INTENTION TO ADOPT CHATGPT IN HIGHER EDUCATION

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INTENTION OF UTILIZING CHATGPT IN HIGHER EDUCATION

BY

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A final year project submitted in partial fulfilment of the requirement for the degree of

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MAY 2024

DECLARATION

I hereby declare that:

(1) This undergraduate FYP is the end result of my own work and that due acknowledgement has been given in the reference to ALL sources of information be they printed, electronic, or personal

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Sole contribution has been made by me in completing the FYP.

(4) The word count of this research report is 11593 words.

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Furthermore, I would like to extend our sincere appreciation to all the participants who dedicated their valuable time and effort to complete the surveys. With the respondents' assistance and support, I have effectively completed this section of the questionnaire.

DEDICATION

This study is dedicated to my respected supervisor, Dr. Law Kian Aun, who provided me with guidance, direction, and assistance throughout the entirety of the research.

Moreover, this study is also dedicated to all participants who volunteered their time and effort in order to contribute valuable insights by completing the questionnaires.

Additionally, this research is dedicated to my cherished family and friends in recognition of their support and tolerance. Their consistent assistance is indispensable to the successful completion of this research.

TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
ChatGPT	Chat Generative Pre-Trained Transformer
NLP	Natural Language Processing
ITS	Intelligent Tutoring Systems
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
UTAUT	Unified Theory of Acceptance and Use of Technology
LLM	Large Language Model
GUI	Graphical User Interface
SPSS	Statistical Package for the Social Sciences
PU	Perceived Usefulness
PEOU	Perceived Ease of Use
HM	Hedonic Motivation
SI	Social Influence
ITAC	Intention to Adopt ChatGPT
IT	Information Technology

LIST OF APPENDICES

PREFACE

In recent years, technological advancements have significantly altered the higher education sector, impacting instructional methodologies and student interactions with learning materials. One of the most significant developments is artificial intelligence (AI), which has the potential to bring about a profound transformation in numerous areas of academia. An instance that highlights the potential of artificial intelligence is conversational agents, of which ChatGPT is a leading pioneer.

ChatGPT, an innovative language model created by OpenAI, serves as a prime example of how natural language processing and machine learning are integrated to provide an unparalleled environment for interactive engagement. The extraordinary fluency with which it can comprehend, produce, and react to human language has generated considerable interest in its implementation throughout educational environments.

This preface establishes the foundation for an investigation into the various potential applications of ChatGPT to augment educational and learning processes within the realm of higher education. The potential applications of ChatGPT are extensive and diverse, ranging from helping to facilitate personalised tutoring sessions to enhancing the generation of course content. Despite its potential, there are numerous ethical, efficacy, and academic concerns that must be addressed in light of the changing landscape of education in the digital age.

This research aims to explore the intention of utilizing ChatGPT in higher education. It seeks to provide insights into the factors associated with exploiting ChatGPT in the higher education context. Through the analysis of empirical evidence, conceptual framework, and practical applications, our goal is to enhance our comprehension of how ChatGPT can influence the future of education.

ABSTRACT

As Artificial Intelligence increasingly penetrates and transform education, these technological advancements will radically alter the existing approach to students' learning progress, thus transforming learning styles and teaching techniques. Hence, the objective of this study is to examine the relationship between perceived usefulness, perceived ease of use, hedonic motivation, and social influence towards the intention to adopt ChatGPT in higher education. In account of the ChatGPT context, researchers have made modifications to the Technology Acceptance Theory (TAM) and the Unified Theory of Technology Acceptance and Technology Use (UTAUT) and UTAUT 2 in order to identify a more suitable conceptual framework.

Moreover, a total of 200 questionnaires were distributed to university students in Malaysia via online platforms and subsequently utilized for analysis. The findings indicate that three factors which are perceived usefulness, perceived ease of use, and social influence, have a statistically significant impact on students in higher education when it comes to adopting ChatGPT. However, hedonic motivation has no significant relationship with the intention to adopt ChatGPT in higher education.

In short, this research will provide valuable insights for educational institutions to have a deeper understanding of the intention of students to adopt ChatGPT in order to develop an innovative and ethical learning environment.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

The aims of the research are to study the intention of utilizing ChatGPT in higher education. In this study, it will discuss about the factors intent to use ChatGPT in higher education. The factors that are involving in this study are perceived usefulness, perceived ease of use, hedonic motivation and social influence. This chapter will also generally outline the background of research which is related to ChatGPT in higher education as well as describing the problem statements, developing the research objectives, research questions, hypothesis, and significance of research. Thus, this study will be able to gather the results in terms of significance among the factors intent to use ChatGPT in higher education.

1.1 Research Background

In an age when technology advances are reshaping human existence, one groundbreaking power emerges as particularly noteworthy: Artificial Intelligence (AI). AI has extensively infiltrated all aspects of our life, discreetly and significantly altering the manner in which we engage in work, communicate, and navigate our surroundings (Bahroun et al., 2023, p. 1). The implementation of AI in the domain of natural language processing has led to the development of sophisticated virtual assistants and avatars that are able to both comprehend and generate human language (Farrokhnia et al., 2023, p. 2). The 'Chat Generative Pre-Trained Transformer' (ChatGPT) is an instance of a potent chatbot propelled by AI.

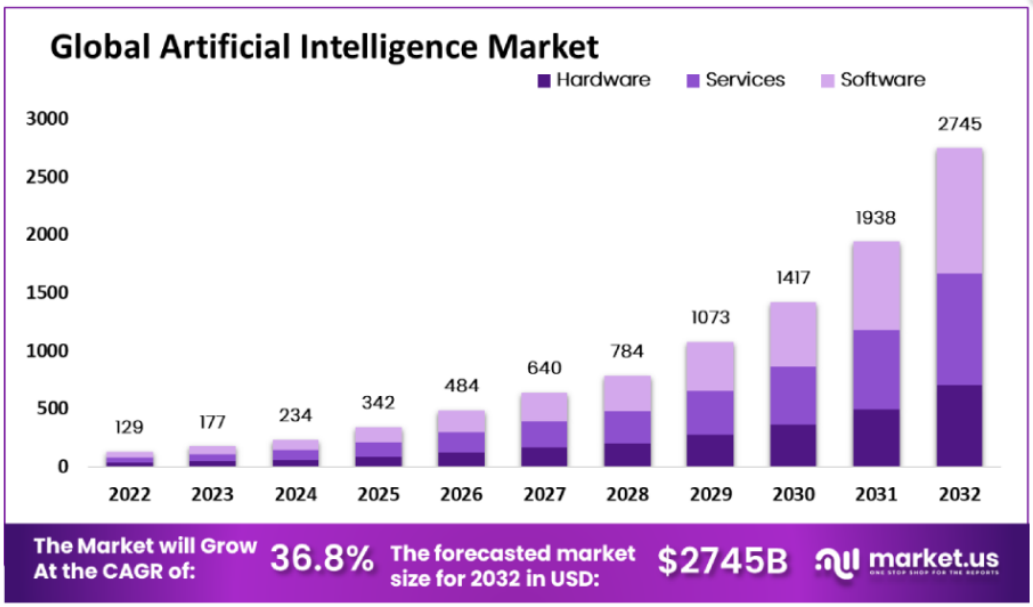
In November 2022, OpenAI, a research laboratory specializing in artificial intelligence, released a chatbot named ChatGPT. ChatGPT is an artificial intelligence interface designed for conversation. It utilizes natural language processing (NLP) to communicate in a realistic manner. It has the ability to respond to follow-up queries, acknowledge errors, question faulty assumptions, and decline improper requests (OpenAI, 2022). Although ChatGPT was initially designed to simulate human interaction, its functionality beyond this purpose. It has the capacity to generate original content, such as poems, stories, or novels, and may emulate other roles within the limits of its capabilities (Romero-Rodríguez et al., 2023, p. 2). ChatGPT represents a groundbreaking AI technology that has the potential to genuinely test the Turing Test and determine its ability to mimic human thought processes. While the long-term success of passing the Turing Test remains uncertain, it is undeniable that ChatGPT is a groundbreaking conversational AI-powered bot (Somoye, 2023). ChatGPT, unlike traditional chatbots, is built on GPT-3, the third version of the GPT series developed by OpenAI. GPT-3 is more advanced in terms of its scale, with 175 billion (Bonsu & Baffour-Koduah, 2023, p. 2) parameters compared to GPT-2's 1.5 billion (Tlili et al., 2023, p. 2). It also utilizes a larger dataset for training, incorporates more fine-tuning, and exhibits enhanced capabilities, resulting in more human-like text generation (Raman et al., 2023, p. 3). The utilization of NLP and a generative AI system that depends on deep learning has empowered ChatGPT to generate text that resembles human language and uphold a conversational manner, hence enabling more authentic and realistic natural discussions (Tlili et al., 2023, p. 2).

ChatGPT has emerged as a pioneering advancement in the field of educational technology, specifically in its use of conversational artificial intelligence. This AI model, constructed on a basis of comprehensive language training, possesses the

exceptional capability to comprehend natural language and context (Hasanein & Sobaih, 2023, p. 1). The potential of this technology in education is versatile, as it can accommodate individualized learning experiences for students. It accomplishes this by adaptively modifying the complexity of educational resources according to the individual advancement of each student. Additionally, ChatGPT has the capability to provide prompt feedback on students' assignments and optimize administrative duties such as evaluating and maintaining records. ChatGPT expands its influence beyond conventional classroom settings by providing students with crucial access to educational materials and support in remote learning environments, transcending the physical limitations of schools and universities. The adaptability and diversity of this technology make it a powerful tool for transforming education. It has the potential to greatly improve the learning experiences of students in many educational settings (Mhlanga, 2023, p. 1; Shaengchart, 2023, p. 2).

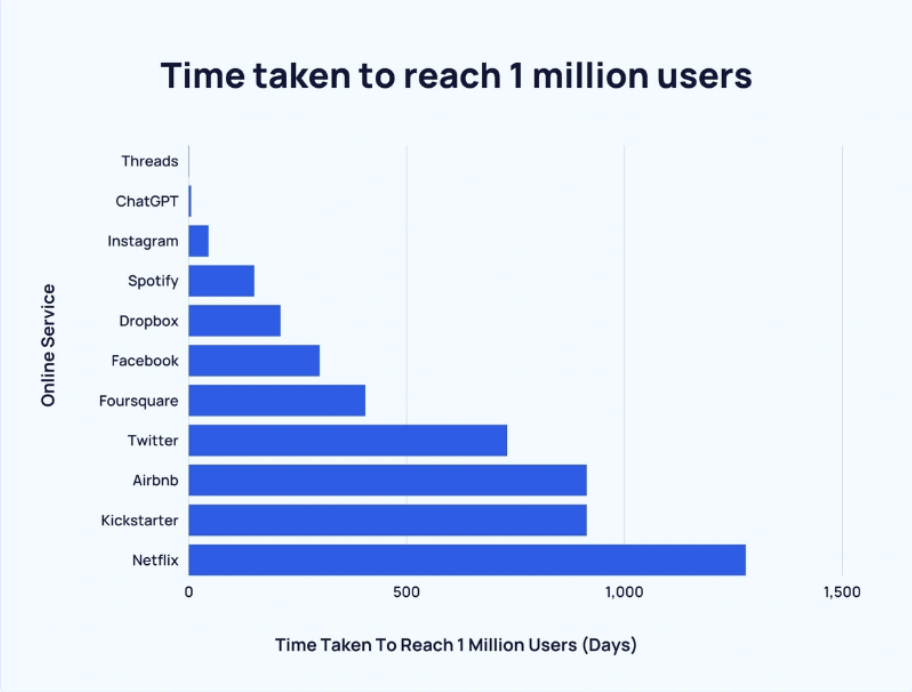
The potential of ChatGPT to produce essays has posed difficulties for instructors, nevertheless there are individuals who appear prepared to embrace the prospects for inventive approaches in instructing and learning that this disruptive AI application offers. According to Imran & Almusharraf (2023), this marks the commencement of an era characterized by the widespread integration of AI in education and learning. In this era, the utilization of freely accessible tools in everyday activities is increasingly becoming a tangible reality. Similarly, Rudolph et al., (2023) proposes involving students and teachers in the process of shaping and utilizing these AI tools to enhance learning, rather than prohibiting students from using them. Although ChatGPT poses a danger to the use of essays as evaluations, this situation presents an opportunity for instructors to implement creative evaluation methods. Instructors mostly employ assessments to evaluate students' learning. Most teachers lack the necessary skills to effectively utilize evaluation for both learning purposes and as a means of learning. Institutions can capitalize on this opportunity to bolster instructor proficiency in assessment and leverage disruptive AI tools like ChatGPT to boost students' learning (Rudolph et al., 2023).

