



EXAMINING THE RELATIONSHIP BETWEEN ATTITUDE TOWARD CHATGPT,
COGNITIVE MOTIVATION, AND PROBLEM-SOLVING SKILLS AMONG
UNDERGRADUATE STUDENTS IN UNIVERSITI PENDIDIKAN SULTAN IDRIS

NURHUDA DINI BINTI MOHD NASIR



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UNIVERSITI
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SULTAN IDRIS

UNIVERSITY OF EDUCATION
SULTAN ABDUL JALIL SHAH

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I, Nurhuda Dini Binti Mohd Nasir, Student ID D20202096154
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ABSTRACT

This study explored the attitudes of undergraduate students at *Universiti Pendidikan Sultan Idris* (UPSI) toward ChatGPT and examined its relationship with cognitive motivation and problem-solving skills. A quantitative research design was employed, utilizing an online survey with 161 valid responses. The study used the Technology Acceptance Model Edited to Assess ChatGPT Adoption (TAME-ChatGPT) scale, the Need for Cognition (NFC) scale, and the Problem-Solving Inventory (PSI) scale to measure students' attitudes, cognitive motivation, and problem-solving abilities. The results indicated a significant positive relationship between students' attitudes toward ChatGPT and their cognitive motivation, suggesting that higher acceptance of ChatGPT corresponds with increased cognitive engagement. However, no significant relationship was found between attitudes toward ChatGPT and problem-solving skills, indicating that while ChatGPT may encourage cognitive effort, it does not directly enhance problem-solving abilities. These findings highlight the potential of ChatGPT as a tool for fostering student engagement and cognitive motivation in educational settings. However, its role in developing problem-solving skills remains uncertain, emphasizing the need for educators to consider complementary instructional strategies. Future research should explore broader sample representations and mixed-method approaches to provide deeper insights into the role of AI in learning.



ABSTRAK

Kajian ini meneroka sikap pelajar sarjana muda di Universiti Pendidikan Sultan Idris (UPSI) terhadap ChatGPT serta hubungannya dengan motivasi kognitif dan kemahiran penyelesaian masalah. Penyelidikan ini menggunakan reka bentuk kuantitatif dengan kaedah tinjauan dalam talian, melibatkan 161 respons yang sah. Skala *Technology Acceptance Model Edited to Assess ChatGPT Adoption* (TAME-ChatGPT), *Need for Cognition* (NFC), dan *Problem-Solving Inventory* (PSI) digunakan untuk mengukur sikap pelajar, motivasi kognitif, dan kemahiran penyelesaian masalah mereka. Keputusan kajian menunjukkan terdapat hubungan positif yang signifikan antara sikap pelajar terhadap ChatGPT dan motivasi kognitif mereka. Ini mencadangkan bahawa penerimaan ChatGPT yang lebih tinggi dapat meningkatkan penglibatan kognitif pelajar. Namun, tiada hubungan signifikan ditemukan antara sikap terhadap ChatGPT dan kemahiran penyelesaian masalah. Dapatan ini menunjukkan bahawa walaupun ChatGPT boleh menggalakkan usaha kognitif, ia tidak semestinya meningkatkan kemahiran penyelesaian masalah. Oleh itu, kajian ini menekankan potensi ChatGPT sebagai alat untuk meningkatkan motivasi dan penglibatan kognitif dalam pendidikan. Walaubagaimanapun, peranannya dalam pembangunan kemahiran penyelesaian masalah masih tidak jelas, menekankan keperluan bagi pendidik untuk mempertimbangkan strategi pengajaran yang lebih komprehensif. Kajian masa hadapan disarankan untuk melibatkan sampel yang lebih luas serta pendekatan kaedah campuran bagi memperoleh pemahaman yang lebih mendalam tentang peranan kecerdasan buatan (AI) dalam pembelajaran.

