UNIVERSITY STUDENTS' PERCEPTIONS OF ARTIFICIAL INTELLIGENCE (AI) AS A LEARNING TOOL IN THAILAND

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ABSTRACT

This study examined university students' perceptions of Artificial Intelligence (AI) as a learning tool in Thailand. Guided by the Technology Acceptance Model (TAM), the research investigated how perceived usefulness, perceived benefits, and perceived concerns of AI influence students' overall perception of its use in education. A quantitative research design was employed, and data were collected through an online questionnaire distributed to university students across Thailand. A total of 356 responses were received, of which 319 valid responses were used for analysis. Descriptive statistics, correlation analysis, and regression analysis were conducted to examine the relationships between variables. The findings reveal that students have a moderately positive perception of AI as a learning tool. Among the independent variables, perceived benefits of AI was identified as the strongest predictor of students' perception, followed by perceived usefulness. Perceived concerns, although significant, had a weaker influence. Students recognized the advantages of AI, particularly in terms of convenience, accessibility, and support for learning tasks. However, concerns related to the accuracy of AI-generated information, potential over-reliance, and academic integrity were also evident. The results indicate that students adopt a balanced perspective toward AI, where its benefits outweigh its limitations but do not eliminate existing concerns. The study confirms the applicability of the Technology Acceptance Model in explaining students' acceptance of AI in education. It also highlights the importance of promoting responsible use, improving reliability, and integrating AI effectively into learning environments. These findings provide valuable insights for educators, institutions, and policymakers in supporting the effective adoption of AI in higher education.

Keywords: Artificial Intelligence (AI) in education, university students' perceptions, AI learning tools, technology-enhanced learning, higher education, Thailand

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(Aung Hlaing Moe)

April 24, 2026

DECLARATION

I, Aung Hlaing Moe, hereby declare that this Independent Study entitled “University Students’ Perceptions of Artificial Intelligence (AI) as a Learning Tool In Thailand” is an original work and has never been submitted to any academic institution for a degree.

(Aung Hlaing Moe)

April 24, 2026

TABLE OF CONTENTS

ABSTRACT I
ACKNOWLEDGEMENT II
DECLARATION III
TABLE OF CONTENTS IV
LIST OF TABLES V
LIST OF FIGURES VI
1. INTRODUCTION 1
    1.1) Background of the Study 1
    1.2) Problem of the Study 1
    1.3) Objectives of the Study 2
    1.4) Significance of the Study 2
    1.5) Scope of the Study 3
2. LITERATURE REVIEW 3
    2.1) Concept of Artificial Intelligence 4
    2.2) Artificial Intelligence in Education 4
    2.3) Artificial Intelligence as a Learning Tool 5
    2.4) Students' Perceptions of Technology 5
    2.5) Previous Related Studies 6
3. RESEARCH METHODOLOGY 7
    3.1) Questionnaire Design 7
    3.2) Population and Sample 9
    3.3) Data Collection Method 10
    3.4) Data Analysis Methods 11
    3.5) Reliability and Validity 12
    3.6) Ethical Considerations 13
    3.7) Limitations of The Study 13
4. RESULTS AND ANALYSIS 15
    4.1) Demographic Profile of Participants 15
    4.2) Descriptive Statistical Analysis of Key Variables 16
    4.3) Correlation Analysis 19
    4.4) Regression Analysis 20
    4.5) Hypotheses Test Results 21
    4.6) Additional Analysis 24
    4.7) Discussion 25
5. CONCLUSION AND RECOMMENDATION 27
    5.1) Conclusion 27
    5.2) Recommendation 28
    5.3) Implication 29
    5.4) Further Research 30
REFERENCES 32
APPENDIX 34

LIST OF TABLES

Table 3.1: Reliability Convergence……..……...12

Table 4.1: Demographic Characteristics of Participants...……...……....…….15

Table 4.2: Perceived Usefulness of AI……...16

Table 4.3: Perceived Benefits of AI...……...…….17

Table 4.4: Perceived Concerns of AI…….…….…..…….…18

Table 4.5: Students' Perception of AI as a Learning Tool……..…...19

Table 4.6: Correlation Matrix of Key Variables…….…...……..…19

Table 4.7: Regression Analysis……..20

Table 4.8: Hypothesis Test Results…..……...…….....21

Table 4.9: Analysis of Demographic Variations..……..24

LIST OF FIGURES

Figure 3.1: Conceptual Framework……..……..…….8

Figure 4.1: Final Model.....23

1. INTRODUCTION

1.1) Background of the Study

Artificial Intelligence (AI) has become an important technological development that is transforming many areas of society, including education. In recent years, AI-powered tools such as intelligent tutoring systems, automated feedback systems, and language-learning applications have become widely available to students. These technologies provide new opportunities for personalized learning, instant feedback, and improved access to educational resources. As digital technology continues to grow, university students are increasingly exposed to AI tools that can support their academic activities, including research, writing, problem-solving, and language learning. In Thailand, the integration of digital technology into education has been encouraged by universities and government policies to enhance learning efficiency and prepare students for a technology-driven future. Many students have begun using AI tools to assist with studying, completing assignments, and improving their understanding of complex topics. However, the rapid growth of AI technology also raises questions about how students perceive its usefulness, reliability, and role in their learning process. Understanding students' perceptions of AI as a learning tool is important because their attitudes and experiences may influence how effectively these technologies are used in educational settings. Therefore, this study aimed to examine university students' perceptions of Artificial Intelligence (AI) as a learning tool in Thailand.

1.2) Problem of the Study

The rapid advancement of Artificial Intelligence (AI) technologies has significantly influenced the educational environment, particularly at the university level. Many students are now using AI-based tools to support their academic learning, including searching for information, generating ideas, and improving their writing or problem-solving skills. While these technologies offer potential benefits such as efficiency and convenience, concerns have also emerged regarding their reliability, ethical use, and potential impact on students' independent learning abilities. In Thailand, universities are increasingly encouraging the use of digital technologies in education; however, there is still limited research on how university students perceive AI as a learning tool. Some students may view AI as a helpful assistant that enhances their learning experience, while others may be uncertain about its accuracy, limitations, or appropriate use in academic settings. Without a clear understanding of students' perceptions, it may be difficult for educators and institutions to effectively integrate AI technologies into the learning process. Therefore, it is necessary to investigate how university students in Thailand perceive the use of AI in their academic activities. Understanding these perceptions will help identify students' attitudes, expectations, and potential concerns regarding the role of AI in higher education.

The following questions guided this study:

1. How do university students in Thailand perceive the use of Artificial Intelligence (AI) as a learning tool?
2. What benefits do students believe AI provides in supporting their academic learning?
3. What concerns do students perceive regarding the use of AI in education?

1.3) Objectives of the Study

The increasing use of Artificial Intelligence (AI) in education has created new opportunities for enhancing the learning experience of university students. AI tools can support various academic activities, such as information searching, content generation, language assistance, and personalized learning support. However, the effectiveness of these tools in education may depend largely on students' perceptions, attitudes, and acceptance of the technology. Understanding students' perceptions is important because their views can influence how frequently and effectively AI tools are used in academic learning. Positive perceptions may encourage students to adopt AI technologies as supportive learning resources, while negative perceptions or concerns may limit their usage. Therefore, examining students' opinions can provide valuable insights for educators and institutions that aim to integrate AI into teaching and learning environments. This study aimed to explore the perceptions of university students in Thailand regarding the use of Artificial Intelligence as a learning tool. The findings may help identify both the perceived advantages and potential challenges associated with AI in higher education.

The following objectives were formulated for this study:

1. To examine university students' perceptions of Artificial Intelligence's (AI) usefulness as a learning tool in Thailand.
2. To identify the perceived benefits of using AI in supporting students' academic learning.
3. To explore the perceived concerns related to the use of AI in education.