Figure 1.1.1: Global Growth of AI Market



Source: market us. (2024). Artificial Intelligence Market. https://market.us/report/artificial-intelligence-market/

Figure 1.1.2: ChatGPT Users in 5 Days after Launching



Source: Duarte, F. (2024). Number of ChatGPT Users (Apr 2024). https://explodingtopics.com/blog/chatgpt-users

1.2 Problem Statements

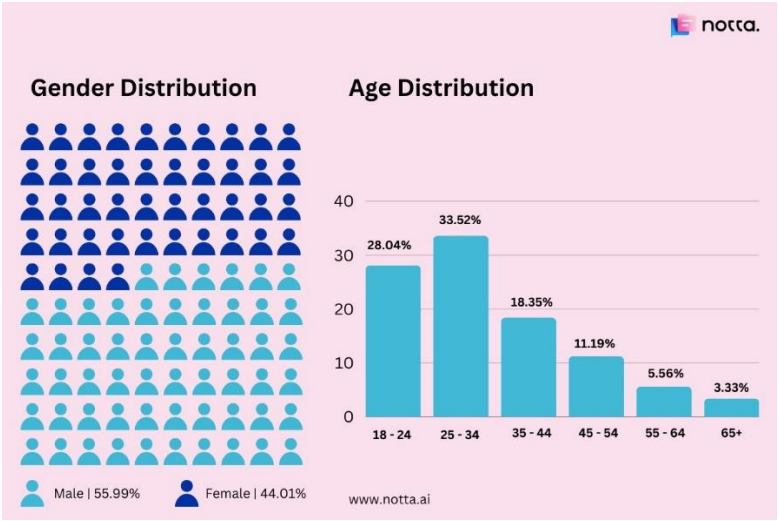
The implementation of AI applications that are oriented towards students presents remarkable possibilities for enhancing intelligent support systems for students and facilitate personalized and adaptive student learning (Zawacki-Richter et al., 2019). Intelligent tutoring systems (ITSs) are widely considered to be one of the most advantageous applications of artificial intelligence in the field of education. They are highly effective tools for customizing instruction to individual learners. The proliferation of personalization is now occurring as education academics explore novel learning models, leading to emerging prospects in the sector (Bahroun et al., 2023). By utilizing AI-powered algorithms, ITSs may now replicate the support offered by a tutor, including delivering tailored guidance in problem-solving. ChatGPT is taught using an extensive collection of textual data, allowing it to acquire knowledge of language patterns and associations. Consequently, it may produce novel material that closely resembles the text it was trained on. Nevertheless, the model employs a neural network structure known as a Transformer, which is highly adept at handling and producing textual content. Without comprehensive research, it seems that the technology underpinning ChatGPT has the potential to enhance the effectiveness of personalized adaptive learning. Currently, the ChatGPT model is mostly focused on refining its performance by fine-tuning certain tasks such as language translation or question answering. It is crucial to acknowledge that ChatGPT's remarkable skills and constraints stem from its operation, which is akin to Google's smart composition suggestions. It generates ideas by drawing from its prior reading and processing. As a result, it may give the impression of being self-assured without actually showing a profound comprehension of the topic. Although ChatGPT has demonstrated outstanding skills in assisting students with writing, AI-powered writing tools have previously been extensively utilized for a considerable duration (Rudolph et al., 2023). The fact that ChatGPT has generated significant anxiety within the academic world is paradoxical, considering that it has the potential to be highly beneficial for teachers in promoting more inventive methods of teaching and learning.

Prior to the launch of ChatGPT, there were already existing AI programs. However, the exceptional quality and complexity of ChatGPT's outputs have raised significant issues regarding academic integrity. These worries revolve around the potential misuse of the technology by students during university assessments. Within a span of less than two months since its launch, a portion of scholars have identified that approximately 20% of students are utilizing AI programs for assessment assignments (Cassidy, 2023). The current rate of student use may already exceed expectations. A survey of over one thousand university students conducted in January 2023 found that over one-third of the respondents were employing ChatGPT to complete assessments. Among these students, 75% acknowledged that their actions constituted cheating yet proceeded with it anyhow (Singh, 2023). These student behaviors lead many colleges to prohibit the utilization of ChatGPT and elicited descriptions from certain academics characterizing such tools as a "menace" and a "scourge on education" (Sullivan et al., 2023).

Thus far, academic viewpoints on ChatGPT have not reached a consensus about AI technologies posing a significant menace to higher education. Contrary to other viewpoints, some comments have acknowledged that although ChatGPT may include factual errors and biases, it can nonetheless improve student learning. Therefore, it is crucial for educators to adapt the instructional and assessment approaches to integrate the present conditions of living, employment, and learning in a world where AI is easily available (García-Peñalvo, 2023). In summary, these tools present a chance to reconsider an emphasis on written assignment completion and shift the attention towards the ways in which students are cultivating advanced critical thinking abilities. Moreover, they facilitate the comprehension of complex ideas by students through the use of accessible language and promote inclusivity for individuals with communication impairments (Hemsley et al., 2023). Educational institutions should prioritize instructing students on the ethical utilization of ChatGPT and comparable tools, with an emphasis on cultivating critical thinking skills.

This significant discourse necessitates additional investigation into the manners in which ChatGPT is being deliberated within the context of higher education. Decades of research have been devoted to AI and its effects on learning. Recent systematic reviews that examine the use of AI in higher education emphasize that research typically frames AI primarily as a tool to assist with administrative tasks and improve assignment feedback, rather than delving into issues pertaining to academic integrity (Sullivan et al., 2023). The utilization of ChatGPT by students gives rise to worries regarding the reduction of creativity, the influence on the learning culture, the erosion of originality, and the cultivation of dependence on technology (Elkhodr et al., 2023, p. 2). Additionally, it has raised concerns around plagiarism and breaches of academic integrity in higher education (Bin-Nashwan et al., 2023, p. 8). The purpose of this research is to identify the factors intended higher education to utilize ChatGPT. As stated by García-Avilés (2020), the adoption rate of an innovation is substantially influenced by the perceived attributes of that innovation. Therefore, it is necessary to gain a more thorough understanding of the elements that influence the decision to deploy ChatGPT in higher education.

Figure 1.2: ChatGPT Age Distribution as of September 2023



Source: Mahajan, V. (2023). *100+ Incredible ChatGPT Statistics & Facts in 2024*. https://www.notta.ai/en/blog/chatgpt-statistics

1.3 Research Objectives

The aim of conducting this research is to explore on the intention of utilizing ChatGPT in higher education.

1.3.1 General Objectives

The primary objective of this research is to understand in-depth of the intention of utilizing ChatGPT in higher education through identifying the key factors intended higher education to adopt ChatGPT.

1.3.2 Specific Objectives

The specific objective for this research is to investigate the relationship between the factors and the intention to adopt ChatGPT in higher education as shown as following:

i. To examine the relationship between the perceived usefulness and intention to adopt ChatGPT in higher education.
ii. To examine the relationship between the perceived ease of use and intention to adopt ChatGPT in higher education.
iii. To examine the relationship between the hedonic motivation and intention to adopt ChatGPT in higher education.
iv. To examine the relationship between the social influence and intention to adopt ChatGPT in higher education.

1.4 Research Questions

There are several questions generated in this research and it will be answered as following:

a) What are the relationships among perceived usefulness and intention to adopt ChatGPT in higher education?
b) What are the relationships among perceived ease of use and intention to adopt ChatGPT in higher education?
c) What are the relationships among hedonic motivation and intention to adopt ChatGPT in higher education?
d) What are the relationships among social influence and intention to adopt ChatGPT in higher education?

1.5 Hypothesis of Study

Followings are the developed of hypothesis included:

H_0: There is no significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.
H_1: There is a significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

H_0: There is no significant relationship between perceived ease of use and the intention to adopt ChatGPT in higher education.
H_2: There is a significant relationship between perceived ease of use and the intention to adopt ChatGPT in higher education.

H_0: There is no significant relationship between hedonic motivation and the intention to adopt ChatGPT in higher education.
H_3: There is a significant relationship between hedonic motivation and the intention to adopt ChatGPT in higher education.

H_0: There is no significant relationship between social influence and the intention to adopt ChatGPT in higher education.
H_4: There is a significant relationship between social influence and the intention to adopt ChatGPT in higher education.

1.6 Significant of Study

The research on the intention of utilizing ChatGPT in higher education is of great importance due to its capacity to fundamentally transform the educational environment. As technological advancements persistently transform educational paradigms, it is imperative for institutions, policymakers, and educators to comprehend the ramifications of integrating sophisticated AI tools such as ChatGPT. This research makes a scholarly contribution by providing insights into the manner in which the aforementioned factors will influence the intention to adopt ChatGPT in higher education. Furthermore, incorporating ethical considerations pertaining to bias, data privacy, and the cultivation of critical thinking abilities introduces an additional level of accountability to the process of integration. The results of this research can provide valuable insights for academic establishments seeking to determine the optimal level of ChatGPT integration, thereby maximizing its advantages and minimizing potential drawbacks. In essence, this research holds importance that transcends the realm of academia, as it will shape the future course of artificial intelligence in education and promote a more sophisticated and morally upright approach to learning environments powered by technology.

1.7 Conclusion

To summarise, Chapter 1 provided a fundamental comprehension of the investigation into the intention of utilizing ChatGPT in higher education. Additionally, it provides a crucial framework for future advancements in the field of research. Therefore, Chapter 2 will examine previous pertinent research conducted by diverse scholars to present a comprehensible overview of the study.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Chapter 2 will provide a comprehensive review of the literature that is pertinent to the study. This chapter comprises three sections that specifically examine the intention of utilizing ChatGPT in higher education. The initial section focuses on investigating the dependent variable, which is the intention to adopt ChatGPT. This is then followed by an examination of four independent variables (perceived usefulness, perceived ease of use, hedonic motivation, and social influence). The next section will involve an inquiry into relevant theoretical models. The last portion will consist of the proposed conceptual framework and hypotheses that will be explored in the research.

2.1 Underlying Theories and Models

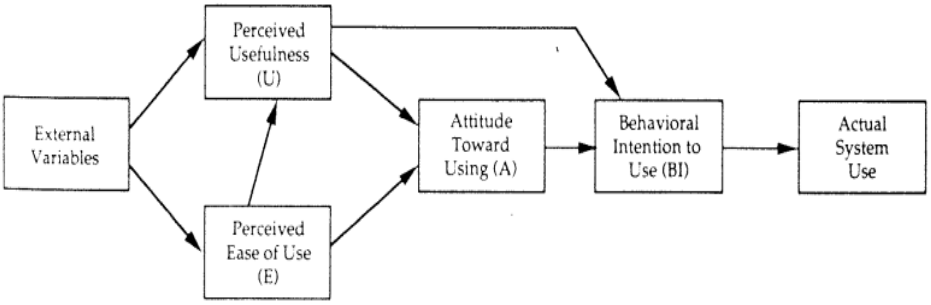
2.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), which was adapted from the "Theory of Reasoned Action" (TRA) by Fishbein & Ajzen (1977) and developed by (Davis et al., 1989, p. 985), is a model designed to forecast user acceptance of novel technologies. The objective of TAM is to provide an elucidation of the components that comprise technology acceptance by examining how individuals' conduct is influenced by their attitudes and intention to use towards a specific novel technology (Davis et al., 1989). The determination of TAM primarily relies on two critical variables: perceived usefulness and perceived ease of use.

Subsequent research has made extensive use of TAM to forecast the perceived usefulness and intention to use technology through the incorporation of context-specific individual variables, including subjective

norms, social influence, and previous experience (Venkatesh & Davis, 2000). Furthermore, TAM is frequently criticised for its simplicity, as it fails to incorporate other important factors such as the impact of social processes and subjective standards, which are offered in the TRA model. Thus, Venkatesh & Davis (2000) constructed TAM 2 to enhance the interpretative power of the original model by incorporating other theoretical variables such as social factors and cognitive factors. This was done to address the limitations of the original model, which did not explicitly account for persuasive influential elements. The evolution of TAM 2 incorporates the impact of subjective norms, such as social influence, which has greatly contributed to the advancement of AI adoption theories. This provides a valuable foundation for future studies to develop their conceptual framework, especially for present study.

Figure 2.1.1: Example of Technology Acceptance Model TAM



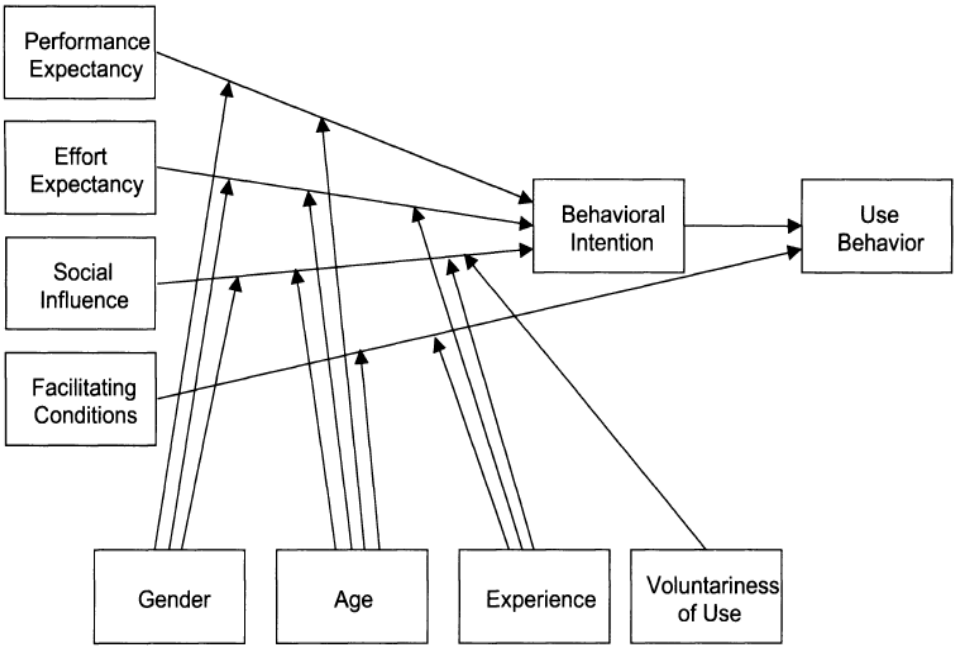
Source: (Davis et al., 1989, p. 985). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, *52*(8), 982–1003. https://doi.org/10.1287/mnsc.35.8.982

2.1.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

"Unified Theory of Acceptance and Use of Technology" (UTAUT) is a renowned theoretical framework that is frequently applied to explain and forecast technology acceptance (Venkatesh et al., 2003). The UTAUT framework consolidates the ideas and user interactions that constitute the basis for theories on how users accept and adopt an information system (Almaiah et al., 2019). The UTAUT model was developed by combining and consolidating eight existing models of information technology acceptance. The model incorporates components such as performance expectancy, social influence, effort expectancy, and facilitating conditions, which have been observed to have a substantial impact on the "behavioural intention" to utilise a technology. In addition, the UTAUT model takes into account individual variations, such as age, gender, voluntariness of use, and experience, as moderators of the four constructs.

