FACTORS OF INFLUENCING THE ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) IN HIGHER EDUCATION

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Submitted in Partial Fulfillment of the Requirement for the Bachelor of Technology Management (High Technology Marketing) With Honours

Faculty of Technology Management and Technopreneurship

Universiti Teknikal Malaysia Melaka

2025

DECLARATION

I declare that this thesis entitled "FACTORS OF INFLUENCING THE ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) IN HIGHER EDUCATION" is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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APPROVAL

I hereby declare that I have checked this report entitled “FACTORS OF INFLUENCING THE ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) IN HIGHER EDUCATION” and in my opinion, this thesis it complies the partial fulfillment for awarding the award of the degree of Bachelor of Technology Management (High Technology Marketing) With Honours.

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Date : ……

DEDICATIONS

I would like to thanks my family members who provided full support in terms of money and time for my education, especially my mother. Thank you also to my supervisor, Dr. Diana Rose Binti Faizal and the panel, Madam Azrina who encouraged and guided me with their knowledge throughout this research and my course mates who shared their experiences to help me complete this research.

ACKNOWLEDGEMENTS

In preparing this report, I was in contact with many people, researchers, academicians and practitioners. They have contributed towards my understanding and thought. In particular, I wish to express my sincere appreciation to my main project supervisor, Dr. Diana Rose Binti Faizal, for encouragement, guidance critics and friendship. I am also very thankful to my panel, Madam Azrina Binti Othman for her guidance, advices and motivation. Without their continued support and interest, this project would not have been same as presented here.

My fellow postgraduate students should also be recognized for their support. My sincere appreciation also extends to all my colleagues and others who have provided assistance at various occasions. Their views and tips were useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful to all my family members.

ABSTRACT

In the era of rapidly advancing technology, it can influence the field of education in higher learning among university students. The Ministry of Education Malaysia (KPT) has observed the development of university students in leading the field of information technology in line with the increasingly sophisticated times. It also impacts the field of education by facilitating the search for information more quickly and accurately through the use of information technology for artificial intelligence (AI). However, there are still students who lack proficiency in using information technology to provide a clear understanding to artificial intelligence (AI) in order to obtain important content for higher education students. Therefore, this research aims to identify the factors influencing the acceptance of artificial intelligence (AI) in higher education. The independent variables for this research examine the relationship of factors with ease and efficiency, enhanced learning experience, and access to various resources for artificial intelligence in higher education. The dependent variable for this research is the factors that influence the use of artificial intelligence in higher education. The researcher collected data from 300 respondents, primarily focusing on higher education, IPTA. In this regard, the majority of the student respondents were from UTeM due to the limited time for data collection. Then, the researcher analysed the data using the Statistical Package for the Social Sciences (SPSS) Version 29.

Keywords: *education, technology, higher education, artificial intelligence (AI)*

ABSTRAK

Pada era teknologi yang sedang berkembang pesat dapat mempengaruhi bidang pendidikan dalam pembelajaran tinggi di kalangan pelajar universiti. Kementerian Pelajaran Malaysia (KPT) telah melihat berkembangan pelajar universiti dalam menerajui bidang teknologi maklumat seiring dengan peredaran zaman yang semakin canggih. Ia juga memberi kesan kepada bidang pendidikan untuk kemudahan bagi mencari maklumat dengan lebih cepat dan tepat dalam penggunaan teknologi maklumat bagi kecerdasan buatan (AI). Walaupun begitu, masih terdapat pelajar yang masih kurang berkemahiran dalam penggunaan teknologi maklumat untuk memberikan kefahaman yang jelas kepada kecerdasan butan (AI) untuk mendapatkan isi-isi penting kepada pelajar pendidikan tinggi. Oleh itu, penyelidikan ini bertujuan untuk mendapatkan faktor mempengaruhi penerimaan kecerdasan buatan (AI) dalam pendidikan tinggi. Pembolehubah tidak bersandar untuk penyelidikan ini melihat hubungan faktor dengan Kemudahan dan Kecekapan, Pengalaman Pembelajaran yang Dipertingkatkan dan Akses kepada Pelbagai Sumber bagi kecerdasan buatan dalam pendidikan tinggi.. Pembolehubah bersendar bagi penyelidikan ini adalah apakah faktor yang mempengaruhi penggunaan kecerdasan buatan dalam pendidikan tinggi. Pengkaji mengumpul data daripada 300 responden yang terutamanya kajian ini memberi tumpuan kepada pendidikan tinggi, IPTA. Sehubungan itu, majoriti daripada responden pelajar di UTeM ini kerana masa yang terhad untuk mengumpul data. Kemudian, pengkaji menganalisis data dengan menggunakan Statistical Package of Social Science (SPSS) Versi 29.

Kata kunci: *Pendidikan, Teknologi, Pendidikan Tinggi, Kecerdasan Buatan (AI)*

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LIST OF SYMBOLS AND ABBREVIATIONS

ABBREVIATION	MEANING
AI	Artificial Intelligence
KPT	Ministry of Higher Education
IV	Independent Variable
DV	Dependent Variable
CALL	Computer-Assisted Language Learning
VR	Virtual Reality
AR	Augmented Reality
UTeM	Universiti Teknikal Malaysia Melaka
SPSS	Statistical Package for Social Science

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter discusse the background of the study, problem statement, research questions, research objectives, motivation of study, scope and limitation of the study, significant of study and summary of the whole chapter.

1.2 Background of Study

Artificial intelligence (AI) has become widely accepted across numerous sectors, including the education sector. Consequently, applications of artificial intelligence are being utilized in higher education for automated evaluation, personalized learning, and intelligent education to assist educators. Consequently, AI teaching assistants reduce the time instructors spend answering students' recurring, simple questions in online discussion forums, allowing them to dedicate more attention to higher-value activities (Seo, 2021; Goel & Polepeddi, 2016). Consequently, they offer support, often resulting in enhanced learning and reduced expenses. Consequently, the domain of artificial intelligence has generated entities exhibiting

human-like intelligence, featuring cognitive abilities, flexibility, and decision-making skills (Chassignol et al., 2018). These systems have been broadly embraced and utilized in education in various ways. Significantly, the use of artificial intelligence in education started with computer technologies, then advanced to online and web-based intelligence platforms, ultimately evolving into humanoid robots that perform tasks and functions as instructed.

Consequently, artificial intelligence within educational systems takes on multiple functions, such as teaching students and assessing their work (Boinett et al., 2022). Certainly, artificial intelligence aids educators in enhancing their efficiency in performing these tasks. In a similar manner, artificial intelligence systems adapt to the specific learning needs of each student, effectively customizing education to their strengths and weaknesses. Moreover, tutoring AI systems can "assess a student's prior knowledge and learning preferences to provide tailored and individualized instruction and assistance." Importantly, chat-bots, which are fundamentally AI-driven software applications, function by assessing conversational contexts and mimicking human interactions and dialogues. As stated by Chen et al. (2020), artificial intelligence has the ability to understand the context of a conversation and produce responses that are suitable for that context. Consequently, they can respond to numerous questions since they were trained with large linguistic data collections.

Interactive artificial educators capable of providing customized and flexible training may revolutionize online education (Woolf, 2010). AI-driven learning systems are effective resources in education as they offer tailored and adaptable instruction (VanLehn, K., 2011). The efficient implementation of AI in education necessitates thorough assessment of cognitive and motivational elements, alongside management of possible challenges and ethical issues (Bulger, 2019). The implementation of artificial intelligence in higher education is analyzed through AI intentions and actual usage metrics. The intention to utilize AI indicates the regularity with which a user opts to use AI for academic purposes, while measurements of actual AI usage provide insights into how a user incorporates AI into their academic tasks (Pallathadka, H., et al., 2022).

1.3 Problem Statement of Study

The main and crucial point regarding the fundamental significance of the issue is the adaptability of human choices. This results in a philosophical quandary regarding the method of choosing an individual's preferences over their lifetime (Pettigrew 2020), coupled with a practical issue of preventing AI systems from influencing human preferences to enhance their fulfillment. The simplest illustration of an assistance game includes two players: a robot and a human. It is a game characterized by incomplete information because, although the human (in the basic version) comprehends the payoff function, the robot does not fully understand it—however, the robot aims to enhance this understanding. In a Bayesian framework, the robot begins with an initial probability distribution regarding the human payoff function, which gets updated as the robot and human participate in interactions during the game. The basic help game framework can be expanded to include agents demonstrating imperfect rationality (Hadfield-Menell et al. 2017b), those who misunderstand their preferences (Chan et al. 2019), a variety of human participants (Fickinger et al. 2020), different types of robots, and others.

A robot that possesses an ambiguous understanding of human intentions has a non-negative drive to shut itself down (Hadfield-Menell et al. 2017b). In general, it will result in actions governed by people. A major issue related to AI in decision- making is the phenomenon known as the black box problem (Castelvecchi 2016; Rudin 2019). Various AI tools, particularly those based on machine learning methods, are intended to analyze large volumes of data, identify 'hidden' trends, and provide a solution (e.g., a legal decision, a healthcare treatment strategy, a financial loan, etc.). The problem lies in the fact that, because of several factors, we frequently struggle to understand how or why the algorithm arrived at the proposed result. This might evidently pose a problem. Imagine we chose to utilize AI for managing relatively simple legal cases to lessen judges' burdens and speed up the legal system. The inquiry is whether we would accept such a judgment 'irrespective of the situation' or if we would demand at least a fundamental understanding of how the algorithm makes its determinations. Should we allow AI systems to stay 'black boxes', or should we be able to investigate them to understand their functions?.

In AI research, the concept of the black box is frequently referred to as explainability (Guidotti et al. 2018; Miller 2019; Arrieta et al. 2020; Vilone and Longo 2021). Generally, an AI system (such as a machine learning model) is considered explainable if people can understand it via an external, simplified representation, while also acknowledging the interpretive importance of internal model components (see Jain and Wallace 2019; Wiegreffe and Pinter 2019). The topic is frequently examined from two different perspectives: technical (IT) and legal, highlighting a notable discrepancy. The legislation does not define explainability; nonetheless, it offers guidelines, particularly requirements, related to the concept of explainable automated decision-making found in scholarly literature (DoshiVelez et al. 2017, Wachter et al. 2017a, Bibal et al. 2021).

1.4 Research Question

General Research Question:

What are the factors that influence the adoption of artificial intelligence in the higher education.

Specific Research Question:

RQ1: What are the factors on convenience and efficiency influencing the adoption of artificial intelligence in the higher education.

