suitable for further analysis.

The path coefficient from deep learning to accounting comprehension is 0.471, indicating a positive and substantial effect. This suggest that students who engage in deeper, meaningful learning processes tend to demonstrate higher levels of accounting comprehension. Similarly, learning motivation shows a positive effect on accounting comprehension with a path coefficient of 0.291, indicating that motivated students are more likely to achieve better conceptual understanding in accounting subjects.

The R-square value of accounting comprehension is 0.802, which indicates that 80.2% of the variance in accounting comprehension can be explained jointly by deep learning, learning motivation, and the moderating effects included in the model. This value reflects a strong explanatory power of the structural model.

Regarding the moderating effects, the interaction between digital literacy and deep learning shows a coefficient of 0.138, while the interaction between digital literacy and learning motivation shows a coefficient of -0.079. These coefficients indicate the extent to which digital literacy strengthens or weakens the relationships between the independent variables and accounting comprehension.



Source: *SmartPLS 3 Software*

Figure 1*. Outer Model Values*

3. Evaluation of Measurement Model

3.1 Convergent Validity

Convergent validity was evaluated through outer loading values and Average Variance Extracted (AVE). All indicators had outer loading values above 0.60 and most were above 0.70, thus meeting the criteria for convergent validity. The AVE values of all constructs were also above 0.50, indicating that the constructs were able to explain more than 50% of the variance of the indicators. The AVE $\geqslant$ 0.50 criterion refers to (Hair Jr et al., 2019) in the PLS-SEM model evaluation. The Average Extracted (AVE) values obtained in this study are presented in **Table 5.**

Table 5. *Average Variance Extracted (AVE) Results.*

	Average Variance Extracted (AVE)
X_1 Deep Learning	0.573
X_2 Learning Motivation	0,647
Y Accounting Comprehension	0,715
Z Digital Literacy	0,625

As shown in **Table 5**, all constructs have AVE values above 0.50. these results indicate that all variables have achieved adequate convergent validity, meaning that the indicators used are able to represent their respective constructs effectively. Therefore, it can be concluded that all constructs in this study meet the requirements for convergent validity and are suitable for further analysis.

3.2 Reliability

The Cronbach's alpha and Composite Reliability values of all variables are above 0.70. This indicates that the construct has good internal consistency. The Cronbach's Alpha and Composite Reliability values obtained in this study are presented in **Table 6 and Table 7.**

Table 6. *Cronbach's Alpha Results.*

	Cronbach's Alpha
X_1 Deep Learning	0,892
X_2 Learning Motivation	0,912
Y Accounting Comprehension	0,942
Z Digital Literacy	0,914

As shown in **Table 6,** all constructs have Cronbach's Alpha values above the recommended threshold of 0.70. these results indicate that all variables demonstrate high internal consistency, meaning that the indicators used in each construct are reliable in measuring their respective variables. Therefore, it can be concluded that all constructs meet the reliability criteria based on Cronbach's Alpha.

Table 7. Composite Reliability Results.

	Composite Reliability
X_1 Deep Learning	0,914
X_2 Learning Motivation	0,936
Y Accounting Comprehension	0,952
Z Digital Literacy	0,930

Based on **Table 7,** all constructs show Composite Reliability values exceeding the threshold of 0.70. These findings confirm that all constructs have strong reliability and are consistent in measuring the intended variables. Therefore, it can be concluded that all constructs in this study are reliable and suitable for further analysis.

3.3 Discriminant Validity

Discriminant validity was tested using the Heterotrait-Monotrait Ratio (HTMT). All HTMT values were within the tolerance limit (<0.95), so it can be concluded that constructs in this study have adequate discriminant validity (Henseler et al., 2015). The results of the HTMT analysis are presented in **Table 8.**

Table 8. Heterotrait-Monotrait Ratio (HTMT) Results.

	X_1 Deep Learning	**X_2 Learning Motivation**	**Y Accounting Comprehension**	**Z Digital Literacy**

X_1 Deep Learning	0,757			
X_2 Learning Motivation	0,825	0,805		
Y Accounting Comprehension	0,862	0,818	0,846	
Z Digital Literacy	0,649	0,618	0,688	0,790

Based on the HTMT criterion, a value below 0.90 indicates that discriminant validity has been established between constructs. The results show that all HTMT values in this study are below the threshold of 0.90, indicating that each construct is empirically distinct from one another.

Deep Learning (X_1)

The HTMT values between deep learning and other constructs are all below 0.90, 0.825 with learning motivation, 0.862 with accounting comprehension, and 0.649 with digital literacy. These results indicate that the deep learning construct is empirically distinct from the other constructs.

