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Adoption of ChatGPT in Higher Education: Insights from the Unified Theory of Acceptance and Use of Technology Model

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Abstract

Artificial Intelligence (AI) already emerged as a dominant and transformational strength in industry, research, academia, and business. ChatGPT is one example of Generative AI in education that can transform teaching methods and improve users' soft skills. The objective of this research to examine the factors in UTAUT 2 that drive ChatGPT adoption among students in higher education. Data were obtained from questionnaires distributed to 340 higher education students and then analysed using the PLS-SEM method. The results found that age-moderated performance expectations, gender-moderated effort expectations were shown to influence the behavioural intention of using ChatGPT on student learning. Likewise, social influence and habit. The results of this study are expected to add important insights for policy makers in higher education in developing AI technology adoption strategies in accordance with the development and needs of students, given that this is a newly introduced technology.

Keywords: adaptive learning, ChatGPT, education landscape, learning environment, learning moderated, learning performance

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1. Introduction

One of the growing technologies around the world today is Artificial Intelligence (AI). AI already emerged as a dominant and transformational strength. The foray of AI into education can be attributed to the development of early chatbots in the 1960s. (Weizenbaum, 1966) in his research developed the ELIZA programme and tested it on secondary students (Strzelecki, 2023). The result was that the programme could solve the given problems. Over time, great improvements in AI capabilities, in the area of generative AI, have become apparent in the last decade or so. The rapid evolution has led to AI evolving into a new content-generating thing or what can be dubbed generative artificial intelligence (GenAI) that can change the education landscape

GenAI can generate various types of content similar to human output like text, images, video, and audio that is able to answer instructions given in raw text (Wang et al., 2024). By proposing innovative tools, there is potential for the education space to enhance teachers‘ pedagogical practices and students’ learning performance in the classroom. Today, GenAI has driven great

advancements in the field of education and brought about major changes in the way learning is done. GenAI tools, for example ChatGPT, can give valuable assistance to students by giving useful support and improving their adaptable and highly interactive learning environment. (Baidoo-Anu & Owusu Ansah, 2023; Baskara et al., 2023).

But based (Celik, 2023), still many educators are yet to realize its potential in teaching and learning. Although there are calls for greater application of AI, several educationists resist using software that gathers student data or remain skeptical of IT companies heralding the technology as the answer to all issues in education areas (Stockman and Nottingham 2022). The introduction of GenAI technologies such as ChatGPT in education has the power to revitalize old-fashioned education techniques, enhancing the learning experience and promoting soft skills development for its adopters.

ChatGPT or Chat Generative Pre-Trained Transformer as an AI tool released by OpenAI, on 20 November 2022, a web-assisted chatbot and is free to users who have an OpenAI registered account. A chatbot is AI-based software which is designed to simulate human speech over audio or text, and delivers personalized natural language responses to human input in a spoken setup. Even while the predictive linguistic tech work behind ChatGPT is readily applicable since at a less in 2018, ChatGPT provides an easily accessible and easy to utilize platform using both established and newer AI technologies (Boscardin et al. 2024). According to a survey conducted by Populix, in Annur (2023), ChatGPT is the most widely used AI application in Indonesia. Noted, as many as 52% of respondents have used the generative AI platform. No wonder natural language capabilities, multilingual support and multifunctionality that are both understandable and increase the productivity of various groups including students make ChatGPT the choice of most people. This is where the researcher made ChatGPT as a generative AI that was researched in the study.

Many university students first discovered ChatGPT via social media platforms (Bonsu and Baffour-Koduah 2023). The utilization of ChatGPT to enhance learning, for example ChatGPT may be utilised as a tool to create an answer to a theory-orientated query and produce a starting thought for an essay (Kasneci et al. 2023; Alafnan et al. 2023), However, students also have to realise the need to check the validity of the responses produced by ChatGPT. ChatGPT's advanced conversational capabilities can provide constructive feedback on essays and serve as a mentoring mechanism by encouraging crucial thought or discussion between students. Research by (Ansari et al., 2024) shows that the use of ChatGPT is an easy tool to use by students, teachers, and researchers to assist their tasks in their role as user assistants. Students who used ChatGPT were categorized into three main purposes: operationalizing learning, writing assistance, and adaptive learning. The outcomes of the research show that ChatGPT simplifies and describes complicated concepts in an easy-to-read way, that offers students the ability to access learning opportunities that assist in making the student's understanding clearer. ChatGPT works as a tool to familiarise students with unknown concepts and tasks and acts as a platform for continuous learning in comprehensive course subject domains.