RQ2: What are the factors on enhanced learning experience influencing the adoption of artificial intelligence in the higher education.

RQ3: What are the factors on access to diverse resources influencing the adoption of artificial intelligence in the higher education.

1.5 Research Objectives

General Research Objective:

To identify the factors that influence adoption of artificial intelligence in the higher education.

Specific Research Objectives:

RO1: To identify the factors on convenience and efficiency influencing the adoption of artificial intelligence in the higher education.

RO2: To identify the factors on enhanced learning experience influencing the adoption of artificial intelligence in the higher education.

RO3: To identify the factors on access to diverse resources influencing the adoption of artificial intelligence in the higher education.

1.6 Significant of Study

Moreover, the role of AI autonomy in higher education from a practical and rewarding viewpoint. Nonetheless, the majority of students in higher education prioritize their performance on exams over their enjoyment or engagement in the learning process (Becker et al., 1968; Cilliers et al., 2010). The focus on assessment outcomes may manifest in different ways: every student attempts to clear tests, while a certain group of students aims for elevated scores (Kickert et al., 2019). Additionally, the influence of AI autonomy in higher education is analyzed from a uses and enjoyment perspective. Additionally, a comprehensive review of AI uses in higher education underscores the importance of AI in academic support, institutional services, and teaching practices, stressing the requirement for educators to comprehend and utilize AI for educational advantages and enhanced student results.

These sources agree that the incentive for studying AI in higher education stems from its potential to improve learning experiences, educational results, and prepare students for the changing demands of the future labour market.

In the past ten years, there has been an increasing focus on implementing innovative educational methods and resources to enhance the motivation and academic success of undergraduate students. Academic studies have demonstrated that motivation plays a crucial role in enhancing students' academic success, as it boosts their eagerness to engage in learning and participate in the educational journey (Dewaele et al., 2022; Fatiha et al., 2014). However, conventional teaching resources, like printed texts and oral presentations, face challenges in effectively engaging students in the modern 21st-century foreign language learning context. The relevant limitations are the absence of interactive features, customized learning experiences, and specific methods that cater to each student's unique requirements.

By overcoming these constraints, Artificial Intelligence (AI) models can greatly transform language teaching. AI models have the ability to generate customized and adaptable learning experiences for students, boosting their motivation to learn. AI models can offer prompt feedback, encourage immediate interactions, and create a gamified and tailored learning experience reflecting each learner's preferences. Multiple studies have shown the efficacy of artificial intelligence models in enhancing motivation and addressing the shortcomings of conventional teaching approaches (Seven, 2020; Umar, 2017; Ghamdi, 2014).

1.7 Scope and Limitation of Study

The research will concentrate on identifying artificial intelligence (AI) in higher education. In addition, the elements that contributed to the approval of artificial intelligence (AI) in higher education. Moreover, consider the connection between artificial intelligence (AI) and university admissions. Additionally, this area of study examines the key variables that artificial intelligence (AI) can identify in higher education. Consequently, the study's target respondents will focus on the application of artificial intelligence (AI) in higher education among students, as they provide insights into the convenience with which students obtain information and the rationale behind their choice to utilize artificial intelligence (AI) in higher education. The researchers will subsequently share the statement with the intended respondents via online surveys, like Google Forms.

The limitation of this study focuses only on the acceptance of artificial intelligence (AI) in higher education among students for the purpose of demonstrating effectiveness in helping students find information. Therefore, this study cannot cover all other fields because research is limited to the education developed using artificial intelligent for higher student. Furthermore, this study may be limited in establishing relationships between factors to be discussed to identify significant variables in the field of higher education. Among other factors, such as technology, student behavior, information sources, and the updating of knowledge over time, which can also affect the acceptance of artificial intelligence (AI) in higher education, it makes it difficult to get accurate information to help students. Lack of cooperation from respondents will also be faced by researchers when conducting this study.

1.8 Significance of Study

Initially, through this research, scholars can gain a clearer insight into the acceptance of artificial intelligence (AI) within higher education. Furthermore, this study might also clarify the elements that affect the acceptance of artificial intelligence (AI) in assisting with information retrieval in higher education. Therefore, this research will aid additional students involved in higher education to improve their potential. Moreover, this research may serve as a future reference for other studies intending to explore the acceptance of artificial intelligence (AI) in higher education among students.

1.9 Summary

The structure of this chapter served as an overarching introduction to the study. This research presents its topic selection, encompassing the research background, problem statement, research question and goals, research motivation, scope and limitations, and the significance of the research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will cover the literature review pertaining to this research. The researcher would describe the meaning of technology, artificial intelligence (AI), higher education, the elements affecting the adoption of artificial intelligence in higher education, the influences on the adoption process, and the importance of adopting artificial intelligence within the higher education sector. Furthermore, the independent and dependent variables will be specified to create the hypotheses. By the conclusion of this chapter, the researcher will create a conceptual framework to elucidate the study.

2.2 Technology

In the age of globalisation, developments in internet technology make it easier for people to obtain information (Wardana et al, 2023), which can aid in accomplishing technology's primary aims of issue solving, increased productivity, and improved human life. To achieve the primary purpose of technology, a range of technologies

must be used, including mobile devices, networks, computer hardware and software, and the Internet (Sharer, 2023). Yani Supriani, Giyanti, and Tb. Sofwan Hadi (2020) focus their work on social and economic variables in higher education.

2.3 Artificial Intelligence

The administration of artificial intelligence (AI) differs from conventional information technology (IT) management. AI is not merely a technique or a collection of technologies; instead, it signifies an ever-evolving boundary of groundbreaking computing abilities (McCorduck 2004; Meyer 2011). The main machine learning systems of contemporary AI demonstrate increased autonomy, enhanced learning abilities, and are less transparent than earlier "intelligent" information technology tools (Baird and Maruping 2021). Modern AI technologies, including robotics, self-driving cars, facial recognition, natural language understanding, and various virtual assistants, are utilized to address a broad array of challenges. According to several estimates, over half of companies were adopting some type of this new wave of technologies in 2020 (Balakrishnan et al. 2020), and the applications are expanding at an astonishing rate.

McCarthy (Cristianini, 2016) coined the term in 1956, drawing from Turing's research (Turing, 1937, 1950). Turing suggested that intelligent reasoning and thought could be integrated into smart machines. Since 1956, the concept of AI has transformed and shifted, accompanied by major improvements in AI functionalities. AI is currently characterized as "computing systems capable of performing human- like functions such as learning, adjusting, synthesizing, self-correcting, and utilizing data for intricate processing activities" (Popenici et al., 2017). The diverse interests of researchers in languages, psychology, education, and neuroscience in linking AI to terminology, perceptions, and understanding in their fields might pose a challenge in defining AI.

This has led to the necessity of classifying AI into particular fields of study. In the twenty-first century, artificial intelligence has gained greater importance in people's lives, being touted as a resource that can enhance and progress every facet of our existence (Górriz et al., 2020). The increasing interest in AI is greatly impacted by developments in information and communication technology (Alajmi et al., 2020). AI serves as a resource applied across multiple fields such as language education (Liang et al., 2021), engineering education (Shukla et al., 2019), math education (Hwang & Tu, 2021), and medical education (Winkler-Schwartz et al., 2019).

2.4 Higher Education

Higher education institutions offer diverse language courses and programs aimed at assisting students in achieving language proficiency (Erling & Hilgendorf, 2006; Dimova & Kling, 2020; Oralova, 2012). These programs often incorporate communicative language instruction, task-driven language education, and computer-aided language learning (CALL) (Chong & Reinders, 2020; Nguyen et al., 2015; Parmaxi & Demetriou, 2020). The incorporation of technology in language education offers numerous advantages, such as personalized teaching, opportunities for interactive practice, and the development of genuine language materials for learners to utilize (Chen et al., 2021; Kirkwood & Price, 2014; Vieira et al., 2014). Acquiring a language allows learners to enhance their intercultural communication abilities, broaden their perspectives, and obtain fresh insights (Citron, 1995; Tafazoli et al., 2018; Truong & Tran, 2014).

Education in higher learning involves acquiring new knowledge, skills, and intellectual abilities that can be utilized to effectively solve problems. The integration of technology in education is not a new idea in higher learning (Poon, 2012). The overall effect of higher education on global competitiveness is generally recognized; it represents the fifth pillar (Higher Education and Training) of the esteemed Global

Competitiveness Index (World Economic Forum, 2017), and a statistically significant relationship between the two assessments has been found (Sekuloska, 2014).

2.5 Identification Impact Factors Influencing Adoption Artificial Intelligence (AI) In Higher Education.

Multiple elements affect the implementation of AI in education. Artificial intelligence (AI) is rapidly becoming more applicable and beneficial in educational environments as advancements in fields like machine learning and natural language processing continue (Rana, P., Gupta, L. R., Kumar, G., and Dubey, M. K., 2021). Teachers are attracted to AI's ability to offer customized learning experiences tailored to personal preferences and educational styles. AI plays a vital role in enhancing educational transparency and accessibility, while also assisting students with diverse learning needs. Government programs and monetary incentives might promote the adoption of AI in education. To secure public backing, issues relating to ethics concerning privacy and data security need to be tackled. To ensure a successful implementation, instructors need to be adequately prepared and trained. Cultural viewpoints regarding artificial intelligence and technology affect their adoption (Smith, J., & Johnson, A., 2020).

The remaining research articles were utilized to gather essential elements of artificial intelligence for this study. A comprehensive review of the literature grants the author several important benefits associated with the use of artificial intelligence in education (Srivastava, P., Hassija, T., and Goyal, A. P., 2020). The subsequent factors were recognized.

2.5.1 Convenience and Efficiency

Through AI-driven solutions, students could gain fast and convenient access to resources, support, and information. AI captivates attention for tasks like research, data gathering, and education due to its rapid responses, personalized suggestions, and 24/7 accessibility. These technologies utilize artificial intelligence to provide customized learning experiences, adapt to user preferences, and furnish quick feedback. A recent study indicates that these changes can significantly benefit students by providing them with a more engaging, adaptable, and inclusive learning environment (Clark, D. B., & Martinez-Garza, M., 2019; Smith, J., & Johnson, A., 2018; Johnson, R., & Williams, B., 2019).