In a recent development, UTAUT underwent an update to become UTAUT2, incorporating three additional constructs: habit, price value, and hedonic motivation (Venkatesh et al., 2012). UTAUT2 is a well-known theoretical framework that seeks to comprehend the factors that influence the acceptance and use of new technologies by individuals within both personal and organisational settings (Tamilmani et al., 2021). UTAUT2, which was formulated subsequent to an extensive empirical investigation, gives researchers with a comprehensive framework for determining critical variables that intent the adoption and utilization of technology. The UTAUT2 model is utilised in higher education to identify factors that influence the intentions of teachers or students to utilize various technological instruments, including e-learning systems.

Figure 2.1.2: Example of Unified Theory of Acceptance and Use of Technology (UTAUT)



Source: (Venkatesh et al., 2003, p. 447). *User Acceptance of Information Technology: Toward a Unified View*. *27*(3), 425–478.

2.2 Review of Literature & Hypothesis Development

2.2.1 ChatGPT

ChatGPT is a recent breakthrough in AI. It is a large language model (LLM) that has revolutionized the way we get information (Abdaljaleel et al., 2023). ChatGPT, a product created by OpenAI, a US-based firm founded in 2015, was published in its 3.5 version in November 2022. This state-of-the-art AI chatbot employs advanced deep learning methodologies and has undergone extensive training using a vast corpus of internet textual information (Shabitha & Mekala, 2023). ChatGPT has been developed as an innovative language model that is capable of producing text while mimicking human

conversation with a high degree of accuracy (Rahman & Watanobe, 2023). Consequently, it becomes exceedingly challenging to differentiate between a text generated by GPT and one produced by a human. GPT achieved a milestone of one million registered members in a span of five days (Firat, 2023, p. 2) and amassed a staggering 100 million active users in under three months (Menon & Shilpa, 2023, p. 2). Additionally, ChatGPT, powered by GPT-4, has the added capability of accepting photos as input (Cheng et al., 2023). ChatGPT has emerged as a formidable contender within the realm of search engines. ChatGPT is perceived as a threat to Google's monopoly as the provider of the preeminent search engine globally. Significantly, the integration of ChatGPT by Microsoft into its Bing search engine enables users to obtain responses that are more imaginative in nature (Zhang et al., 2023, p. 5&6). In other words, search engines aid users in locating the desired information, whereas ChatGPT facilitates replies through a reciprocal dialogue, thereby augmenting the user experience.

Due of its training on extensive Internet data and versatility in various tasks, the ChatGPT model utilizes the GPT-3 pretrained LLM as its starting point (Shihab et al., 2023, p. 1). Nevertheless, GPT-3 has the drawback of having "insufficiently defined behavior" (Rahman & Watanobe, 2023, p. 2). In order to prevent the generation of toxic and inaccurate responses, ChatGPT has implemented three distinct approaches which are supervised fine-tuning, reward modeling, and reinforcement learning. The procedure commences with the acquisition of a dataset comprising demonstrations by labelers, which is then employed to refine GPT-3 through supervised learning. Subsequently, a dataset including rankings of model output is employed to further enhance the supervised model using reinforcement learning based on human feedback. Ultimately, the model that is obtained is referred to as InstructGPT (Ouyang et al., 2022). ChatGPT utilizes a LLM to access online resources and gather knowledge, enabling it to offer accurate suggestions and responses. This is an application that utilizes a robust machine learning software system. An outstanding attribute of ChatGPT is its capacity to retain a continuous character or identity during a chat, hence providing more

authentic and cohesive dialogues rather than fragmented responses (Cai et al., 2023). This ability has been developed through rigorous training on a wide-ranging dataset comprising different types of conversational text, such as forum threads, chat records, and social media exchanges (Shaengchart et al., 2023, p. 4). This feature distinguishes ChatGPT as a more distinctive model compared to other Language Learning Models. ChatGPT has exhibited outstanding proficiency across multiple domains, encompassing the production of cohesive material and essays, provision of chatbot responses, language translation, query answering, and programming code generation (Haleem et al., 2022, p. 2). Within the realm of education, ChatGPT can provide support to students by aiding them in resolving intricate problems and inquiries, composing essays, and elucidating specialized subjects, hence expediting their learning process.

2.2.2 Perceived Usefulness

First and foremost, one of the factors that intent students in higher education to utilize ChatGPT is the perceived usefulness. The perceived usefulness component assessed a person's belief that employing technology would improve their performance and result in a better outcome (Bonsu & Baffour-Koduah, 2023, p. 6). In the context of ChatGPT, perceived usefulness pertains to the conviction that ChatGPT may augment academic achievement and streamline work, hence demonstrating its value as an educational tool (Shaengchart et al., 2023, p. 6). ChatGPT is a valuable tool that can aid individuals in completing their homework, tasks, and projects. Students have the opportunity to inquire, request clarifications, and receive assistance with their academic assignments (Hasanein & Sobaih, 2023). ChatGPT facilitated their comprehension of complex ideas and aided them in exam preparation. The explanations offered them alternate scenarios for subjects they had found difficult to comprehend, and it also furnished them with pertinent study materials (Jowarder, 2023, p. 3&4).

Besides, performance expectancy is one of the crucial elements that will impact perceived usefulness. Perceived usefulness refers to a more comprehensive notion that covers the total worth and benefits that users attribute to a technology. On the other hand, performance expectancy focuses specifically on the expectations connected to enhanced task performance. Performance expectancy, as it pertains to ChatGPT, denotes the degree to which students anticipate that the utilization of ChatGPT will enhance the effectiveness and efficiency of their task execution (Menon & Shilpa, 2023, p. 4). ChatGPT-generated summaries aid in enhancing students' reading and writing proficiency. Thus, it is reasonable to anticipate that students who have confidence in ChatGPT's ability to expedite learning activities, enhance learning outcomes, boost productivity and efficiency, and facilitate easy learning are more inclined to utilize ChatGPT for educational purposes (Foroughi et al., 2023, p. 5). Moreover, ChatGPT can assist them in enhancing their language proficiency through the provision of precise evaluations that improve the work's lucidity, coherence, and accuracy, thereby facilitating the effective communication of their ideas. By doing so, they not only enhance the calibre of their submissions but also cultivate and refine their writing abilities. Next, ChatGPT can be also utilized as a tool for problem-solving, which represents a paradigm shift in the field of education. This multifunctional AI-driven assistant offers prompt elucidation of intricate or perplexing concepts and addresses difficult mathematical problems encountered in academic pursuits. In addition, ChatGPT is capable of executing a multitude of data analysis functions. These include but are not limited to summarizing extensive text volumes, detecting patterns or recurrent themes in discussions, classifying information, resolving mathematical challenges, and delivering statistical or quantitative evaluations of the data it processes. It encourages independence and enables students to progress at their own tempo through the provision of detailed explanations and step-by-step solutions (Hasanein & Sobaih, 2023, p. 7&8).

H_1: There is a significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

2.2.3 Perceived Ease of Use

Next, another factor that will impact on the utilization of ChatGPT in higher education is perceived ease of use correlates with the notion that ChatGPT is intuitive and simple to interact with, thereby enhancing the product's probability of being adopted (Shaengchart et al., 2023, p. 6). The intuitive design of this technology significantly impacts students' choices regarding its seamless integration into their academic schedules. When ChatGPT is perceived as user-friendly in terms of navigation and interaction, the cognitive load that is commonly associated with acquiring and adjusting to a novel tool is mitigated (Abdaljaleel et al., 2023, p. 11). ChatGPT is capable of providing students with a streamlined, straightforward, amicable, and comprehensible interface through which they can submit inquiries, obtain replies, and navigate its various features (Hasanein & Sobaih, 2023, p. 7). The simplicity of use of ChatGPT establishes the foundation for an enduring and mutually beneficial association between students and the software. ChatGPT's intuitive interface enables its prompt usability by students from diverse backgrounds. By offering an immediate resource for elucidating intricate concepts, ChatGPT has the potential to diminish obstacles to learning in the realm of higher education. The user-friendly nature of the system can also provide a customized educational experience that caters to the specific requirements and preferences of each learner. Moreover, the fast functionality of ChatGPT in retrieving information and generating content can enable university students to dedicate additional time to comprehending intricate educational materials, resulting in a more efficient attainment of the desired learning objectives (Abdaljaleel et al., 2023, p. 11). Simultaneously, the user-friendly design of ChatGPT spared students from investing significant amounts of effort in digesting its functionality.

In addition, effort expectancy is one of the important factors that will influence perceived ease of use. Effort expectancy pertains to the level of simplicity connected with the utilization of the system (Foroughi et al., 2023, p. 6). Students' effort expectancy pertains to their perception of the level of

simplicity associated with utilizing ChatGPT for educational objectives. Although an innovation may offer benefits, there are those who contend that its implementation necessitates an extra level of exertion that ultimately undermines its advantages. Users are more inclined to adopt an innovation that possesses user-friendly features. Similar to conducting an Internet search, learning how to use ChatGPT does not require learners to invest additional effort (Foroughi et al., 2023, p. 6). Furthermore, ChatGPT provides convenient information access to students and teachers across several platforms, such as websites or smartphone apps, covering a wide range of subjects. It is a more effective tool in comparison to conventional search engines, as it provides a comprehensive response instead of a mere compilation of references (Farrokhnia et al., 2023, p. 4). ChatGPT possesses the capability to locate and condense pertinent material, hence facilitating swift access to detailed information for pupils. From an educational standpoint, ChatGPT can reduce the time students spend on accessing information, enabling individuals to devote a greater amount of time to perusing and conducting critical analysis of the material provided. Other than that, ChatGPT's processing speed can fluctuate based on a number of variables, including the quantity and intricacy of the queries. Conversely, by employing a sophisticated natural language processing architecture, ChatGPT has the capability to comprehend intricate queries and deliver pertinent responses instantaneously. A study examining the efficacy of ChatGPT for academic writing found that the response rate of ChatGPT was exceptionally fast, taking less than 2 minutes to generate a text output of 300-500 words. This feature has the potential to greatly streamline the information retrieval process, eliminating the need for users to manually scour through many sources and search engines. In an increasingly dynamic society where the pursuit of plausible solutions is often accompanied by time constraints or the requirement for prompt decision-making, this attribute can yield significant advantages (Farrokhnia et al., 2023, p. 3&4).

H_2: There is a significant relationship between perceived ease of use and the intention to adopt ChatGPT in higher education.

2.2.4 Hedonic Motivation

Other than that, the third factor that intent students in higher education to utilize ChatGPT is hedonic motivation. Hedonic motivation pertains to the pleasurable experience derived from utilizing novel technologies. Hedonic motivation refers to the degree to which students perceive the use of ChatGPT for academic purposes as pleasurable, entertaining, and exciting (Foroughi et al., 2023, p. 6). Previous research in the field of e-learning has established that the adoption of new learning technologies is influenced by hedonic motivation. E-learners are more inclined to discover engaging, enjoyable, and beneficial courses that exhibit proficiency, interactivity, and well-structured content. The conversational nature of ChatGPT has the potential to enhance enjoyment and amusement. ChatGPT offers learners a pleasurable experience despite being exclusively a digital application; its capability of generating responses that imitate human writing is what sets it apart (Foroughi et al., 2023, p, 7).

In addition to its practical benefits, the happiness and pleasure experienced by students when utilizing ChatGPT becomes a significant motivating factor. Students are more inclined to integrate ChatGPT into their academic regimens when their interactions with it are both exciting and gratifying. The hedonic aspect of the tool's appeal is enhanced by its capacity to provide an innovative and interactive learning experience, surpassing its functional limitations (Ali et al., 2023). Students, who frequently encounter the challenges of higher education, value a tool that not only fulfils educational objectives but also adds a sense of enjoyment to their learning experience. The newness of interacting with a language model such as ChatGPT, together with the possibility for imaginative and participatory exchanges, amplifies its pleasure-driven motivation. In an educational environment where conventional learning approaches can occasionally feel repetitive, the introduction of a device that not only assists with academic duties but also offers a pleasurable and intellectually engaging experience can be highly valued (Risang Baskara, 2023). With the growing number of students

looking for tools that complement their personal preferences and enhance the learning experience, the hedonic motivation linked to ChatGPT emerges as a significant factor, cultivating favourable attitudes and reinforcing its status as a valuable and pleasurable companion in the quest for knowledge and scholastic distinction.

The need for exceptional academic and non-academic (administrative) support services has grown in order to aid students in their studies and foster their enthusiasm for learning (Zhao et al., 2022). Integrating ChatGPT can facilitate the establishment of a supportive learning atmosphere for students through the provision of prompt and precise information, alleviating administrative difficulties, and serving as a cost-effective solution for higher education institutions. Furthermore, previous studies have established a positive correlation between the implementation of chatbots and online messaging systems and the augmentation of student engagement within institutions of higher education (Abbas et al., 2022). ChatGPT possesses the capacity to yield substantial advantages for students in tertiary education institutions. The constructivist view of learning highlights the significance of active learning, wherein learners engage actively in their own learning process rather than being passive recipients of information.