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LIST OF SYMBOLS

N	Frequency
p	Probability value
r	Correlation coefficient

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
CGPA	Cumulative Grade Point Average
ChatGPT	Chat Generative Pre-Trained Transformer
EFA	Exploratory Factor Analysis
GenAI	Generative Artificial Intelligence
GCLA	Guidance ChatGPT-assisted Learning Aid
LPSSEF	Level of Problem-Solving Skills Estimate Form
MEPS	Means-Ends Problem-Solving
NFC	Need for Cognition
OpenAI	An artificial intelligence research organization
PSI	Problem-Solving Inventory
SCT	Social Cognitive Theory
SLT	Social Learning Theory
SPSS	Statistical Package for the Social Sciences
STEM	Science, Technology, Engineering, and Mathematics
TAM	Technology Acceptance Model
TAME-ChatGPT	Technology Acceptance Model Edited to Assess ChatGPT Adoption
UPSI	Universiti Pendidikan Sultan Idris

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter provides an overview of the study, offering the reader an understanding of its topic and relevance. It begins with the background of the study, addressing issues related to ChatGPT in education, both in Malaysia and internationally. The problem statement follows, identifying gaps or issues in existing research. The objectives and research questions guiding the study are then presented. The significance of the study is explained, focusing on the importance of exploring the relationship between attitudes toward ChatGPT, cognitive motivation, and problem-solving skills. Additionally, this chapter includes the conceptual and operational definitions of the key variables, the theoretical approach adopted, the conceptual framework derived from this theory, and the study's hypotheses. The chapter concludes with a summary of its contents.

1.2 Background of Study

Artificial intelligence (AI) technology has gained significant attention across various industries in recent years. Since its creation, progress has been made in expanding its utility and capabilities. The origins of Generative AI (GenAI) can be traced back to the 1950s and 1960s when researchers began exploring early techniques for generating data (Vujović, 2024). Its ability to reproduce objects, including images, text, audio, and video, by replicating existing data models or newer models based on different training data sets has attracted the attention of diverse sectors such as healthcare, finance, and education (Chiu, 2024).

Its role in education stands out among GenAI's many applications. Programs like ChatGPT (Chat Generative Pre-Trained Transformer) demonstrate GenAI's capabilities. Introduced in February 2022 by OpenAI, ChatGPT is a conversational chatbot that answers questions, interprets, summarizes, and generates information (Nashwan et al., 2023). This technology has rapidly gained traction, with an estimated 180.5 million active users as of March 2024 and approximately 1.6 billion monthly website visitors, making it one of the fastest-growing consumer services (Duarte, 2024).

Despite its increasing popularity, some educational institutions have chosen to ban this tool in educational settings. For instance, some school districts in New York, universities in Hong Kong, and universities in France have banned ChatGPT use in assessments (Tang & Chaw, 2023). Meanwhile, certain institutions in Japan have

limited their use, and Australian universities have begun redesigning assessment practices to minimize the risks associated with ChatGPT (Tang & Chaw, 2023).

This ban arises from concerns about the threats and risks posed by ChatGPT that could affect the learning process. Research has shown high levels of concern about the increased risk of plagiarism facilitated by ChatGPT (Sallam, 2023; Rahman & Watanobe, 2023). Despite the existence of plagiarism detection software, recent studies have highlighted a concerning trend where ChatGPT's ability to generate seemingly original content bypasses traditional detection methods, posing a severe challenge to academic integrity (Grassini, 2023). This is followed by concerns about the accuracy and reliability of ChatGPT information, potential bias in ChatGPT-generated information, and concerns about its impact on critical thinking skills if over-reliance occurs (Das & Madhusudan, 2024; Hasanein & Sobaih, 2023). As a result, educators and policymakers are left grappling with the question of how to navigate the use of ChatGPT in educational settings efficiently (Hasanein & Sobaih, 2023).

In contrast to these restrictive measures in other countries, the use of ChatGPT in Malaysia remains unrestricted. Former Minister of Higher Education, Datuk Seri Mohamed Khaled Nordin, expressed Malaysia's openness to AI-driven tools like ChatGPT, citing their potential benefits in the learning process (Mail, 2023). However, this endorsement comes with the caveat that ChatGPT usage must adhere to guidelines set forth by the Ministry of Higher Education, aimed at outlining best practices and addressing potential challenges (Thomas, 2023).

A study by Tang and Chaw (2023) examining Malaysian sentiments toward ChatGPT in education revealed a nuanced perspective. While there is interest in ChatGPT's potential benefits, concerns have been raised about its impact on cognitive skills, such as creative thinking and problem-solving (Tang & Chaw, 2023). This underscores the importance of exploring how attitudes toward ChatGPT may influence cognitive activities, particularly in educational settings where students increasingly rely on non-traditional sources for knowledge acquisition (Chan & Hu, 2023).