2.5.2 Enhanced Learning Experience

AI algorithms can mimic intense discussions to create captivating and immersive learning opportunities. AI-driven virtual reality (VR) and augmented reality (AR) applications can offer students immersive experiences, simulations, and visualizations to assist them in grasping and recalling challenging concepts. The use of AI in educational settings can assist learners in improving their learning techniques and critical thinking skills (Madan, R., & Ashok, M., 2022). Virtual assistants can offer quick feedback and assistance, enabling students to ask for help whenever necessary. Virtual assistants and VR/AR applications, both forms of AI technologies, hold great potential for enhancing student education via engaging and immersive learning opportunities. Implementing these advancements in education could foster inclusivity, personalized learning, and the development of essential skills required for the future (Huang, Y., Liu, D., & Cui, G., 2020; Lee, S., & Kim, H., 2017).

2.5.3 Access to Diverse Resources

Platforms powered by AI can aggregate and sift through vast amounts of educational content from various sources, providing students with an extensive range of resources to fulfill their study requirements. AI algorithms can also recommend relevant studies, articles, videos, and online courses based on students' preferences and learning approaches. These online platforms can transform higher education by providing students with access to a diverse array of educational resources and tools from various sources (Melchor, M.Q., Julián, C.P., 2008). This greater accessibility fosters equality and cohesion by enabling students to explore a wider range of learning resources and improve their overall educational journey. Technologies driven by AI can enhance education by facilitating tailored teaching, boosting enduring learning abilities, and providing access to a wide variety of information. Likewise, additional research is required to explore long-term effects, tackle biases and ethical issues, and suggest practical integration strategies (Lee & Kim, 2017; Brown & Davis, 2018).

2.6 Factors and Past Question From the Previous Studies.

Table 2.1 – Questionnaire items and references.

Factors	Questions	References
Convenience and Efficiency	1. AI-powered tools provide me with convenient ways to access information, resources, and support.	Duan, Y., Li, H., Whinston, A. B., & Zhang, X. (2009)
	2. Instant responses, personalized recommendations, and 24/7 availability make AI appealing for my study tasks.	
	3. AI tools have improved the efficiency of my research, note-taking, and studying.	
Enhanced Learning Experience	1. AI technologies like virtual assistants and chatbots have created engaging and immersive learning experiences for me	Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., & Hall, C. (2016)
	2. Virtual reality (VR) and Augmented reality (AR) applications powered by AI have made complex concepts more accessible and memorable for me.	
	3. I find AI-powered interactive conversations and simulations to be helpful in my learning.	
Access to Diverse Resources	1. AI-powered platforms have provided me with a wide range of educational resources from various sources	Cho, V., & Lai, Y. (2018)
	2. The recommendations provided by AI algorithms have helped me discover relevant articles, research papers, videos, and online courses.	
	3. AI has enhanced my access to diverse resources for my study needs.	

2.7 Proposed Conceptual Framework

The purpose of this research was to identify the acceptance of the adoption of artificial intelligence (AI) in higher education to help students improve their knowledge of advanced technologies. There are three independent variables (IV) that are considered: convenience and efficiency, enhanced learning experience, and access to diverse resources. Depending variables (DV) are factors of influence the adoption of artificial intelligence (AI) in higher education. Thus, the independent variable (IV) is the variable tested to measure (DV). Figure 2.1 shows the conceptual framework of this research.

Table 2.2 - Dependent Variables and Independent Variables

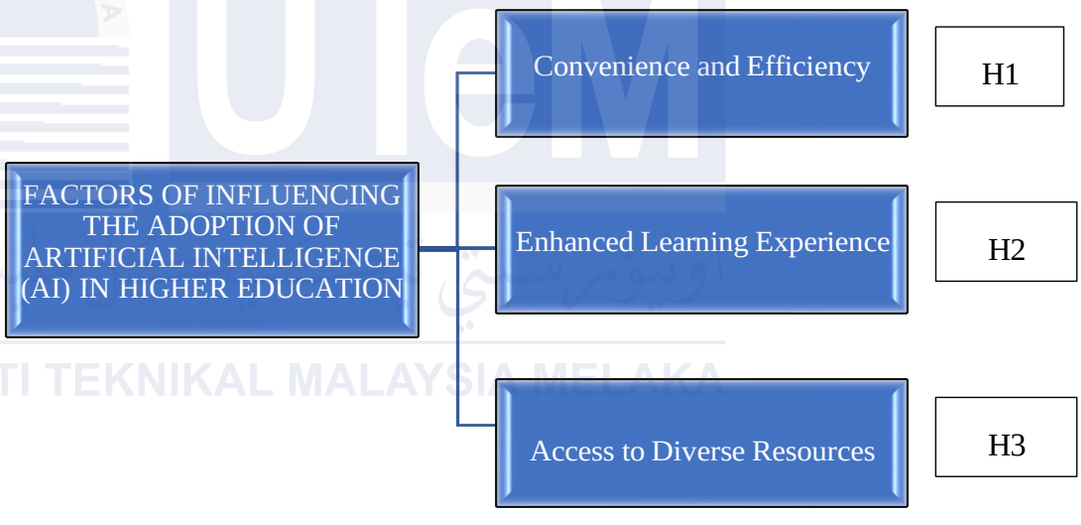

Figure 2.1: Conceptual Framework

2.8 Hypotheses

Hypothesis 1 (H1)

H0: There is no significant relationship between perceived convenience and efficiency and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

H1: There is a relationship between perceived convenience and efficiency and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

Hypothesis 2 (H2)

H0: There is no significant relationship between perceived enhanced learning experience and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

H1: There is a relationship between perceived enhanced learning experience and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

Hypothesis 3 (H3)

H0: There is no significant relationship between access to diverse resources and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

H1: There is a relationship between access to diverse resources and the factors that influence the adoption of artificial intelligence (AI) in Higher education.

2.9 Summary

To summarise, the keywords and concepts were discussed in this chapter. The material was gathered from secondary sources, including publications, journals, the internet, and websites. The hypothesis was developed by stating both independent and dependent variables. Conceptual frameworks have been created to better explain the relationship between variables. In the next chapter, the researcher will explain the study's methodology.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discuss about the method that used to collect the data and the information for this research. It was about how the researcher designed a study in a systematic way to ensure valid and reliable results that addressed the study's aims and objectives. Choosing the right research method was crucial, because it helped to obtain the results of the research. There were a few discussions about the research mythology which was research design, methodology choices, data source, sampling design, research strategy, data analysis method, and validity and reliability in this chapter.

3.2 Research Design

Research design is an approach that employs empirical data to answer research questions. According to Nick Jain (2023), in order to accurately answer the research question, the researcher must use a complete method known as research design to bring together the many components of the study in a logical and consistent manner.

Yashri Jain (2024) describes a research design as an overarching strategy for linking theoretical research inquiries with applicable and relevant empirical studies. The research design enabled the investigator to determine strategies for addressing research queries and preparing for achievement. A study may be structured to fulfill an exploratory, descriptive, explanatory, evaluative, or mixed objective. Exploratory research is a research method that examines questions that have not been investigated before. Most exploratory research is qualitative in nature (Sunaina Singh, 2023).

In addition, there are three types of research designs: exploratory, descriptive, and explanatory (Jilcha Sileyes 2019). An analyst specifically conducts exploratory research to discover phenomena and gain a deeper understanding of the subject area. Descriptive research aims to precisely depict environments, occurrences, or individuals associated with research subjects. An explanatory study explores a problem or situation to illuminate the relationship between various factors.

3.3 Methodological Choices

There were three methodologies to select from: quantitative, qualitative, and mixed methods. The quantitative technique was the most fundamental level, and it was focused with collecting and evaluating data in order to represent it statistically. Furthermore, quantitative research approaches provided more objective results than qualitative methods. Interviews, focus groups, case studies, discourse analysis, and literature reviews were employed to get insight into people's thoughts, concepts, or experiences (Thattamparambil, 2020). It was essentially a survey of people's views and experiences. Furthermore, the mixed approach is a data collecting and analysis methodology that blends quantitative and qualitative methods (Divya Sreekumar,2023).

This study uses a quantitative way to collect data. Quantitative analysis was the process of gathering data and getting results through statistical analysis. This was because the quantitative method allowed for the observation of situations or events that had an impact on anything. As a result, quantitative methodologies can be used to determine whether adopting artificial intelligence (AI) has the potential to influence higher education and to assess the usefulness of AI in learning.

3.4 Primary Data Sources

In this research, as per Anshuman Singh (2024), data gathered by the researcher initially from primary sources from the beginning is referred to as primary data. This information is gathered straight from the original source. It is immediate data and is consistently tailored to the researcher's requirements. The main data is accessible in unprocessed form. The researcher must invest a significant amount of time gathering primary data, making it costly as well. Nevertheless, primary data is more accurate and reliable than secondary data. Examples of sources for gathering primary data include observations, surveys, experiments, personal interviews, and questionnaires.

Consequently, the data that is already available and has been gathered by others for different reasons is referred to as secondary data. Nevertheless, the expense of gathering secondary data is lower. Since the data was previously gathered, it is available in a polished format. The precision and dependability of secondary data are generally lower than that of primary data. The likelihood of locating the precise information or data tailored to the researcher's requirements is diminished. Nonetheless, the duration needed to gather secondary data is brief, making it a swift and simple procedure. Examples of sources for gathering secondary data include books, journals, internal documents, government records, articles, websites, and publications from the government.

3.5 Sampling Design

Sample design is an essential element in carrying out research of high quality. It involved choosing a small group of population representatives to participate in the research study. Talk about the sample design to guarantee that it reflects the population accurately. Sampling design plays a crucial role in carrying out research of high quality. The process of sampling design includes these steps: identifying the population, deciding on the sample size, choosing the sampling method, constructing the sampling frame, randomizing the sample, gathering data from the sample, and analyzing the collected data. Adhering to these procedures enables researchers to confirm that the sample accurately represents the community and that the research results are relevant to the whole population. By employing high-quality sampling techniques, researchers can generate superior study results (Prince Kumar, 2023).

Non-probability sampling approaches acknowledge that not everyone will have the opportunity to complete a survey. This is the inverse of probability sampling, which seeks to ensure that everyone in the population has an equal chance of receiving a survey (Jasko Mahmutoric, 2023). Thus, non-probability samples allow the scholar to use a subjective method of selecting units from a population. This is because academics must discover the characteristics that influence the application of artificial intelligence in higher education. To make the correct decision, researchers must carefully select respondents who are higher education students.

As a result, researchers will utilise purposeful sampling approaches since they will only obtain information from students studying at a high level to determine the possible application of artificial intelligence (AI) in learning sessions. Mainly this study focus on the higher education, IPTA. The majority that respondent students in Universiti Teknikal UTeM. The total of almost 12,000 students in UTeM. This is because of limited time for collecting data and targeted population of 300 respondents enrolled in higher education. In addition, the questions will be sent electronically using Google Forms to collect data. Participants answer questionnaires willingly.