Learning Motivation (X_2)

Similarly, the HTMT values between learning motivation and other constructs are below 0.90, including 0.805 with deep learning, 0.818 with accounting comprehension, and 0.618 with digital literacy. This confirm that the learning motivation construct has adequate discriminant validity.

Accounting Comprehension (Y)

The HTMT values for accounting comprehension in relation to other constructs are also below 0.90, namely 0.846 with learning motivation and 0.688 with digital literacy. This indicates that the accounting comprehension constructs is distinct and measures a different concept compared to other variables.

Digital Literacy (Z)

Furthermore, the HTMT values between digital literacy and other constructs are below the recommended threshold, including 0.790 with accounting comprehension, 0.649 with deep learning, and 0.618 with learning motivation. These results demonstrate that digital literacy is empirically distinct from the other constructs.

Therefore, it can be concluded that all constructs in this study meet the criteria for discriminant validity based on the HTMT assessment.

4. Structural Model Evaluation (without moderation)

4.1 Coefficient of Determination (R^2)

The coefficient of determination (R2) was used to evaluate the explanatory power of the structural model. The results of the (R^2) analysis are presented in **Table 9.**

Table 9. R^2 Results.

	R Square	**R Square Adjusted**
Y Accounting Comprehension	0,797	0,792

As shown in **Table 9**, the R^2 value for the Accounting Comprehension variable is 0.797. This indicates that 79.7% of the variation in accounting comprehension can be explained by deep learning, learning motivation, and digital literacy. While 20.3% is influenced by other variables not included in this model. Based on the criteria of (Hair Jr et al., 2019), this value is classified as strong, indicating that the model has substantial explanatory power.

4.2 Effect Size (f^2)

The effect size (f^2) was used to assess the contribution of each exogeneous variable to the endogenous variable. The results of the (f^2) analysis are presented in **Table 10.**

Table 10. f Square Results.

	X_1 Deep Learning	X_2 Learning Motivation	Y Accounting Comprehension	Z Digital Literacy
X_1 Deep Learning			0,362	
X_2 Learning Motivation			0,125	
Y Accounting Comprehension				
Z Digital Literacy			0,090	

Based on Table 10, deep learning shows a large effect on accounting comprehension with an (f^2) value of 0.362. meanwhile, learning motivation has a small to moderate effect with an (f^2) value of 0.125, and digital literacy has a small effect with an (f^2) value of 0.090. According to the criteria proposed by (Becker, 2000), these results indicate that deep learning is the most influential variable in explaining accounting comprehension, followed by learning motivation and digital literacy, which contribute to a lesser extent.

4.3 Predictive Relevance (Q^2)

The Q^2 value of 0.558 (>0) indicates that the model has good predictive relevance. The bootstrapping result show:

- Deep learning has a positive and significant effect on accounting comprehension (β = 0.506; p < 0.001)
- Learning motivation has a positive and significant effect on accounting comprehension (β = 0.288; p = 0.001)
- Digital literacy has a positive and significant effect on accounting comprehension (β = 0.181; p < 0.015)

Based on the bootstrapping results, deep learning has a positive and significant effect on accounting comprehension (β = 0.506; p < 0.001), indicating that **H1 is accepted.** Learning motivation also has a positive and significant effect on accounting comprehension (β = 0.288; p = 0.001), **indicating H2 is accepted.**

5. Moderating Analysis

After adding the interaction term, the R^2 value increased to 0.802. However, bootstrapping result show that:

- The interaction between deep learning and digital literacy is not significant (p = 0.184).
- The interaction between learning motivation and digital literacy is not significant (p = 0.496).

However, the interaction effect between deep learning and digital literacy is not significant (p = 0.184), indicating that **H3 is rejected**. Similarly, the interaction between learning motivation and digital literacy is not significant (p = 0.496), indicating that **H4 is rejected.**

The moderating effect size is also below 0.02, indicating a very small effect. Thus, digital literacy does not act as a moderating variable in the relationship between deep learning and learning motivation on accounting comprehension.

Discussion

1. **The Effect of Deep Learning on Accounting Comprehension**

   The result of the study indicate that deep learning has a positive and significant effect on accounting comprehension. This is in line with deep learning theory, which emphasizes conceptual understanding, reflection, and meaning connection (Mystakidis et al., 2021). This finding is consistent with previous studies that state learning approaches that encourage meaning-making and reflection can improve student's conceptual understanding in academic fields. The findings is also supported by previous studies which highlight that learning processes influenced by structured approaches and active engagement can significantly shape students' behavior and academic outcomes, particularly in accounting education contexts (Sari et al., 2025).

