

# Analysis of ChatGPT Usage to Support Student Lecture Assignments

Syaeful Anas Aklani<sup>1</sup>, Jenary Randa Liling<sup>2</sup>

<sup>1,2</sup>Sistem Informasi, Fakultas Ilmu Komputer, Universitas Internasional Batam

<sup>1</sup>[syaeful@uib.ac.id](mailto:syaeful@uib.ac.id), <sup>2</sup>[2031180.jenary@uib.edu](mailto:2031180.jenary@uib.edu)\*

## Abstract

*Technology is revolutionizing the way education is delivered, making it more accessible, efficient, and effective than ever before. The pace of technological advancement in the educational sector is accelerating at an unprecedented rate, transforming the traditional classroom model, and empowering learners with new tools and resources to enhance their learning experience. One such technology is artificial intelligence, such as ChatGPT. This artificial intelligence technology developed by OpenAI is increasingly being utilized in educational settings, particularly to assist students in completing their academic tasks. This study aims to analyze and understand the perspectives of students regarding the use of ChatGPT, an AI-powered chatbot, as an aid in their academic coursework. The research employs both quantitative and qualitative approaches based on the Technology Acceptance Model (TAM), and data analysis is conducted using PLS-SEM. The results indicate that the research variable "Perceived Usefulness" has a significant influence on students' attitudes towards the use of ChatGPT. Additionally, the variable "Attitude towards ChatGPT" significantly impacts students' intention to use ChatGPT as a tool to assist them with academic tasks in the future. These findings provide valuable insight into the potential benefits of ChatGPT as an educational tool and highlight the importance of students' perceptions and attitudes towards technology in shaping their academic experiences.*

*Keywords: ChatGPT, Artificial Intelligent, TAM, PLS-SEM*

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## 1. Introduction

The development of increasingly advanced and rapid technology brings various significant impacts in the current era of globalization. Technology has become a tool that can help and facilitate the completion of any task in any field of work [1]. In an educational environment, technological developments have a very influential role in improving the quality of teaching and learning process [2]. One technology that is currently popular in the educational environment is ChatGPT artificial intelligence technology or Chat Generative Pre-Trained Transformer [3].

ChatGPT is an artificial intelligence (AI) technology developed by OpenAI and functions to perform interactions in text-based conversations [4]. OpenAI is an artificial intelligence research and implementation company based in California [5]. ChatGPT was developed using Reinforcement Learning from Human Feedback (RLHF) methods and Natural Language Processing (NLP) technology that can respond to words or sentences given to it, but will not respond to words or sentences that are considered illegal or violent [6]. The responses given by ChatGPT are well structured and can remember questions that have been previously given [7]. Therefore, ChatGPT can be used as a virtual assistant that can help students answer questions about learning materials [4].

Apart from the technology owned by ChatGPT, the use of AI technology ChatGPT among students to assist in the process of working on college assignments still raises many concerns because

every answer given by ChatGPT is not necessarily correct and cannot be fully accounted for, especially every information provided has not been accompanied by clear sources that can be the cause of plagiarism [8]. For instance, recent research examining ChatGPT reveals that although the model attained a 56.7% accuracy in responding to open-ended queries at first, its accuracy in answering multiple-choice questions was limited, marking a 43.3% success rate [9]. From the adverse effects previously feared, it is necessary to know what factors affect the use of ChatGPT, so that until now ChatGPT technology is still widely used.

This study is based on previous research that focused on identifying factors that determine students' attitudes toward using ChatGPT artificial intelligence (AI) technology for learning purposes based on the Technology Acceptance Model (TAM). TAM is a model built to predict and explain how technology is adopted and used by users in their daily life [10]. This study was conducted using a quantitative approach by distributing questionnaires answered by 375 respondents and tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicated that students had a positive view of using ChatGPT for learning purposes [11].

Another study focused on analyzing the perception of FTIK IAIN Kerinci students on the use of ChatGPT in education. This research was conducted using quantitative and qualitative approaches, namely the distribution of questionnaires and interviews. The results showed that FTIK IAIN

Kerinci students have a positive view of the ease of using ChatGPT, increasing their knowledge, being satisfied with the accuracy of the answers provided by ChatGPT, ease of using ChatGPT, increasing efficiency and effectiveness of time in learning with the help of ChatGPT, but have not been able to increase their learning motivation [12].