3.6 Research Strategy

A research strategy was a plan that outlined the overall direction of study. A solid research strategy guides study direction and determines the most effective approach for data collection and analysis. The researcher used a survey as their study approach. The survey technique collected data using quantitative methods, making it valuable for explaining attributes in large populations.

3.6.1 Questionnaire Design

The study create a questionnaire and distribute it to the respondents in order to collect primary data. The researcher would create the questionnaire based on previous research related to this study. Section A, Section B, and Section C were the three sections of the questionnaires. Section A contains questions about the respondent's demographics, such as gender, age, and education. Section B would be about dependent variables which was the factors that adoption of artificial intelligence in the higher education and section c consist of perceived convenience and efficiency, enhanced learning experience, and access to diverse resources.

Next, the researcher would add 5-point Likert Scale in Section B and C. This was because 5-point Likert Scale was a psychometric response scale, the degree of agreement of respondents to a statement was generally divided into five points :(1) strongly disagree; (2) Disagree; (3) Neutral; (4) Agree; (5) Strongly agree. Moreover, the questionnaire would be created by using Google form. The table 3.1 show that the Likert scale in five points.

Table 3.1 Five-point Likert Scale

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

3.6.2 Pilot Test

The researcher plans to carry out a pilot test in this study to confirm that all participants comprehend the questions and obtain improved results. Pilot testing is a preliminary study carried out by researchers before launching the actual survey to evaluate the validity of questions and the data collection process. Consequently, a researcher utilizes it to assess the questions' efficacy and ascertain if the survey is expected to succeed. A pilot study is a minor initial investigation utilized in research to evaluate a suggested study prior to complete execution. The aim of the pilot test was to uncover the respondents' unclear items (Aslam, 2020). Additionally, it would identify any mistakes or flaws in the questionnaire, which the researcher can fix later before sharing it with respondents.

The researcher would select 50 respondents for a pilot test. All suggestions and feedback from respondents in these pilot tests were evaluated and integrated into the final questionnaire. Finally, the revised questionnaire would be distributed to the respondents.

3.7 Data Analysis Method

To analyse the data, the researcher would use the Statistical Package for Social Science (SPSS) version 29. SPSS was a sophisticated statistical programme that could analyse data efficiently. Furthermore, the researcher's interpretation of the data was rather straightforward. In this study, the researcher would analyze the data using a variety of methods, including descriptive analysis, Pearson Correlation analysis, and linear regression analysis.

3.7.1 Descriptive Analysis

Descriptive statistics were utilised to summarise and organise the data set features. To quantify central tendency, the researcher would use mean, mode, and median, whereas variance, standard deviation, and percentage would be used to evaluate dispersion. Descriptive analysis was a crucial sort of data analysis due to its ability to provide valuable insights from initial data. Descriptive analysis will be utilised to gather demographic information from respondents.

3.7.2 Pearson Correlation Analysis

The Pearson correlation coefficient tests the link between two continuous variables. The optimum measure of correlation between variables of interest was based on covariance. Pearson correlation analysis was used to understand the link between independent and dependent variables. The correlation from -1 to 1 ranges from extremely weak to very high. Table 3.2 shows the Pearson Correlation Coefficient (r).

Table 3.2: Pearson Correlation Coefficient

r	Interpretation
0.81 to 1.00	Very Strong
0.61 to 0.80	Strong
0.41 to 0.60	Moderate
0.21 to 0.40	Low
0.00 to 0.20	Very low

3.7.3 Linear Regression Analysis

Regression analysis is a collection of statistical methods for estimating the relationship between one or more independent variables and a dependent variable. This research consists of three independent variables: convenience and efficiency, enhanced learning experience, and access to diverse resources. In this study, the researcher will use linear regression analysis using the equation showed below.

$y = a + bx1 + cx2 + dx3$

Where,

y = dependent variable value (factors of influencing the adoption of artificial intelligence (AI) in higher education)

a = constant

b, c, d = regression coefficient

x1 = independent variable value (convenience and efficiency)

x2 = independent variable value (enhanced learning experience)

x3 = independent variable value (access to diverse resources)

3.8 Validity and Reliability

The concepts of reliability and validity were used to assess the quality of research. They referred to a technique, method, or test for determining whether something is good or bad. The consistency of measurement was referred to as reliability, and the accuracy of measurement was referred to as validity. It was critical to consider reliability and validity when developing our research design, planning methodology, and writing the results, especially in quantitative research.

3.8.1 Validity

Validity means that the data obtained is appropriate for the use of measuring instruments (Peshtar & El Sadig, 2022). The results of the analysis are accurate, thanks to the use of validated measuring instruments. Internal Validity: The degree to which it can be claimed that the independent variable brought about the effect obtained. Internal validity is achieved when the impact of dependent variable is only due to independent variables. This was how far a result could be manipulated.

3.8.2 Reliability

The phrase "reliability" refers to a technique for determining the consistency of something. A measurement is reliable if the same results can be achieved repeatedly using the same procedure under the same conditions (Middleton, 2022). The Cronbach's Alpha method was used by the researcher in this study to assess the research's reliability. The Alpha Coefficient ranges between 0 and 1. To indicate study reliability, the result must be greater than 0.6. If the result is less than 0.6, there is an issue with the data. The Cronbach's Alpha coefficient values were shown in the table below. The scale of Cronbach's alpha is shown in the table below.

Table 3.3: Cronbach's Alpha Coefficient

Cronbach's Alpha Coefficient	Internal Consistency
$\alpha \geq 0.9$	Excellent
$0.7 \leq \alpha < 0.9$	Good
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

3.9 Research Framework

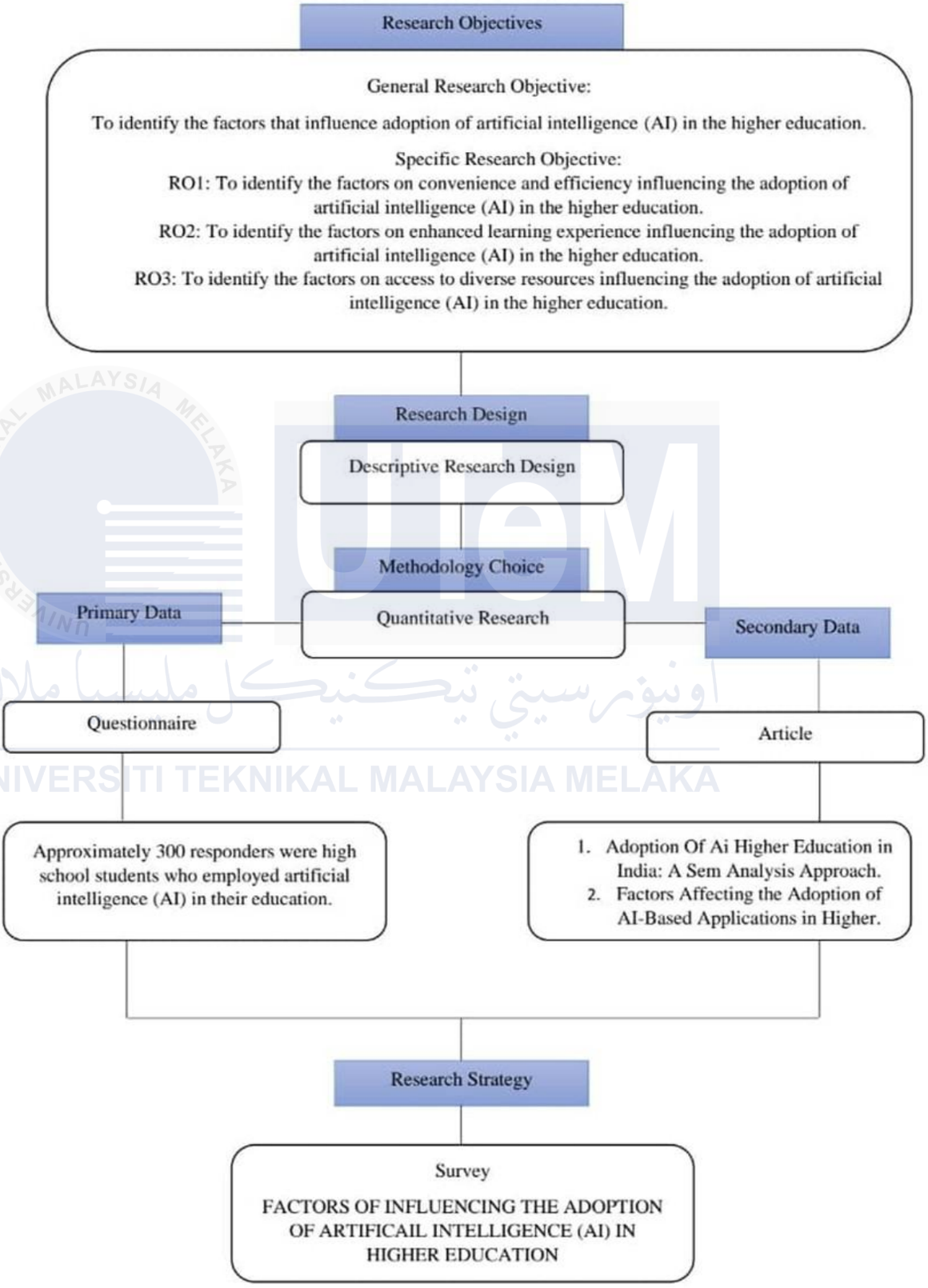

Figure 3.1 Research Framework

3.10 Summary

To conclude, the research methods of this study were discussed in this chapter. Descriptive research was selected as the research design, quantitative method and purposive sampling technique was used to collect data. The primary data source was the questionnaire survey of this study, and the secondary data source was articles and journals on the website. The researcher would also conduct pilot test and calculate Cronbach's Alpha coefficient to ensure the validity and reliability of the study. The Social Science Statistical Software Package (SPSS) version 29 would also be used by researcher to analyse the data.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 INTRODUCTION

In this chapter, the study analyzed and developed the data gathered from the distributed questionnaire. The study highlighted with the demographic profiles of the respondent, survey reliability test, descriptive analysis, and multiple regressions to determine the relationship between the constructs. Data analysis is generated based on the Social Science Statistical Package (SPSS) version 29.

4.2 PILOT TEST

The purpose of the pilot test is to determine if the questionnaire is correct to capture the required data as expected. Therefore, the effectiveness of the pilot test and the reliability of the questionnaire can be tested. For pilot testing, check internal reliability by using Cronbach's Alpha. For the pilot test, the researcher chooses 50 people out of 300 respondents at random to fill out the questionnaire. All of the items in the table below were found to be reliable and valid.