Therefore, ChatGPT assumes a pivotal function in enhancing students' self-confidence (Ali et al., 2023, p. 4). Students construct a sense of mastery and proficiency in the subject when they are provided with timely and precise answers to their inquiries and difficulties. In addition, ChatGPT's assistance can assist students in completing difficult problems and assignments, boosting their self-confidence and competence in managing scholastic obligations (Cao, 2023). Regarding punctual submission, ChatGPT has the potential to greatly enhance time management abilities, as it enables students to dedicate more time towards researching, writing, and correcting their assignments. ChatGPT's assistance enables students to effectively meet deadlines, eliminating the anxiety associated with last-minute rushes and resulting in a greater frequency of timely submissions. Additionally, the efficiency gained from utilizing ChatGPT for activities like as research and

content creation enable students to allocate their time and attention to other facets of their education, fostering a more harmonious and controllable workload (Hasanein & Sobaih, 2023, p. 9).

H_3: There is a significant relationship between hedonic motivation and the intention to adopt ChatGPT in higher education.

2.2.5 Social Influence

Last but not least, social influence is one of the factors that intent students in higher education to utilize ChatGPT. Social influence refers to the extent to which an individual believes that influential people in their life expect them to adopt and utilize the new system (Romero-Rodríguez et al., 2023, p. 327). Social influence is a potent determinant in moulding attitudes and behaviours, may exert a substantial impact on the adoption of ChatGPT among university students. Social influence is of considerable importance during the initial phases of technology penetration, when users are not acquainted with the innovation and are unsure of its operation (Skare & Riberio Soriano, 2021). Social influence in education refers to the impact of the immediate social surroundings. A domino effect can be generated by the decisions and selections of peers, educators, or influential members of the academic community, which may motivate students to adopt novel technologies such as ChatGPT (Strzelecki, 2023, p. 3). When utilizing novel technologies, individuals often experience a sense of uncertainty and depend on their immediate networks for direction. Individuals partake in such conduct in order to adhere to collective standards or enhance their public perception (Foroughi et al., 2023, p. 6).

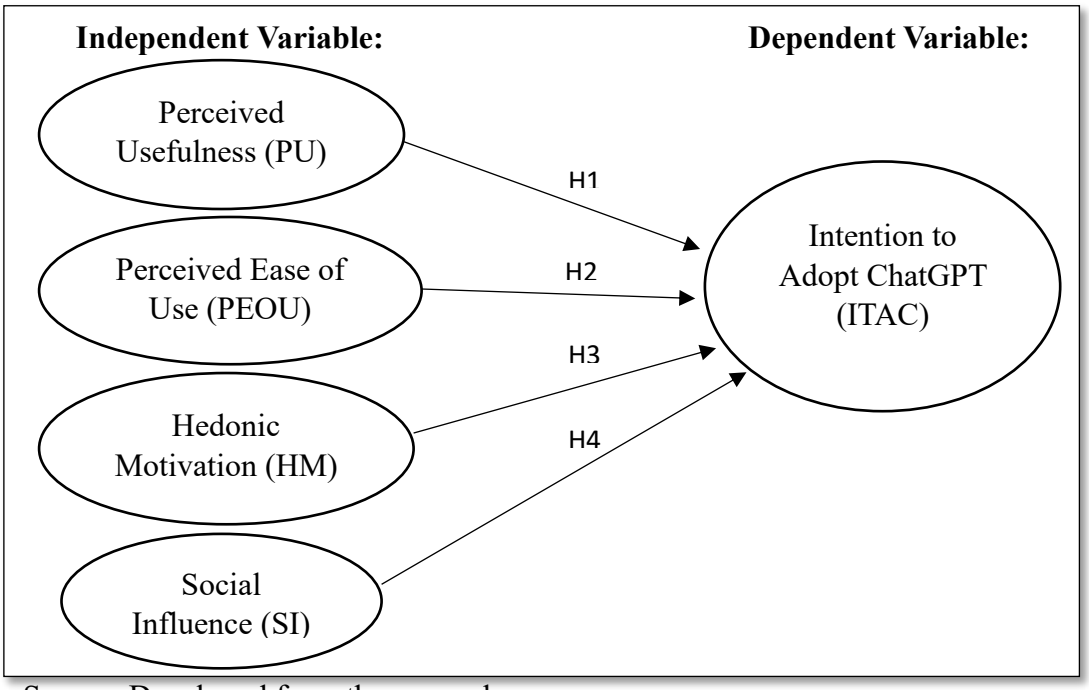
The endorsement and integration of ChatGPT by esteemed professors or influential peers into their academic practices has the potential to establish a social norm that motivates other students to emulate this behaviour. In addition, the cooperative aspect of higher education frequently entails

collective assignments and deliberations. If ChatGPT demonstrates its ability to improve collaboration and communication, it has the potential to be embraced by students as a shared tool, motivated by the aspiration to conform to the social dynamics of the academic sphere (Fauzi et al., 2023). Furthermore, perceptions can be substantially shaped by the impact of online communities and platforms where students share their insights and recommendations (Jowarder, 2023, p. 3). For instance, positive peer ratings and testimonials can foster trust and dependability, inspiring students to actively engage with and integrate ChatGPT into their personal learning approaches. Within this particular social environment, where the viewpoints and behaviours of others carry significant weight, the element of social influence emerges as a potent catalyst in motivating students to embrace ChatGPT as a valuable asset throughout their pursuit of higher education.

H_4: There is a significant relationship between social influence and the intention to adopt ChatGPT in higher education.

2.3 Proposed Theoretical Conceptual Framework

Figure 2.3: Proposed Conceptual Framework



Source: Developed from the research

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

This chapter will provide an overview of the diverse methods utilized in our study, including research design, data collection methods, data sampling, design instruments, measurement construction for our research, data analysis, and data processing.

3.1 Research Design

The research design, also referred to as the structure of research, serves as a comprehensive blueprint for the intended research endeavour, outlining the methodologies and processes that will be employed to collect and analyse the needed data. The research design is a detailed plan that outlines the sources and types of information necessary for addressing the research problem (Abutabenjeh & Jaradat, 2018). This research has utilized quantitative, causal, and descriptive conceptual frameworks.

3.1.1 Quantitative Research

Quantitative research involves the systematic study of phenomena by processing and analyzing numerical data, as well as doing mathematical and statistical analysis. Quantitative research aims to identify patterns in human behavior by breaking down the social environment into measurable elements known as variables, which can be expressed in numerical terms such as rates or frequencies. It was used to identify the impact of perceived usefulness, perceived ease of use, hedonic motivation, and social influence on the intention of higher education towards utilizing ChatGPT. Through

this research, it able to show which of the independent variables have the most significant impact towards the intention of higher education in utilizing ChatGPT.

3.1.2 Descriptive Research

Descriptive study aims to provide a detailed account of the characteristics of a population. It attempts to respond to questions about the characteristics of a population, such as who, what, when, where, and how, in order to gather essential information for further analysis of demographic data (Co, 2012, p. 22).

3.2 Data Collection Method

Data collection is the systematic gathering, evaluation, and analysis of accurate information for research purposes using established methodologies. A researcher can evaluate the hypothesis by analyzing the gathered data. Data collection methods change based on the specific subject of study and the required data. The primary goal of data collecting is to ensure the collection of reliable and informative data for statistical analysis, enabling data-driven decision-making in research. There are two types of data collection methods which are primary data and secondary data (Mazhar, 2021, p. 6).

3.2.1 Primary Data

Primary data consists of information that is newly collected and of the initial generation. Experimental research involves collecting primary data through experiments (Mazhar, 2021, p. 6&7). On the other hand, descriptive research and surveys get primary data through observation or direct discussion with respondents. The data are collected with a specific focus on

addressing the research objectives, resulting in which variables are more validity and reliability. Primary data can identify which factors have strongly influence the intention of higher education in utilizing ChatGPT. As a result, a questionnaire was chosen as the investigational instrument for collecting primary data for the current study.

3.3 Sampling Design

Sampling is the systematic procedure in which a researcher deliberately chooses a subset of individuals from a broader population of interest using both probability and non-probability approaches for the purpose of conducting a more detailed investigation. Sampling design should, whenever feasible, provide inclusion and exclusion criteria to define the parameters for selecting or excluding items from a certain study population (Mweshi & Sakyi, 2020, p. 1&2).

3.3.1 Target Population

The target population refers to the complete set of persons that the researcher aims to study and derive conclusions from. The current research aims to focus on Malaysians who pursuing in higher education that are utilizing ChatGPT. In fact, most of the users of ChatGPT are from the age range of 18 to 34 (Appendix 1). Therefore, the target population of this research is focusing on the users in higher education.

3.3.2 Sampling Frame and Sampling Elements

A sampling frame consists of a selected subset of the student's population that serves as a representative sample of the entire population. The participants who are offering their responses in the questionnaire constitute

the sampling elements of this study. However, a sampling frame was not provided in the present investigation. Thus, the current research study employed a non-probability sampling strategy, which eliminates the need for a sample frame. While sampling elements for this study involve gender, age range and current educational level of participants.

3.3.3 Sampling Location

In order to collect data, survey questionnaire will be distributed through online to university students and reached in the universities such as University Tunku Abdul Rahman (UTAR) Sungai Long campus. This is because reach in the students in UTAR Sungai Long campus is the most effective way to collect qualified respondents for this survey.

3.3.4 Sampling Techniques

There are two most common types of sampling techniques which are probability sampling and non-probability sampling. Probability sampling is founded upon the principles of probability theory and encompasses the implementation of any sampling strategy that ensures each element in the population has an equal and identifiable opportunity of being selected, without any zero-sum outcomes (Mweshi & Sakyi, 2020, p. 6&7). However, non-probability sampling refers to non-random criteria are used to select participants; therefore, not all individuals are afforded an equal opportunity of being included (Mweshi & Sakyi, 2020, p. 10).

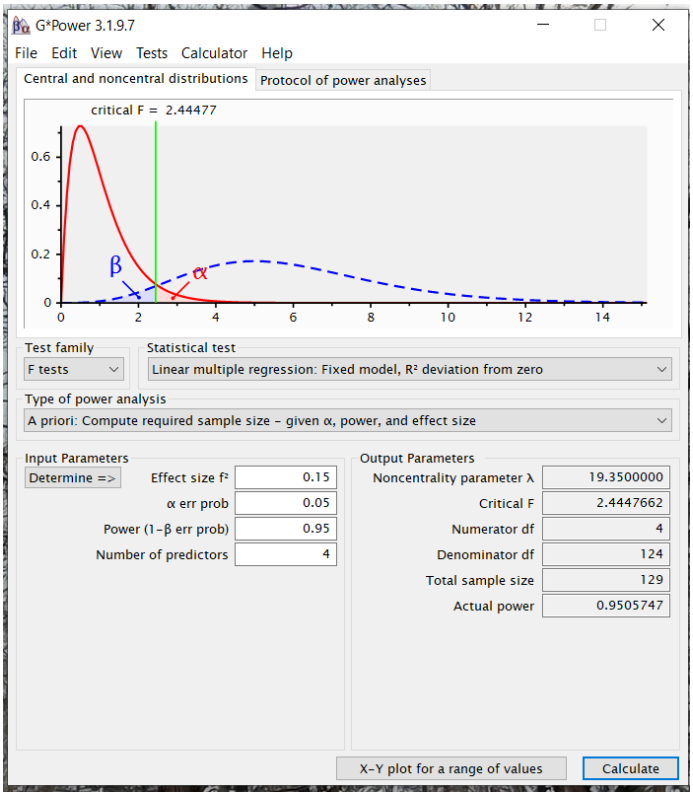
In this study, one of the non-probability samplings has been adopted which is convenience sampling. Convenience sampling enables researchers to select subjects or individuals based on their easy accessibility, availability, and closeness. It is more efficient by selecting every eligible individual from the target group until the desired sample size is reached (Mweshi & Sakyi,

2020, p. 11). Consequently, the current study will utilise Google Form, a software for survey administration, to disseminate the questionnaire efficiently and cost-effectively through a website link in order to collect data and information. The questionnaire website link will be distributed via various social networking platforms such as WhatsApp, Facebook, Instagram, WeChat, and others to ChatGPT users in higher education. However, a limitation of the convenience sampling method is the presence of selection bias, which prevents the generalisation of the study's findings to the entire population.

3.3.5 Sampling Size

Often, the procedure of determining the appropriate sample size and conducting a power analysis is too intricate and challenging for commonly used programmes to be practical. In order to determine sample size or conduct power analysis, several software programmes necessitate a comprehensive understanding of statistics and/or software development, while other commercial programmes are prohibitively costly for practical use (Kang, 2021). In order to obviate the necessity for profound expertise in software development and statistics, we discovered the G*Power software for determining sample size and power that utilizing the graphical user interface (GUI). The G*Power software is user-friendly and allows for the calculation of sample size and power for a range of statistical procedures, including F, t, $\chi 2$, Z, and exact tests. In addition, it is available for free download (Kang, 2021).

Figure 3.3.5: Result from G*Power 3.1.9.7



Source: Developed for research

As a result, a sample size of 129 was determined, with a confidence level (α) of 95%, a desired precision level (e) of 5%. Therefore, in order to reduce the likelihood of obtaining inaccurate or unreliable data from the participants, the present study aims to increase the sample size from the recommended 129 to 200 samples.

3.4 Research Instruments

A research instrument is a specialised tool used to collect, quantify, and analyse data that is pertinent to the subjects being studied. The research instruments utilized in the current study consist of questionnaires and a pilot test.

3.4.1 Questionnaire Design Instruments

A questionnaire is a research tool that is specifically built with a series of questions in order to gather information from respondents. A well-crafted questionnaire has the ability to produce precise and impactful data. To effectively reach a wide range of individuals, the present study has suggested the use of an online questionnaire via Google Form for conducting the research. Consequently, the questionnaire was formulated using closed-ended questions, enabling respondents to independently complete it without the researcher's involvement. Moreover, the questionnaire was constructed using the findings from the literature review in order to investigate the correlation between perceived usefulness, perceived ease of use, hedonic motivation and social influence in relation to the intention of higher education in utilizing ChatGPT.