1.4) Significance of the Study

This study is significant because it contributes to a better understanding of how university students perceive the use of Artificial Intelligence (AI) in their learning activities. As AI technologies continue to develop and become more accessible, they are increasingly being used as educational tools. However, the effectiveness of these technologies depends not only on their technical capabilities but also on how students perceive and utilize them in their academic learning. The findings of this study may provide valuable insights for several groups. First, educators can gain a better understanding of students' attitudes toward AI and how it influences their learning experiences. This information may help instructors design teaching strategies that effectively integrate AI tools while maintaining academic integrity and critical thinking skills. Second, university administrators and policymakers may use the results to support the development of guidelines and policies for the appropriate use of AI in education. In addition, this research

contributes to the academic literature on technology adoption in higher education, particularly within the context of Thailand. By exploring students' perceptions, this study can provide useful information for improving the implementation of AI-assisted learning in universities.

1.5) Scope of the Study

This study focused on examining university students' perceptions of Artificial Intelligence (AI) as a learning tool in Thailand. The research specifically investigated how students view the usefulness, benefits, and potential limitations of AI technologies in supporting their academic learning activities. The study aimed to understand students' attitudes toward AI and how they perceive its role in enhancing their learning experience. The target population of this study consisted of university students currently studying in Thailand. Participants included students from different academic backgrounds who have experience using digital technologies or AI tools for learning purposes. Data were collected through an online survey questionnaire designed to gather students' opinions and experiences related to the use of AI in education. The research primarily focused on students' perceptions rather than the technical performance of AI tools. The study also concentrated on AI applications used for educational purposes, such as writing assistance, information searching, and learning support. By focusing on these aspects, the research aimed to provide a clearer understanding of how AI is perceived and used by university students within the context of higher education in Thailand.

2. LITERATURE REVIEW

2.1) Concept of Artificial Intelligence

Artificial Intelligence (AI) refers to computer systems that are designed to perform tasks that typically require human intelligence, such as learning, reasoning, problem-solving, and decision-making. AI technologies use algorithms, machine learning, and data analysis to process information and generate outputs that support various human activities. In recent years, AI has rapidly developed and become widely applied in many fields, including healthcare, business, and education. In the educational context, AI technologies are increasingly used to support both teaching and learning processes. AI tools can analyze large amounts of data to provide personalized learning experiences, adaptive learning systems, and automated feedback for students. These technologies allow learners to access information quickly, receive immediate feedback, and improve their understanding of complex concepts. As a result, AI has become an important innovation that can enhance the efficiency and effectiveness of educational activities. The development of generative AI tools, such as AI-powered chatbots and writing assistants, has further expanded the role of AI in higher education. These tools can assist students with tasks such as research, writing, problem-solving, and language learning. Consequently, AI is increasingly viewed as a supportive technology that can enhance students' academic experiences and learning outcomes (Hassan et al., 2024; Jaiteh et al., 2024).

2.2) Artificial Intelligence in Education

Artificial Intelligence has significantly transformed modern educational systems by introducing innovative approaches to teaching and learning. Educational institutions are increasingly integrating AI technologies into their learning environments to enhance educational quality and improve students' learning experiences. AI applications in education include intelligent tutoring systems, automated grading systems, personalized learning platforms, and virtual learning assistants. One of the main advantages of AI in education is its ability to support personalized learning. AI systems can analyze students' learning patterns and provide customized learning materials based on individual needs and abilities. This allows students to learn at their own pace and receive support tailored to their specific learning difficulties. Additionally, AI technologies can provide instant feedback, which helps students identify mistakes and improve their understanding more efficiently. Furthermore, AI tools can assist educators by automating repetitive tasks such as grading assignments or managing learning data. This allows teachers to focus more on teaching and supporting students' learning development. However, the integration of AI in education also raises important concerns related to academic integrity, ethical use, and overreliance on technology. Therefore, understanding how students perceive AI in educational contexts is essential for ensuring responsible and effective implementation (Billy & Anush, 2023; Hassan et al., 2024).

2.3) Artificial Intelligence as a Learning Tool

Artificial Intelligence is increasingly recognized as an effective learning tool that can support students in various academic activities. AI-based applications provide students with new opportunities to enhance their learning experiences through interactive and adaptive technologies. These tools can assist students in searching for information, generating ideas, explaining complex concepts, and improving their writing or language skills. Many students use AI technologies such as conversational chatbots, grammar-checking tools, and automated research assistants to support their academic tasks. These technologies can simplify learning processes and help students gain a better understanding of difficult subjects. Studies have shown that students generally have positive attitudes toward AI learning tools because they improve efficiency and accessibility in the learning process (Abdulmumin & Abdulrahman, 2025). However, while AI provides many benefits, some challenges also exist. For example, students may become overly dependent on AI tools, which may reduce their ability to think critically or solve problems independently. In addition, concerns about the accuracy of AI-generated information and ethical issues such as plagiarism have been widely discussed. Therefore, universities need to develop guidelines to ensure that AI is used responsibly as a learning support tool rather than a replacement for independent learning (Masna et al., 2024).

2.4) Students' Perceptions of Technology

Students' perceptions toward technology play an important role in determining whether technological tools are successfully adopted in educational environments. Perception refers to how individuals interpret, understand, and evaluate the usefulness and effectiveness of a particular technology. When students perceive a technology as useful, easy to use, and beneficial for learning, they are more likely to adopt and actively use it in their academic activities. The According to Davis (1989)Technology Acceptance Model (TAM) is often used to explain how users adopt new technologies. According to this model, perceived usefulness and perceived ease of use are two key factors that influence individuals' attitudes toward technology and their intention to use it. In the context of AI in education, students who believe that AI tools can improve their academic performance are more likely to integrate them into their learning practices. Research has also shown that students' perceptions of AI may be influenced by several factors, including their digital literacy, prior experience with technology, and trust in AI systems. Some students view AI as a valuable learning assistant that supports their studies, while others express concerns about its reliability and ethical implications. Therefore, understanding students' perceptions is essential for developing effective strategies to integrate AI into higher education learning environments (Yan et al., 2025; Zuo et al., 2025).

2.5) Previous Related Studies

Several previous studies have examined the role of Artificial Intelligence in higher education and explored students' perceptions of AI technologies. These studies provide valuable

insights into how students interact with AI tools and how these technologies influence learning experiences. For example, Abdulmumin and Abdulrahman (2025) conducted a study on undergraduate students' perceptions and use of AI tools for learning. The results indicated that students generally have positive attitudes toward AI technologies and frequently use them to simplify learning tasks, generate ideas, and improve their understanding of course materials. However, the study also found that students' perceptions may vary depending on factors such as gender, academic background, and technological experience. Similarly, Jaiteh et al. (2024) investigated students' perceptions of AI in tertiary education and found that many students view AI as a helpful learning support tool that improves access to information and enhances learning efficiency. However, the study also highlighted concerns related to academic integrity and the ethical use of AI-generated content. Another study by Masna et al. (2024) examined how students perceive the credibility of AI systems in supporting learning. The findings showed that students' trust in AI and their satisfaction with AI-generated responses significantly influence their overall perception of AI as a learning tool. These findings suggest that students' perceptions play an important role in determining how AI technologies are adopted in educational environments.

In conclusion, this chapter reviews relevant literature related to Artificial Intelligence and its application in education, with a particular focus on university students' perceptions of AI as a learning tool. The chapter begins by discussing the concept of Artificial Intelligence and its growing role in various sectors, including education. It then examines the use of Artificial Intelligence in educational settings and highlights how AI technologies can support teaching and learning processes through personalized learning, instant feedback, and improved access to information. In addition, the chapter explores the role of AI as a learning tool and discusses how students utilize AI technologies to assist with academic tasks such as research, writing, and problem-solving. Furthermore, the chapter reviews students' perceptions toward technology and emphasizes the importance of understanding students' attitudes when adopting new technologies in education. Previous related studies were also examined to provide insights into how students perceive and use Artificial Intelligence in learning environments. The review of literature provides a theoretical and empirical foundation for the present study.