Furthermore, the research aims to generate empirical insights into the extent to which ChatGPT is understood and utilized by English as a Foreign Language (EFL) learners outside the classroom. This study uses quantitative approaches and Technology Acceptance Model (TAM) to conceptualize the attitudes, intentions, and behaviors of EFL learners in using ChatGPT for their informal digital English learning. Data collection was carried out by distributing questionnaires based on TAM with a scale including “Perceived Ease of Use”, “Perceived Usefulness”, “Attitude”, “Behavioral Intention”, and “Actual Use” getting 405 respondents. The results obtained by conducting Structural Equation Modeling (SEM) analysis show that although “Perceived Ease of Use” fails to predict student “Attitude” directly, it can leave an impact on student “Attitude” directly through full mediator “Perceived Usefulness”. It was also found that learners who had a positive attitude toward ChatGPT usability tended to exhibit higher levels of “Behavioral Intention”, which positively and strongly predicted the actual use of ChatGPT in English learning outside the classroom [13].

The next study aims to analyze how students, lecturers, and staff in universities adapt to the presence of artificial intelligence (AI) in the university environment. The research was conducted with a quantitative approach and used the Unified Theory of Acceptance and Use of Technology (UTAUT) model. The results of the study based on PLS-SEM analysis conducted using data from 329 respondents from the survey that has been shared, show that the model carried out in this study can help related parties facilitate the adoption of AI in high-judgment [14].

Another study focused on analyzing university admissions in Spain to ChatGPT based on the UTAUT2 model. This study used a quantitative approach by distributing an online survey answered by 400 respondents of Spanish university students. The data obtained is processed using IBM SPSS and IBM SPSS Amos applications. The results indicated that “Gender” was not the determining variable in any construct, while “User Experience” was the factor that scored higher in all constructs. “Experience”, “Performance Expectations”, “Hedonic Motivation”, “Price Value”, and “Habits” influence “Behavioral Intentions” to use ChatGPT. “Facilitating Conditions”, “Habits”, and “Behavioral

Intentions” are conditioning factors in the “User Behavior” [15].

Based on the study above, researchers conducted a study entitled “*Analysis of ChatGPT Usage to Support Student Lecture Assignments*” Using a quantitative [11] and a qualitative approach [12]. The model of this study will use the Technology Acceptance Model [13]. Testing of research hypotheses was carried out using the PLS-SEM analysis method [14] using IBM SPSS Statistics software [15] and SmartPLS. The purpose of this study is to analyze the use of ChatGPT among students in helping with their coursework.

## 2. Research Method

### 2.1. Research Model

Initially, TAM stated 4 variables, namely, “Perceived Usefulness” (PU), “Perceived Ease of Use” (PEU), “Attitude towards Use” (ATT), and “Behavioral Intention” (BI). However, based on previous studies [11], the addition of the variables “Perceived Credibility” (PC), “Perceived Social Presence” (PSP), and “Hedonic Motivation” (HM) is proposed.

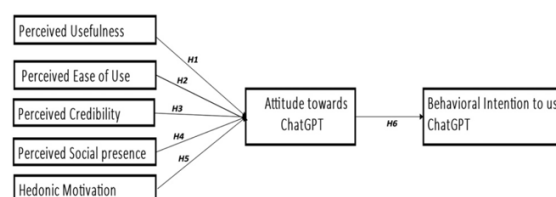


Figure 1 Research Model [11]

Based on the research model above, 6 hypotheses will be used in this study, which are as follows:

1. H10: “Perceived Usefulness” positively influences students’ “Attitude” to use ChatGPT for academic purposes.  
H1a: “Perceived Usefulness” does not positively influence students’ “Attitude” to use ChatGPT for academic purposes.
2. H20: “Perceived Ease of Use” positively influences students’ “Attitude” to use ChatGPT for academic purposes.  
H2a: “Perceived Ease of Use” does not positively influence students’ “Attitude” to use ChatGPT for academic purposes.
3. H30: “Perceived Credibility” positively influences students’ “Attitude” to use ChatGPT for academic purposes.  
H3a: “Perceived Credibility” does not positively influence students’ “Attitude” to use ChatGPT for academic purposes.
4. H40: “Perceived Social Presence” positively influences students’ “Attitude” to use ChatGPT for academic purposes.