Using Social Cognitive Theory (SCT) as a theoretical framework, this study explores the relationship between attitudes toward ChatGPT and cognitive motivation, as well as between attitudes toward ChatGPT and problem-solving skills, among undergraduate students at *Universiti Pendidikan Sultan Idris* (UPSI). These three variables were chosen because they represent important aspects of ChatGPT's potential impact on cognitive activity and educational outcomes, contributing to a deeper understanding of its role in educational settings. Additionally, the findings of Tang and Chaw (2023) further highlight the necessity of examining these relationships to understand ChatGPT's impact on education fully.

1.3 Problem Statement

Research on ChatGPT has increased significantly, particularly regarding its role in education. In educational settings, ChatGPT is seen as a tool that offers both opportunities and challenges in the educational process.

In terms of opportunities, ChatGPT has demonstrated its ability to improve students' reading, writing, problem-solving, and critical thinking skills, providing them with an interactive and innovative learning experience (Chan & Hu, 2023; Rahman & Watanobe, 2023). Educators have utilized ChatGPT to help plan comprehensive lessons, answer student questions, find assessments, generate questions, and assist in research and data analysis (Chan & Hu, 2023; Michel-Villarreal et al., 2023; Rahman & Watanobe, 2023).

Concerning the challenges, research findings highlight concerns about ChatGPT's impact on academic abilities and integrity. In terms of abilities, there are concerns that over-reliance on ChatGPT may hinder personal growth, skills development, and intellectual progress (Hasanein & Sobaih, 2023; Chan & Hu, 2023; Lo, 2023; Michel-Villarreal et al., 2023). Regarding academic integrity, studies express concerns about potential cheating and plagiarism, which may affect learning outcomes and erode academic standards (Abbas et al., 2024; Chan, 2023; Chaudhry et al., 2023).

Despite these discussions, research on ChatGPT in Malaysia remains limited, making it difficult to understand its impact on local users. Most existing studies conducted outside Malaysia may not fully represent the effects on the Malaysian population due to cultural and educational system differences. Therefore, local research is essential to explore these gaps and develop effective strategies for integrating ChatGPT into educational practices while mitigating risks.



In Malaysian higher education, understanding the relationship between students' attitudes toward ChatGPT and specific cognitive outcomes, such as cognitive motivation and problem-solving skills, is crucial. As Tang and Chaw (2023) highlighted, while there is interest in ChatGPT's benefits, concerns have been raised about its impact on cognitive skills and learning outcomes. These concerns emphasize the need to investigate how students' attitudes toward ChatGPT may influence their cognitive motivation and problem-solving abilities.

Therefore, in this research study, higher education institutions, specifically UPSI, will be the main focus in examining the relationship between attitudes toward ChatGPT, cognitive motivation, and problem-solving skills. University students are the primary users of ChatGPT, and its widespread use in learning environments makes it an important area of study (Nerdynav, 2024).

In conclusion, while the use of ChatGPT in Malaysia remains largely unrestricted, its full impact on users needs further understanding through local research. By addressing the concerns stated in Tang and Chaw's study (2023), this research aims to explore the relationship between attitudes toward ChatGPT, cognitive motivation, and problem-solving skills among undergraduate students at UPSI. These findings are crucial for understanding the associations between these variables and guiding future research on the impact of ChatGPT in Malaysia.



1.4 Research Objectives

Based on the problem statement, the objectives of this research were as follows:

1. To determine the attitude level of undergraduate students at UPSI toward ChatGPT.
2. To investigate the significant relationship between attitude toward ChatGPT and cognitive motivation among undergraduate students at UPSI.
3. To investigate the significant relationship between attitude toward ChatGPT and problem-solving skills among undergraduate students at UPSI.

1.5 Research Questions

Based on the problem statement and research objectives, this study sought to answer:

1. What was the attitude level of undergraduate students at UPSI toward ChatGPT?
2. Was there any significant relationship between attitude toward ChatGPT and cognitive motivation among undergraduate students at UPSI?
3. Was there any significant relationship between attitude toward ChatGPT and problem-solving skills among undergraduate students at UPSI?