Another study focused on students' utilisation of ChatGPT, which is helpful in

the writing of essays or tasks, their work in courses and tutorials, and as an analysation device in many academic departments (Rasul et al. 2023). (Strzelecki 2024) researched university students' acceptance of ChatGPT, finding that habit and performance expectations most affect behavioural intentions towards ChatGPT usage. (Dahri et al. 2024) found high acceptability of ChatGPT in university students which revealed that student acceptance is influenced by many factors, one of which is social influence.

To understand how ChatGPT is utilized by students learning, the researcher chose a well-tested model of technology acceptance and utilization. Unified Theory of Acceptance and Use of Technology or UTAUT 2 model incorporates insights from basic models of acceptance and utilization of information technology. UTAUT 2 takes into consideration several key variables that affect an individual's behavioral intention and their actual usage of a specific technology system (Venkatesh, et al., 2012). These factors include Habit (HT), Performance Expectancy (PE), Facilitating Conditions (FC), Effort Expectancy (EE), Price Value (PV), Social Influence (SI), Hedonic Motivation (HM), Behavioral Intention (BI), and Use Behavior (UB). In addition, there are three moderating variables in the UTAUT 2 model, namely gender, age, and experience. The UTAUT 2 model has been used in research exploring a range of educational technologies e.g. digital tools (Hoi 2020), learning systems (Zacharis and Nikolopoulou 2022), and learning management software (Raza et al., 2022).

Implementation of UTAUT 2 in this research is expected to facilitate the understanding of student involvement and acceptance models on ChatGPT, resulting in increased knowledge in this newly existing research area. However, the appearance of ChatGPT is causing concern about its potential impact, especially at the level of university. As research by Abbas et al. (2024) showed that students who were experiencing high academic related workload and time stress to accomplish their task reported greater use of ChatGPT. In addition, students who frequently used ChatGPT were more procrastinating than those who used the tool frequently. Likewise, research (Lo 2023). The effects of ChatGPT on university education exposed challenges relating to the possibility of informational errors and student plagiarisation.

This methodological approach aligns with the approach recently utilised in a study investigating factors influencing the acceptance and use of ChatGPT among university students. The research reported in that study corroborated the appropriateness of (Strzelecki 2023) adapted UTAUT2 model for understanding the use of ChatGPT among the university student community identify Habit as the most important construct affecting behavioural intentions, along with Hedonic Motivation and Performance Expectancy.

Research on the use and acceptance of ChatGPT in education is still small because the launch of ChatGPT is also arguably the latest worldwide (Habibi et al. 2023), including in developing countries such as Indonesia. Even though ChatGPT itself has entered into Indonesian education in meeting the learning needs of student (Maulana et al., 2023). Therefore this research is important to provide an understanding of the application of ChatGPT in education, especially in Indonesia. The application of the UTAUT 2 model in the field of higher education is also still little researched in Indonesia. This study is intended to contribute insights and knowledge about the factors that influence

behavioural intentions in using technology, specifically ChatGPT in student learning. This research can contribute to research on the use of UTAUT 2 in the realm of learning and AI technology. As well as being able to provide information for policymakers such as universities and educational institutions in implementing technology in learning. For students, this research can support the adoption of ChatGPT in learning which can maximize learning in the classroom as well as improve students' digital skills. The novelty of this This study centres on the usage of ChatGPT in student learning which is measured using the UTAUT 2 model which involves all variables that affect the use of ChatGPT without any exceptions. In contrast to (Zacharis and Nikolopoulou 2022; Purbonuswanto et al., 2024); (Gansser & Reich, 2021) research which only examined some variables from UTAUT 2 or without involving moderators of age, gender, and experience. This study aims to find out how the use of ChatGPT in student learning by using variables in the UTAUT 2 model. To analysing the extent to which the variables in UTAUT 2 affect the usage of ChatGPT on college students' learning. Although many international studies have examined the acceptance of ChatGPT in student learning using UTAUT2, in Indonesia itself the research is still relatively new. Moreover, the use of UTAUT 2 in previous studies only focused on certain variables and even without involving moderators. So, from this gap, this research needs to be carried out in Indonesian education.