- H4a: “Perceived Social Presence” does not positively influence students’ “Attitude” to use ChatGPT for academic purposes.
5. H50: “Hedonic Motivation” positively influences students’ “Attitude” to use ChatGPT for academic purposes.
- H5a: “Hedonic Motivation” does not positively influence students’ “Attitude” to use ChatGPT for academic purposes.
6. H60: Students’ “Attitude” positively influences their intention to adopt ChatGPT for academic purposes.
- H6a: Students’ attitude does not positively influence “Behavioral Intention to Adopt ChatGPT” for academic purposes.

## 2.2. Research Instruments

In developing research instruments, the following is an operational definition of the variables used.

Table 1 Research Instrument [11]		
No.	Variables	Indicators
1.	Perceived usefulness	PU01: Useful in education
		PU02: Enhances the quality of learning
		PU03: Accomplishes tasks more quickly
		PU04: Enhances learning effectiveness
2.	Perceived ease of use	PEU01: Easy to use
		PEU02: Easy to master
		PEU03: Uncomplicated and less mental efforts
		PEU04: Interaction is clear and understandable
3.	Perceived social presence	PSP01: Feeling of being involved with a person
		PSP02: Feeling of communicating with intelligent agent
		PSP03: Feeling accompanied by an intelligent being
		PSP04: Sense of human sensitivity
4.	Perceived credibility	PC01: Trustworthy
		PC02: Reliable
		PC03: Safe
		PC04: Confidential

5.	Hedonic motivation	HM01: Enjoyable
		HM02: Entertaining
		HM03: Fun
6.	Attitude towards ChatGPT	ATT01: Positive attitude toward usage
		ATT02: Makes learning interesting
		ATT03: Positive attitude toward learning
		ATT04: Positive general opinion
7.	Behavioral intention to use ChatGPT	BI01: Intention to use in future
		BI02: Predicting to use for learning experience
		BI03: Frequent use
		BI04: Attempt to use for education

## 2.3. Data Collection Techniques

This research uses quantitative and qualitative approaches. The quantitative approach is carried out by distributing questionnaires and the qualitative approach is carried out by interviews. The results obtained from the qualitative approach will be used to support the research hypothesis resulting from the quantitative approach.

### 2.3.1 Questionnaires

To collect data using a quantitative approach, questionnaires are distributed to the participants. Questionnaires are a collection technique carried out by providing several structured written questions to respondents to find out their responses to the various variables studied [16]. In this study, a questionnaire will be made in the form of a Google form containing 27 questions based on variables in Table 2. The questionnaire used is a Likert scale model questionnaire to facilitate concluding the data obtained [17].

### 2.3.2 Interviews

Data collection using a qualitative approach is accomplished through conducting interviews. Interviews are a method of gathering qualitative data by directly asking questions to the research participants. The questions used in interviews with research resource persons were 7 questions made based on Table 1.

### 2.3.3 Research Population

The study population was students from Batam International University (UIB). This research will

use the Random Sampling Method in collecting assessment data from UIB students on the use of ChatGPT. The total respondents targeted in this study are at least 344 people from a population of approximately 3,263 people [18] using the Slovin formula and calculated with a confidence level of 95% and a margin of error of 5%. Total number of interviewees required to conduct interviews is 30 people.

## 2.4. Data Analysis

### 2.4.1 Quantitative

Quantitative data analysis is the measurement of data in the form of numbers and objective statistics [19]. The first step taken in data analysis is the outlier test. Outlier is a condition that arises with extreme values either univariate or multivariate due to the combination of unique characteristics it has [20]. Outlier data on the questionnaire needs to be removed because it will be considered invalid data. The way to find out the data outlier is by z-score analysis. If the z-score is  $>3$  or  $<-3$ , then it is an outlier data that should be eliminated.