There is total 26 questions involved in the questionnaire, and it has divided into section A and B. In section A, it consists of four questions about the demographic information of the respondents which are gender, age, current education level, and race/ ethnicity. Then, there are two general questions regarding ChatGPT in order to identify the appropriate respondents.

In section B, there is total of twenty scale questions which regarding the intention of higher education to utilizing ChatGPT. The independent variables (i.e. perceived usefulness, perceived ease of use, hedonic motivation, and social influence), and dependent variable (i.e. intention to adopt ChatGPT) have been measured by 5-point Likert Scale, ranging from "1-Strongly Disagree", "2-Disagree", "3-Neutral", "4-Agree", to "5-Strongly Agree." Table 3.1 has displayed the summary of measures.

Table 3.4.1: Summary of Measures

Variables	Construct	Number of items	Measurement Scale
Independent Variables	**Perceived Usefulness**	5	5-Point Likert Scale (1=Strongly Disagree to 5=Strongly Agree)
	Perceived Ease of Use	5	5-Point Likert Scale (1=Strongly Disagree to 5=Strongly Agree)
	Hedonic Motivation	5	5-Point Likert Scale (1=Strongly Disagree to 5=Strongly Agree)
	Social Influence	2	5-Point Likert Scale (1=Strongly Disagree to 5=Strongly Agree)
Dependent Variable	**Intention to Adopt ChatGPT**	3	5-Point Likert Scale (1=Strongly Disagree to 5=Strongly Agree)

Source: Developed for research

3.4.2 Pilot Test

A pilot study is a preliminary investigation aimed at assessing the viability of different facets of the methodologies intended for a more extensive, rigorous, or confirmatory trial. The primary purpose of conducting a pilot study is to assess the questionnaire's validity and reliability, and to ensure that the questions posed are understandable to the participants (Lowe, 2019). From the study of Lowe (2019), it suggests that a sample size of 10 - 20% of the total data amount is adequate.

Consequently, a total of 21 sets of questionnaires were disseminated via an online platform for the purpose of pilot testing in the present study. Furthermore, the researcher has the ability to make modifications to the questionnaire depending on the feedback provided by the respondents, as indicated by the pilot results, prior to starting with the actual study. In addition, the reliability test in this study was conducted using the "Statistical Package for the Social Sciences" (SPSS) system. According to the research conducted by Taber (2017, p. 1278), Cronbach's alpha is a statistical metric used to assess the internal consistency reliability of a measured value in relation to the measured object. Taber (2017, p. 1278) states that a Cronbach's alpha coefficient of 0.7 or higher is considered to indicate a high level of reliability. According to the findings presented in Table 3.2, the cumulative score for each item variable surpasses 0.7, suggesting that the research exhibits a notable degree of dependability and consistency.

Table 3.4.2 Reliability Statistic for Pilot Test

Variables	Cronbach's Alpha	No. of Items
PU	0.847	5
PEOU	0.789	5
HM	0.891	5
SI	0.886	2
ITAC	0.786	3

Source: Developed for research

3.5 Construct Measurement

3.5.1 Scale of Measurements

In Section A, the questionnaire has employed a nominal scale to ascertain the gender and ethnicity of the participants. In contrast, the ordinal scale was utilized to ascertain the age and current education level of the respondents.

Next, the questionnaire has applied nominal scale for the screening questions that consisting of "Yes" and "No".

In Section B, the interval scale has been adopted to determine the respondents' attitude regarding the intention of utilizing ChatGPT. Utilising a 5-point Likert Scale spanning from "1-Strongly Disagree" to "5-Strongly Agree," the dependent and independent variables (i.e. intention to adopt ChatGPT, perceived usefulness, perceived ease of use, hedonic motivation, and social influence) were assessed by eliciting the respondent's degree of agreement with the statements concerning the ChatGPT.

3.5.2 Origins of Constructs

In this study, the original construct elements have been incorporated and adjusted to align with the current research environment. The formulation of the formula for the construct of independent and dependent variables is as follows:

Table 3.5.2: Origin of Constructs

Variables	Constructs	Sources
Perceived Usefulness	Utilizing ChatGPT enhanced my learning experience.	Raman, R., Mandal, S., Das, P., Kaur, T., JP, S., & Nedungadi, P. (2023)
	ChatGPT aligns seamlessly with my preferred learning approach.	
	Utilizing ChatGPT will enhance the standard of my work.	
	ChatGPT is an excellent study tool.	Ngo, T. T. A. (2017)
	ChatGPT can assist in comprehending concepts and theories.	

Perceived Ease of Use	I easily comprehended the navigation of ChatGPT.	Raman, R., Mandal, S., Das, P., Kaur, T., JP, S., & Nedungadi, P. (2023)
	The usage instructions for ChatGPT were straightforward.	
	ChatGPT operates as a search engine.	Ngo, T. T. A. (2017)
	ChatGPT is prompt in its responses.	
	ChatGPT can assist in optimising the time usage.	
Hedonic Motivation	ChatGPT enhanced my enjoyment significantly.	Raman, R., Mandal, S., Das, P., Kaur, T., JP, S., & Nedungadi, P. (2023)
	ChatGPT can augment my learning by providing tailored and adaptable learning experiences.	Ngo, T. T. A. (2017)
	I am inclined to utilize ChatGPT more frequently due to a sense of motivation.	Shoufan, A. (2023)
	ChatGPT provided essential tools and resources that augment to my learning experience, thereby enhancing my self-confidence.	Hasanein, A. M., & Sobaih, A. E. E. (2023)
	ChatGPT can help and lead me with a variety of administrative tasks to make my learning better.	

Social Influence	I have observed other individuals use ChatGPT.	Raman, R., Mandal, S., Das, P., Kaur, T., JP, S., & Nedungadi, P. (2023)
	I will sign up for ChatGPT after seeing my friends utilizing it.	
Intention to Adopt ChatGPT	I will definitely use ChatGPT to help me study.	Raman, R., Mandal, S., Das, P., Kaur, T., JP, S., & Nedungadi, P. (2023)
	I am interested in using ChatGPT to learn.	
	ChatGPT will definitely aid me in my learning	

Source: Developed for research

3.6 Data Processing

Data processing refers to the systematic procedure of gathering and converting a raw dataset into information that is both useful and valuable. The process entails checking questionnaires, data editing, data coding, transcribing, and cleaning data.

3.6.1 Questionnaire Checking

Following the completion of the pilot test, a comprehensive questionnaire checking process will be implemented to ascertain that the final question is devoid of any errors. The questionnaire checking procedure is conducted to identify any errors in the questionnaire, including issues about the questions, question flow, grammar, and other related aspects. The purpose of this measure is to guarantee the integrity of the study data and to ensure that the respondents comprehend the questions posed.

3.6.2 Data Editing

Data editing refers to the systematic process of discovering and correcting errors present in observable data (de Waal, 2013, p. 475). If ambiguous or inaccurate data collected from the participants has the potential to compromise the integrity of the overall findings, it will be excluded. Therefore, data modification is an essential step prior to transferring the data for analysis. It contributes to the maintenance of the research's quality by reducing the likelihood of errors.

3.6.3 Data Coding

The data should be standardised and converted to numeric form prior to coding. Each category that is classified in the questionnaires will be allocated a series number. For instance, in Section A of the questionnaire for this research, males are coded as 1 and females are coded as 2. Additionally, as indicated in Section B, respondents' levels of agreement with the statements can be encoded as 1 to 5, ranging from strongly disagree to strongly agree.

3.6.4 Data Transcribing

Data transcription pertains to the procedure of entering coded data obtained from eligible participants into a statistical analysis software, specifically the SPSS. Subsequently, the researcher will employ SPSS software to execute the gathered data in order to examine hypotheses and examine the outcomes.

3.6.5 Data Cleaning

Data cleansing is a procedure that involves thoroughly examining and addressing missing responses to ensure consistency and appropriateness. The process entails conducting consistency checks to eliminate data points that exhibit logical inconsistencies and fall outside the acceptable range (Chu et al., 2016). Additionally, it involves identifying missing replies that correspond to unknown values within a variable. In this study, the SPSS Version 28 was used to do data cleaning in order to enhance the data quality.

3.7 Data Analysis Tools

3.7.1 Data Analysis

Data analysis involves the interpretation of data using a specialised analytical tool, such as SPSS in this study, to examine information obtained from survey data and aid in making informed business decisions. Data analysis encompasses two distinct types which are descriptive analysis and inferential analysis.

3.7.2 Descriptive Analysis

In order to provide an organised summary of data, descriptive statistics illustrate the relationship between variables within a population (Pyzdek, 2021, p. 1). In the current research, frequency distribution analysis was utilised to convert the analysed data into tabular or graphical representations, including bar and pie charts. It entails the utilisation of frequency and percentage measures to analyse the data gathered in Section A, which consists of the respondent's demographic and general information.

Moreover, the data collected in Section B were analysed utilising measures of central tendency (i.e., mean) and degree of dispersion (i.e., range, standard deviation, and variance).

3.7.3 Reliability Test

A reliability test is an indicator utilized to assess internal consistency, which pertains to the extent to which measurements are devoid of inflexible error and, consequently, produce consistent outcomes. Satisfying the reliability test will enhance transparency and diminish the likelihood of bias (Livingston, 2018). The researcher estimated the reliability of multiple-item scales using Cronbach's Alpha Coefficient rules of thumb in order to evaluate the dependability of variables. The size of the coefficient is detailed in Table 3.7.3.

Table 3.7.3 Rules of Thumb of Cronbach's Alpha Coefficient Size

Coefficient Range	**Indicator**
< 0.6	Poor
0.6 to < 0.7	Moderate
0.7 to < 0.8	Good
0.8 to < 0.9	Very Good
> 0.9	Excellent

Source: Livingston, S. A. (2018). Test Reliability - Basic Concepts. *Research Memorandum ETS RM-18-01, January,* 1–38. https://www.ets.org/Media/Research/pdf/RM-18-01.pdf

3.7.4 Inferential Analysis

In this study, inferential analysis is implemented to ascertain the validity of the hypothesis through the examination of the interrelation among the variables (Jargowsky & Yang, 2004, p. 31). Previous studies have indicated a variety of statistical inference techniques that can be employed for the purpose of data interpretation. This research has utilised Multiple Regression Analysis to forecast and deduce the relationship between independent and dependent variables.

3.7.4.1 Multiple Regression Analysis

Multiple regression analysis is a methodological approach utilized to examine the linear association between a dependent variable and many independent variables. The utilization of multiple regression analysis is deemed suitable in cases where both the dependent and independent variables can be quantified using a consistent scale (Uyanık & Güler, 2013, p. 234&235).

Figure 3.7.4.1: Example of Multiple Linear Regression Equation

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots + b_nX_n + e_i$$

Source: Uyanık, G. K., & Güler, N. (2013). A Study on Multiple Linear Regression Analysis. Procedia - *Social and Behavioral Sciences, 106,* 234–240. https://doi.org/10.1016/j.sbspro.2013.12.027

Whereby,

Y = Dependent variable

b_0 = Constant term (y-intercept)

X_n= Different independent variables

b_n= Regression coefficient (slope of coefficient for each IV)

e_i = Error term

According to the equation model above, the researcher has developed a multiple linear regression equation for this study:

ITAC = b0 + b1 (PU) + b2 (PEOU) + b3 (HM) + b4 (SI) +e

Whereby,

ITAC = Intention to adopt ChatGPT

PU = Perceived usefulness

PEOU = Perceived ease of use

HM = Hedonic motivation

SI = Social influence

3.8 Conclusion

Overall, this chapter has provided a comprehensive overview of the methodologies employed in the execution of the full research endeavour. In order to conduct data analysis and interpretation, a total of 200 sets of questionnaires will be given to the target respondents. The collected data will then be entered into the SPSS software.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

In Chapter 4, the findings will be presented, and the obtained data will be analysed in relation to the research questions and hypotheses. SPSS software will be implemented for testing on all gathered data and concluding the research.

4.1 Descriptive Analysis

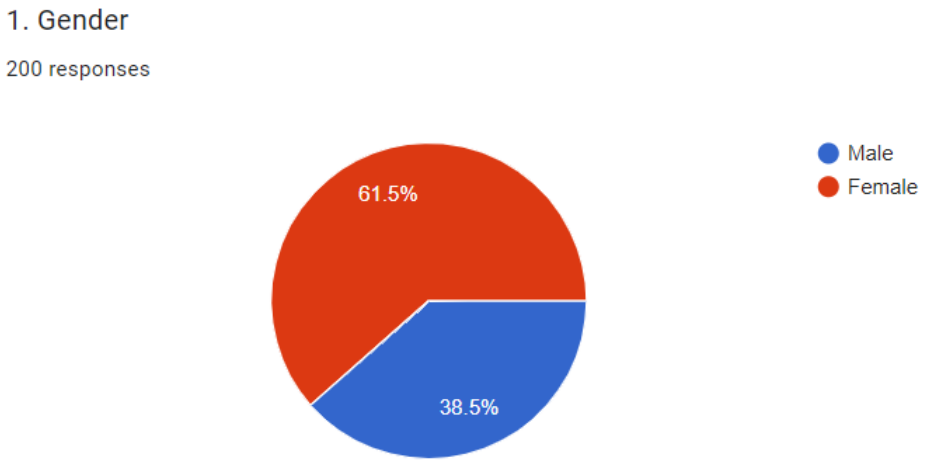
In this section, relevant tables and figures will be employed to examine the demographic characteristics of the respondents. There are 200 valid questionnaires will be used in this study.

4.1.1 Respondents' Demographic Profile

There are four (4) demographic questions in Section A which are gender, age, current education level, and race/ ethnicity.