The operational definition of each variable is used to better understand the meaning of each variable that produces the hypothesis in this study shown in the Table 1.

Table 1. Operational Definition and Research Hypotesis

	Variable	Hypotesis
a.	Performance Expectancy (PE) The belief that ChatGPT will improve the performance of using technology would be beneficial for the user in performing a given task.	H1: Performance expectancy (PE) affect behavioral intention (BI) of ChatGPT use by students in learning moderated by age and gender.
b.	Effort Expectancy (EE) Perceptions of ease of using (effort) ChatGPT the level of ease associated with the use of technology by consumers.	H2: Effort expectancy (EE) affect behavioral intention (BI) of using ChatGPT by students in learning moderated with gender, age, and experience.
c.	Social Influence (SI) Social pressure of others on the decision to use ChatGPT. Users feel that other important people (for example friends and family) trust that they must be using ChatGPT.	H3: Social influence (SI) affect behavioral intention (BI) of ChatGPT use by college students in learning moderated with age, gender, and experience.
d.	Facilitating Conditions (FC) Availability of infrastructure or support that facilitates the use of ChatGPT.	H4: Facilitating conditions (FC) affect behavioral intention (BI) of ChatGPT use by students in learning moderated with age, gender, and experience.
		H5: Facilitating conditions (FC) affect ChatGPT usage behavior (UB) by students in learning moderated with age and experience.
e.	Hedonic Motivation (HM) The delight or amusement gained from the use of ChatGPT.	H6: Hedonic motivation (HM) affect behavioral intention (BI) of ChatGPT use by students in learning moderated with age, gender, and experience.
f.	Price Value (PV) Value setting or price range on ChatGPT.	H7: Price value (PV) affect behavioral intention (BI) of using ChatGPT by students in learning moderated with age

Variable	Hypotesis
	and gender.
g. Habit (HT) Perceptions that reflect the results of previous experiences.	H8: Habit (HT) affect behavioral intention (BI) of using ChatGPT by students in learning moderated with age, gender, and experience.
	H9: There is an influence of habit (HT) on ChatGPT usage behavior (UB) by students in learning moderated with age, gender, and experience.
h. Behavioral Intention (BI) Desire of people or intention to use ChatGPT.	H10: Behavioral intention (BI) affect student behavior in using ChatGPT in learning (UB) in experience-moderated.
i. Use Behavior (UB) The quantity or frequency with which users use ChatGPT.	

2. Method

This research uses a quantitative survei design where data is obtained from a questionnaire using a Likert scale of 1-5, with a cross sectional approach, where data is collected at one time by respondents who are representative of a particular population. Researchers selected this method as it is efficient in collecting large-scale data and allows statistical analysis of variable relationships. The UTAUT 2 model is relevant because it is able to explain the variables that influence intention and behavior in the use of technology. The research model is illustrated in Figure 1.