Table 4.1: Reliability Test For 50 Respondents

[Sources: Data Analysis of SPSS]

Case Processing Summary			
		N	%
Cases	Valid	50	100.0
	Excluded[a]	0	.0
	Total	50	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.661	.612	4

Table 4.1 displays the Cronbach's alpha for the 50 participants utilized in gathering the data. The table indicates that every item in the questionnaire demonstrates strong reliability, and the questionnaires have shown validity since Cronbach's Alpha value is below 0.7, specifically 0.661, which could be deemed acceptable. As per (Pallathadka, H., et al., 2022), the implementation of artificial intelligence in higher education is evaluated using both the intention to utilize AI and the actual application of AI metrics. The intention to utilize AI indicates how often a user decides to employ AI for their academic tasks, while the actual use of AI assessments will reveal how a user is incorporating AI into their academic efforts.

4.3 DESCRIPTIVE ANALYSIS

4.3.1 Background of the Respondents

The study used the descriptive statistics to describe the data collected such as basic characteristics by questionnaire. The details of demographic from 300 respondents, factors of influencing the adoption of artificial intelligence (AI) in higher education. Descriptive statistics are one of the methods that used table, graph and overview the study. Furthermore, the data analysis reveals that the basic demographic data collected from 300 respondents who completed the questionnaires, as shown in Table 4.2.

Table 4.2: Summary of Total Demographic Information

Demographic	Demographic Details	Frequency	Percentage (%)
Gender	Male	151	50.4%
	Female	149	49.5%
Age	Below 20 years	9	3.0%
	21 year – 25 years	291	97.0%
	26 year – 30 years	0	0
	31 year – 35 years	0	0
	36 years above	0	0
Level Education in UTeM	Stpm	9	3.0%
	Diploma	10	3.3%
	Degree	281	93.7%
	Master	0	0
	Phd	0	0

4.3.1.1 Gender of Respondents

Table 4.3: Gender of Respondents

[Source: Data Analysis of SPSS]

GENDER					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FEMALE	149	49.7	49.7	49.7
	MALE	151	50.3	50.3	100.0
	Total	300	100.0	100.0	

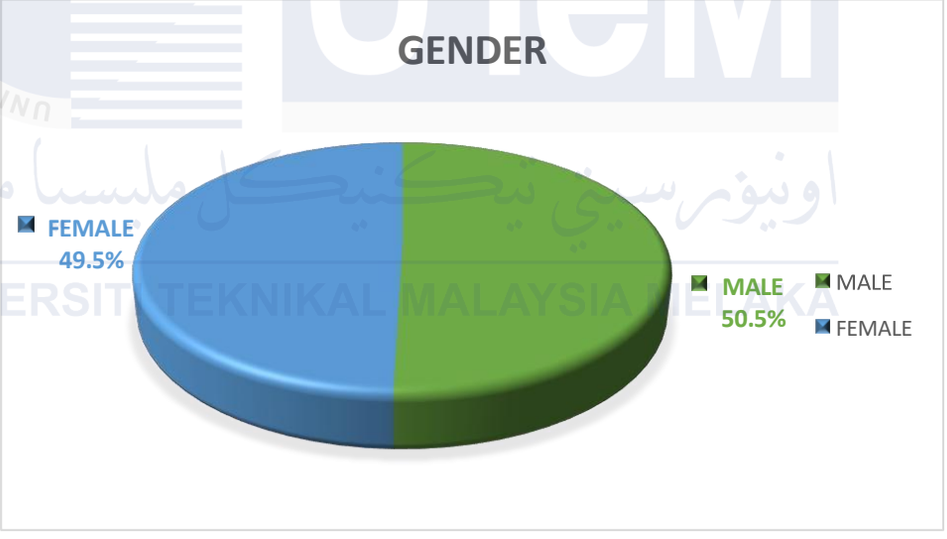

Figure 4.1: Gender of Respondents

[Source: Data Analysis of SPSS]

In the sample of 300 respondent shown table 4.3 and Figure 4.1 above, there are majority male is 151 (50.5%) and female 149 (49.5%) responders in total. According to the proportion, there are significantly more male respondents than female respondents.

4.3.1.2 Age of Respondents

Table 4.4: Age of Respondents

[Source: Data Analysis of SPSS]

AGE					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21 YEAR - 25 YEAR	290	96.7	96.7	96.7
	26 YEAR - 30 YEAR	1	.3	.3	97.0
	BELOW 20 YEAR	9	3.0	3.0	100.0
	Total	300	100.0	100.0	

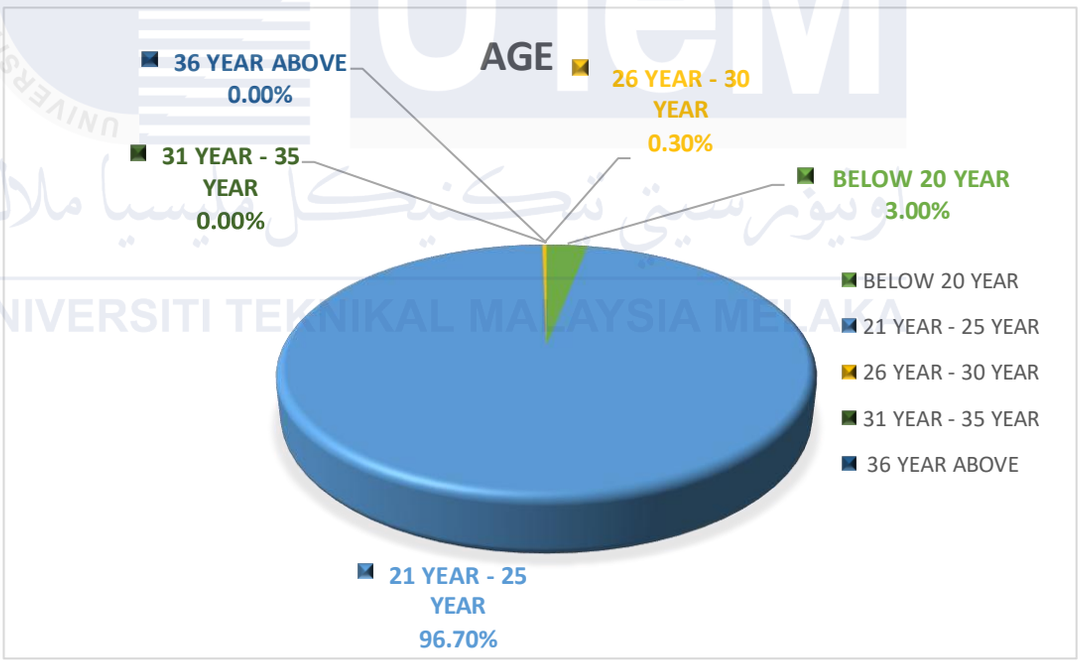

Figure 4.2: Age of Respondents

[Source: Data Analysis of SPSS]

Table 4.4 and Figure 4.2 shows the age group who took part in answering the questionnaire. In this study, the majority of the respondents are from the age group of 21 year – 25 year old with 290 respondents (96.7%), followed by the age group of 20 year below with 9 respondents (3%) and 1 respondents from group 26 year – 30 year (0.30%). Than for 31 year – 35 year and 36 year above don't have respondents answering the questionnaire.

4.3.1.3 Level Education In Utem

Table 4.5: Level Education in UTeM of Respondents

[Source: Data Analysis of SPSS]

LEVEL EDUCATION IN UTEM				
	Frequency	Percent	Valid Percent	Cumulative Percent
DEGREE	281	93.7	93.7	93.7
DIPLOMA	10	3.3	3.3	97.0
STPM	9	3.0	3.0	100.0
Total	300	100.0	100.0	

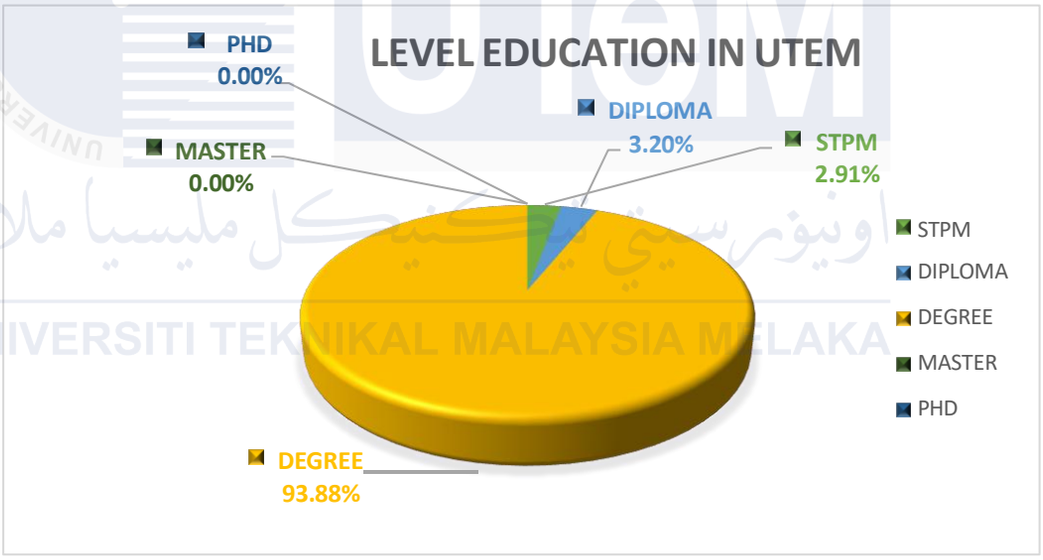

Figure 4.3: Level Education in UTeM of Respondents

[Source: Data Analysis of SPSS]

Table 4.5 and Figure 4.3 show the level education in UTeM who took part in answering the questionnaire. In this study, the majority of the respondents are from the degree with 281 respondents (93.7%), the level education followed by diploma with 10 respondents (3.3%) and the least respondents are at the education level from stpm with 9 respondents (3.0%). The level education master and phd don't have respondents answering the questionnaire.

4.3.2 RESEARCH QUESTION ANALYSIS

4.3.2.1 Dependent Variable: **Factors of Influencing The Adoption of ARTIFICIAL Intelligence (AI) In Higher Education.**

Table 4.6: Factors of Influencing The Adoption of Artificial Intelligence (AI) In Higher Education.