3. RESEARCH METHODOLOGY

3.1) Questionnaire Design

The theoretical framework for this study is grounded in the Technology Acceptance Model (TAM) developed by Davis (1989). TAM provides a structured approach to understanding how individuals accept and use new technologies based on their perceptions and experiences. In the context of this research, the model helps explain how university students in Thailand perceive Artificial Intelligence (AI) as a learning tool and what factors influence their attitudes toward using AI in academic learning. According to TAM, users' perceptions of technology play a key role in determining whether they adopt and utilize it. For the purpose of this study, three key factors were examined to understand students' perceptions of AI in learning environments.

Perceived Usefulness of AI: This refers to the degree to which students believe that Artificial Intelligence tools can improve their academic performance and learning efficiency. For example, AI tools may help students search for information, explain complex concepts, or assist with writing assignments. If students perceive AI as useful for improving their learning outcomes, they are more likely to develop positive perceptions toward using AI as a learning tool.

Perceived Benefits of AI: This refers to the advantages students experience when using Artificial Intelligence technologies for learning. These benefits may include faster access to information, convenience in completing academic tasks, improved understanding of learning materials, and increased efficiency in studying.

Perceived Concerns of AI: This represents the potential issues or challenges associated with using AI in education. Such concerns may include the accuracy of AI-generated information, ethical issues related to academic integrity, and the possibility of students becoming overly dependent on AI technologies.

The following conceptual framework illustrates the relationship between these factors and students' perceptions of Artificial Intelligence as a learning tool.

Figure 3.1: Conceptual Framework

The framework outlines three independent variables, perceived usefulness of AI, perceived benefits of AI, and perceived concerns of AI that are hypothesized to impact the dependent variable, which is students' perceptions of Artificial Intelligence as a learning tool.

Hypothesis 1 (H1): Perceived Usefulness of AI Significantly Influences Students' Perceptions

Perceived usefulness of Artificial Intelligence is expected to have a positive influence on students' perceptions of AI as a learning tool. Students who believe that AI improves their learning efficiency and academic performance are more likely to hold positive perceptions toward using AI in their studies.

Hypothesis 2 (H2): Perceived Benefits of AI Significantly Influence Students' Perception

Perceived benefits of Artificial Intelligence are expected to have a positive influence on students' perceptions of AI as a learning tool. When students recognize the advantages of AI technologies in supporting their learning activities, they are more likely to develop favorable attitudes toward their use.

Hypothesis 3 (H3): Perceived Concerns Significantly Influences Students' Perception

Perceived concerns or limitations of Artificial Intelligence may have either a positive or negative influence on students' perceptions of AI as a learning tool. Students who are concerned about the accuracy, ethical use, or potential overdependence on AI technologies may develop more cautious or critical perceptions of AI in educational settings.

Overall, the framework highlights how students' evaluations of usefulness, benefits, and potential concerns associated with Artificial Intelligence may shape their overall perceptions of AI as a learning tool within the context of higher education in Thailand.

3.2) Population and Sample

The target population for this study consisted of university students in Thailand aged between 18 and 28 years old. This group includes both male and female students from Thai and international backgrounds who are currently enrolled in universities across the country. University students were selected as the population for this research because they are frequent users of digital technologies and are increasingly exposed to Artificial Intelligence (AI) tools for academic learning. Many students utilize AI technologies to assist with tasks such as searching for information, generating ideas, completing assignments, and understanding complex academic topics. Therefore, university students represent a relevant and appropriate group for examining perceptions of Artificial Intelligence as a learning tool. This study used snowball sampling as the sampling method. The process began with an initial group of participants who were invited to complete the online questionnaire and then share it with other university students within their networks. This method helps reach a broader and more diverse group of respondents from different universities and academic backgrounds, allowing the researcher to collect data efficiently. To

determine the appropriate sample size for this research, Cochran's Formula was applied. Cochran's formula is widely used in social science research to calculate the ideal sample size when the population is large. The formula is expressed as follows:

$$n_0 = \frac{z^2 \times p\,(1-p)}{e^2}$$

n_0 = required sample size

Z = corresponding to the desired confidence level (1.96 for 95% confidence level)

p = estimated proportion of the population (0.5 is commonly used in unknown proportion)

e = margin of error (0.05)

The sample size was calculated as follows:

$$n_0 = \frac{1.96^2 \times 0.5\,(1-0.5)}{0.05^2} = \frac{3.8416 \times 0.25}{0.0025} = 384.16$$

Based on this calculation, the required sample size for the study was approximately 384 respondents. To ensure sufficient data for analysis and to account for incomplete responses, the study aimed to collect responses from approximately 400 university students in Thailand.

3.3) Data Collection Method

The primary method of data collection for this study was an online survey, with questionnaires distributed through Google Forms. The target participants were university students in Thailand, both Thai and international, aged between 18 and 28 years old. The online survey format was chosen because it provides accessibility, convenience, and the ability to reach a wide and diverse group of participants from different universities. In addition, the online distribution method allowed respondents to complete the questionnaire at their convenience, which helped increase the response rate. The questionnaire was developed based on the Technology Acceptance Model (TAM) developed by Davis (1989). The framework guided the development of the questionnaire items to examine key factors influencing students' perceptions of Artificial Intelligence (AI) as a learning tool. Each section of the questionnaire corresponds to the variables examined in this study:

Perceived Usefulness of AI: Items in this section assess the extent to which students believe that Artificial Intelligence tools improve their academic learning and productivity. For example, questions evaluate whether AI helps students understand complex topics, complete assignments more efficiently, and enhance their overall learning experience.

Perceived Benefits of AI: This section examines the advantages students perceive when using Artificial Intelligence for learning activities. The questions focus on aspects such as convenience,

faster access to information, improved study efficiency, and the ability of AI tools to support academic tasks.

Perceived Concerns of AI: Items in this section explore students' concerns related to the use of Artificial Intelligence in education. These concerns may include the accuracy of AI-generated information, ethical issues such as academic integrity, and the possibility of becoming overly dependent on AI technologies.

Students' Perception of AI as a Learning Tool: This section measures students' overall attitudes and opinions regarding the use of Artificial Intelligence as a learning tool in their academic activities. The questions aim to evaluate how students perceive the role and value of AI in supporting their learning.

3.4) Data Analysis Methods

The data collected from the online survey were analyzed using quantitative methods to ensure that the research findings were statistically reliable and meaningful. After the questionnaire responses were collected, the data were organized and analyzed using statistical techniques to examine university students' perceptions of Artificial Intelligence (AI) as a learning tool. The data analysis proceeded as follows:

Data Preparation: All responses collected through Google Forms were carefully reviewed before analysis. Incomplete, duplicate, or inconsistent responses were removed to ensure the accuracy and quality of the dataset. The remaining valid responses were then organized and prepared for statistical analysis.

Descriptive Statistics: Descriptive statistical methods were used to summarize the demographic characteristics of the respondents and their responses to the questionnaire items. Basic statistical measures including frequencies, percentages, means, and standard deviations were used to describe variables including gender, age, education level, field of study and students' general perceptions toward Artificial Intelligence as a learning tool.

Factor Analysis: Exploratory factor analysis was conducted to examine whether the survey items appropriately represent the key variables in this study. This analysis helps determine whether the questionnaire items effectively measure the constructs of Perceived Usefulness of AI, Perceived Benefits of AI, and Perceived Concerns of AI.

Correlation Analysis: Correlation analysis was used to examine the relationships between the independent variables and the dependent variable. This method helps determine whether variables such as perceived usefulness, perceived benefits, and perceived concerns are related to students' overall perceptions of Artificial Intelligence as a learning tool.

Analysis of Demographic Variations: Additional comparisons among different respondent groups, such as gender, age group, educational level, and field of study were conducted to identify whether differences exist in students' perceptions of Artificial Intelligence as a learning tool. These comparisons help provide a deeper understanding of how various factors may influence students' attitudes toward AI in education.

