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Understanding the teacher's intention to use artificial intelligence for accounting learning

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Keyword

artificial intelligence, accounting learning, teacher's intention to use, perceived usefulness, extended TAM

Abstract

This research aims to analyze the factors that determine accounting teachers' intentions to use artificial intelligence in learning using the technology acceptance model (TAM) that has been developed. The research respondents were high school and vocational school accounting teachers in Semarang City, Central Java, Indonesia. 73 units of data were obtained using accidental sampling techniques. Questionnaires developed by previous researchers were used to obtain research data. SEM-PLS is used as a data analysis method. The research results indicate that only perceived usefulness can determine the level of teacher intention to utilize AI in learning. Other variables were not proven to have a significant influence. Some respondents thought that using AI was not an easy thing to do. Facilities and social support cannot encourage them to utilize AI in learning. Respondents also do not have sufficient IT competency, so they appear worried and less confident about utilizing AI in learning. The practical implication of this research is the importance of training and education for teachers so that they can utilize AI in learning because they are already convinced of the benefits of AI.

INTRODUCTION

Artificial intelligence (AI) is a technology that has developed rapidly in recent years and has made significant contributions in many fields. AI has changed several sectors and increased the accessibility of sophisticated tools used in everyday life, including education (Moura & Carvalho, 2024). In education, AI can also change society's fundamental understanding and practices of teaching and learning (An et al., 2023). AI systems are technologies that can imitate human intelligence. The education sector is no exception to the fields currently using AI through machine learning in developing and automating processes (Adelana et al., 2024). One of the most significant benefits of AI technology is that it offers solutions to problems in various areas of society. Education is one of the fields where innovative applications of AI are being used (Yilmaz et al., 2023).

Recent studies show that through the benefits provided by AI, teachers can be relieved of tedious teaching tasks such as homework correction, error analysis, personalized weakness analysis, and even basic teaching knowledge (Niu et al., 2024). Despite growing interest in AI, AI is still poorly understood in many fields (Moura & Carvalho, 2024). Despite the growing importance of artificial intelligence (AI) education at the K-12 level, a lack of teacher preparedness hinders the integration of AI in schools (Park & Kwon, 2024). Even though it has many benefits, AI technology and applications are still underutilized in teaching and learning (Zulkarnain & Yunus, 2023).

The technology acceptance model (TAM) is a theory that is widely used to understand the behavior of teachers and students in accepting and using technology. TAM is a general theoretical

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framework that explains two important factors influencing user acceptance of technology (Yu, 2024). The extended TAM model is the most frequently used theory to assess user acceptance of AI technology (Chocarro et al., 2023). In addition, the Unified theory of acceptance and usage of technology (UTAUT) model was also developed to better understand user behavior in using information technology (Emon et al., 2023). Previous researchers also used the Technology Continuance Theory, an integrative theory developed from a combination of TAM, the Expectation Confirmation Model, and the Cognitive Model for predicting the long-term usage of technological innovations (Zulkarnain & Yunus, 2023). Interpretative phenomenological analysis (IPA) is also used to understand user behavior qualitatively (Al-Mughairi & Bhaskar, 2024).

Previous studies developed extended TAM to analyze factors influencing the intention to use AI-powered ChatGPT to support metacognitive self-regulated learning (Dahri et al., 2024). They used it to explore factors influencing the acceptance of ChatGPT for English language teaching (Dehghani & Mashhadi, 2024). Other researchers enriched the TAM model to investigate various factors influencing teacher education students in information-based teaching (Ma & Lei, 2024). The TAM model, augmented with teacher data, investigates the factors influencing science teachers' use of AI (Nja et al., 2023). The TAM 3 model was developed to evaluate students' intentions to adopt AI-based robots in education (Algerafi et al., 2023).

This research analyzes the intention to use AI in accounting learning by developing the TAM and UTAUT models, adding factors such as teacher experience and IT competence. The variables developed from TAM include convenience and usefulness factors, while the variables developed from UTAUT are facility support and social influence. These four variables will be added with IT experience and competence so that they will explain the factors that determine the level of accounting teachers' intention to utilize AI.

The convenience and usefulness factors are the two main variables in the TAM model, which can determine whether someone accepts and utilizes technology in their activities (Davis, 1989; Davis et al., 1989). Teachers will use AI in learning if they think AI is easy to use. Teachers will also take advantage of AI if they think AI can be useful for improving their learning performance. Easy use of AI will further increase teachers' intentions to continue using it. The increasing benefits of using AI in learning will encourage teachers to study and use AI in learning. Previous studies have provided empirical evidence that these two TAM constructs significantly influence teacher and student intentions in taking advantage of AI. Research results show that perceived convenience and usefulness lead to greater acceptance of text-based virtual assistant chatbots (chatbots) (Chocarro et al., 2023). Perceived usefulness is significantly related to ESL elementary school teachers' continued intention to use AI technology in their teaching and learning processes (Zulkarnain & Yunus, 2023).