1.6 Significance of Study

From a practical perspective, the research offered a better understanding of how ChatGPT influences students' learning outcomes and attitudes. By exploring how ChatGPT usage affected learning, students could make informed decisions about its integration into their study practices. Educators could leverage these insights to tailor instructional methods, ensuring that ChatGPT complemented rather than detracted from the learning experience. For example, the study's findings informed curriculum design and teaching strategies that optimized the benefits of ChatGPT while mitigating potential challenges.

Additionally, the study provided a nuanced understanding of Malaysian students' attitudes toward ChatGPT, which was crucial for educators and policymakers alike. By examining the relationship between attitudes toward ChatGPT and cognitive motivation and problem-solving abilities, educators were able to develop targeted interventions to support student learning effectively. These insights were particularly relevant in the Malaysian context, where the Ministry of Higher Education actively pursued integrating AI technologies into the education system (Jeevita & Liew, 2024).

In summary, this study addressed a gap in the existing literature by exploring the impact of ChatGPT on student attitudes and learning outcomes within the Malaysian context. By offering insights into the practical use of ChatGPT in education, this research contributes to the ongoing discussion about AI in educational settings. The findings provide valuable information that can help educators and

policymakers better understand how AI tools like ChatGPT can be used effectively in learning environments while highlighting potential challenges that must be addressed.

1.7 Conceptual Definition

This section provides the conceptual definitions for the key variables in this study. These definitions establish the foundation for understanding the constructs examined in the research, including attitudes toward ChatGPT, cognitive motivation, and problem-solving skills.

1.7.1 Attitude toward ChatGPT

Attitude toward ChatGPT can be understood as the overall assessment, feelings, and beliefs individuals had about ChatGPT, which can elicit positive or negative affective responses (Olufemi, 2012). According to Ajlouni et al. (2023), attitude toward ChatGPT is a psychological construct encompassing three components: cognitive, affective, and behavioural, derived from the ABC model of attitudes introduced by psychologists Martin Fishbein and Icek Ajzen in the 1960s. The cognitive component pertains to the beliefs or perceptions individuals have about ChatGPT. The affective component refers to the emotional aspect of attitude, reflecting an individual's feelings or reactions toward ChatGPT. The behavioural component relates to the actions or conduct of individuals toward ChatGPT (Ajlouni et al., 2023).

Attitudes toward ChatGPT depend on several dimensions, such as perceived usefulness, perceived ease of use, perceived risks and anxiety, attitude toward technology, social influence, cognitive and behavioural factors, and perceived risks of use (Sallam et al., 2023). Additionally, factors such as ChatGPT's functions, the quality of the information, privacy and ethical issues, holistic competencies, human values, and the social norms surrounding ChatGPT may influence individuals' attitudes and responses (Chan & Hu, 2023). In summary, attitude toward ChatGPT encompasses how individuals perceive, feel about, and behave toward the tool, shaped by various cognitive, emotional, and behavioural factors.

1.7.2 Cognitive Motivation

Cognitive motivation refers to the internal drives, interests, or desires that lead students to engage in cognitive activities such as thinking, learning, problem-solving, and decision-making (Blumenfeld et al., 2005). According to Cacioppo and Petty (1984), cognitive motivation can be related to the need for cognition, a concept characterized by an intrinsic desire to engage in challenging intellectual activity. Research suggests that intrinsic motivation significantly impacts an individual's engagement in cognitive tasks (Ramme et al., 2022).

Cognitive motivation includes cognitive, affective, and behavioural dimensions that collectively influence individuals' inclination to engage in and persist with cognitive tasks and their attitudes and behaviours in the face of cognitive challenges (Blumenfeld et al., 2005). Various factors, including task complexity,



perceived competence, social influences, and environmental factors, influence this multifaceted construct. These elements can either increase or decrease an individual's motivation to engage with a task, depending on the context in which they are applied (Blumenfeld et al., 2005). Overall, cognitive motivation drives students to engage with academic tasks and persist through challenges shaped by individual factors and the surrounding environment.

1.7.3 Problem-Solving Skills

Problem-solving skills refer to students' ability to navigate cognitive processes when tackling unfamiliar challenges. Rooted in Polya's framework (1954), problem-solving involves three key components: the available information (givens), the desired outcomes (goals), and employing appropriate methods to reach solutions (operations). This process unfolds through stages, including understanding the problem, devising a plan, implementation, and retrospective evaluation (Wang & Chiew, 2010).