[Source: Data Analysis of SPSS]

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
DV1.1. The artificial intelligence (AI) has become an essential tool for due to the enjoyment it provides.	300	4	5	4.58	.494
DV1.2. Given the choice, I prefer using the artificial intelligent (AI) over alternative methods for assistance.	300	4	5	4.62	.485
DV1.3. The artificial intelligent (AI) has been a valuable resource in solving the queries or problems.	300	4	5	4.58	.494
DV1.4. The artificial intelligent (AI) has positively contributed to overall user experience.	300	4	5	4.59	.493
Valid N (listwise)	300				

Table 4.8 shows the descriptive analysis of dependent variable which is the factors of influencing the adoption of artificial intelligence (AI) in higher education based on 300 respondents. The respondents agreed with the iteam DV1.2," Given the choice, I prefer using the artificial intelligent (AI) over alternative methods for assistance," which its mean value is the highest 4.62 and standard deviation is 0.485. The second highest statement that agreed by respondents is iteam DV1.4," The artificial intelligent (AI) has positively contributed to overall user experience," make a mean with 0.493 and standard deviation is 0.493. Followed by the DV1.1," The artificial intelligence (AI) has become an essential tool for due to the enjoyment it provides," and DV1.3," The artificial intelligent (AI) has been a valuable resource in solving the queries or problems," make a same mean with 4.58 and standard deviation same to is 0.494.

4.3.2.2 Independent Variable: Convenience And Efficiency

Table 4.7: Convenience and Efficiency

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
IV1.1. AI-powered tools provide me with convenient ways to access information, resources, and support.	300	4	5	4.51	.501
IV1.2. Instant responses, personalized recommendations, and 24/7 availability make artificial intelligence (AI) appealing for my study tasks.	300	3	5	4.60	.498
IV1.3. Artificial intelligence (AI) tools have improved the efficiency of my research, note-taking, and studying.	300	3	5	4.56	.504
Valid N (listwise)	300				

Table 4.7 above revealed that descriptive statistics of independent variable convenience and efficiency among 300 respondents. The respondents agreed with the statement iteam of IV1.2," Instant responses, personalized recommendations, and 24/7 availability make artificial intelligence (AI) appealing for my study tasks,"with mean of 4.60 and a standard deviation of 0.498. Whereas, a statement iteam of IV1.3, "Artificial intelligence (AI) tools have improved the efficiency of my research, note- taking, and studying," has the second highest mean value of 4.58 and standard deviation of 0.504. Next, for the statement of item IV1.1,"AI-powered tools provide me with convenient ways to access information, resources, and support," has the thrird highest mean 4.51 and standard deviation of 0.501.

4.3.2.3 Independent Variable: Enhanced Learning Experience

Table 4.8: Enhanced Learning Experience

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
IV2.1. Artificial intelligence (AI) technologies like virtual assistants and chatbots have created engaging and immersive learning experiences for me.	300	4	5	4.52	.500
IV2.2. Virtual reality (VR) and Augmented reality (AR) applications powered by Artificial intelligence (AI) have made complex concepts more accessible and memorable for me.	300	4	5	4.58	.494
IV2.3. I find artificial intelligence, AI-powered interactive conversations and simulations to be helpful in my learning.	300	4	5	4.58	.494
Valid N (listwise)	300				

Table 4.8 show the descriptive statistics of all items of enhanced learning experience among 300 respondents. According to table 4.8, the respondents agreed with the satatement that IV2.2. “Virtual reality (VR) and Augmented reality (AR) applications powered by Artificial intelligence (AI) have made complex concepts more accessible and memorable for me,” and IV2.3. “I find artificial intelligence, AI- powered interactive conversations and simulations to be helpful in my learning,” which have the same highest mean 4.58 and the same standard deviation of 0.494. From the table the statement of IV2.1. “Artificial intelligence (AI) technologies like virtual assistants and chatbots have created engaging and immersive learning experiences for me,” lower highest mean 4.52 and standard deviation 0.500.

4.3.2.4 Independent Variable: Access To Diverse Resources.

Table 4.9: Access to Diverse Resources.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
IV3.1. Artificial intelligence, AI-powered platforms have provided me with a wide range of educational resources from various sources.	300	4	5	4.60	.490
IV3.2. The recommendations provided by Artificial intelligence have helped me discover relevant articles, research papers, videos, and online courses.	300	4	5	4.59	.493
IV3.3. AI has enhanced my access to diverse resources for my study needs.	300	4	5	4.58	.494
Valid N (listwise)	300				

Table 4.9 above revealed that descriptive statistics of independent variable access to diverse resources among 300 respondents. The respondents agreed with the statement item of IV3.1. “Artificial intelligence, AI-powered platforms have provided me with a wide range of educational resources from various sources,” with mean of 4.60 and a standard deviation of 4.90. Whereas, a statement item of IV3.2. “The recommendations provided by Artificial intelligence have helped me discover relevant articles, research papers, videos, and online courses,” has the second highest mean value of 4.59 and statement deviation 0.493. Next, for the statement of item IV3.3. “AI has enhanced my access to diverse resources for my study needs,” has the third highest mean value 4.58 and standerd deviation of 0.494.

4.4 Reliability Analysis

The researcher also used Cronbach's Alpha analysis to perform the reliability analysis because it was the best tool for measuring the reliability and internal consistency of variables. Moreover, SPSS was used by the researcher to perform the Cronbach's Alpha analysis. The reliability test would display Cronbach's Alpha, where a result of 0.7 and above was considered good reliability, while a result below 0.6 is considered poor or unacceptable. Thus, the Cronbach's alpha value of this research was shown in the table below.

Table 4.10: Reliability Statistics

[Source: Data Analysis of SPSS]

Case Processing Summary			
		N	%
Cases	Valid	300	100.0
	Excluded[a]	0	.0
	Total	300	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics	
Cronbach's Alpha	N of Items
.098	4

Table 4.10 shows the reliability test of the questionnaire among 300 respondents. According to Table 4.10, Cronbach's Alpha value is 0.098, while a result below 0.6 is considered poor internal consistency or unacceptable. Therefore, it can be concluded that all items in the questionnaire had very lower reliability as the Cronbach's Alpha value was greater than 0.90.

4.5 Pearson Correlation Analysis

Convenience and Efficiency

Table 4.11 Pearson Correlation Analysis

[Source: Data Analysis of SPSS]

Correlations

		Factors of influence the adoption of artificial intelligence (AI) in higher education	Convenience And Efficiency	Enhanced Learning Experience	Access To Diverse Resources
Factors of influence the adoption of artificial intelligence (AI) in higher education	Pearson Correlation	1	.151**	.266**	.143*
	Sig. (2-tailed)		.009	.000	.013
	N	300	300	300	300
Convenience And Efficiency	Pearson Correlation	.151**	1	.182**	.285**
	Sig. (2-tailed)	.009		.002	.000
	N	300	300	300	300
Enhanced Learning Experience	Pearson Correlation	.266**	.182**	1	.155**
	Sig. (2-tailed)	.000	.002		.007
	N	300	300	300	300
Access To Diverse Resources	Pearson Correlation	.143*	.285**	.155**	1
	Sig. (2-tailed)	.013	.000	.007	
	N	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.11 shows the Pearson Correlation Analysis of independent variables, which are convenience and efficiency, enhanced learning experience, access to diverse resources and a dependent variable, which is the factors of influence the adoption of artificial intelligence (AI) in higher education. Based on the result, it show that all the independent variables positively correlate with the dependent variable. Firstly, the correlation analysis result revealed that between enhanced learning experience and the factors of influence the adoption of artificial intelligence (AI) in higher education there was a strong relationship with an r value of 0.266, $n=300, p<0.05$. Next, the relationship between convenience and efficiency and the factors of influence the adoption of artificial intelligence (AI) in higher education is a second strong positive relationship with an r value of 0.151,$n=300, p>0.05$. Lastly, the correlation between the access to diverse resources and factors of influence the adoption of artificial intelligence (AI) in higher education is 0.013, with is a lower relationship with an r value of 0.013,$n=300, p>0.05$.

In conclusion, the independent variables are statistically significant while the dependent variables are in the negetif range. The correlation coefficients at the level of 0.01 (2-tailed) only one independent variable with is enhanced learning experience. That know to determine the relationship between the independent and dependent variables.

4.6 Multiple Regression Analysis

A technique for estimating a value based on two or more independent and dependent variables is known as multiple regression analysis. The effect of the independent variables on the dependent variable is analyzed by multiple regression analysis in this study, with three independent variables (Convenience And Efficiency, Enhanced Learning Experience, and Access to Diverse Resources) and one dependent variable (is the factors of influence the adoption of artificial intelligence (AI) in higher

education). As a consequence, the table below presents the results of the multiple regression analysis.

Table 4.12 Model Summary

[Source: Data Analysis of SPSS]

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.296[a]	.088	.079	.245
a. Predictors: Convenience And Efficiency, Enhanced Learning Experience, Access To Diverse Resources.				
b. Dependent Variable: Factors of influence the adoption of artificial intelligence (AI) in higher education.				

The summary results of the multiple regression analysis model are displayed in Table 4.12. Based on Table 4.12, the R value stands at 0.296, indicating a connection between the dependent and independent variables. Next, the R square value is 0.088, indicating that the three independent variables explain 8.8% of the variation in the dependent variable. This demonstrates that 8.8% of the variability in the factors affecting the adoption of artificial intelligence (AI) in higher education can be attributed to the variations in convenience and efficiency, improved enhanced learning experience, and access to various resources.

Table 4.13 Anova

[Source: Data Analysis of SPSS]

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.715	3	.572	9.509	.000[b]
	Residual	17.797	296	.060		
	Total	19.512	299			
a. Dependent Variable: Factors of influence the adoption of artificial intelligence (AI) in higher education.						
b. Predictors: (Constant), : Convenience And Efficiency, Enhanced Learning Experience, Access To Diverse Resources.						

From Table 4.13 above, the result shows that F-test value from this multiple regression analysis is 9.509, and the significant level is 0.000. The p value of 0.000 is less than the threshold of 0.05 ($p<0.05$). This means that numerous regression models may be used to predict factors of influence the adoption of artificial intelligence (AI) in higher education. In other words, convenience and efficiency, enhanced learning experience, access to diverse resources have a substantial influence on higher education students in using artificial intelligence (AI).

Table 4.14 Coefficient

[Source: Data Analysis of SPSS]

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.063	.305		10.050	.000
Constant Convenience and Efficiency	.072	.050	.085	1.445	.150
Enhanced Learning Experience	.199	.048	.238	4.187	.000
Access to Diverse Resources	.064	.045	.082	1.413	.159

a. Dependent Variable: Factors of influence the adoption of artificial intelligence (AI) in higher education.