4.1.1.1 Gender

Figure 4.1.1.1: Percentage of Respondents Based on Gender



Source: Developed for research

Table 4.1.1.1: Result of Respondents Based on Gender

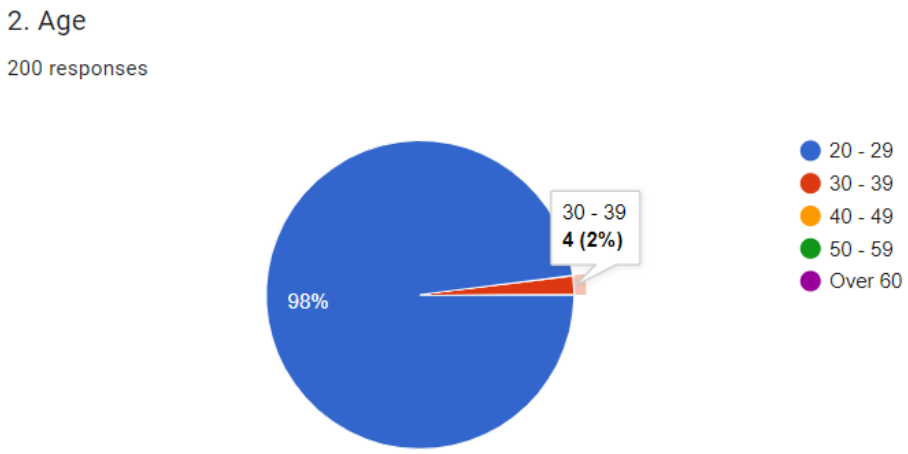
	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
Female	123	61.5	61.5	61.5
Male	77	38.5	38.5	100
Total	200	100	100	

Source: Developed for research

According to the Figure and Table 4.1.1.1 above, there are 200 respondents participated in this study. From the data above, it shown that there are 123 (61.5%) female and 77 (38.5%) male.

4.1.1.2 Age

Figure 4.1.1.2: Percentage of Respondents Based on Age



Source: Developed for reserch

Table 4.1.1.2: Result of Respondents Based on Age

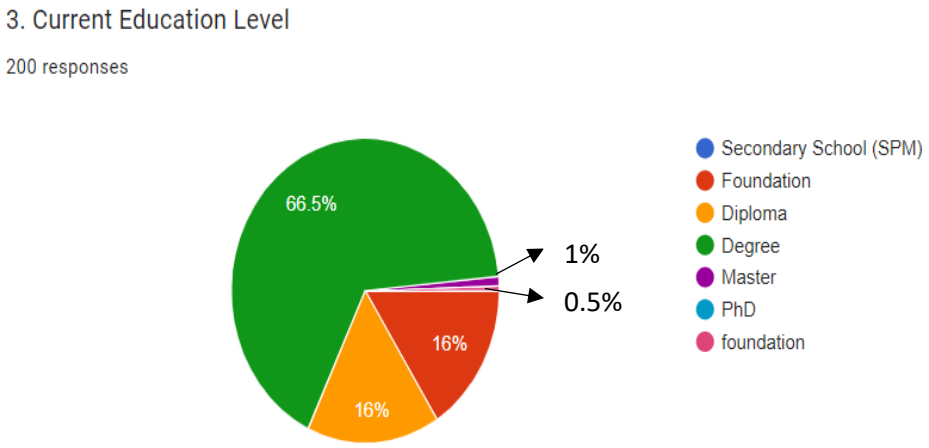
	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
20-29	196	98	98	98
30-39	4	2	2	100
Total	200	100	100	

Source: Developed for research

In this research, it would focus on age groups that involved in higher education. According to Figure and Table 4.1.1.2, majority of the respondents are between 20-29 years which accounted for 98% (196), while the remaining 2% (4) are between 30-39 years.

4.1.1.3 Current Education Level

Figure 4.1.1.3: Percentage of Respondents Based on Current Education Level



Source: Developed for research

Table 4.1.1.3: Result of Respondents Based on Current Education Level

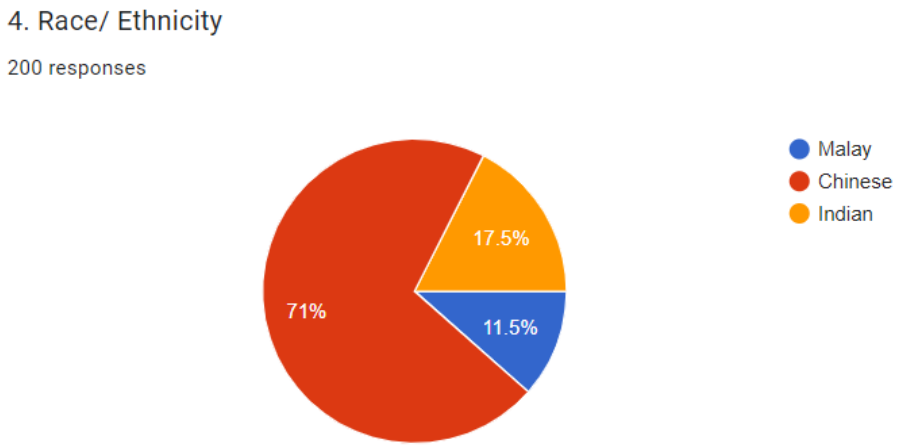
	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
Degree	133	66.5	66.5	66.5
Diploma	32	16	16	82.5
Foundation	33	16.5	16.5	99
Master	2	1	1	100
Total	200	100	100	

Source: Developed for research

According to the Figure 4.1.1.3 and Table 4.1.1.3, it has clearly shown that most of the respondents are studying in Degree, which accounts for 133 (66.5%) of the total respondents. Besides, there are 33 (16.5%) respondents are studying in Foundation, followed by 32 (16%) are in Diploma. Lastly, only the remaining 2 (1%) are in Master.

4.1.1.4 Race/ Ethnicity

Figure 4.1.1.4: Percentage of Respondents Based on Race/ Ethnicity



Source: Develop for research

Table 4.1.1.4: Result of Respondents Based on Race/ Ethnicity

	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
Chinese	142	71	71	71
Indian	35	17.5	17.5	88.5
Malay	23	11.5	11.5	100
Total	200	100	100	

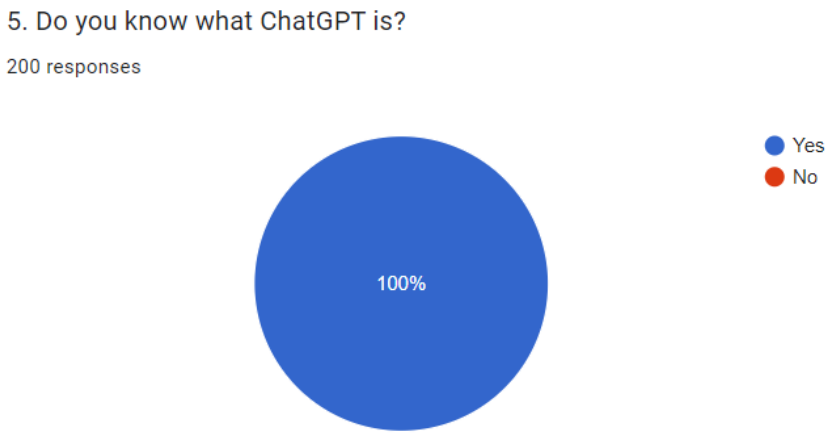
Source: Developed for research

According to the Figure 4.1.1.4 and Table 4.1.1.4, the data above shown that 142 (71%) are Chinese, followed by 35 (17.5%) are Indian, and 23 (11.5%) are Malay.

4.1.2 Filter Question

4.1.2.1 Filter Question 1

Figure 4.1.2.1: Filter Question 1



Source: Developed for research

Table 4.1.2.1: Filter Question 1

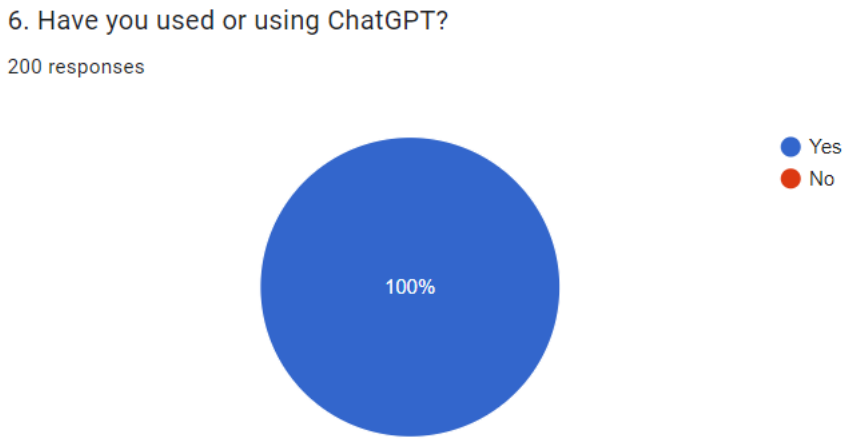
Do you know what ChatGPT is?				
	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
Yes	200	100	100	100

Source: Developed for research

According to the Figure 4.1.2.1 and Table 4.1.2.1, it clearly shown that all of the respondents (100%) acknowledged ChatGPT. This may be due to ChatGPT is popular in higher education and the researcher has distributed most of the questionnaires in UTAR Sungai Long Campus.

4.1.2.2 Filter Question 2

Figure 4.1.2.2: Filter Question 2



Source: Developed for research

Table 4.1.2.2: Filter Question 2

Have you used or using ChatGPT?				
	Frequency	Percent (%)	Valid Percent (%)	Cummulative Percent (%)
Yes	200	100	100	100

Source: Developed for research

According to the Figure 4.1.2.1 and Table 4.1.2.1, it clearly shown that all the respondents (100%) have been used or are using ChatGPT during their higher education.

4.2 Scale Measurement

4.2.1 Reliability Analysis

Table 4.2.1: Summary of Reliability Statistic (Actual Research)

Variables	Cronbach's Alpha	No. of Item
Perceived Usefulness (PU)	0.867	5
Perceived Ease of Use (PEOU)	0.839	5
Hedonic Motivation (HM)	0.875	5
Social Influence (SI)	0.781	2
Intention to Adopt ChatGPT (ITAC)	0.831	3

Source: Developed for research

The researchers in this study have utilized Cronbach's Alpha to assess the validity and reliability of all twenty (20) variables listed above. Table 4.9 displays the actual reliability statistic result of this study.

As shown in table 4.2.1, the reliability analysis results for all five (5) variables exceed the minimum requirement of 0.6 for Cronbach's Alpha values, which is indicative of reliable results. As mentioned in Chapter 3, Cronbach's alpha coefficient values as ≥0.7 or >0.7 are considered acceptable to show good reliability. Table 4.2.1 demonstrates that the majority of constructs exhibited a high level of reliability, as shown by Cronbach's alpha values over 0.80. In summary, the results suggest that the variables in this research contribute significantly to its reliability and consistency.

4.2.2 Item Statistic

Table 4.2.2.1: Perceived Usefulness (PU)

Item	Mean	Std. Deviation	N
PU1	4.12	.809	200
PU2	3.94	.809	200
PU3	4.27	.825	200
PU4	4.19	.853	200
PU5	4.26	.882	200

Source: Developed for research

Table 4.2.2.2: Perceived Ease of Use (PEOU)

Item	Mean	Std. Deviation	N
PEOU1	4.10	.723	200
PEOU2	4.18	.781	200
PEOU3	4.11	.870	200
PEOU4	4.28	.803	200
PEOU5	4.28	.814	200

Source: Developed for research

Table 4.2.2.3: Hedonic Motivation (HM)

Item	Mean	Std. Deviation	N
HM1	3.99	.730	200
HM2	4.08	.835	200
HM3	4.13	.868	200
HM4	4.19	.811	200
HM5	4.17	.857	200

Source: Developed for research

Table 4.2.2.4: Social Influence (SI)

Item	Mean	Std. Deviation	N
SI1	4.05	.835	200
SI2	4.22	.817	200

Source: Developed for research

Table 4.2.2.5: Intention to Adopt ChatGPT (ITAC)

Item	Mean	Std. Deviation	N
ITAC1	4.11	.714	200
ITAC2	4.30	.825	200
ITAC3	4.14	.748	200

Source: Developed for research

4.3 Inferential Analysis

4.3.1 Multiple Regression Analysis

Table 4.3.1: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.861[a]	.742	.737	.33892

Source: Developed for research

a. Predictors: (Constant), SI, PEOU, HM, PU

As refer to the Table 4.3.1, it shows that the R value is 0.861, R square value is 0.742, Adjusted R Square value is 0.737. This indicates that 74.2 % of the dependent variable (ITAC) is explained by the four independent variables (PU, PEOU, HM and SI). However, the remaining 25.8% of the variation in ITAC cannot explained by this study and might explain by other unknown

or unforeseen factors. Nonetheless, this research has deemed the model to be of satisfactory quality, as the R Square value of the results exceeds the rule of thumb of R Square of 50%.

Table 4.3.1.1: ANOVA

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	64.454	4	16.114	140.279	.000[b]
Residual	22.399	195	.115		
Total	86.853	199			

Source: Developed for research

a. Dependent Variable: ITAC

b. Predictors: (Constant), SI, PEOU, HM, PU

According to the Table 4.3.1.1, the F value is 140.279 with the significant p-value of 0.000 which is lower than 0.05. This indicates that the four (4) independent variables (PU, PEOU, HM and SI) are significantly impact to the dependent variable (ITAC).

Table 4.3.1.2: Coefficients

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	.463	.164		2.821	.005
PU	.290	.080	0.297	3.644	.000
PEOU	.275	.093	0.260	2.954	.004
HM	.042	.079	0.043	0.537	.592
SI	.286	.057	0.324	4.985	.000

Source: Developed for research

a. Dependent Variable: ITAC

Based on Table 4.3.1.2, the following linear equation can be formed:

ITAC = 0.463 + 0.290 (PU) + 0.275 (PEOU) + 0.042 (HM) + 0.286 (SI)

According to the linear equation above, it indicates that when the degree of PU increases by one unit, it will increase by 0.29 units towards the ITAC, while other factors remain changed. Besides, when there is a unit increase in PEOU, HM, and SI, it will result in an increase of 0.275, 0.042 and 0.286 units in ITAC respectively.