These skills encompass cognitive processes such as critical thinking, which involves conceptualizing, reasoning, and decision-making (Rahman, 2019). Emotions and attitudes also shape problem-solving, guiding goal-setting, and affective states influencing competence (Tepfenhart, 1994; Goldin, 2000). Observable behaviours and strategies underpin problem-solving skills, including keen observation, interpretation, and adaptation based on situational demands (Rahman, 2019; Wang & Chiew, 2010). These skills operate within contextual frameworks, influenced by available resources and social norms (Dohrenwend & Dohrenwend, 1978). In sum, problem-solving skills



are a combination of cognitive processes, emotional resilience, and behavioural strategies, all of which contribute to effective problem resolution in academic contexts.

1.8 Operational Definition

This section provides the operational definitions for the variables under study. These definitions lay the groundwork for understanding how these constructs were measured and analysed in this research.

1.8.1 Attitude toward ChatGPT

Attitudes toward ChatGPT are operationally defined as the composite measure of individuals' perceptions, beliefs, feelings, and attitudes toward ChatGPT. This will be measured using the "Technology Acceptance Model Edited to assess ChatGPT adoption" (TAME-ChatGPT) questionnaire developed by Sallam et al. (2023). The questionnaire was chosen because it explicitly measures attitudes toward ChatGPT, incorporating perceived usefulness, perceived ease of use, perceived risk, anxiety, attitude toward technology, social influence, and cognitive/behavioural factors.

The questionnaire consists of two scales: the attitude scale for participants who have heard about ChatGPT but have not used it (13 items) and the attitude and usage scale for those who have used ChatGPT (27 items). Scores on the scales reflect



cautious or positive attitudes toward ChatGPT based on various factors. All items are rated on a 5-point Likert scale, ranging from "Agree" to "Disagree" (Abdaljaleel et al., 2024; Abdaljaleel et al., 2023).

1.8.2 Cognitive Motivation

Cognitive motivation is operationally defined as how individuals engage in cognitive tasks and enjoy thinking. This was measured using participants' self-reported scores on the Need For Cognition (NFC) scale, developed by Cacioppo and Petty (1982). The NFC scale was selected to measure cognitive motivation because it directly addresses individuals' tendencies to engage in and enjoy cognitive tasks, aligning with the research question regarding the relationship between attitude toward ChatGPT and cognitive motivation.

The NFC scale consists of 18 items rated on a 5-point Likert scale, ranging from "Extremely Uncharacteristic" to "Extremely Characteristic," with scores ranging from 18 to 90 points. Higher scores indicate a greater propensity for cognitive engagement and motivation, while lower scores suggest a lower inclination toward cognitive tasks and enjoyment of thinking (Cacioppo & Petty, 1982; Cacioppo et al., 1984; Cacioppo et al., 1996).



1.8.3 Problem-Solving Skills

Problem-solving skills are operationally defined as individuals' awareness of their problem-solving abilities or style, including their problem-solving appraisal. This was measured by participants' self-reported scores on the Problem-Solving Inventory (PSI) scale developed by Heppner and Peterson (1982). The PSI scale was chosen to assess individuals' evaluations of their problem-solving styles and confidence levels, enabling a thorough examination of how students perceive and approach problem-solving tasks in the context of ChatGPT utilization.

The PSI consists of 35 items rated on a 6-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree." Participants' total PSI scores are the sum of three constructs: problem-solving confidence, approach-avoidance style, and personal control, ranging from 35 to 210 points. Lower scores on the PSI and its constructs suggest behaviours and attitudes associated with successful problem-solving, such as higher problem-solving confidence, a tendency to approach rather than avoid problems, and a positive perception of personal control (Heppner & Peterson, 1982; Heppner & Baker, 1997; Heppner & Anderson, 1985; Heppner et al., 2009).