UTAUT was developed to understand better the factors that influence the acceptance and use of technology by adding the constructs of facilitating conditions and social influence in addition to the performance expectancy (usefulness) and effort expectancy (ease of use) factors (Venkatesh et al., 2003). Teachers will increasingly utilize AI in learning if they have supporting facilities such as the availability of gadgets (computers, smartphones, internet). Adequate facility support will make it easier and more enthusiastic for teachers to master and use AI in learning. Support factors from peers and other social environments will also encourage teachers to be able to utilize AI in learning. Fellow teachers who have utilized AI will encourage and support other teachers so they can utilize AI in learning. Empirical studies have provided evidence that facilitating conditions and social influence are significant factors in teachers' intentions to utilize AI in learning. Intention to use ChatGPT among professionals in Bangladesh is significantly influenced by UTAUT dimensions (Emon et al., 2023). Other findings also show that the UTAUT dimensions are an important factor in the intention to adopt Artificial Intelligence Tools in Education (EAIT) (Abdelmoneim et al., 2024). It was revealed that academics' BI in using ChatGPT was significantly influenced by UTAUT dimensions (Strzelecki et al., 2024).

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IT experience and competence are also important predictors of utilizing AI for learning. Teachers with sufficient IT experience will increasingly encourage them to continue utilizing AI in learning. They will not have significant difficulty utilizing AI. Likewise, teachers' competence will be a determining factor in the level of teacher intention in utilizing AI for learning. Teachers will not worry about utilizing AI because they have adequate IT competence. However, teachers with low IT experience and competence will tend to be afraid and will not dare to use AI in their learning. Research findings have indicated that IT experience and competency determine teachers' level of intention to utilize AI. Another study recommended that teachers receive more in-depth training on using AI in their practice (Moura & Carvalho, 2024). Other opinions also emphasize that teachers need more knowledge about the operation of ChatGPT as one of the most popular AIs to ensure correct use and maintain the quality of the education system (Lozano & Blanco Fontao, 2023).

METHOD

This research uses a quantitative approach (SEM-PLS model) to analyze the factors influencing teachers' intentions to utilize AI in their learning. The research respondents were accounting teachers at high schools and vocational schools in Semarang City. 73 teachers filled out the research questionnaire distributed via Google Forms. Descriptions of respondents are presented in Table 1. Respondents were mostly women or 69.86%; more were over 40 years old, or more than 85%. Based on the length of teaching, most research respondents were those who had taught for more than 20 years, or 58.80%.

The dependent variable in the research is the teacher's intention to use AI, measured by three statement items. The independent variables consist of perceived ease of use, perceived usefulness, facilitating conditions, social influence, IT experience, and IT competence. Each variable is measured with three statement items on a 5 Likert scale. The research questionnaire was developed based on the opinions of previous researchers to collect research data. The research questionnaire has been tested for validity and reliability. The data analysis method used is SEM-PLS with a model as in Figure 1 below.

Table 1. Respondent description

No.	Description	Amount	Percentage
1.	Gender		
	Male	22	30.14
	Female	51	69.86
	Amount	73	100%
3.	Age		
	Less than 30 years	2	02.74
	31-40 years	9	12.32
	41-50 years	31	42.47
	51-60 years	28	38.36
	More than 60 years	3	04.11
	Amount	73	100%
3.	Learning Experience		
	Less than 5 years	2	02.74
	5-10 years	3	04.11
	11-20 years	25	34.25
	21-30 years	37	50.68
	More than 30 years	6	0822
	Amount	73	100%