Based on Table 4.14, the beta for convenience and efficiency is 0.072, for enhanced learning experience is 0.199, and access to diverse resources is 0.064 respectively. Based on beta, perceived usefulness has the highest beta value while access to diverse resources has the lowest beta value. From the result of Table 4.14, the researcher notices that there is no independent variable with negetif sign, it indicates the adsence of variable, which has negative relationship with factors of influence the adoption of artificial intelligence (AI) in higher education. The contant is 3.063. Therefore, the the researcher formed the following equation as shown as below:

$$y = a + bx1 + cx2 + dx3$$

$$a = 3.063 ,$$

$$b = 0.072,$$

$$c = 0.199,$$

$$d = 0.064,$$

Factors of influence the adoption of artificial intelligence (AI) in higher education = 3.063 + 0.072 (Convenience and Efficiency) + 0.199 (Enhanced Learning Experience) + 0.064 (Access to Diverse Resources)

4.7 Summary of Hypothesis Testing

According to the linear equation above, there a only one relationship between the factors of influence the adoption of artificial intelligence (AI) in higher education which is enhanced learning experience that value of t-test is 4.187 and singnificent is 0.000. The independent variable of convenience and efficiency and access to diverse resources not has relationship with the factors of influence the adoption of artificial intelligence (AI) in higher education.

Hypothesis 1 (H1)

H0: There is no significant relationship between convenience and efficiency and the factors of influence the adoption of artificial intelligence (AI) in higher education.

H1: There is a relationship between convenience and efficiency and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Reject H0, if p value lower than 0.05, t value higher than 1.96

Based on the Table 4.16, the p value of convenience and efficiency is 0.150 which is higher than 0.05, and t value is 1.445 which is lower than 1.96. Thus, H0 is accepted. There is not a relationship between convenience and efficiency and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Acknowledging individual variations is crucial for developing educational resources targeted at specific students and for tailoring education to address personal requirements across different levels. Data analytics is unable to reveal students' learning patterns or identify their specific needs (Gobert and Sao Pedro, 2017; Mislevy et al., 2020). There are moral and algorithmic challenges in aligning human-provided education with machine-supported learning. The significant effect of AI and contemporary technologies is a dual-faceted issue (Khechine and Lakhal, 2018). On the other hand, it may lead to algorithmic prejudice and a reduction in essential skills in students who rely significantly on technology.

For instance, in educational settings that depend on creativity or experience, technology may hinder learning since it could stop students from acquiring direct experiences and participating in learning activities (Cuthbertson et al., 2004). Algorithmic bias is another controversial issue (Obermeyer et al., 2019). Considering that modern AI algorithms rely significantly on data, their efficiency is completely determined by that data. Algorithms adapt to the inherent qualitative and quantitative characteristics of data. For example, if the dataset is imbalanced and contains much more accurate information on the general population than on minorities, the algorithms may produce persistent and repeated mistakes that adversely affect minority groups.

In conclusion, H1 is reject. This study no significant relationship between convenience and efficiency and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Hypothesis 2 (H2)

H0: There is no significant relationship between enhanced learning experience and the factors of influence the adoption of artificial intelligence (AI) in higher education.

H1: There is a relationship between enhanced learning experience and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Reject H0, if p value lower than 0.05, t value higher than 1.96

Based on the Table 4.16, the p value of enhanced learning experience is 0.000. which is lower than 0.05, and t value is 4.817 which is higher than 1.96. Thus, H1 is accepted. There is not a relationship between enhanced learning experience and the factors of influence the adoption of artificial intelligence (AI) in higher education.

In the first volume of the Handbook of Artificial Intelligence, Artificial Intelligence (AI) is described as “the branch of computer science dedicated to developing intelligent computer systems, which exhibit characteristics associated with human intelligence—like language comprehension, learning, logical reasoning, and problem-solving" (Barr & Feigenbaum, 1981, p). It seems you haven't included the text that you would like me to paraphrase. Kindly provide the material you'd like me to assist with! After selecting classes and successfully completing a term, the system can offer more customized job and volunteer opportunities that align with the skills the student has gained from their education. Lam and Khare (2018) state, "predict whether the combination of classes a student is taking this term could overwhelm the student." Self-directed learning enables the program to decide when to present a new topic or review a previous one based on the student's preferences.

The models used by Intelligent tutoring systems may help in determining when a student has understood a concept and is ready to move on to the next one (Lin & Chi, 2016; David, Segal, & Gal, 2016). Data collected from tasks and practice questions, along with response times, are often used to assess the 'learned' status and develop a student model that accurately represents students' understanding (Lin, Shen, & Chi, 2016). These systems provide feedback, suggest guidance, and give clarifications when students make mistakes (Shute, 2008). They observe the learning outcomes and can pinpoint the content appropriate for the student's difficulty level (VanLehn, 2006). In this way, the students' learning experience is prioritized over the lessons themselves.

In conclusion, H1 is accepted. This study is significant relationship between there is a relationship between enhanced learning experience and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Hypothesis 3 (H3)

H0: There is no significant relationship between access to diverse resources and the factors of influence the adoption of artificial intelligence (AI) in higher education.

H1: There is a relationship between access to diverse resources and the factors of influence the adoption of artificial intelligence (AI) in higher education.

Reject H0, if p value lower than 0.05, t value higher than 1.96

Based on the Table 4.16, the p value of access to diverse resources is 0.159. which is higher than 0.05, and t value is 1.413 which is lower than 1.96. Thus, H0 is accepted. There is not a relationship between access to diverse resources and the factors of influence the adoption of artificial intelligence (AI) in higher education.

As noted by Hazan (2016), when monitoring data is complicated or training on the full dataset is not practical due to computational limits, it is better to utilize methods that directly adjust decisions based on the latest observed data. This is based on online learning, a machine learning technique utilized to respond to a series of questions with data provided in a sequential manner. A robot unsure of human preferences has a positive incentive to permit itself to be turned off (Hadfield-Menell et al. 2017b). Overall, it will yield to human control actions. According to Neapolitan and Naimipour (2010), these are referred to as parameters. A notable instance of interest in online learning arises when both the control set and the loss function are convex (Hazan, 2016). A key algorithm in this scenario is online gradient descent, which involves taking a step at each iteration from the latest control towards the negative direction of the gradient of the prior loss (M. Zinkevich (2013).

In conclusion, H1 is reject. This study no significant relationship between access to diverse resources and the factors that influence the adoption of artificial intelligence (AI) in higher education.

Table 4.15 Hypotheses Results

Hypothesis	Standardized Coefficients Beta	t-value	Result
Hypothesis 1	0.085	1.445	Reject
Hypothesis 2	0.238	4.187	Accepted
Hypothesis 3	0.082	1.413	Reject

4.8 Summary

In summary, the researcher has addressed the findings in this chapter. The reliability analysis, descriptive analysis, Pearson correlation analysis, and multiple linear regression analysis have been conducted using SPSS version 29. Following the analysis, the researcher identified the connection between the dependent variable and three independent variables. Additionally, the researcher conducted hypothesis testing, resulting in one accepted and two rejected hypotheses in this study. In the following chapter, the researcher will address the recommendations and conclusion of the study.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter explain the result calculated in previous chapter and all the objectives were answered accordingly in different subtopics. This chapter also discuss about why the hypothesis is being accepted or rejected. The researcher also gives the further recommendations to the upcoming researcher for the relevant study.

5.2 Summary of Study

The application of artificial intelligence (AI) in higher education has various disadvantages that must be addressed. First, relying on AI can impair critical thinking and problem-solving skills because students may become overly reliant on technology to obtain answers. Second, unequal access to AI technology can result in a digital gap, with pupils from low socioeconomic backgrounds being unable to fully reap the benefits of AI. Third, AI systems' use of students' personal data puts them at risk of being misused or stolen, posing privacy and security issues. Furthermore, AI that is not well-suited to students' particular needs may result in a less effective and non- inclusive learning process. Finally, the expensive expense of developing and

sustaining AI technology might place a strain on educational institutions, affecting the quality of education provided to students.

The limitations and differences among AI tools present significant challenges for users. One primary limitation is the lack of interoperability, as many AI tools are designed for specific tasks or platforms and may not integrate seamlessly with other systems. This can hinder efficiency, especially in complex workflows. Another issue is the varying levels of accuracy and reliability among tools; some AI systems excel in certain domains but struggle in others due to differences in training data or algorithms. Additionally, the cost of advanced AI tools can be prohibitive, restricting access for smaller institutions or individuals. Some tools also require substantial technical expertise to operate effectively, creating a steep learning curve for non- specialist users.

Furthermore, ethical concerns such as bias in AI models and data privacy issues vary significantly across tools, depending on how they are designed and implemented. These differences highlight the importance of careful evaluation and selection of AI tools based on specific needs and contexts.

The focus of this research was to identify acceptance of the factors of influence the adoption of artificial intelligence (AI) in higher education. There were three independent variables that form from the previous research which are constant convenience and efficiency, enhanced learning experience, and access to diverse resources that has been selected to identify the acceptance of using artificial intelligence (AI) in higher education. These variables are to identify the solution that describe in the research's problem statement.

This research explores the factors influencing the adoption of artificial intelligence (AI) in higher education, focusing on three specific dimensions. First, it examines the factors related to convenience and efficiency, investigating how AI enhances operational and learning processes. Second, it analyzes the factors contributing to an enhanced learning experience, emphasizing AI's role in improving engagement, personalization, and learning outcomes. Finally, it delves into the factors related to access to diverse resources, exploring how AI facilitates access to a broader range of educational materials and opportunities. Together, these dimensions provide a comprehensive understanding of AI adoption in higher education.

The hypotheses were developed to investigate the relationship between three independent variables (convenience and efficiency, enhanced learning experience, and access to diverse resources) and dependent variable (the factors that influence the adoption of artificial intelligence (AI) in the higher education).

5.3 Implication of Study

The study's findings would be useful for management in determining the factors that influence the adoption of artificial intelligence (AI) in higher education. By understanding factors such as constant convenience and efficiency, enhanced learning experiences, and access to diverse resources, management can formulate more effective strategies to integrate artificial intelligence (AI) into the education system. In addition, these findings also help management identify the needs of students and lecturers, as well as provide the necessary technical support and training to ensure the effective use of artificial intelligence (AI). With a planned approach, management can leverage artificial intelligence (AI) technology to enhance the quality of education, accelerate digital transformation, and ensure that higher education institutions remain relevant in the rapidly evolving technological era.