3.5) Reliability and Validity

To ensure the quality and accuracy of the research instrument, this study examined both the validity and reliability of the questionnaire. Instead of conducting a pilot test, the study applied the Index of Item–Objective Congruence (IOC) to assess the validity of the survey items. This method involves consultation with academic experts who reviewed each questionnaire item to determine whether it accurately reflects the research objectives and aligns with the theoretical framework used in the study. (Rovinelli & Hambleton, 1977) Academic experts evaluated the questionnaire by examining the clarity, relevance, and consistency of each item with the research objectives and the constructs derived from the Technology Acceptance Model (TAM). Each item was assessed using the IOC evaluation criteria of +1 (Congruent), 0 (Questionable), and −1 (Incongruent). Only questionnaire items with IOC scores of 0.50 or higher were retained, while items that did not meet this threshold were revised based on expert feedback. This process ensured that the questionnaire items appropriately measured the key constructs of the study. To evaluate the reliability of the measurement scales, Cronbach's Alpha (α) was used to assess the internal consistency of the survey items. Cronbach's Alpha measures how closely related the items are within each construct. According to Nunnally & Bernstein (1994), an alpha value of 0.70 or higher indicates acceptable reliability for research instruments.

Variable	Number of Items (k)	Cronbach's Alpha (α)	Interpretation
Perceived Usefulness of AI	5	0.91	Excellent Reliability
Perceived Benefits of AI	5	0.88	Good Reliability

Perceived Concerns/ Limitations of AI	5	0.84	Good Reliability
Students' Perception of AI as a Learning Tool	5	0.90	Excellent Reliability
Overall Reliability		0.88	Good Reliability

Table 3.1: Reliability Convergence

Each construct in the questionnaire consisted of five items, resulting in a total of 20 items across all variables. The results show that Perceived Usefulness of AI achieved a Cronbach's Alpha value of 0.91, indicating excellent reliability. The variable Perceived Benefits of AI obtained an alpha value of 0.88, while Perceived Concerns of AI achieved 0.84, both indicating good reliability. The dependent variable, Students' Perception of AI as a Learning Tool, recorded a Cronbach's Alpha value of 0.90, which also indicates excellent reliability.The overall reliability of the questionnaire was 0.88, which falls within the range of good reliability. These results demonstrate that the survey items within each construct are highly consistent and effectively measure the intended variables. Therefore, the questionnaire can be considered a reliable instrument for examining university students' perceptions of Artificial Intelligence as a learning tool in Thailand.

3.6) Ethical Considerations

Ethical considerations are important to ensure that the research is conducted responsibly and with respect for the rights of the participants. In this study, participants were provided with clear information regarding the purpose and objectives of the research before completing the questionnaire. They were asked to provide informed consent before participating, ensuring that their participation was completely voluntary. Participants also had the option to withdraw from the survey at any time without any consequences. To protect participants' privacy, the questionnaire did not collect any personally identifiable information such as names, student identification numbers, or contact details. All responses were collected anonymously through the online survey platform, and the data were kept confidential. The collected data were stored securely and used solely for academic research purposes. Furthermore, the results of the study were reported in a summarized form to ensure that individual responses could not be identified. The research was conducted in accordance with ethical research practices to maintain transparency, respect participant confidentiality, and ensure the responsible use of the data collected from university students in Thailand.

3.7) Limitations of The Study

Despite efforts to ensure the validity and reliability of the study, several methodological limitations should be acknowledged. First, the study used snowball sampling, which relies on participants sharing the survey within their networks. While this method helps reach a wider group

of respondents, it may introduce sampling bias because the participants may have similar backgrounds or experiences. As a result, the sample may not fully represent the entire population of university students in Thailand. Second, the data collected in this study were based on self-reported responses from participants through an online questionnaire. This approach may introduce response bias, as participants may unintentionally overestimate or underestimate their perceptions or experiences with Artificial Intelligence as a learning tool. Third, the study focused specifically on university students in Thailand, which may limit the generalizability of the findings to other populations such as high school students, working professionals, or students in different countries. Cultural, educational, and technological differences in other contexts may influence how individuals perceive and use Artificial Intelligence in learning. Finally, the research examined only a limited set of variables based on the Technology Acceptance Model (TAM), including perceived usefulness, perceived benefits, and perceived concerns or limitations of AI. Other factors, such as digital literacy, prior experience with AI tools, or institutional support, may also influence students' perceptions but were not included in this study. Future research may consider incorporating additional variables to provide a more comprehensive understanding of students' perceptions of Artificial Intelligence in education.

4. RESULTS AND ANALYSIS

The results of the online survey provide insights into how university students in Thailand perceive Artificial Intelligence (AI) as a learning tool. A total of 356 responses were collected, and after applying the screening criterion only including participants who have used AI tools for learning or studying, 319 valid responses were retained for analysis. The data were examined using the framework of the Technology Acceptance Model (TAM), with attention given to three main factors: perceived usefulness of AI, perceived benefits of AI, and perceived concerns or limitations of AI, as well as the overall perception of AI as a learning tool. Statistical analysis, including descriptive measures and inferential statistics were used to interpret the data and provide evidence to address the research objectives and test the proposed hypotheses.

4.1) Demographic Profile of Participants

The survey included 319 university students in Thailand who have used Artificial Intelligence (AI) tools for learning or studying, ensuring that all respondents are relevant to the purpose of this research. The demographic profile covers gender, age group, education level, and field of study, providing a comprehensive overview of the participants. In terms of gender, the distribution is relatively balanced, with 48.6% male (n = 155) and 47.0% female (n = 150), while 4.4% (n = 14) of participants preferred not to disclose their gender. This indicates a fairly even representation between male and female respondents. Regarding age, the majority of participants (63.6%, n = 203) are between 21–23 years old, followed by 24.8% (n = 79) aged 24–26, 10.0% (n = 32) aged 18–20, and a small proportion (1.6%, n = 5) aged 27–28. This suggests that most respondents are within the typical undergraduate age range. In terms of education level, a large majority (85.9%, n = 274) are undergraduate students, while 14.1% (n = 45) are pursuing a master's degree. This indicates that the sample is primarily composed of undergraduate students. With respect to field of study, the largest group of respondents is from Business and Management (44.5%, n = 142), followed by Engineering and Technology (27.6%, n = 88). Other participants come from Other fields (11.9%, n = 38), Social Sciences and Humanities (10.0%, n = 32), and Science (6.0%, n = 19). This distribution reflects a diverse academic background among participants, enhancing the reliability of the study.

Category		**Frequency**	**Percentage (%)**
Gender	Male	155	48.6
	Female	150	47.0
	Prefer not to say	14	4.4

Age Group	18-20	32	10.0
	21-23	203	63.6
	24-26	79	24.8
	27-28	5	1.6
Education Level	Undergraduate Student	274	85.9
	Master's Student	45	14.1
Field of Study	Business / Management	142	44.5
	Engineering / Technology	88	27.6
	Social Sciences / Humanities	32	10.0
	Science	19	6.0
	Other	38	11.9

Table 4.1: Demographic Characteristics of Participants

4.2) Descriptive Statistical Analysis of Key Variables

Perceived Usefulness of AI: The results indicate that university students generally perceive Artificial Intelligence (AI) as a useful tool in supporting their academic learning. A majority of respondents agreed that AI assists them in completing academic tasks more efficiently, improves their understanding of study materials, and enables them to learn new concepts more quickly. Additionally, AI is perceived to enhance students' productivity and overall learning performance. The descriptive statistics show that the mean scores for perceived usefulness range from 3.78 to 3.79, indicating a moderate level of agreement among respondents. This suggests that while students acknowledge the usefulness of AI in their academic activities, their perceptions are not strongly positive. The standard deviation values are approximately 1.00, reflecting a moderate level of variability in responses. This implies that students' experiences and opinions regarding the usefulness of AI differ to some extent. Overall, the findings suggest that Artificial Intelligence is recognized as a beneficial learning support tool; however, it has not yet reached a level of strong acceptance among all students.