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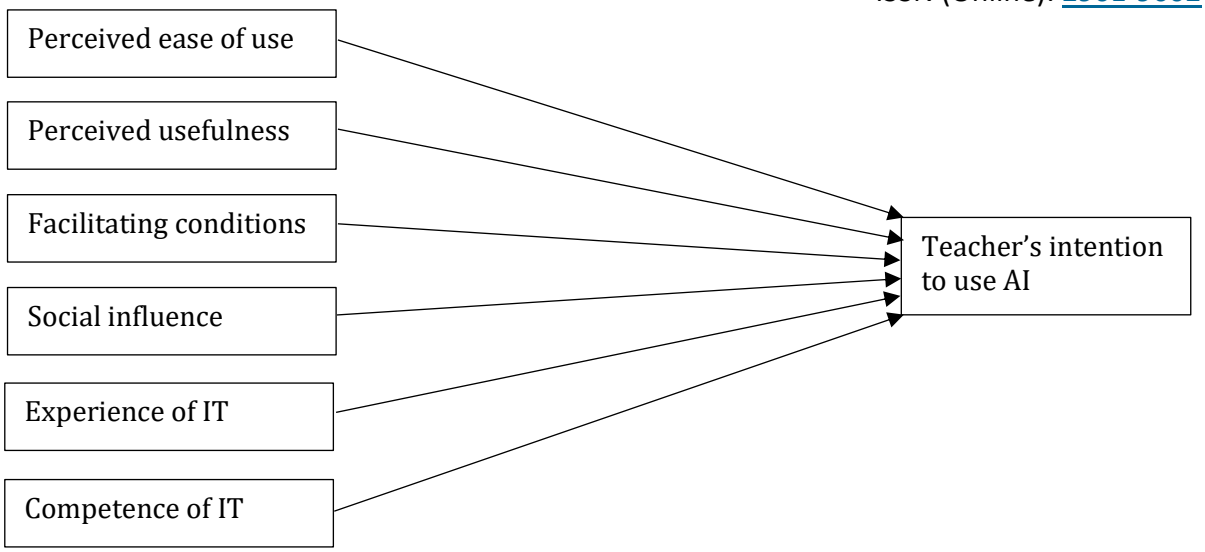

Figure 1. Research model

RESULTS

The results are presented from descriptive statistics of research variables, validity and reliability testing, model suitability, and hypothesis testing results. Table 2 shows the descriptive statistics of the research variables and indicates that the teacher's level of intention to use AI for accounting learning is in the high category. The average score is 11.19, with a maximum score of 15. Most teachers think that using AI is still not easy. The average value of the ease-of-use variable is 9.73 out of a maximum value of 15. Likewise, the teacher IT competency variable is also classified as needing improvement. The mean value is 9.26 out of a maximum score of 15.

Table 2. Descriptive statistics

No.	Variables	N	Minimum	Maximum	Mean	Std-Dev.
1.	Intention to use AI	73	3	15	11.19	2.504
2.	Ease of use	73	3	15	9.73	2.652
3.	Ease of usefulness	73	5	15	11.44	2.478
4.	Facilitating conditions	73	6	15	11.81	2.283
5.	Social influence	73	6	15	11.07	2.137
6.	Experience of IT	73	3	15	10.23	2.606
7.	Compete of IT	73	3	15	9.26	3.046

Hypothesis testing in this research is the SEM-PLS model using the SmartPLS application. The stages begin with testing the validity and reliability of the instrument, which is presented in Table 3 and Table 4; analysis of the goodness of fit test and model suitability test, which are presented in Table 5, as well as the results of the research hypothesis testing which are presented in table 6. Table 3 shows the results of outer loading and indicates that all statement items are valid. The AVE (Average variance extracted) value for all variables is more than 0.05, which indicates that all valid indicators converge in forming their respective variables. Table 4 also shows that Cronbach's alpha value for each variable is more than 0.06, so it can be stated that all variables and items used in this research meet reliability in variable measurement. Thus, the research variables have met the validity and reliability tests.

Table 3. The result of outer loading analysis

	Competence of IT	Ease of Use	Experience of IT	Facilitating Condition	Intention to Use AI	Social Influence	Usefulness
Compete1	0.922						

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	Competence of IT	Ease of Use	Experience of IT	Facilitating Condition	Intention to Use AI	Social Influence	Usefulness
Compete2	0.926						
Compete3	0.837						
Ease1		0.925					
Ease2		0.919					
Ease3		0.927					
Exper1			0.902				
Exper2			0.922				
Exper3			0.814				
Facil1				0.946			
Facil2				0.939			
Facil3				0.803			
Intention1					0.932		
Intention2					0.958		
Intention3					0.948		
Social1						0.829	
Social2						0.838	
Social3						0.823	
Usef1							0.896
Usef2							0.956
Usef3							0.937

Table 4. The result of construct reliability and validity analysis

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Competence of IT	0.876	0.88	0.924	0.803
Ease of Use	0.914	0.919	0.946	0.853
Experience of IT	0.86	0.919	0.912	0.775
Facilitating Condition	0.878	0.894	0.926	0.807
Intention to Use AI	0.941	0.944	0.962	0.895
Social Influence	0.778	0.793	0.869	0.689
Usefulness	0.922	0.93	0.95	0.865

The next analysis tests goodness of fit by looking at the R-square and adjusted R-square in Table 5 below. The R-square value (coefficient of determination) of the intention to use the AI variable is 0.707, which means that the independent variable in this study can explain the intention to use the AI variable by 70.70%. Table 5 also shows the results of the model suitability test by looking at the Q^2predict score, RMSE (root mean square error), and MAE (mean absolute error). The Q^2predict value is 0.663 or more than 0, which means the research model has a relevant predictive model. The RMSE score is 0.592 and is quite close to 0, so the model in this study is quite suitable.