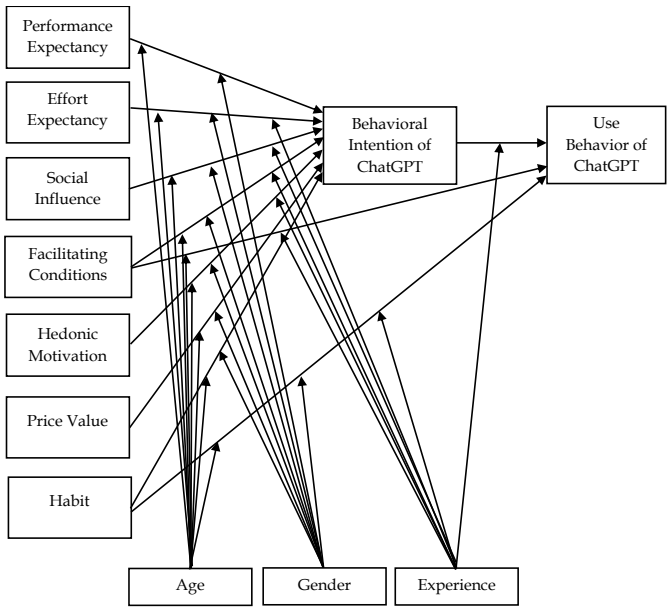

Figure 1. Research Model

The sampling technique is simple random sampling, where everyone in the population has the same opportunity to be selected as a respondent. this technique can avoid bias and ensure that the selected sample can represent the population. as for the population selection criteria in this study are students of the Surabaya State University Economics Education Study Program. This is based on the level of technology use in students who are arguably frequent, especially on ChatGPT in their learning. The population amounted to more than 500

students and the sample calculation used the formula (Hair et al. 2016).

N = (5 - 10 x number of indicators)

N = 10 x 34

N = 340

That research took a sample of 340 students from the Surabaya State University Economics Education Study Program. The instrument used is made based on the indicators in each variable in the UTAUT 2 displayed in the Table 2 each item was adapted to reflect the context of ChatGPT usage in learning. To ensure the validity and reliability of the research instruments, validity and reliability checks were performed utilizing the SmartPLS PLS-SEM approach. The validity test is conducted by examining the outer loading and AVE, while the reliability test examines Cronbach alpha and composite reliability.

Table 2. Indicator of Variable

No.	Variables	Indicator	Statement
	Venkatesh et al. (2003), Venkatesh et al. (2012)	(Huang and Kao 2015)	(Strzelecki 2023)
1.	Performance expectancy	a. The usefulness perceived	PE1: I trust ChatGPT is useful in my study.
		b. Extrinsic motivation.	PE2: I feel I have a greater chance of achieving important things in my studies when using ChatGPT.
		c. Job suitability	PE3: I feel more productive when using ChatGPT in my studies
		d. Relative benefits	PE4: I complete tasks and projects faster when using ChatGPT
2.	Effort expectancy	a. Perceptions of easiness of usage	EE1: I find using ChatGPT easy for me
			EE2: I feel my interactions with ChatGPT are clear and comprehensible
		b. Complexity	EE3: I found ChatGPT simple to use, which makes me skillful in using ChatGPT.
		c. Ease of utilise	EE4: I found it easy to learn how to use ChatGPT
3.	Social influence	a. Subjective Norm	SI1: People important to me think that I have to use ChatGPT
		b. Social factor	SI2: People influential to me, think that I have to use ChatGPT
		c. Imagery	SI3: People who I admire think that I have to use ChatGPT
4.	Facilitating conditions	a. Perceived behavioral control	FC1: I have the knowledge necessary to use ChatGPT
		b. Enabling conditions	FC2: I have the resources necessary to use ChatGPT
		c. Compatibility	FC3: I think ChatGPT is compatible with the technology I use
			FC4: I can get help from others when I have difficulty in utilising ChatGPT
5.	Hedonic motivation	a. Pleasure	HM1: I enjoyed using ChatGPT
		b. Attraction	HM2: I am happy when utilizing ChatGPT
		c. Curiosity	HM3: I am entertained when utilizing ChatGPT
6.	Price Value	a. Quality	PV1: I feel that with the current access fees, ChatGPT provides good benefits to me
		b. Value	PV2: I feel that the cost of accessing ChatGPT is worth the benefits I get.