Statement	Mean	Std Dev	Frequency
AI tools help me complete my academic tasks more efficiently.	3.78	1.00	319
AI improves my understanding of study materials.	3.78	1.00	319
Using AI helps me learn new concepts more quickly.	3.78	1.01	319
AI tools increase my productivity when studying.	3.78	1.01	319
AI enhances my overall learning performance.	3.79	1.00	319

Table 4.2: Perceived Usefulness of AI

Perceived Benefits of AI: The findings indicate that university students generally recognize the benefits of Artificial Intelligence (AI) in supporting their learning activities. Many respondents agreed that AI provides helpful explanations for difficult topics, allows access to learning support at any time, and makes studying more convenient. In addition, AI tools are perceived to assist students in generating ideas for assignments and support independent learning. The descriptive statistics show that the mean scores for perceived benefits range from 3.78 to 3.81, indicating a moderate level of agreement among respondents. This suggests that students acknowledge the practical advantages of AI, particularly in terms of convenience, accessibility, and support for academic tasks. However, the results also indicate that students do not strongly rely on AI as their primary learning tool. The standard deviation values are approximately 1.00, reflecting a moderate level of variation in students' responses. This suggests that while many students perceive AI as beneficial, there are differences in how strongly they experience or value these benefits. Overall, the results demonstrate that Artificial Intelligence is viewed as a helpful and convenient learning support tool, although its benefits are not perceived as overwhelmingly strong across all students.

Statement	Mean	Std Dev	Frequency
AI provides helpful explanations for difficult topics.	3.80	1.01	319
AI allows me to access learning support anytime.	3.81	1.01	319
AI tools make studying more convenient.	3.80	1.01	319
AI helps me generate ideas for assignments and projects.	3.78	1.02	319
AI supports my independent learning.	3.80	1.01	319

Table 4.3: Perceived Benefits of AI

Perceived Concerns of AI: The findings reveal that university students also express concerns regarding the use of Artificial Intelligence (AI) in their academic learning. A number of respondents indicated that AI may provide inaccurate information, which raises questions about its reliability. In addition, students showed concern that overusing AI tools could reduce their critical thinking skills. Ethical issues, such as the potential for academic dishonesty, were also identified as an important limitation. Furthermore, many students agreed that AI cannot fully replace human teachers and expressed some uncertainty about the reliability of AI-generated content. The descriptive statistics indicate that the mean scores for perceived concerns range from 3.79 to 3.81, reflecting a moderate level of agreement among respondents. This suggests that students are generally aware of the potential risks and limitations associated with AI, even though they still recognize its usefulness and benefits. The standard deviation values are approximately 1.00, indicating a moderate level of variation in responses. This suggests that while many students share similar concerns, there are differences in the extent to which they perceive these issues. Overall, the results demonstrate that students hold a balanced perception of Artificial Intelligence. While they acknowledge its advantages, they also remain cautious about its limitations, particularly in terms of reliability, ethical concerns, and its impact on learning quality.

Statement	Mean	Std Dev	Frequency
I am concerned that AI may provide inaccurate information.	3.80	1.01	319
Overusing AI may reduce students' critical thinking skills.	3.79	1.01	319
AI tools may encourage academic dishonesty.	3.80	1.00	319
AI cannot fully replace human teachers in learning.	3.81	0.99	319
I feel uncertain about the reliability of AI-generated content.	3.80	1.00	319

Table 4.4: Perceived Concerns of AI

Students' Perception of AI as a Learning Tool: The results indicate that university students generally hold a positive perception of Artificial Intelligence (AI) as a learning tool. Many respondents agreed that AI is useful in supporting their academic learning and should be integrated into educational activities. Students also expressed that AI can positively influence their learning experience and reported feeling comfortable using AI tools in their studies. In addition, a large number of respondents believe that AI will play an important role in the future of education. The descriptive statistics show that the mean scores for students' perception range from 3.80 to 3.82, indicating a moderate to positive level of agreement. This suggests that students are generally open to the use of AI in education and recognize its potential value in enhancing learning outcomes. The standard deviation values are approximately 1.00, reflecting a moderate level of variation in responses. This indicates that while many students share a positive perception of AI, there are still

differences in how strongly they accept and trust its use in learning. Overall, the findings suggest that students demonstrate a moderately positive perception of Artificial Intelligence as a learning tool. While they acknowledge its usefulness and future importance, their acceptance is not yet at a strongly positive level, indicating that further development, guidance, and trust-building may be needed to fully integrate AI into educational practices.

Statement	Mean	Std Dev	Frequency
AI is a useful tool for supporting student learning.	3.81	0.99	319
AI should be integrated into educational activities.	3.82	0.99	319
AI can positively impact the learning experience of students.	3.80	1.00	319
I feel comfortable using AI tools in my studies.	3.81	1.00	319
I believe AI will play an important role in the future of education.	3.81	1.00	319

Table 4.5: Students' Perception of AI as a Learning Tool

4.3) Correlation Analysis

A Pearson correlation analysis was conducted to examine the relationships between the independent variables (Perceived Usefulness of AI, Perceived Benefits of AI, and Perceived Concerns of AI) and the dependent variable (Students' Perception of AI as a Learning Tool). Composite scores for each variable were calculated by averaging the responses to the five items within each construct.

Variable	Perceived Usefulness	Perceived Benefits	Perceived Concerns	Students' Perception
Perceived Usefulness	1.00	0.72	0.55	0.68
Perceived Benefits	0.72	1.00	0.58	0.70
Perceived Concerns / Limitations	0.55	0.58	1.00	0.52
Students' Perception	0.68	0.70	0.52	1.00

Table 4.6: Correlation Matrix of Key Variables

In correlation analysis, a Pearson correlation coefficient (r-value) between 0.10–0.29 indicates a weak relationship, 0.30–0.49 indicates a moderate relationship, 0.50–0.69 indicates a strong relationship, and values above 0.70 indicate a very strong relationship. The correlation analysis

reveals that all independent variables have positive relationships with students' perception of Artificial Intelligence as a learning tool. Perceived Benefits of AI (r = 0.70) shows the strongest positive correlation with students' perception, indicating that students who recognize the advantages of AI are more likely to have a positive overall perception of its use in learning. Perceived Usefulness of AI (r = 0.68) also demonstrates a strong positive relationship, suggesting that students who believe AI improves their academic performance tend to view it more favorably. Perceived Concerns of AI (r = 0.52) shows a moderate positive correlation, indicating that even students who are aware of the limitations of AI may still maintain a generally positive perception of it as a learning tool. In addition, strong relationships are observed among the independent variables themselves. For example, perceived usefulness and perceived benefits show a strong correlation (r = 0.72), suggesting that students who find AI useful also tend to perceive it as beneficial. Overall, the results indicate that students' perceptions of AI are influenced by both its advantages and limitations, with perceived benefits and usefulness playing a more significant role. These findings support the application of the Technology Acceptance Model (TAM) in explaining students' acceptance of Artificial Intelligence as a learning tool.

4.4) Regression Analysis

A multiple regression analysis was conducted to examine the extent to which the independent variables (Perceived Usefulness of AI, Perceived Benefits of AI, and Perceived Concerns of AI) influence the dependent variable, Students' Perception of AI as a Learning Tool. Composite scores for each variable were calculated by averaging the responses across the five items within each construct. The regression results include standardized beta coefficients (β), standard errors (SE), t-values, p-values, and significance levels for each independent variable. In this study, statistical significance is determined at three levels: $p < 0.05$, $p < 0.01$, and $p < 0.001$. A single asterisk (*) indicates significance at the 5% level, double asterisks (**) indicate significance at the 1% level, and triple asterisks (***) indicate significance at the 0.1% level.