Furthermore, the validity and reliability test, the validity test is carried out to find out whether the data tested is valid or not. If the significant value of Pearson Correlation  $<0.05$ , then the data is considered valid [21]. However, if the significant value of Pearson Correlation  $>0.05$ , then the data is considered invalid. Then, reliability tests are carried out to test whether the data is reliable or not. Data was measured using Cronbach's Alpha. If Cronbach's Alpha value  $>0.6$  then the variable is considered reliable [22]. If Cronbach's Alpha value  $<0.5$ , then the variable is not reliable.

After that, a research method was carried out using Partial Least Square-Structural Equation Modeling (PLS-SEM). This statistical testing method is carried out using the SmartPLS application.

### 2.4.2 Qualitative

Qualitative data analysis is the process of analyzing data that is not in the form of numbers and is generally subjective [23]. Qualitative data analysis is carried out by reducing data, namely selecting, and simplifying data obtained from interviews with resource persons. After that, based on the data that has been collected, conclusions will be drawn that include important points from the data. The results of qualitative data analysis will be used to support the results of quantitative data analysis.

## 3. Result and Discussion

The research questionnaire that has been distributed to students of Batam International University was filled out by 380 respondents. There were 52 respondents aged less than 20 years, 310 respondents aged around 20-25 years, and 18 respondents aged

more than 18 years. Respondents consisted of 191 men and 189 women. Of the 380 respondents, 350 respondents have used ChatGPT, and 30 respondents have never used ChatGPT.

Table 2 Respondent Characteristics

Characteristics	Category	N=380	Percentage
Age	<20	52	13,7%
	20-25	310	81,6%
	>25	18	4,7%
Gender	Male	191	50,3%
	Female	189	49,7%
Have used ChatGPT	Yes	350	92,1%
	No	30	7,9%

The outlier test using z-score analysis was conducted on the SPSS Statistics application version 29. There are 30 data outliers out of the 380 data that have been collected. The outlier data was abolished. Therefore, the respondent data used for the next stage of analysis is 350 data.

Furthermore, validity and reliability tests were carried out using the SPSS Statistics application version 29. In the validity test, all indicators of the research variable have a significant value of Pearson Correlation less than 0.05 which means that all research indicators are considered valid. Then, reliability testing of variables measured using Cronbach's Alpha was carried out. All variables of this study had Cronbach's Alpha values of more than 0.6 and less than 1. Therefore, the research variables are declared reliable.

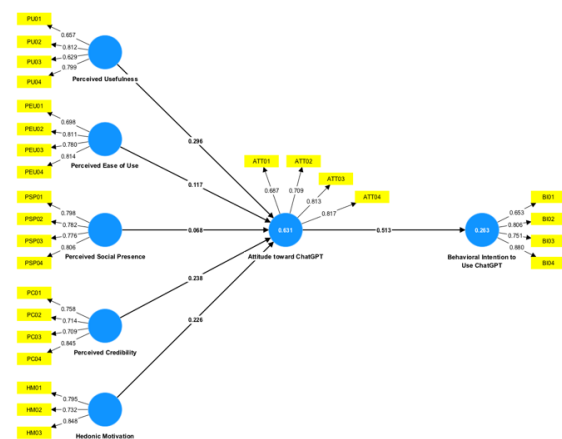


Figure 2 Measurement Model

Next, hypothesis testing will be carried out with the Partial Least Squares Structural Equation Modeling (PLS-SEM) test using the SmartPLS application version 4. The Measurement Model used can be seen in Figure 2.

Table 3 Path Coefficients

Hypotheses	O	M	STDEV	T Statistics	P Values	Conclusion
PU→ATT	0.296	0.294	0.073	4.066	0.000	Significant

PEU→AT T	0.117	0.117	0.052	2.232	0.026	Signifi cant
PSP→ATT	0.068	0.069	0.062	1.104	0.270	Not Signifi cant
PC→ATT	0.238	0.242	0.072	3.292	0.001	Signifi cant
HM→ATT	0.226	0.221	0.071	3.175	0.002	Signifi cant
ATT→BI	0.513	0.513	0.062	8.329	0.000	Signifi cant

A hypothesis has a positive or significant effect if it has a P value of less than 0.050 and T statistics over 1.960 [24]. Based on the output of Path Coefficients in Table 3, the results of the hypothesis test are as follows.