Table 6 shows the results of the research hypothesis testing and indicates that only the usefulness variable positively and significantly influences the intention to use AI. The P value is 0.000 with T statistics of 9.016 and a path coefficient of 0.639. The P-value of the other variables

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is more than 0.05, which means it is not proven to have a significant effect on the intention to use AI.

Table 5. The result of r-square and q-square analysis

	R-square	**R-square adjusted**	
Intention to Use AI	0.707	0.691	
	Q^2predict	**RMSE**	**MAE**
Intention to Use AI	0.663	0.592	0.451

Table 6. Path coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Competence of IT -> Intention to Use AI	-0.069	-0.074	0.095	0.731	0.465
Ease of Use -> Intention to Use AI	0.128	0.128	0.106	1.206	0.228
Experience of IT -> Intention to Use AI	0.087	0.098	0.116	0.749	0.454
Facilitating Condition -> Intention to Use AI	0.041	0.035	0.08	0.515	0.606
Social Influence -> Intention to Use AI	0.103	0.11	0.076	1.364	0.172
Usefulness -> Intention to Use AI	0.639	0.628	0.071	9.016	0.000

DISCUSSION

The research results provide empirical evidence that only perceived usefulness can influence teachers' intentions to utilize AI in their learning. These results support the TAM and UTAUT models, which confirm that perceived usefulness will influence users' future use of technology. Accounting teachers in Semarang City high schools and vocational schools believe that using AI in learning will improve their performance. Therefore, they will continue to use AI in learning. The benefits of AI in learning are numerous and can increase student interaction and involvement in learning. The learning designs they create will be more diverse and enjoyable for students. Teacher performance in learning will improve by utilizing AI.

The research results align with previous findings, which found a significant influence of perceived usefulness on teachers' intentions to use AI in learning. Previous findings show that perceived usefulness leads to greater acceptance of text-based virtual assistant chatbots (chatbots) (Chocarro et al., 2023). Perceived usefulness is significantly related to ESL elementary school teachers' continued intention to use AI technology in their teaching and learning processes (Zulkarnain & Yunus, 2023).

The findings in this study cannot prove the TAM and UTAUT models. The experience and IT competency factors were also not proven to have a significant effect. Judging from the respondents' descriptions, it is known that most respondents are teachers with more than 20 years of teaching experience, and most are more than 40 years old. High teaching experience does not prove that teachers can adopt AI developments in learning. Mature age does not encourage teachers to learn creatively by utilizing AI. They consider using AI to be an activity that is not easy to do. This is proven by the average perceived ease of use variable, which is quite low.

These results do not support previous findings, which indicate a significant influence of IT experience and competence on teachers' intention to utilize AI in learning. Empirical studies confirm that facilitating conditions significantly influence teachers' and students' behavioral

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intentions to use AILP (Xiaohong et al., 2024). Another study found that social influence positively predicts behavioral intention (An et al., 2023). In addition, the same results were also obtained in other studies that show that social influence had a significant and positive effect on behavioral intention (Milicevic et al., 2024).

Previous research shows that successful implementation of Education 4.0 requires significant investment in infrastructure and resources to support integrating new technology into the Education system (Mohamed & Ahmad, 2023). Another opinion recommends the importance of digital literacy at all levels of education to overcome ChatGPT disruption in education (Lozano & Blanco Fontao, 2023). A good understanding of AI will help them make optimal use of ChatGPT so that it can become a tool that supports the learning process rather than being an obstacle. In addition, continuous training and adequate resources are also needed to ensure that all stakeholders can adapt quickly to technological changes.

CONCLUSION

This study attempts to analyze teachers' intentions to utilize AI in accounting learning by combining the TAM and UTAUT models added with experience and competence of IT variables. The results of the analysis indicate that only performance expectancy positively and significantly influences teachers' intentions to utilize AI in learning. High school and vocational school accounting teachers in Semarang City think using AI will improve their learning performance and encourage them to continue using AI. They will try to improve digital competence and literacy to use AI better.

This research failed to support the TAM and UTAUT models, with the dimensions of these two models not being proven to determine teachers' intentions to utilize AI in accounting learning. The convenience factor does not have a significant effect because the use of AI in education is still considered a job that is not easy. Likewise, the factors of supporting facilities and social influence cannot increase teachers' intentions to utilize AI in learning, which is still considered new and requires time to be studied further.

The recommendations that can be given in this research are increasing IT competency and digital literacy so that teachers can reduce their concerns about difficulties in utilizing AI. Training and workshops can be carried out on an ongoing basis, accompanied by assistance for teachers to make better use of AI in learning. Future research can also apply the latest models, such as technology continuation theory, to capture the latest findings about teacher behavior and utilize AI in learning. Many types of AI can be used in learning.

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