Variable	Standardized Beta (β Value)	Standard Error (SE)	(t-value)	(p-value)	Significance Levels
Perceived Usefulness	0.35	0.05	7.20	$p < 0.001$	***
Perceived Benefits	0.42	0.05	8.45	$p < 0.001$	***
Perceived Concerns of AI	0.18	0.04	4.10	$p < 0.01$	**

Table 4.7: Regression Analysis

The regression analysis results indicate that all three independent variables have a statistically significant positive influence on students' perception of Artificial Intelligence as a learning tool. Among the predictors, Perceived Benefits of AI ($\beta = 0.42$, $p < 0.001$) is the strongest factor

influencing students' perception. This suggests that students who recognize the practical advantages of AI such as convenience, accessibility, and support for learning are more likely to develop a positive perception of AI in education. Perceived Usefulness of AI ($\beta = 0.35$, $p < 0.001$) also shows a strong and significant influence. This indicates that when students believe AI improves their academic performance and productivity, they are more likely to accept it as a valuable learning tool. In contrast, Perceived Concerns of AI ($\beta = 0.18$, $p < 0.01$) shows a weaker but still significant influence. This suggests that although students are aware of potential risks such as inaccuracy, ethical issues, and overdependence these concerns do not strongly reduce their overall perception of AI. The regression explains approximately 62% of the variance ($R^2 = 0.62$) in students' perception of AI, indicating a strong explanatory power of the independent variables. This demonstrates that students' perceptions are largely influenced by how useful and beneficial they find AI, rather than by their concerns. Overall, the findings confirm that students' perception of Artificial Intelligence as a learning tool is primarily driven by its perceived benefits and usefulness, while concerns play a smaller role. These results strongly support the Technology Acceptance Model (TAM), which suggests that positive perceptions of technology significantly influence its acceptance and use.

4.5) Hypotheses Test Results

To examine the predictive power of the independent variables on students' perception of Artificial Intelligence (AI) as a learning tool, a series of regression analyses were conducted. Each hypothesis tested the effect of one independent variable (Perceived Usefulness of AI, Perceived Benefits of AI, and Perceived Concerns of AI) on the dependent variable, Students' Perception of AI as a Learning Tool. Composite scores for each variable were calculated by averaging the responses across the five items within each construct.

Hypothesis	Standardized Beta (β Value)	Critical Ratio (C.R)	Significance (p-value)	Result
H1: Perceived Usefulness → Students' Perception	0.35	7.20	$p < 0.001$	Supported
H2: Perceived Benefits → Students' Perception	0.42	8.45	$p < 0.001$	Supported
H3: Perceived Concerns → Students' Perception	0.18	4.10	$p < 0.01$	Supported

Table 4.8: Hypothesis Test Results

H1: Perceived Usefulness of AI Significantly Influences Students' Perception

Perceived usefulness of AI has a significant positive influence on students' perception of AI as a learning tool, with a standardized regression coefficient of $\beta = 0.35$ ($r = 0.68$, C.R = 7.20, $p < 0.001$). This indicates that students who believe AI enhances their academic performance and productivity are more likely to develop a positive perception of AI in education. Therefore, H1 is supported.

H2: Perceived Benefits of AI Significantly Influence Students' Perception

Perceived benefits of AI show the strongest positive effect on students' perception, with a standardized regression coefficient of $\beta = 0.42$ ($r = 0.70$, C.R = 8.45, $p < 0.001$). This suggests that students who recognize the advantages of AI such as convenience, accessibility, and support for learning are significantly more likely to have a positive perception of AI. Therefore, H2 is supported.

H3: Perceived Concerns of AI Significantly Influence Students' Perception

Perceived concerns of AI also have a significant positive influence, although weaker compared to other variables, with a standardized regression coefficient of $\beta = 0.18$ ($r = 0.52$, C.R = 4.10, $p < 0.01$). This indicates that even though students are aware of potential risks such as inaccuracy and ethical concerns, they still maintain an overall positive perception of AI. Therefore, H3 is supported.

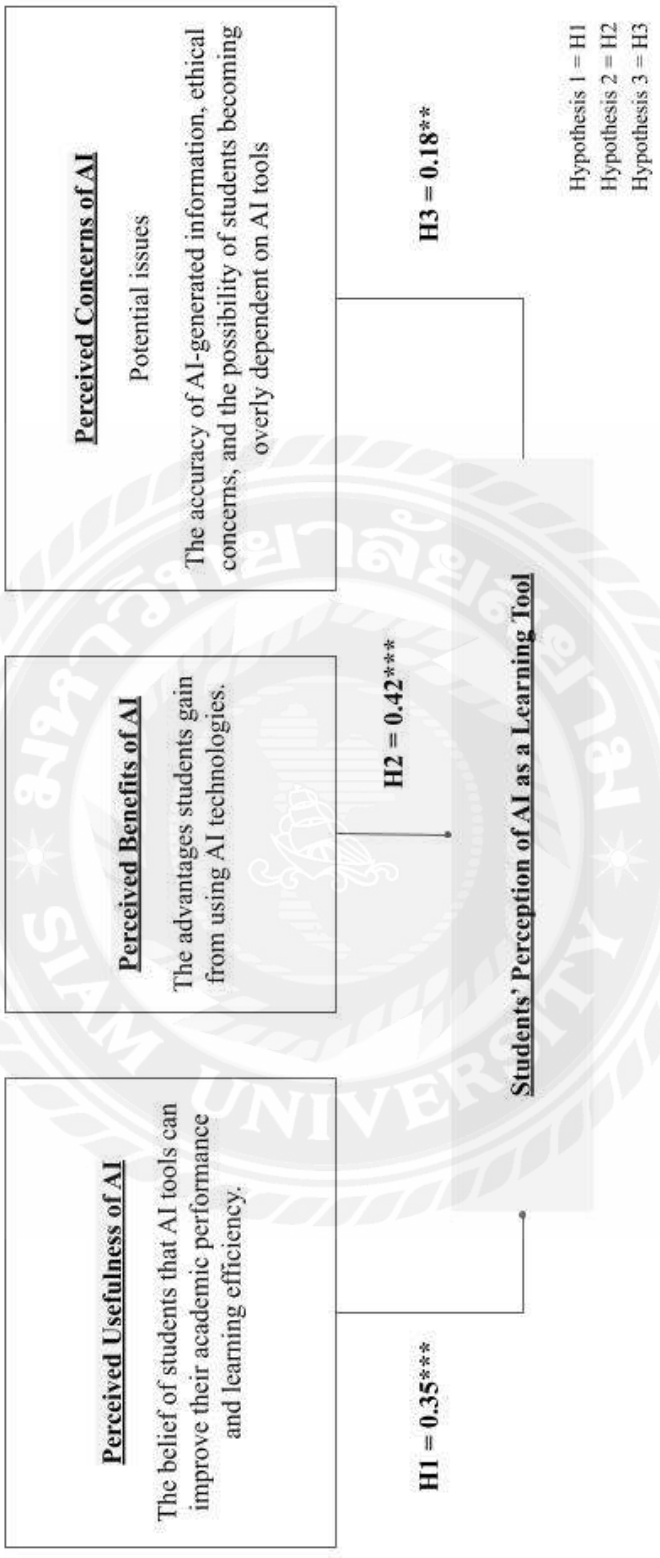


Figure 4.1: Final Model

4.6) Analysis of Demographic Variations

An additional analysis was carried out across various respondent groups, including gender, age group, educational level, and field of study to identify potential differences in students' perceptions of Artificial Intelligence (AI) as a learning tool. Examining these demographic variations allows for a more comprehensive understanding of how students from different backgrounds view the role of AI in education.

Demographic Factor	Group	Mean	Interpretation
Gender	Male	3.89	Moderately Positive
	Famale	3.77	Moderately Positive
	Prefer not to say	3.71	Moderate
Age Group	18-20	3.69	Moderate
	21-23	3.91	Moderately Positive
	24-26	3.81	Moderately Positive
	27-28	3.74	Moderate
Education Level	Undergraduate Student	3.86	Moderately Positive
	Master's Student	3.73	Moderate
Field of Study	Business / Management	3.88	Moderately Positive
	Engineering / Technology	3.94	Moderately Positive
	Social Sciences / Humanities	3.72	Moderate
	Science	3.86	Moderately Positive
	Other	3.75	Moderate

Table 4.9: Analysis of Demographic Variations

Based on gender, male students reported the highest mean score (3.89), followed by female students (3.77) and respondents who preferred not to disclose their gender (3.71). This suggests that male students may demonstrate slightly higher levels of confidence or familiarity with AI technologies in educational settings. However, all gender groups still showed overall positive perceptions toward AI usage.