The data gathering includes students' experiences with artificial intelligence (AI) in higher education. With the commitment of those who adopt artificial intelligence in higher education, research on AI in this field will further benefit students in terms of guidance for future scenarios. Initially, this research offers current and comprehensive insights on how AI can enhance the educational experience, including the implementation of adaptive learning systems tailored to the specific needs of students. This research assists students in understanding how AI can offer access to a wider variety of educational resources, including teaching materials from across the globe. Students can additionally explore how AI can enhance the effectiveness of education by automating assessments and providing personalized learning assistance.

According, the government, Ministry of Higher Education (KPT), and universities play an important role in improving the skills of education to students through the use of artificial intelligence (AI). The government can give funding and incentives for the advancement of AI technology in education, such as research funding and the creation of smart learning platforms example cloud assess, Ispring learn and skyprep. The Ministry of Higher Education (KPT) can also develop rules and frameworks to ensure that the integration of AI into the educational system is in line with the needs of future industries. Universities can incorporate AI-based learning into their curricula, offering AI programming classes, data analysis, and applications across various sectors. They can also provide students with access to technical infrastructure like AI labs and adaptive learning tools, preparing them for a technologically driven environment and practical skills development.

5.4 Limitation of The Study

The researcher encountered some constraints while conducting this study. According, using Google Forms to collect research results can present several challenges for researchers. One major issue is the limitation in response validation, which can lead to incomplete or inconsistent data if participants do not fully understand or follow instructions. Additionally, Google Forms may not support advanced survey designs, such as complex branching logic or dynamic question flows, limiting the depth of data collection. Another concern is data security and privacy, as sensitive information might not be adequately protected depending on the researcher's setup. Furthermore, if the target audience has limited access to the internet or is unfamiliar with digital tools, it could reduce the response rate and skew the data.

Secondly, when there is insufficient time to gather respondents due to daily activities, it can significantly impact the research process. Busy schedules and competing priorities often make it challenging for potential respondents to allocate time to participate in surveys or interviews. This can result in a lower response rate,

leading to insufficient data for meaningful analysis. Additionally, researchers may feel pressured to rush the data collection process, which could compromise the quality and reliability of the responses. To address this, researchers may need to adopt strategies such as flexible data collection methods, online surveys, or shorter response times to accommodate participants' schedules. However, even with these adjustments, time constraints can still pose a considerable challenge to obtaining comprehensive and representative data.

5.5 Recommendation For Future Research

The Ministry of Higher Education should concentrate on many key recommendations to improve student learning potential in the age of technology. First, they should invest in infrastructure modernisation, such as providing institutions with high-speed internet, superior computing resources, and AI-powered learning tools. Second, creating a complete digital curriculum that incorporates emerging technologies like artificial intelligence, virtual reality, and data analytics into many subjects is critical for preparing students for future difficulties. Furthermore, providing educators with training on how to use technology effectively in the classroom will help ensure that kids receive a high-quality, technology-based education. Partnerships with technology businesses and industry specialists should be promoted to provide students with real-world applications and internships, thereby bridging the gap between academic understanding and industry expectations. Finally, fair access to electronic resources for all students, regardless of socioeconomic status, is critical for reducing the digital gap and promoting inclusive learning.

Universities should apply a number of strategic proposals to improve students' understanding of artificial intelligence (AI) for the future. For starters, they should incorporate AI-focused courses into the curriculum across all disciplines, ensuring that students from all fields have a solid understanding of AI concepts and applications. Second, building dedicated AI laboratories or innovation centres equipped with

cutting-edge tools and resources can provide hands-on experience while also encouraging innovation. Workshops, seminars, and hackathons guided by industry professionals can also help to close the gap between academic understanding and practical application. Furthermore, colleges should encourage collaborations with AI corporations and research groups to provide internships, mentorship programs, and hands-on problem-solving opportunities. Finally, developing a supportive environment that includes accessible resources and peer-to-peer learning platforms will ensure that students from diverse backgrounds can effectively engage with AI technology.

Future studies on artificial intelligence (AI) in higher education ought to concentrate on investigating its lasting effects on student achievements, encompassing critical thinking, creativity, and emotional intelligence, which are harder to measure yet vital for comprehensive education. Moreover, research ought to explore ethical issues, including data privacy and possible biases in AI systems, to guarantee fair access and utilization. Attention should also be directed toward recognizing how AI can connect educational disparities in underserved areas and assist personalized learning routes. Ultimately, collaborations across disciplines among educators, technologists, and policymakers should be promoted to create sustainable structures for AI implementation in education.

5.6 Conclusion

In conclusion, this research concentrated on the elements that affect the adoption of artificial intelligence (AI) in higher education. Every goal has been clarified in this chapter. Additionally, this chapter addressed the study's implications, including the use of artificial intelligence (AI) to influence those factors with three independent variables for identification. Finally, this chapter also outlines the limitations and suggestions for future research as a reference.

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APPENDICES

APPENDIX A GANTT CHART PSM 1

PROJECT PLANNING (GANTT CHART)

List all the relevant activities of the proposed project and mark the period of time that is needed for each of the activities.

Project Activities	PSM 1												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Briefing PSM 1							MID-SEMESTER BREAK						
PSM 1 and Title briefing													
Title Confirmation & Discussion with Supervisor													
Chapter 1 Briefing													
Chapter 1 Draft Submission: Problem Statement, Research Question & Research Objectives													
Correction of Chapter 1													
Chapter 2 Briefing: Literature Review & Conceptual Framework													
Chapter 2 Draft Submission													
Correction of Chapter 2													
Chapter 3 Briefing: Methodology Choice, Research Design & Research Framework													
Chapter 3 Draft Submission													
Correction of Chapter 3													
Preparation & Submission of Report													
PSM 1 Report Drafting Preparation for Proposal Presentation Submission													
Presentation & Q&A													

APPENDIX B GANTT CHART PSM 2

PROJECT PLANNING (GANTT CHART)																
List all the relevant activities of the proposed project and mark the period of time that is needed for each of the activities.																
				PSM 2												
Project Activities	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Briefing PSM 2							MID-SEMESTER BREAK									
Questionnaire confirmation & Discussion with supervisor																
Distribute Questionnaire																
Completion of Data Collection and Pilot Test																
Chapter 4 : Discussion & Analysis																
Correction																
Chapter 5 : Conclusion																
Correction																
Submission of Final Draft Report																
Slide preparation																
Presentation & QnA																
Correction Full Report																
Report Submission																

APPENDIX C QUESTIONNAIRE

Bachelor of technology Management (High Technology Marketing) with Honours

Faculty of technology management and technopreneurship

Universiti Teknikal Malaysia Melaka (UTeM)

FACTORS OF INFLUENCING THE ADOPTION OF ARTIFICIAL INTELLIGENCE (AI) IN HIGHER EDUCATION

Learning in the age of technology has made it possible for higher education students to receive information on their courses more swiftly and precisely. The Ministry of Education Malaysia (KPM) encourages students to use the information technology facilities given in accordance with the more sophisticated period to the benefit of all students. As a result, university students will make full use of the resources available to them in order to accomplish the assignments assigned by their professors. As a result, there are several elements that influence the usage of artificial intelligence (AI) in higher education. Thus, the questionnaire will be divided into three sections: Section A, Section B, and Section C. Please answer all of the questions provided. Your time and feedback are much appreciated. Thank you.

Statement of Confidentiality:

All of the information is confidential and only will be using for research purposes.	
References: **NUR FATIN AMIRAH BINTI ZUBIR** Bachelor of Technopreneurship with Honors (High Technology Marketing) Faculty of Technology Management and Technopreneurship _____	**DR. DIANA ROSE BINTI FAIZAL** Supervisor Faculty of Technology Management and Technopreneurship

SECTION A: DEPENDENT VARIABLE

This section relates with your background in brief. Please SELECT your answer in each question respectively.

Q1: Gender of Respondents

- ☐ Male
- ☐ Female

Q2: Age of Respondents

- ☐ Below 20 year
- ☐ 21 year – 25 year
- ☐ 26 year – 30 year
- ☐ 31 year – 35 year
- ☐ 36 year above

Q3: Level education in UteM

- ☐ Stpm
- ☐ Diploma
- ☐ Degree
- ☐ Master
- ☐ Phd

SECTION B: DEPENDENT VARIABLE

This section of only one part, the question are about the factors that influence adoption of artificial intelligence (AI) in higher education. (Intention to use and actual usage)

Please rate your level of agreement with each statement.

Strongly Disagree	Disagree	Neural	Agree	Strong Agree
1	2	3	4	5

No	**To identify the factors that influence adoption of artificial intelligence in the higher education.**	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strong Agree (5)
F1	The artificial intelligence (AI) has become an essential tool for due to the enjoyment it provides.					
F2	Given the choice, I prefer using the artificial intelligent (AI) over alternative methods for assistance.					
F3	The artificial intelligent (AI) has been a valuable resource in solving the queries or problems.					
F4	The artificial intelligent (AI) has positively contributed to overall user experience.					

SECTION C: INDEPENDENT VARIABLE

To determine the three independent variables (IV) that are considered: convenience and efficiency (IV1), enhanced learning experience (IV2), and access to diverse resources (IV3).

Strongly Disagree	Disagree	Neural	Agree	Strong Agree
1	2	3	4	5

No	**To determine the three independent variables (IV) that are considered: convenience and efficiency, enhanced learning experience, and access to diverse resources.**	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strong Agree (5)
1.	**Convenience and Efficiency**					
IV1.1	AI-powered tools provide me with convenient ways to access information, resources, and support.					
IV1.2	Instant responses, personalized recommendations, and 24/7 availability make artificial intelligence (AI) appealing for my study tasks.					

IV1.3	Artificial intelligence (AI) tools have improved the efficiency of my research, note-taking, and studying.					
2.	**Enhanced Learning Experience**					
IV2.1	Artificial intelligence (AI) technologies like virtual assistants and chatbots have created engaging and immersive learning experiences for me.					
IV2.2	Virtual reality (VR) and Augmented reality (AR) applications powered by Artificial intelligence (AI) have made complex concepts more accessible and memorable for me.					
IV2.3	I find artificial intelligence, AI-powered interactive conversations and simulations to be helpful in my learning.					

3.	**Access to Diverse Resources**					
IV3.1	Artificial intelligence, AI-powered platforms have provided me with a wide range of educational resources from various sources.					
IV3.2	The recommendations provided by Artificial intelligence have helped me discover relevant articles, research papers, videos, and online courses.					
IV3.3	AI has enhanced my access to diverse resources for my study needs.					