Furthermore, Table 4.3.1.2 shows that 3 out of 4 independent variables which are PU, PEOU and SI have significant relationship on ITAC in higher education. As the p-value of these 3 variables (PU, PEOU, and SI) are lower than 0.05 which the p-value of PU and SI are 0.000, while PEOU is 0.004. However, there is no significant relationship between HM and ITAC, as the p-value is 0.592 which is higher than 0.05. To summarize, H3 is rejected and only HI, H2 and H4 are accepted in this research.

Additionally, by referring to the standardized coefficient in Table 4.3.1.2, it shows that SI has the most significant influence on ITAC in higher education as it has the highest standardized coefficient beta value of 0.324 comparing to other independent variables.

4.4 Hypothesis Testing

Six hypothesises will be tested in this study and the results were shown below:

Hypothesis 1

H_1: Perceived Usefulness is significantly influencing the intention to adopt ChatGPT in higher education.

Table 4.3.1.2 shows the significant value of PU is 0.000, which is lower than the p-value of 0.05; therefore, reject H_0 and accept H_1. Hence, there is a significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

Hypothesis 2

H2: Perceived Ease of Use is significantly influencing the intention to adopt ChatGPT in higher education.

Table 4.3.1.2 shows the significant value of PEOU is 0.004, which is lower than the p-value of 0.05; therefore, reject H_0 and accept H_2. Hence, there is a significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

Hypothesis 3

H3: Hedonic Motivation is significantly influencing the intention to adopt ChatGPT in higher education.

Table 4.3.1.2 shows the significant value of HM is 0.592, which is higher than the p-value of 0.05; therefore, reject H_3 and accept H_0. Hence, there is no significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

Hypothesis 4

H4: Social Influence is significantly influencing the intention to adopt ChatGPT in higher education.

Table 4.3.1.2 shows the significant value of SI is 0.000, which is lower than the p-value of 0.05; therefore, reject H_0 and accept H_4. Hence, there is a significant relationship between perceived usefulness and the intention to adopt ChatGPT in higher education.

4.5 Conclusion

Overall, this study utilized descriptive analysis to examine the demographic profile of the respondents. In addition, a reliability test was conducted by incorporating five variables for the purpose of scale measurement. Furthermore, a statistical analysis was conducted using Multiple Linear Regression to assess the significant influence of each independent variable on the dependent variable. In conclusion, the findings indicate that all independent variables, except for HM, exhibit a significant relationship with ITAC.

CHAPTER 5: Discussion, Conclusion and Implications

5.0 Introduction

In Chapter 5, it discusses important findings that validate the study's objectives and hypotheses, theoretical and managerial implications, research limitations, and recommendations for further research.

5.1 Discussions on Major Findings

The purpose of conducting this research is to determine the factors that influencing on the intention of utilizing ChatGPT in higher education. There were total of four (4) hypotheses had developed for this study. According to the Table 4.3.1 has highlighted the results of the hypotheses testing; however, it has found that all hypotheses were valid except for H_3.

5.1.1 Findings on Hypotheses

5.1.1.1 Perceived Usefulness and Intention to Adopt ChatGPT

Based on Table 4.3.1.2, the results show that H1 is supported with the Beta value of 0.290 and p-value of 0.000, which has a positive significant impact on the intention of utilizing ChatGPT in higher education. These results are consistent with the previous research done by Foroughi et al. (2023), Hasanein & Sobaih (2023), Menon & Shilpa (2023), and Abdaljaleel et al. (2023). Researchers discovered that ChatGPT becomes beneficial in the field of education by improving the overall quality of learning. Students can utilise ChatGPT to obtain answers to various inquiries, thereby augmenting

their understanding and expertise on diverse subjects. This will enhance their knowledge and understanding of the concepts and advancements in their area of interest. Moreover, according to Tiwari et al. (2023) and Romero-Rodríguez et al. (2023), The study demonstrates that ChatGPT's perceived usefulness lies in its ability to effectively comprehend and address students' requirements and learning styles through the utilization of an advanced natural language processing algorithm. Consequently, learners are provided with individualized feedback and assistance that is specifically designed to help them overcome their own obstacles and accomplish their educational goals.

5.1.1.2 Perceived Ease of Use and Intention to Adopt ChatGPT

According to Table 4.3.1.2, results showed that the Beta value is 0.275 and p-value is 0.004, which H2 is positively influence ITAC in higher education. This result was in line with prior studies by Raman et al. (2023), Foroughi et al. (2023) and Abdaljaleel et al. (2023). The results indicated that the incorporation of user-friendly functionalities facilitates students' exposure to ChatGPT. Research has shown that when searching for answers to queries, students find ChatGPT to be user-friendly. Meanwhile, previous studies have also stated that ChatGPT provides students with timely and precise solutions to their inquiries and difficulties with minimal effort. This results in time saving towards activities such as content creation and investigation (Hasanein & Sobaih, 2023; Menon & Shilpa, 2023). Wherefore, this result may be explained by the fact that if an AI tool like ChatGPT is eased to use and able to get the response promptly, the more likely the students in higher education will tend to adopt it for their learning.

5.1.1.3 Hedonic Motivation and Intention to Adopt ChatGPT

Table 4.3.1.2 shows that the p-value of H3 is 0.592, which is higher than the significant value ($p>0.05$), thereby indicates that there is a negative relationship among HM and ITAC in higher education. This discovery appears unexpected and contradicts the findings of numerous previous studies cited in Chapter 2. Previous research has established that HM is a significant predictor of the intention to adopt ChatGPT in higher education (Menon & Shilpa, 2023; Foroughi et al., 2023; Tiwari et al., 2023; Strzelecki, 2023).

However, there a few reasons that indicate negative relationship between HM and ITAC in higher education. Trust and credibility play crucial roles in the acceptance and implementation of technology in the field of education (Malik et al., 2023). Students require assurance in the trustworthiness, precision, and appropriateness of the tools and resources they utilize for learning (Sison et al., 2023). If ChatGPT is predominantly dedicated to pleasure or recreational purposes, students could doubt its trustworthiness as a dependable source of information or aid for academic assignments. They can have concerns over the accuracy of the information offered by ChatGPT or its capacity to adequately meet their learning requirements.

Furthermore, certain academic institutions may place a premium on academic rigor and gravity, placing significant emphasis on the value of scholarly endeavors and intellectual participation (Krems & Shaaban, 2023). Within such contexts, technological tools that are predominantly linked to leisure or informal discourse, such as ChatGPT, might not correspond with the values or standards of the institution. Consequently, students who affiliated with these establishments might experience reduced motivation to adopt ChatGPT for educational purpose. This skepticism may result in a negative relationship between HM and ITAC in higher education. Therefore, reject H_3 and accept H_0.

5.1.1.4 Social Influence and Intention to Adopt ChatGPT

Based on Table 4.3.1.2, the results showed that H4 has the most significant impact on the ITAC in higher education, which indicates that the Beta value is 0.286 and p-value is 0.000. This result is supported by Menon & Shilpa (2023). Besides, in recent studies by Abdaljaleel et al. (2023), the findings illustrate that SI has a higher influence on the ITAC towards students in higher education. They claimed that social media platforms, such as forums, online communities, and social networks, can significantly influence outcomes by shaping individuals' decisions through the influence of others' opinions. this favourable outcome could also be attributed to individuals feeling pressured to adopt novel technology when they observe their friends doing so in order to conform and prevent experiencing a sense of exclusion.

Furthermore, the study suggests that as awareness of the advantages of using ChatGPT in education grows, those with limited technological knowledge or experience will rely heavily on the opinions of others to determine their willingness to adopt ChatGPT. (Abdaljaleel et al., 2023, p. 10&11; Raman et al., 2023, p. 20). This demonstrates that SI plays a crucial role in motivating early adopters to utilize the technology as well as invite their peers and friends to participate in the technology. Thus, the outcome of this study is acceptable, and SI has a significant relationship with ITAC towards students in higher education.

5.2 Implications of Study

5.2.1 Theoretical Implications

The TAM, UTAUT1 and UTAUT2 served as the theoretical foundations for this research. Building upon the existing conceptual framework, the researcher has developed a new comprehensive framework that incorporates the factors of perceived usefulness, perceived ease of use, hedonic motivation, and social influence. The study seeks to analyse the factors that intent the students in higher education to adopt ChatGPT. Due to the scarcity of previous research on ChatGPT towards higher education, the researcher anticipates that this study will contribute to enhancing the knowledge regarding students' intention of utilizing ChatGPT in higher education by providing novel variables and relevant theories. Consequently, it will broaden the scope of research on ChatGPT and the intention of higher education students.

Nevertheless, this study demonstrates that HM has no impact on the intention of students in higher education to adopt ChatGPT. Therefore, it is imperative for future researchers to take this matter into account when carrying out subsequent investigations. For example, substituting another correlated characteristic that could greatly influence users' acceptance of new technologies. In addition, future researchers should prioritise the examination of educators' perspectives or students that studying in particular course by incorporating HM as a variable in their research, rather than focusing primarily on students in higher education contexts.

5.2.2 Managerial Implications

The insight from present study could benefit both educational institutions and AI development companies. In fact, due to the advancement of AI technology, people increasingly utilize AI tools such as ChatGPT, especially students in higher education. Hence, this study allows ChatGPT to improve it features and functions in order to gain users' loyalty and new users. Besides, this study also offers valuable insights for academic institutions to utilise the advantages of ChatGPT while maintaining ethical norms and encouraging responsible usage among the academic community.

According to the research, PU has been proved to have a significant relationship with ITAC in higher education. Hence, the ethical implications associated with the perception of usefulness emphasize the responsibility of educational institutions to utilize ChatGPT in a way that authentically enhances the educational experience while upholding academic integrity. Institutions ought to give precedence to transparency and honesty when it comes to disclosing the capabilities and limitations of ChatGPT, to prevent students from being misinformed about its effectiveness. Furthermore, it is imperative that educators place an emphasis on critical thinking abilities in conjunction with ChatGPT utilization, so as to enable students to assess the dependability and precision of the data produced by the system.

Secondly, results have proved that PEOU has a significant relationship with ITAC in higher education. Based on the findings, it seems that students in higher education tend to adopt ChatGPT due to its user-friendly functions and prompt responses. Educational institutions must carefully assess the ethical implications of adopting ChatGPT as a user-friendly tool, while simultaneously taking measures to prevent excessive reliance or dependency. Institutions should offer comprehensive training and assistance to ensure that students and educators possess the necessary skills to proficiently utilize ChatGPT, while also encouraging a culture of self-directed investigation and critical thinking. Furthermore, it is imperative to design ethical protocols to

specifically address concerns pertaining to plagiarism and originality when integrating ChatGPT into academic assignments and assessments.

Furthermore, based on these findings, it proved that SI has a significant relationship with ITAC in higher education. Thus, it emphasizes the significance of promoting for responsible and ethical utilisation of ChatGPT within the academic community. Educational institutions ought to promote and foster open discussions and analytical conversations regarding the moral ramifications of AI technologies such as ChatGPT, encompassing factors such as bias, privacy, and autonomy. Institutions should proactively implement measures to reduce potential negative impacts such as algorithmic biases or the propagation of stereotypes, by consistently assessing and improving the algorithms that drive ChatGPT. Moreover, cultivating a culture that promotes ethical consciousness and responsibility among students and instructors can aid in reducing the potential negative outcomes linked to the impact of social influence on the usage of ChatGPT.

5.3 Limitations of the Study and Recommendations for Future Research

It is important to recognise and consider the limitations of this study while analysing the results. At the same time, recommendations will be provided based upon the limitations found in this study for the guidance of future research. Firstly, the emphasis on university students may restrict the applicability of the findings to other educational levels. Nevertheless, the sample exhibited a wide range of study experience. We did not take into account various study programmes as a moderating variable. Different academic programmes, such as Information Technology (IT), business, design, and finance, may vary in their utilization of AI chat at different levels. In order to improve the external validity of future research, it is advisable to incorporate participants from a wide range of educational backgrounds and age groups in order to provide a more comprehensive picture of learners.

Another limitation was identified with respect to the single data collection method, as the current study exclusively utilised the questionnaire approach to gather data. In the future, researchers may employ a combination of quantitative and qualitative data collection methods in order to compile the data. In addition to utilizing the survey data gathering approach, future study can also employ the face-to-face interview data collection method to acquire more comprehensive insights into participants' thoughts, behaviours, emotions, and attitudes towards ChatGPT.

Moreover, the third limitation is the study was constrained by a small sample size of only 200 participants and was done exclusively in Malaysia, hence potentially restricting the applicability of the results to a broader population. Future studies might consider an expanded sample size and delve into the variables that intent the utilization of ChatGPT in different contexts within various cultural environments, with the aim of attaining a more accurate outcome. Additionally, future research can extend the study to other nations in order to investigate the intention to adopt ChatGPT.

Furthermore, with respect to the demographic profile, the present study's findings have a tendency towards the intention behaviour of Chinese female Malaysian with degree-holding respondents aged 20 to 29 years. This is due to the imbalance in the respondents' gender, age, education level, and ethnic background. Moreover, the current study reveals that 98.5% of the participants are degree holders (66.5%), followed by a foundation (16%) and a diploma (16%). However, there are 71% of the respondents were Chinese. As a consequence, it was suggested that future studies balance the demographic profile of respondents during data collection in order to obtain more accurate and unbiased results.