1.9 Theoretical Approach

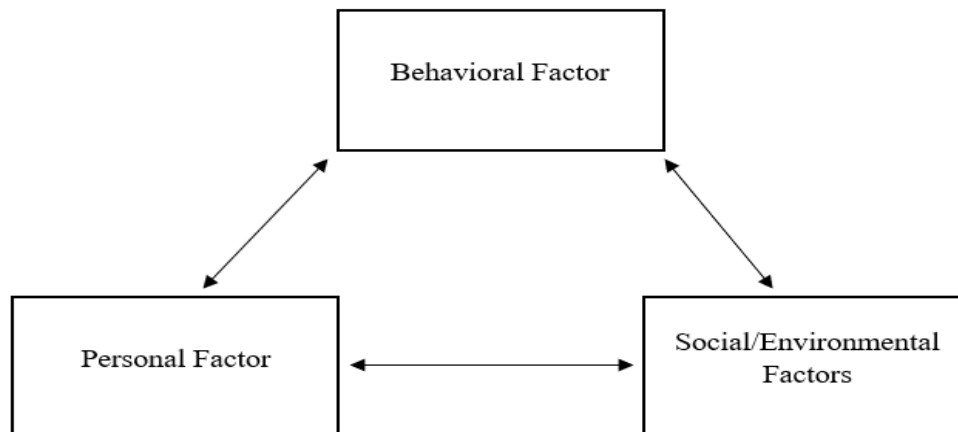
This study applies Social Cognitive Theory (SCT) as the theoretical framework to investigate the relationships between attitudes toward ChatGPT, cognitive motivation, and problem-solving skills among undergraduate university students at UPSI.

Developed by Albert Bandura, SCT emphasizes that human learning and behaviour occur within a social environment, incorporating concepts like human agency and triadic reciprocal determinism (Bandura, 1989; Schunk & Usher, 2012).

SCT extends Social Learning Theory (SLT) by introducing human agency, which is the ability to control one's thinking, motivation, and actions (Abdullah, 2019), and the triadic reciprocal determinism model, which highlights the bidirectional interactions among personal, behavioural, and environmental factors (Schunk & Usher, 2012), as illustrated in Figure 1.1.

Figure 1.1

Triadic Reciprocal Causation Model



This model suggests that the change or acquisition of new behaviours is due to the interplay of personal, behavioural, and environmental factors (Bandura, 1989). The theory's concepts—observational learning, self-regulation, moral disengagement, outcome expectations, self-efficacy, collective efficacy, incentive motivation, and



facilitation—provide a comprehensive framework for understanding how individuals acquire, maintain, and change behaviours (Bartlett, 2011).

Attitudes toward ChatGPT represent the environmental factor in this model. Social or environmental factors play a key role in acquiring, maintaining, and changing behaviours. In this context, individual behaviour results from reinforcement, experiences, aspiration, persuasion, and other social interactions (Bandura, 1989). Factors such as ChatGPT's functions, the quality of the information, privacy and ethical issues, holistic competencies, human values, and social norms surrounding ChatGPT may influence individuals' attitudes and responses (Chan & Hu, 2023). Therefore, individuals' attitudes toward ChatGPT serve as critical determinants in shaping their willingness to engage with and adopt this technology in various contexts. For instance, if students perceive ChatGPT as valuable and easy to use, they are more likely to adopt it, reinforcing their positive attitude and influencing their cognitive motivation (personal factor) and problem-solving skills (behavioural factor), as explained by the triadic reciprocal determinism model.

Cognitive motivation can be seen as both a personal and behavioural factor. SCT's concept of self-efficacy—the belief in one's ability to achieve goals—is directly related to cognitive motivation. As Cook and Artino (2016) mentioned, cognitive motivation is influenced by personal, behavioural, and environmental factors, highlighting the dynamic interplay between individual characteristics and contextual influences. Higher self-efficacy can lead to greater engagement in cognitive tasks, directly affecting how students interact with ChatGPT. For example, students who are





confident in their ability to use ChatGPT effectively may use it more frequently to enhance their learning experience.

Problem-solving skills are considered a behavioural factor within the SCT framework. SCT concepts related to problem-solving skills—such as self-efficacy and outcome expectancies—shape problem-solving behaviour and outcomes. People with high self-efficacy tackle problem-solving tasks with confidence and determination, which results in greater success in overcoming challenges (Heppner et al., 2009). For instance, a student with high self-efficacy in problem-solving may use ChatGPT to break down complex problems into manageable steps, improving their problem-solving skills.



In conclusion, SCT is chosen because it provides a valuable framework for understanding how environmental factors (attitudes), personal factors (cognitive motivation), and behavioural factors (problem-solving skills) interact within a social context. By examining these interactions, the study aims to uncover how students' attitudes toward ChatGPT influence their cognitive motivation and problem-solving abilities. Understanding the interconnectedness between attitudes and cognitive motivation, as well as attitudes and problem-solving skills, will provide deeper insights into how ChatGPT impacts users.