No.	Variables	Indicator	Statement
	Venkatesh et al. (2003), Venkatesh et al. (2012)	(Huang and Kao 2015)	(Strzelecki 2023)
		c. Price	PV3: I find ChatGPT's access fees quite affordable.
7.	Habit	a. Past behavior	HT1: I feel that using ChatGPT is a habit for me
		b. Reflex behavior	HT2: I feel addictive using ChatGPT
		c. Personal experience	HT3: I feel compelled to use ChatGPT
			HT4: I feel like using ChatGPT has become second nature to me
8.	Behavior intention	a. Repurchase intentions	BI1: I intend to continue using ChatGPT in the future
		b. Effective word-of-mouth communication	BI2: I will constantly try to use ChatGPT in my studies
		c. The quality of service	BI3: I planning to keep using ChatGPT regularly
9.	Use behavior	a. Time of usage	UB1: How long have you been using ChatGPT?
		b. Frequency of use	UB2: Select the frequency with which you use ChatGPT: (1: Never; 2: Once a month; 3: Several times a month; 4: Once a week; 5: Several times a week; 6: Once a day; 7: Several times a day)
		c. Use variety	UB3: I often use ChatGPT for my various needs
10.	Age		1) Age
11.	Gender		2) Gender
12.	Experience	Expertise	3) On a scale of 1 to 5, with 1 being 'beginner' and 5 beings 'expert', rate your experience with ChatGPT?

The data obtained will be calculated using the Partial Least Squares Structural Equation Modeling (PLS-SEM) technique. The analytics will be processed with SmartPLS 4.0 software. PLS-SEM is a causal modeling based approach that maximises the variety of latent variables and is capable of working efficiently using small samples and complex models. SEM-PLS analysis can analyse unobserved variables (variables that cannot be directly measurable), test complex research models, and take into account measurement error in a test (Ali Memon et al. 2021) which has several tests, namely the outer model and inner model (Farida et al. 2022). Testing the outer model provides a value for validity and reliability analysis. This technique is very suitable for complex theoretical research such as UTAUT 2. The advantage of PLS - SEM is that it is able to analyze data even though the sample size is small, the data distribution is not normal, and it is still able to provide strong analytical value.

3. Result and Discussion

Data collection was conducted from the results of distributing Google forms online was carried out in March 2025. The questionnaires that have been filled in by Economics Education students at Surabaya State University totaled 340 respondents.

The results of the questionnaire collected have several characteristics displayed in the Table 3.

Table 3. Respondent Criteria

Criteria	Description	Number of Respondents	Percentage (%)
Gender	Male	51	85
	Female	289	15
Age (years)	17	1	0,29
	18	29	8,53
	19	113	33,24
	20	104	30,59
	21	67	19,71
	22	24	7,06
	23	2	0,59
Length of usage of ChatGPT (month)	1-8	153	45,00
	9-16	132	38,82
	17-25	55	16,18
Frequency of ChatGPT Usage	Never	0	0,00
	One time a month	17	5,00
	A few times a month	81	23,82
	One time a week	55	16,18
	A few times a week	114	33,53
	One time a day	58	17,06
	A few times a day	15	4,41

The information in the table shows the classification of respondent characteristics including gender, age, length of use, and frequency of use of ChatGPT. It was summarised that the majority of students who became respondents were female student. While the majority of ChatGPT user respondents' age is 19. The majority of respondents have used ChatGPT for at least 9-16 months and most respondents use it several times a week.

After analyzing the characteristics of the respondents, the researcher tested the outer model which gave a value to the validity as well as reliability analysis. In the outer model, there are several requirements, namely outer loading > 0.7 and Average Variance Extracted (AVE) > 0.5 in validity analysis, while Cronbach Alpha and Composite Reliability> 0.7 in reliability analysis (Hair, Howard, and Nitzl 2020). The outer model results in the SEM-PLS test on SmartPLS 4.0 are depicted in the model at Figure 2.