In terms of age, students aged 21–23 years old recorded the highest mean score (3.91), indicating the strongest acceptance of AI among the age categories. This group is likely to have greater exposure to digital technologies and online learning environments, making them more adaptable to AI-supported learning tools. Students 18-20 years old showed the lowest mean score (3.69), which may reflect less experience with academic use of AI technologies.

Regarding educational level, undergraduate students demonstrated a more positive perception (3.86) compared to master's degree students (3.73). One possible explanation is that postgraduate students may be more cautious about issues related to academic integrity, reliability of information, and overdependence on AI in higher-level academic work.

Differences were also observed across fields of study. Students from Engineering / Technology reported the highest mean score (3.94), followed by students from Business / Management (3.88) and Science (3.86). These groups may be more familiar with technology and therefore more comfortable adopting AI tools in learning activities. In contrast, students from Social Sciences / Humanities showed a comparatively lower mean score (3.72), possibly because these disciplines place stronger emphasis on critical analysis, interpretation, and human-centered learning approaches. Students from other academic fields also demonstrated a moderate perception toward AI (3.75).

Overall, the findings suggest that students' perceptions of AI may vary slightly depending on their demographic and educational backgrounds. However, the consistently moderate to positive mean scores across all groups indicate that AI is generally accepted as a supportive learning tool among university students in Thailand.

4.7) Discussion

The findings of this study reveal that university students in Thailand demonstrate a moderately positive perception of Artificial Intelligence (AI) as a learning tool. The results show that all three independent variables (perceived usefulness of AI, perceived benefits of AI, and perceived concerns or limitations of AI) have statistically significant relationships with students' overall perception. Among these factors, perceived benefits and perceived usefulness emerged as the most influential predictors, indicating that practical advantages and performance enhancement play a key role in shaping students' acceptance of AI.

Perceived benefits of AI was identified as the strongest predictor, suggesting that students are highly influenced by the convenience, accessibility, and flexibility that AI tools provide. Features

such as instant support, idea generation, and ease of use contribute to a more efficient learning experience. This finding aligns with the core principles of TAM, which emphasize that users are more likely to adopt a technology when they perceive clear benefits and advantages in its use. Students appear to value AI primarily as a tool that simplifies and enhances their academic tasks.

Perceived usefulness of AI also showed a strong and significant influence on students' perception. Students who believe that AI improves their understanding, productivity, and learning performance are more likely to develop a positive attitude toward its use. This supports the fundamental assumption of TAM that perceived usefulness is a critical determinant of technology acceptance. However, the moderate level of mean scores suggests that while students acknowledge the usefulness of AI, they may not fully rely on it as an essential part of their learning process.

Interestingly, perceived concerns of AI also demonstrated a significant but weaker influence on students' perception. Students expressed concerns about the accuracy of AI-generated information, the potential impact on critical thinking skills, and issues related to academic integrity.

Despite these concerns, the overall perception of AI remains positive. This indicates that students adopt a balanced perspective, where they recognize both the advantages and risks of AI. Rather than rejecting AI, students appear to use it cautiously, combining it with traditional learning methods. The findings also highlight that students do not view AI as a replacement for human teachers. Instead, AI is perceived as a supportive tool that complements traditional education. This reflects an important insight: while AI enhances learning efficiency, human guidance remains essential for deeper understanding, critical thinking, and ethical learning practices.

Overall, the results confirm the relevance of the Technology Acceptance Model in explaining students' perceptions of Artificial Intelligence as a learning tool. The study demonstrates that students' acceptance of AI is primarily driven by its perceived usefulness and benefits, while concerns play a secondary role. These findings suggest that educational institutions should focus on maximizing the practical benefits of AI while addressing students' concerns related to reliability and ethical use. In summary, this study highlights that students in Thailand are open to adopting AI in education, but their acceptance remains moderate rather than strong. This suggests that further development, proper guidance, and responsible integration of AI tools are necessary to build greater trust and encourage more effective use of Artificial Intelligence in learning environments.

5. CONCLUSION AND RECOMMENDATION

5.1) Conclusion

This study aimed to examine university students' perceptions of Artificial Intelligence (AI) as a learning tool in Thailand. Guided by the Technology Acceptance Model (TAM), the research focused on understanding how students evaluate AI in terms of its usefulness, benefits, and concerns in supporting their academic learning. The findings provide clear insights into students' overall attitudes toward the integration of AI in education.

1. How do university students in Thailand perceive the use of Artificial Intelligence (AI) as a learning tool?

The findings indicate that university students in Thailand have a moderately positive perception of AI as a learning tool. Students generally recognize that AI can support their academic activities and improve learning efficiency. However, their perception is not strongly positive, suggesting that while students are open to using AI, they have not fully embraced it as an essential part of their learning process. This reflects a balanced attitude, where students accept AI but still rely on traditional learning methods.

2. What benefits do students believe AI provides in supporting their academic learning?

The results show that students perceive several key benefits of AI in education. AI is valued for its ability to provide quick and accessible support, help explain complex topics, and assist in generating ideas for assignments. Students also appreciate the convenience of using AI tools anytime and anywhere, which enhances their learning flexibility. These benefits make AI a useful supplementary tool that improves productivity and supports independent learning. Among all factors, perceived benefits were found to be the strongest influence on students' overall perception of AI.

3. What concerns or limitations do students perceive regarding the use of AI in education?

Despite recognizing its advantages, students also express concerns about the use of AI in learning. The most common concerns include the accuracy and reliability of AI-generated information, the potential for reduced critical thinking skills, and issues related to academic dishonesty. Students also believe that AI cannot fully replace human teachers, emphasizing the importance of human interaction in the learning process. These concerns indicate that students are cautious in their use of AI and prefer to use it as a supportive tool rather than a primary source of learning.

In conclusion, the study demonstrates that university students in Thailand hold a balanced perception of Artificial Intelligence as a learning tool. While they clearly recognize its usefulness

and benefits, they also remain aware of its limitations and potential risks. The findings confirm that students are willing to adopt AI in education, but their acceptance is influenced by both positive and negative considerations. This highlights the importance of promoting responsible use, improving reliability, and providing proper guidance to ensure that AI can be effectively integrated into educational practices.

5.2) Recommendation

Based on the findings of this study, several recommendations are proposed to improve the effective use of Artificial Intelligence (AI) as a learning tool among university students in Thailand.

First, educational institutions should promote responsible and ethical use of AI tools. Since students expressed concerns about academic dishonesty and over-reliance, universities should develop clear guidelines on acceptable AI usage in assignments and examinations. Providing examples of appropriate and inappropriate use can help students better understand boundaries.

Second, universities should integrate AI into teaching and learning in a structured manner. Rather than leaving students to explore AI independently, instructors can incorporate AI tools into coursework, such as using them for brainstorming, research assistance, or draft feedback. This guided integration can improve students' confidence and ensure that AI is used effectively.

Third, institutions should offer training programs and workshops to enhance students' digital literacy and AI skills. Many students may use AI tools without fully understanding their limitations. Training sessions can focus on how to evaluate AI-generated content, cross-check information, and apply AI outputs critically.

Fourth, efforts should be made to strengthen critical thinking skills alongside AI usage. Since students are concerned that AI may reduce independent thinking, educators should design activities that require analysis, reflection, and evaluation rather than simple information retrieval. This ensures that AI complements, rather than replaces, cognitive development.

Fifth, universities should encourage a balanced learning approach, where AI is used as a support tool rather than a replacement for traditional learning. Students should be guided to combine AI tools with textbooks, academic journals, and instructor feedback to achieve deeper understanding.

Sixth, developers and educational institutions should focus on improving the accuracy and reliability of AI systems used in education. Since students expressed concerns about incorrect information, improving content quality and transparency in AI responses can increase trust and adoption.

Seventh, universities should consider developing AI-supported learning platforms tailored to specific subjects or disciplines. Customized AI tools designed for academic purposes can provide more relevant and accurate support compared to general AI tools.