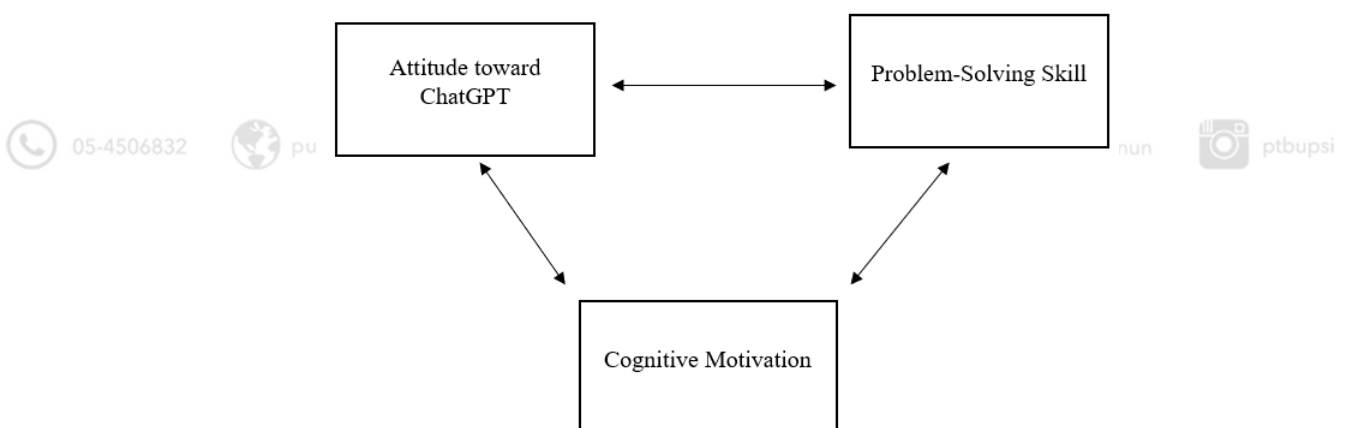


1.10 Conceptual Framework

To explain the relationships between the variables, a conceptual framework based on the triadic reciprocal causation model of SCT has been developed. This model offers a theoretical basis for understanding the relationship between attitudes toward ChatGPT and cognitive motivation and between attitudes toward ChatGPT and problem-solving skills among UPSI students.

Figure 1.2

Conceptual Framework



As illustrated in Figure 1.2, this conceptual framework emphasizes that the variables under investigation—attitudes toward ChatGPT, cognitive motivation, and problem-solving skills—are interrelated but not necessarily in a reciprocal manner involving all three. The bidirectional arrows indicate that attitudes toward ChatGPT influence cognitive motivation and problem-solving skills, and vice versa, but not all three variables are being studied in a mutual relationship simultaneously. The relationship between attitudes and cognitive motivation and attitudes and problem-



solving skills are considered separately but interconnected, underscoring the dynamic and complex nature of how these variables interact in the learning process.

Furthermore, this framework aligns with SCT, describing how personal, behavioural, and environmental factors manifest in the relationships between attitudes toward ChatGPT, cognitive motivation, and problem-solving skills. This connection reinforces the study's theoretical foundations and ensures that the framework is consistent with the principles of SCT.

1.11 Hypotheses

This section presents hypotheses derived from the research objectives, in conjunction with the conceptual framework and theoretical rationale. These hypotheses aim to examine the relationship between the key variables in this study and provide testable propositions for exploring these relationships empirically. The following are the hypotheses of the study:

1. There is no significant relationship between attitude toward ChatGPT and cognitive motivation among UPSI students.
2. There is no significant relationship between attitude toward ChatGPT and problem-solving skills among UPSI students.



1.12 Conclusion

In conclusion, this chapter has addressed the gaps in understanding the use of ChatGPT in education and outlined the significance of this research. It clearly defined the key variables and frameworks, offering insights into their interrelationships and guiding the study's objectives.

By establishing this foundation, the chapter sets the stage for a detailed examination of attitudes toward ChatGPT, cognitive motivation, and problem-solving skills among university students. This groundwork helps to underscore the study's relevance in advancing knowledge about technology-mediated learning and its influence on cognitive processes.