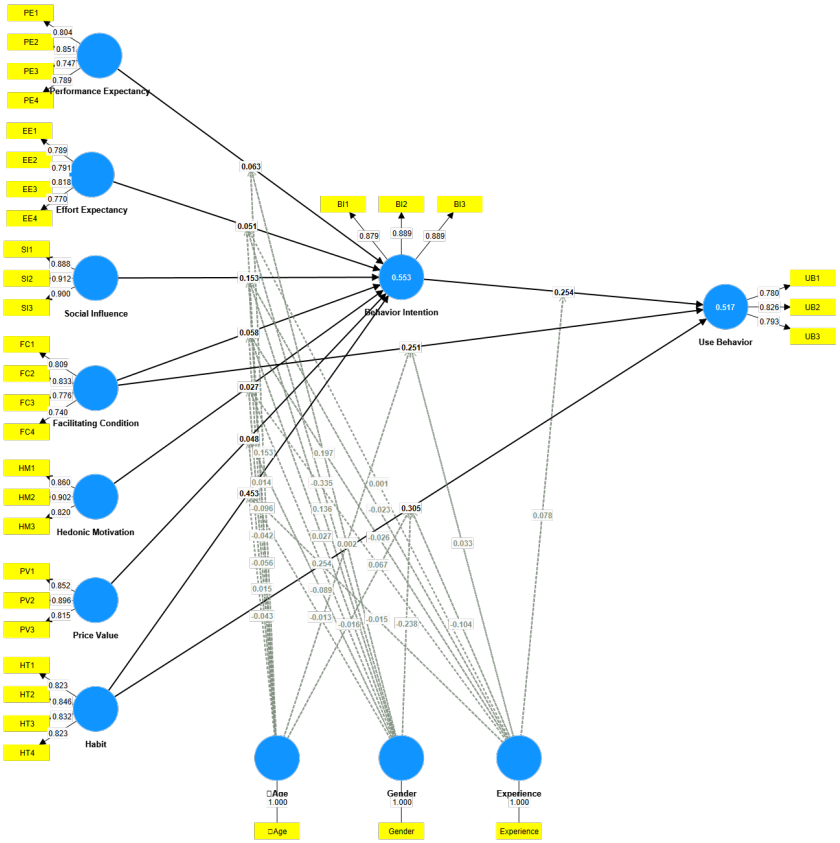

Figure 2. SmartPLS 4.0 Output

Each instrument has a value of > 0.7 which means it has met convergent validity. While the value of AVE, Composite Reliability, and Cronbach's Alpha could be viewed in Table 4.

Table 4. Variable Reliability

Variables	Cronbach's Alpha	Composite Eeliability	AVE
Behavior Intention	0,862	0,916	0,784
Use Behavior	0,723	0,842	0,640
Performance Expectancy	0,810	0,875	0,638
Effort Expectancy	0,804	0,871	0,627
Social Influence	0,883	0,927	0,810
Facilitating Condition	0,799	0,869	0,625
Hedonic Motivation	0,826	0,896	0,742
Price Value	0,816	0,890	0,731
Habit	0,851	0,899	0,691

The AVE value in every variable is > 0.5 which shows that convergent validity is met and can be said as valid. All variables have a Cronbach's Alpha and Composite Reliability value > 0.7 which indicates that all variables have been fulfilled and can be considered reliable.

In the inner model, can define the relationship among existing latent variables. This model describes the relationship structure based on existing theory. The testing of the structural model is done in several ways, namely on the R Square value to assess the goodness of a model. There are three more criteria for the strength of R Square, which are 0.67 is strong, 0.33 is medium, and 0.19 is weak. The resulting R Square test is shown in the Table 5.

Table 5. R Square Value

Variables	R-square	Adjusted R-square
Behavior Intention	0,553	0,510
Use Behavior	0,517	0,499

The information in table 4 present that the R square on ChatGPT user behavior is 0.553, which means that Behavior Intention has an effect of 55.3%, meaning that the percentage of behavior intention variables can be described by Social Influence (SI), Performance Expectancy (PE), Facilitating Conditions (FC), Effort Expectancy (EE), Hedonic Motivation (HM), Habit (H), and Price Value (P) while the remainder 44.7% is are described by another variable that is not included in this research. The variable use behavior may be described by Behavior Intention of 0.517 or 51.7% while the remaining 48.3% is described by other variables not included in this research. Both R Square values are classified in the moderate or medium category.