Eighth, educators should play an active role in guiding students on how to use AI effectively. Teachers can demonstrate practical examples of AI use in learning, helping students understand how to integrate AI into their study routines in a meaningful way.

Finally, policymakers and educational leaders should work toward creating an AI-inclusive educational environment, where technology is thoughtfully integrated into curricula. This includes establishing policies, providing resources, and ensuring that both students and educators are prepared to adapt to the increasing role of AI in education.

5.3) Implication

The findings of this study provide several important implications for theory, practice, and policy, particularly in the context of integrating Artificial Intelligence (AI) into higher education.

1. Theoretical Perspective

This study reinforces the relevance of the Technology Acceptance Model (TAM) in explaining students' acceptance of emerging technologies in education. The results confirm that perceived usefulness and perceived benefits are key determinants of students' perception, while perceived concerns play a secondary but still significant role. This suggests that TAM can be extended to include both positive and negative perceptions when applied to AI in learning environments. The study contributes to existing literature by highlighting that technology acceptance is not solely driven by advantages but also shaped by users' awareness of risks and limitations.

2. Educational Perspective

The findings imply that universities should adopt a balanced approach to AI integration. While students are open to using AI tools, their moderate level of acceptance indicates that full integration has not yet been achieved. This suggests that educational institutions should not only introduce AI technologies but also provide structured guidance and support to maximize their effectiveness. The results also highlight the continued importance of human instructors, as students do not perceive AI as a replacement for teachers. Therefore, AI should be positioned as a complementary tool that enhances, rather than replaces, traditional teaching methods.

3. Practical Perspective

The study emphasizes the need for developing students' digital literacy and critical thinking skills. Since students expressed concerns about accuracy and over-reliance on AI, educational programs

should focus on teaching students how to evaluate AI-generated content critically. This ensures that students can use AI responsibly while maintaining their analytical abilities. Additionally, educators should design learning activities that encourage deeper engagement, rather than passive reliance on AI tools.

4. Institutional and Policy Perspective

The findings suggest that universities and policymakers should establish clear guidelines and frameworks for AI use in education. As AI becomes more widely used, it is essential to address ethical issues such as academic integrity, data privacy, and responsible usage. Institutions should create policies that encourage innovation while maintaining academic standards. Furthermore, investment in AI-supported learning systems and infrastructure will be necessary to support the growing role of technology in education.

5. Technological Perspective

The results highlight the importance of improving the accuracy, reliability, and educational relevance of AI systems. Since concerns about misinformation were identified, developers should focus on enhancing the quality of AI-generated content, particularly in academic contexts. Collaboration between educators and technology developers can lead to the creation of more effective AI tools tailored to students' learning needs.

Finally, the study implies that the future of education will increasingly involve human-AI collaboration. Students' balanced perception suggests that while AI is accepted, it is most effective when used alongside traditional learning methods. This highlights the importance of designing learning environments that integrate both technological and human elements to achieve optimal educational outcomes.

5.4) Further Research

While this study provides valuable insights into university students' perceptions of Artificial Intelligence (AI) as a learning tool in Thailand, several areas remain open for further investigation.

First, future research could explore additional variables that may influence students' perception and acceptance of AI. Factors such as digital literacy, prior experience with AI tools, academic performance, learning styles, and technological readiness could provide a more comprehensive understanding of students' behavior. Including these variables may enhance the explanatory power beyond the current model.

Second, this study focused on university students in Thailand; therefore, future studies could expand the scope by conducting comparative research across different countries or regions.

Cultural differences, educational systems, and levels of technological development may significantly influence how students perceive and use AI. Cross-cultural comparisons would provide deeper insights into global trends in AI adoption in education.

Third, future research could examine differences across academic disciplines. Students from fields such as engineering, business, or humanities may have different levels of exposure to and reliance on AI tools. Investigating discipline-specific perceptions could help tailor AI integration strategies more effectively within different areas of study.

Fourth, this study employed a quantitative approach using a structured questionnaire. Future research could adopt a mixed-method or qualitative approach, such as interviews, focus groups, or case studies, to gain deeper insights into students' experiences, motivations, and concerns. Qualitative data can provide richer explanations that complement statistical findings.

Fifth, future studies could investigate the long-term impact of AI usage on learning outcomes. This includes examining how AI affects students' critical thinking skills, academic performance, problem-solving abilities, and independent learning over time. Longitudinal studies would be particularly useful in understanding whether AI enhances or potentially limits students' cognitive development.

Sixth, further research could explore the role of educators and institutional support in shaping students' use of AI. Factors such as teaching methods, instructor attitudes, and university policies may significantly influence how students adopt and utilize AI tools in their studies.

Seventh, future studies could investigate ethical considerations and academic integrity issues in greater depth. As AI becomes more widely used, understanding how students perceive and manage ethical concerns such as plagiarism, misinformation, and misuse of AI, will be increasingly important.

Eighth, researchers could examine the effectiveness of AI-based educational tools by comparing different types of AI applications, such as chatbots, intelligent tutoring systems, and automated feedback tools. This would help identify which types of AI provide the most value in different learning contexts.

Finally, future research could explore the concept of human-AI collaboration in education, focusing on how students and educators can work together with AI to enhance learning experiences. Understanding this interaction will be essential for designing effective and sustainable AI-integrated educational systems.

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APPENDIX

Title: University Students' Perceptions of Artificial Intelligence (AI) as a Learning Tool in Thailand

The MBA program at Siam University has conducted a survey on University Students' Perceptions of Artificial Intelligence (AI) as a Learning Tool in Thailand. This questionnaire is designed to collect such data. Please help answer all the questions. Please be assured that all information will be kept confidentially. Only aggregate data will be analyzed, and the results will be used for educational purposes only.

Thank you in advance for your kind cooperation.

Section 1: Overview of Respondent's Background (Please choose the most corresponding to yourself and your opinion.)
1. Gender ☐ Male ☐ Female ☐ Prefer not to say
2. Age ☐ 18-20 ☐ 21-23 ☐ 24-26 ☐ 27-28
3. Educational Level ☐ Undergraduate student ☐ Master's student

4. Field of Study

☐ Business / Management

☐ Engineering / Technology

☐ Social Sciences / Humanities

☐ Science

☐ Other

5. Have you used Artificial Intelligence tools (e.g., ChatGPT, Grammarly, Copilot) for learning or studying?

☐ Yes

☐ No

6. How often do you use AI tools for learning or studying?

☐ Very rarely

☐ Occasionally

☐ Sometimes

☐ Often

☐ Very often

Section 2: Perceptions of Artificial Intelligence in Learning

For the scale questions, the scale consists of five points:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly Agree.

Section 2.1 Perceived Usefulness of AI

7. AI tools help me complete my academic tasks more efficiently.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

8. AI improves my understanding of study materials.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

9. Using AI helps me learn new concepts more quickly.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

10. AI tools increase my productivity when studying.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

11. AI enhances my overall learning performance.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

Section 2.2 Perceived Benefits of AI

12. AI provides helpful explanations for difficult topics.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

13. AI allows me to access learning support anytime.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

14. AI tools make studying more convenient.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

15. AI helps me generate ideas for assignments and projects.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

16. AI supports my independent learning.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

Section 2.3 Perceived Concerns / Limitations of AI

17. I am concerned that AI may provide inaccurate information.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

18. Overusing AI may reduce students' critical thinking skills.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

19. AI tools may encourage academic dishonesty.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

20. AI cannot fully replace human teachers in learning.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

21. I feel uncertain about the reliability of AI-generated content.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

Section 2.4 Students' Perception of AI as a Learning Tool

22. AI is a useful tool for supporting student learning.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

23. AI should be integrated into educational activities.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

24. AI can positively impact the learning experience of students.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

25. I feel comfortable using AI tools in my studies.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

26. I believe AI will play an important role in the future of education.

☐ Strongly Disagree

☐ Disagree

☐ Neutral

☐ Agree

☐ Strongly Agree

Thank You!