2. **The Effect of Learning Motivation on Accounting Comprehension.**

Learning motivation has also been shown to have a positive effect on accounting comprehension. This is in line with intrinsic and extrinsic motivation theory, which states that internal and external drives influence learning engagement and outcomes (Leunupun et al., 2021). These findings support previous research showing that students with high learning motivation tend to have better academic understanding. In addition, previous research indicates that internal factors such as pressure and individual conditions can influence students' behavior and learning outcomes, suggesting that motivation plays an essential role in shaping academic performance (Sari et al., 2025). And this result is consistent with previous research showing that learning motivation significantly influences student's academic achievement, where higher motivation encourages greater engagement and leads to improved learning outcomes (Asmawan et al., 2022; Suranto, 2015).

***3*. The Moderating Effect of Digital Literacy on the Relationship between Deep Learning and Accounting Comprehension**

The results of this study indicate that digital literacy does not significantly moderate the relationship between deep learning and accounting comprehension. This finding suggests that although digital literacy is an important competency in the digital era, its role is not strong enough to enhance the effect of deep learning on students' accounting comprehension. One possible explanation is that deep learning itself already emphasizes meaningful understanding, reflection, and active engagement, which may not necessarily depend on students' level of digital literacy (Mystakidis, 2021).

Furthermore, digital literacy primarily reflects student's technical and informational competencies rather than cognitive depth or reflective learning processes. As a result, its presence may not significantly enhance the effect of deep learning. Which inherently focuses on meaningful understanding, critical thinking, and conceptual integration (Mystakidis et al., 2021; Tinmaz et al., 2022). In this context, digital literacy functions more as a supporting tool rather than a strengthening factor in the relationship between deep learning and accounting comprehension.

***4*. The Moderating Effect of Digital Literacy on the Relationship between Learning Motivation and Accounting Comprehension**

The findings also reveal that digital literacy does not significantly moderate the relationship between learning motivation and accounting comprehension. This indicates that students' motivation to learn plays a direct role in influencing their understanding, regardless of their level of digital literacy. Highly motivated students tend to engage in learning activities, seek additional information, and persist in understanding the material, even without relying heavily on digital competencies (Leunupun et al., 2021).

Furthermore, although digital literacy can facilitate access to learning resources, it does not necessarily amplify the effect of motivation if students already possess strong intrinsic or extrinsic motivation. In this context, motivation acts as a more dominant internal factor, while digital literacy serves only as a complementary tool (Tinmaz et al., 2022). Previous studies also indicate that the integration of technology in accounting education influences students' learning experiences, although it does not always strengthen learning outcomes directly (Jatmika & Alviantoro, 2025). This finding suggests that improving students' motivation may be more critical than enhancing digital literacy in supporting accounting comprehension.

In addition, digital literacy is often associated with the ability to access and utilize information, but it does not necessarily influence student's internal drive or motivational intensity. Therefore, even when students possess adequate digital literacy skills, these competencies may not strengthen the relationship between learning motivation and accounting comprehension, as motivation itself is a more dominant psychological factor in determining learning outcomes (Tinmaz et al., 2022; Wahjusaputri & Nastiti, 2022). This supports the argument that digital literacy plays a complementary rather than a moderating role in the learning process (Sari et al., 2025).

Conclusion

This study confirms that deep learning and learning motivation significantly enhance student's accounting comprehension. Deep learning emerges as the dominant factor, highlighting the importance of meaningful engagement, reflective processes, and conceptual orientation in strengthening accounting comprehension. Learning motivation also contributes positively, emphasizing the role of both intrinsic and extrinsic drives in supporting academic achievement. Although digital literacy directly influences accounting comprehension, it does not moderate the relationships between deep learning, motivation, and accounting comprehension, indicating that its role is more supportive than interactive within this context. Theoretically, this study reinforces the integration of deep learning theory and motivational theory in explaining academic understanding in vocational education, while clarifying the position of digital literacy as a direct predictor rather than a moderating variable. Practically, the findings suggest that educators should prioritize instructional strategies that promote reflective, meaningful, and concept-based learning. Strengthening student's motivation through supportive classroom environments and goal-oriented learning practices is equally essential. The development of digital literacy should be aligned with pedagogical strategies rather than treated as an independent enhancer of instructional impact.

This study is limited by its focus on a single vocational school and a specific student population, which may restrict generalizability. Future research should involve broader samples across institutions or regions and consider additional moderating variables, such as self-efficacy or learning readiness. Employing mixed-method approaches may also provide deeper insights into how deep learning and motivation interact within digital learning environments.

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