Furthermore, hypothesis testing is carried out which is seen through the original sample value, p-value, and F Square (Khan et al. 2022). The moderating effect test is seen from the F Square value which is divided into three categories, namely 0.005 is categorized as low, 0.01 is categorized as medium, 0.025 is categorized as high, while the direct effect has a different category range, namely 0.02 is categorized as low, 0.15 is categorized as medium, and 0.35 is categorized as high. (Hair et al. 2019). The results of the test are displayed in Table 6

Table 6. Test Results

	Hypothesis	Original Sample	P Value	F Square	Category	Description
H1	PE -> BI	0,063	0,402	0,003	Low	Declined
	PE*Age -> BI	0,152	0,020	0,016	Medium	Accepted
	PE*Gender -> BI	0,196	0,308	0,003	Low	Declined
H2	EE -> BI	0,051	0,463	0,002	Low	Declined
	EE*Age -> BI	0,012	0,791	0,000	Low	Declined
	EE*Gender -> BI	-0,327	0,025	0,014	Medium	Accepted
	EE*Experience -> BI	0,002	0,991	0,000	Low	Declined
H3	SI -> BI	0,153	0,012	0,027	Low	Accepted
	SI*Age -> BI	-0,096	0,095	0,012	Medium	Declined
	SI*Gender -> BI	0,138	0,461	0,002	Low	Declined
	SI*Experience -> BI	-0,020	0,682	0,001	Low	Declined
H4	FC -> BI	0,058	0,440	0,002	Low	Declined
	FC*Age -> BI	-0,040	0,502	0,001	Low	Declined
	FC*Gender -> BI	0,020	0,897	0,000	Low	Declined
	FC*Experience -> BI	-0,021	0,656	0,001	Low	Declined
H5	FC -> UB	0,251	0,000	0,002	Low	Accepted
	FC*Age -> UB	0,002	0,958	0,000	Low	Declined
	FC*Experience -> UB	0,033	0,430	0,079	Low	Declined
H6	HM -> BI	0,027	0,693	0,001	Low	Declined
	HM*Age -> BI	-0,056	0,349	0,002	Low	Declined
	HM*Gender -> BI	0,253	0,177	0,005	Low	Declined
	HM*Experience -> BI	0,074	0,274	0,004	Low	Declined

	Hypothesis	Original Sample	P Value	F Square	Category	Description
H7	PV -> BI	0,048	0,456	0,002	Low	Declined
	PV*Age -> BI	0,018	0,793	0,000	Low	Declined
	PV*Gender -> BI	-0,090	0,589	0,001	Low	Declined
H8	HT -> BI	0,453	0,000	0,221	High	Accepted
	HT*Age -> BI	-0,044	0,409	0,002	Low	Declined
	HT*Gender -> BI	-0,008	0,934	0,000	Low	Declined
	HT*Experience -> BI	-0,014	0,816	0,000	Low	Declined
H9	HT -> UB	0,305	0,000	0,091	Low	Accepted
	HT*Age -> UB	-0,016	0,728	0,000	Low	Declined
	HT*Gender -> UB	-0,238	0,061	0,013	Medium	Declined
	HT*Experience -> UB	-0,104	0,113	0,010	Medium	Declined
H10	BI -> UB	0,254	0,000	0,065	Low	Accepted
	BI*Experience -> UB	0,078	0,265	0,006	Medium	Declined

From the results of hypothesis testing, it shows that the variables that have a significant affect behavioral intention to use ChatGPT are performance expectancy (PE) moderated by age, effort expectancy (EE) moderated by gender, social influence, and habits. Then the three variables, namely facilitating conditions (FC), habit (HT), and behavioral intentions (BI) are proven to affect use behavior (UB). The moderating variable of age only significantly strengthens performance expectancy (PE) and the moderating variable of gender significantly strengthens effort expectancy (EE) in affecting user behavior intention (BI) of ChatGPT. While experience is not proven to moderate any variable at all.