1. H1: The variable “Perceived Usefulness” has a very significant influence on the variable “Attitude towards ChatGPT”. This hypothesis is also supported by the results of interviews, where the interviewees gave a positive view on the use of ChatGPT and argued that ChatGPT is very useful in helping them do their college assignments.
2. H2: The “Perceived Ease of Use” variable has a positive influence on the “Attitude towards ChatGPT” variable. This hypothesis is strongly supported by sources from interviews that have been conducted. They argue that ChatGPT is very easy to use and understands the prompts given well.
3. H3: The “Perceived Social Presence” variable does not have a significant influence on the “Attitude towards ChatGPT” variable. The interviews also showed that the social presence they felt when using ChatGPT did not really affect their views on using ChatGPT.
4. H4: The “Perceived Credibility” variable has a positive influence on the “Attitude towards ChatGPT” variable. This hypothesis is also supported by the results of interviews that have been conducted. The sources argued that ChatGPT has quite credible information because it can mention the source of the information provided.
5. H5: The “Hedonic Motivation” variable has a positive influence on the “Attitude towards ChatGPT” variable. This is supported by the results of interviews that have been obtained. Research resource persons argue that using ChatGPT is quite fun because it can understand every question given well.
6. H6: The “Attitude towards ChatGPT” variable has a very significant influence on the “Behavioral Intention to Use ChatGPT” variable. This hypothesis is also supported by the results of interviews that have been conducted. Research resource persons argue that a positive attitude towards using ChatGPT

is very influential in how likely they are to use ChatGPT in helping them with college assignments in the future.

#### 4. Conclusion

The outcomes of this research reveal that all indicators derived from 7 variables, as evaluated by the TAM measurement model, are valid and reliable. The findings of this study highlight that:

1. H1 is accepted because the variable “Perceived Usefulness” has a highly significant influence by obtaining a large T-Statistics value of 4.066 on the “Attitude towards ChatGPT” variable.
2. H2 is accepted because the variable “Perceived Ease of Use” has a significant influence on the “Attitude towards ChatGPT” variable by obtaining a T-Statistics value of 2.232.
3. H3 is rejected because the variable “Perceived Social Presence” has a T-Statistics less than 1.960, which is 1.104, on the variable “Attitude towards ChatGPT”.
4. H4 is accepted because the variable “Perceived Credibility” has a high influence on the “Attitude towards ChatGPT” variable, by obtaining a relatively large T-Statistics value, which is 3.292.
5. H5 is accepted because the variable “Hedonic Motivation” exerts a significant influence on the “Attitude towards ChatGPT” variable, with a substantial T-Statistics value of 3.175.
6. H6 is accepted because the variable “Attitude towards ChatGPT” has a highly significant influence on the “Behavioral Intention to Use ChatGPT” variable. The T-Statistics value obtained by this variable is 8.329, which is indicative of a substantial influence.

Based on the results of the data analysis that has been done, the perception of students using ChatGPT is influenced by several key factors that contribute to their continued usage of this tool. Firstly, the perceived usefulness of ChatGPT has a highly significant influence in shaping students' attitudes toward its use. When students perceive ChatGPT as beneficial and valuable for their academic needs, it positively impacts their views and inclination to utilize it further. Secondly, factors like perceived ease of use and the credibility of ChatGPT are influential. If students find the platform easy to navigate and trust the accuracy of the information it provides, it fosters a positive attitude toward using ChatGPT. Additionally, students' hedonic motivation, the enjoyment or satisfaction derived from using ChatGPT, also influences their attitudes. When students find the experience enjoyable or satisfying, it can enhance their likelihood of continued engagement with the tool. Overall, the positive attitude students hold toward ChatGPT significantly influences their intention to use it for future college assignments. This intention reflects

their willingness to integrate ChatGPT into their academic routines based on their positive perceptions of its usefulness, ease of use, credibility, and satisfaction derived from its use. Therefore, ensuring these factors are addressed and optimized could potentially encourage continued and effective usage of ChatGPT among students.

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