5.4 Conclusion

This study attempts to explain the intention to adopt ChatGPT in higher education. The researcher has used TAM and UTAUT as the basic model for this study and has extended UTAUT with new constructs and domains. The results show that perceived usefulness, perceived ease of use and social influence are directly associated with students in higher education's intention to adopt ChatGPT, whereas hedonic motivation is indirectly associated with it. Furthermore, the study has proved that there is a relationship between the factors and the intention to adopt ChatGPT in higher education. Thus, the researcher has achieved and answered the research objectives and questions. Meanwhile, the results of this study are expected to provide valuable insights for educational institutions to have a depth understanding the higher education students' intention to adopt ChatGPT for their learning so universities can consider whether to accept or ban it. Additionally, this study also provides insights for AI-related companies that developed or developing AI tools especially targeted for higher education students; therefore, they can improve for the development. To summarise, our research demonstrates that there are several opportunities for future empirical research to further this field of study, and these opportunities have generated growing interest.

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Appendices

Appendix 3.4.1: Survey Questionnaire

Greetings! I am Lee Zi Wei, an undergraduate student pursuing a Bachelor of International Business (Hons) at University Tunku Abdul Rahman (UTAR). I am currently conducting a research project with the topic of "The Impacts of Utilizing ChatGPT in higher education".

This survey aims to explore various aspects related to the intention to adopt ChatGPT in higher education, including perceived usefulness, perceived ease of use, hedonic motivation, and social influence. Please take a few minutes to answer the following questions thoughtfully based on your experiences and preferences in order to help us have a better understanding about your view in relation to the intention to adopt ChatGPT.

Your responses will be kept confidential, and the information collected will be used solely for research purposes. If you ever have any questions or just want to connect, feel free to reach out to me at ziweiii02@1utar.my.

Hereby consent on my voluntary participation in this survey which will be conducted anonymously. (As proposed accordingly by Personal Data Protection Statement - UTAR)

□ Yes, proceed to the questionnaire

Section A: Demographic Section

Instructions: Please choose and tick the appropriate box next to your answer or write in the space provided.

1. Age

- 20-29
- 30- 39
- 40-49
- 50-59
- Over 60

2. Gender

- Female
- Male

3. Education Level

- Secondary school (SPM)
- Diploma
- Degree
- Master
- PhD
- Others

4. Do you know what ChatGPT is?

- Yes
- No

5. Have you used or using ChatGPT?

- Yes
- No

Section B

This section studies the factors that will influence your intentions to adopt ChatGPT. These determinants include perceived usefulness, perceived ease of use, hedonic motivation, and social influence.

Please indicate how much do you agree or disagree with each of the following statements based on a scale ranging from **1（strongly disagree) to 5 (strongly agree)**

1	2	3	4	5
Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)

Perceived Usefulness		**SD**	**D**	**N**	**A**	**SA**
1	Utilizing ChatGPT enhanced the learning experience	1	2	3	4	5
2	ChatGPT aligns seamlessly with my preferred learning approach	1	2	3	4	5
3	Utilizing ChatGPT will enhance the standard of my work	1	2	3	4	5
4	ChatGPT is an excellent study tool	1	2	3	4	5
5	I will definitely use ChatGPT to help me study	1	2	3	4	5
6	ChatGPT can assist in comprehending concepts and theories	1	2	3	4	5

Perceived Ease of Use		**SD**	**D**	**N**	**A**	**SA**
1	I easily comprehended the navigation of ChatGPT	1	2	3	4	5
2	The usage instructions for ChatGPT were straightforward	1	2	3	4	5
3	ChatGPT operates as a search engine	1	2	3	4	5
4	ChatGPT is prompt in its responses	1	2	3	4	5
5	ChatGPT can assist in optimising the time usage	1	2	3	4	5

Hedonic Motivation		**SD**	**D**	**N**	**A**	**SA**
1	ChatGPT enhanced my enjoyment significantly	1	2	3	4	5
2	ChatGPT can augment my learning by providing tailored and adaptable learning experiences	1	2	3	4	5
3	I am inclined to utilize ChatGPT more frequently due to a sense of motivation	1	2	3	4	5
4	ChatGPT provided essential tools and resources that augment to my learning experience, thereby enhancing my self-confidence	1	2	3	4	5
5	ChatGPT can help and lead me with a variety of administrative tasks to make my learning better	1	2	3	4	5

Social Influence		SD	D	N	A	SA
1	I have observed other individuals use ChatGPT	1	2	3	4	5
2	I will sign up for ChatGPT after seeing my friends utilizing it	1	2	3	4	5

Social Influence		SD	D	N	A	SA
1	I will definitely use ChatGPT to help me study	1	2	3	4	5
2	I am interested in using ChatGPT to learn	1	2	3	4	5
3	ChatGPT will definitely aid me in my learning	1	2	3	4	5

Appendix 3.4.2: Pilot Test Result of Perceived Usefulness (IV)

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.847	5

Item Statistics

	Mean	Std. Deviation	N
PU1	4.43	.507	21
PU2	4.33	.658	21
PU3	4.48	.602	21
PU4	4.43	.598	21
PU5	4.33	.577	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PU1	17.57	3.857	.645	.820
PU2	17.67	3.433	.629	.825
PU3	17.52	3.462	.704	.801
PU4	17.57	3.457	.714	.799
PU5	17.67	3.733	.598	.830

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
22.00	5.400	2.324	5

Appendix 3.4.2 Pilot Test Result of Perceived Ease of Use (IV)

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.789	5

Item Statistics

	Mean	Std. Deviation	N
PEOU1	4.43	.598	21
PEOU2	4.62	.498	21
PEOU3	4.43	.676	21
PEOU4	4.57	.507	21
PEOU5	4.48	.602	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PEOU1	18.10	2.890	.647	.723
PEOU2	17.90	3.090	.699	.715
PEOU3	18.10	3.090	.427	.805
PEOU4	17.95	3.248	.578	.749
PEOU5	18.05	3.048	.549	.756

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
22.52	4.562	2.136	5

Appendix 3.4.2: Pilot Test Result of Hedonic Motivation (IV)

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.891	5

Item Statistics

	Mean	Std. Deviation	N
HM1	4.10	.768	21
HM2	4.19	.602	21
HM3	4.05	.865	21
HM4	4.24	.768	21
HM5	4.33	.796	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
HM1	16.81	6.562	.772	.859
HM2	16.71	8.114	.500	.912
HM3	16.86	6.029	.804	.852
HM4	16.67	6.433	.812	.850
HM5	16.57	6.357	.797	.853

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.90	10.190	3.192	5

Appendix 3.4.2: Pilot Test Result of Social Influence (IV)

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.886	2

Item Statistics

	Mean	Std. Deviation	N
SI1	4.52	.602	21
SI2	4.48	.602	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SI1	4.48	.362	.796	.
SI2	4.52	.362	.796	.

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
9.00	1.300	1.140	2

Appendix 3.4.2: Pilot Test Result of Intention to Adopt ChatGPT (DV)

Case Processing Summary

		N	%
Cases	Valid	21	100.0
	Excluded[a]	0	.0
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.786	3

Item Statistics

	Mean	Std. Deviation	N
ITAC1	4.52	.602	21
ITAC2	4.43	.598	21
ITAC3	4.57	.598	21

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ITAC1	9.00	1.000	.748	.571
ITAC2	9.10	1.290	.452	.886
ITAC3	8.95	1.048	.701	.627

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
13.52	2.262	1.504	3

Appendix 4.2.1: Reliability Test Result of Perceived Usefulness (IV)

Case Processing Summary

		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.867	5

Item Statistics

	Mean	Std. Deviation	N
1. Perceived Usefulness [Utilizing ChatGPT enhanced my learning experience.]	4.12	.809	200
1. Perceived Usefulness [ChatGPT aligns seamlessly with my preferred learning approach.]	3.94	.809	200
1. Perceived Usefulness [Utilizing ChatGPT will enhance the standard of my work.]	4.27	.825	200
1. Perceived Usefulness [ChatGPT is an excellent study tool.]	4.19	.853	200
1. Perceived Usefulness [ChatGPT can assist in comprehending concepts and theories.]	4.26	.882	200

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. Perceived Usefulness [Utilizing ChatGPT enhanced my learning experience.]	16.66	7.221	.813	.809
1. Perceived Usefulness [ChatGPT aligns seamlessly with my preferred learning approach.]	16.84	7.793	.656	.847
1. Perceived Usefulness [Utilizing ChatGPT will enhance the standard of my work.]	16.51	7.899	.611	.858
1. Perceived Usefulness [ChatGPT is an excellent study tool.]	16.59	7.510	.679	.842
1. Perceived Usefulness [ChatGPT can assist in comprehending concepts and theories.]	16.51	7.306	.697	.837

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.78	11.411	3.378	5

Appendix 4.2.1: Reliability Test Result of Perceived Ease of Use (IV)

Case Processing Summary

		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.839	5

Item Statistics

	Mean	Std. Deviation	N
2. Perceived Ease of Use [I easily comprehended the navigation of ChatGPT.]	4.10	.723	200
2. Perceived Ease of Use [The usage instructions for ChatGPT were straightforward.]	4.18	.781	200
2. Perceived Ease of Use [ChatGPT operates as a search engine.]	4.11	.870	200
2. Perceived Ease of Use [ChatGPT is prompt in its responses.]	4.28	.803	200
2. Perceived Ease of Use [ChatGPT can assist in optimising the time usage.]	4.28	.814	200

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
2. Perceived Ease of Use [I easily comprehended the navigation of ChatGPT.]	16.84	6.668	.682	.798
2. Perceived Ease of Use [The usage instructions for ChatGPT were straightforward.]	16.76	6.646	.615	.814
2. Perceived Ease of Use [ChatGPT operates as a search engine.]	16.83	6.450	.572	.829
2. Perceived Ease of Use [ChatGPT is prompt in its responses.]	16.66	6.457	.645	.806
2. Perceived Ease of Use [ChatGPT can assist in optimising the time usage.]	16.67	6.184	.713	.787

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.94	9.735	3.120	5

Appendix 4.2.1: Reliability Test Result of Hedonic Motivation (IV)

		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.875	5

Item Statistics

	Mean	Std. Deviation	N
3. Hedonic Motivation [ChatGPT enhanced my enjoyment significantly.]	3.99	.730	200
3. Hedonic Motivation [ChatGPT can augment my learning by providing tailored and adaptable learning experiences.]	4.08	.835	200
3. Hedonic Motivation [I am inclined to utilize ChatGPT more frequently due to a sense of motivation.]	4.13	.868	200
3. Hedonic Motivation [ChatGPT provided essential tools and resources that augment to my learning experience, thereby enhancing my self-confidence.]	4.19	.811	200
3. Hedonic Motivation [ChatGPT can help and	4.17	.857	200

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
3. Hedonic Motivation [ChatGPT enhanced my enjoyment significantly.]	16.56	7.704	.745	.841
3. Hedonic Motivation [ChatGPT can augment my learning by providing tailored and adaptable learning experiences.]	16.48	7.648	.630	.866
3. Hedonic Motivation [I am inclined to utilize ChatGPT more frequently due to a sense of motivation.]	16.43	7.292	.685	.854
3. Hedonic Motivation [ChatGPT provided essential tools and resources that augment to my learning experience, thereby enhancing my self-confidence.]	16.36	7.459	.708	.848
3. Hedonic Motivation [ChatGPT can help and lead me with a variety of administrative tasks to make my learning better.]	16.38	7.032	.767	.833

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
20.56	11.253	3.355	5

Appendix 4.2.1: Reliability Test Result of Social Influence (IV)

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.781	2

Item Statistics

	Mean	Std. Deviation	N
4. Social Influence [I have observed other individuals use ChatGPT.]	4.05	.835	200
4. Social Influence [I will sign up for ChatGPT after seeing my friends utilizing it.]	4.22	.817	200

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
4. Social Influence [I have observed other individuals use ChatGPT.]	4.22	.668	.641	.
4. Social Influence [I will sign up for ChatGPT after seeing my friends utilizing it.]	4.05	.696	.641	.

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
8.27	2.238	1.496	2

Appendix 4.2.1: Reliability Test Result of Intention to Adopt ChatGPT (DV)

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	200	100.0
	Excluded[a]	0	.0
	Total	200	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.831	3

Item Statistics

	Mean	Std. Deviation	N
5. Intention to Adopt [I will definitely use ChatGPT to help me study.]	4.11	.714	200
5. Intention to Adopt [I am interested in using ChatGPT to learn.]	4.30	.825	200
5. Intention to Adopt [ChatGPT will definitely aid me in my learning]	4.14	.748	200

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
5. Intention to Adopt [I will definitely use ChatGPT to help me study.]	8.43	1.955	.732	.730
5. Intention to Adopt [I am interested in using ChatGPT to learn.]	8.25	1.864	.613	.852
5. Intention to Adopt [ChatGPT will definitely aid me in my learning]	8.41	1.860	.739	.719

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
12.54	3.928	1.982	3

Appendix 4.3.1: Multiple Regression Analysis Result

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.861[a]	.742	.737	.33892	.742	140.279	4	195	.000	1.975

a. Predictors: (Constant), SI, PEOU, HM, PU

b. Dependent Variable: ITAC

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	64.454	4	16.114	140.279	.000[b]
	Residual	22.399	195	.115		
	Total	86.853	199			

a. Dependent Variable: ITAC

b. Predictors: (Constant), SI, PEOU, HM, PU

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.463	.164		2.821	.005	.139	.787		
	PU	.290	.080	.297	3.644	.000	.133	.447	.199	5.015
	PEOU	.275	.093	.260	2.954	.004	.092	.459	.171	5.861
	HM	.042	.079	.043	.537	.592	-.113	.197	.208	4.810
	SI	.286	.057	.324	4.985	.000	.173	.400	.312	3.201

a. Dependent Variable: ITAC