Hypothesis testing results show that performance expectations (PE) moderated with age affect the behavioral intention (BI) of using ChatGPT on students in learning but not on gender and experience. This illustrates that age can strengthen belief in the benefits of ChatGPT in student learning regardless of gender or experience of using ChatGPT. This result is supported by research which states that PE has been proven to have an effect on BI because ChatGPT does promise productivity for individuals (Bazelais et al., 2024; Rahmawati et al, 2022). However, it is contrary to (Strzelecki et al. 2024) research which states that performance expectations (PE) moderated by age have no effect on behavioral intentions (BI). Although both are in the field of education, the age generation of the selected population can also make research results different. This shows the need for further research to explore these variables more deeply.

Similarly, Effort Expectancy (EE) is proven to influence Behavioral Intentions (BI) of ChatGPT use by students in learning moderated with gender but not age and student experience. This illustrates that differences in student gender can strengthen assumptions about the ease of using ChatGPT in their learning. The effect is in line with the research (Strzelecki 2023) but contradicts research (Alshammari and Alshammari 2024) which found that gender moderated the relationship. Given these differences in findings, further research is needed in the future on the factors that influence the use of ChatGPT in student learning.

Habit (HT) and Social Influence (SI) also influence the Behavioral Intention (BI) of using ChatGPT on student learning

regardless of gender, age, and experience of using ChatGPT on students. These results are in line with the research (Tao et al., 2024) and (Osei et al., 2022) but contradict research (Zacharis and Nikolopoulou 2022). This difference could be due to the characteristics of the respondents studied given the different places of the study. Therefore, the researcher hopes that this research will be able to contribute and at the same time invite further researchers, especially in Indonesia, to contribute to studying the adoption of ChatGPT in student learning.

While the three factors, namely facilitating conditions (FC), habit (HT), and behavioral intentions (BI) are proven to influence use behavior (UB), but the three moderating variables are not proven to strengthen this influence. The Declined hypothesis shows that there is no influence on the variables of facilitating conditions (FC), price value (PV), and hedonic motivation (HM) on behavioral intention (BI) using ChatGPT in student learning (Gansser & Reich, 2021; Grassini et al., 2024)

The moderating variables of experience, gender, and age in this research mostly did not moderate the tested relationship. This result is in keeping with the results of (Strzelecki 2023). The absence of a significant effect on this moderating variable may be due to the ease of use on ChatGPT which can be accessed regardless of age, gender, and experience in students who should be the latest in technology including in the field of learning.

This research has an implication for educators and stakeholders in developing strategies for adopting technology in teaching. For example, technology training, facility support, and supportive policies that suit the needs of today's students. This insight can create an adaptive and innovative learning environment. Several rejected hypotheses are the shortcomings of this study. So it is hoped that further research will further examine the acceptance of ChatGPT in student learning with a wider and more diverse sample and a more general context. As well as using a more appropriate methodological approach in order to gain a broader and deeper understanding of the study.

4. Conclusion

This study analyzes the usage of ChatGPT in student learning using factors in UTAUT 2 which are considered capable of measuring adoption and utilisation of technology in individuals. The findings showed that performance expectancy moderated by age, effort expectancy (EE) moderated by gender, social influence (SI) and habit (HT) influenced behavioural intention (BI) of using ChatGPT in student learning. In the variable facilitating conditions (FC), habits (HT), and behavioral intentions (BI) are proven to affect use behavior (UB) but the three moderating variables are not proven to strengthen this influence. While the variables of facilitating conditions (FC), price value (PV), and hedonic motivation (HM) show no influence on behavioral intention (BI) using ChatGPT on student learning. The moderating variables in this study mostly did not moderate the tested relationship. Hopefully, this study makes a theoretical contribution by testing the relevance of the UTAUT2 model in the context of ChatGPT adoption and identifying the key factors that affect the intention and behaviour of users. The present findings indicate that learning environment and habits influence the utilisation of ChatGPT in student learning. Therefore, it is recommended that educational institutions

provide training and technical support to encourage optimal utilisation of ChatGPT. Given that this research is limited to UTAUT2 variables, future studies are expected to explore additional factors such as digital literacy and cultural context to broaden the understanding of technology adoption in education.

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