

# CHATGPT'S EFFECT ON UNIVERSITY STUDENTS' ACADEMIC CONFIDENCE: THE MODERATING ROLE OF ACADEMIC OUTCOME VALENCE, DESIRABILITY OF CONTROL, AND PROTESTANT WORK ETHICS

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## Abstract

ChatGPT has gained significant popularity among students, teachers and researchers since its' release in November 2022. Prior research has shed light on various aspects of ChatGPT use in academia; however, most of these studies have used descriptive analysis to summarize the benefits and downsides of ChatGPT. There is a lack of theoretical underpinning and empirical attempts to study the impact of ChatGPT in higher education, especially regarding how its use might influence university students' academic confidence. In this research, we posit that there is a positive relationship between ChatGPT use and academic confidence. From a social psychology perspective, particularly based on the expectancy theory of motivation, we further propose that university students' academic confidence after using ChatGPT for coursework will be influenced by three moderating factors: the valence of academic outcomes, students' desirability of control, and their protestant work ethic. Five hundred students from the school of business are invited to participate in the study. Findings of this research will contribute to the teaching and learning literature in several ways. First, it contributes to the growing body of literature on the valence of academic outcomes, desire for control, and Protestant work ethic by revealing their relationships with students' usage of generative AI in learning. Second, the current research will have strong implications for students and educators regarding the optimal method of ChatGPT use in teaching and learning

Keywords: ChatGPT, Academic confidence, Valence, Desire of control, Protestant work ethics.

## 1 INTRODUCTION

ChatGPT as one major Generative AI (GenAI) tool has not only changed the way we retrieve and process information, but also profoundly disrupting the way teaching and learning are conducted in higher education. ChatGPT is a chatbot that uses Natural Language Processing to provide human-like answers to users' queries. After learning from large language models, ChatGPT is able to carry out complex tasks, such as content generation, computer code creation, as well as translation and summarization (Deng and Yin, 2023). Due to ChatGPT's super power and efficiency, university students began to use ChatGPT frequently to complete their coursework; university teachers also get involve with using ChatGPT for curriculum design, feedback given, and assessing students' work (Dempere, et al., 2023). Recently, due to the large demand and good feedback from universities, OpenAI further introduced ChatGPT Edu for higher education users in particular.

Prior research has shed light on various aspects of ChatGPT usage in academe. For instance, Firat (2023) highlight its potential to transform education by facilitating personalized learning. Fauzi et al. (2023) analyzed the role of ChatGPT in improving students' productivity. And studies on factors influencing the acceptance of this new technology in higher education (Shaengchart, et al., 2023). Among them, most of the studies in the past used descriptive analysis to summarize the benefits and downsides of ChatGPT for teaching and learning (e.g., Godsk and Elving, 2024).

Although ChatGPT has been used frequently in learning and education at the university level, the past literature has not explored how its usage would influence university students' academic confidence. Academic confidence describes a student's belief about performing a task at particular level in order to attain a specific academic goal (Sander and Sanders, 2005), reflecting a strong belief or sure expectation of success in the academic field. In the current research, we first believe that there is a positive relationship between ChatGPT use and academic confidence. We further propose that university students' academic confidence after using ChatGPT for coursework will be influenced by three factors: the valence of academic outcome, students' desirability of control, and their protestant work ethics.

## **2 HYPOTHESES DEVELOPMENT AND RESEARCH MODEL**

### **2.1 ChatGPT use and academic confidence.**

Academic confidence plays a significant role in students' learning. Students with higher level of academic confidence are proved to be high achievers (Shaukat and Bashir, 2016). Academic confidence can develop from the mastery of skills, various experiences and social and emotional support (Sander and Sander, 2005). Using ChatGPT, a new Generative AI tool is such a skill in enhancing students' confidence in coping with challenges in their academic studies. Good past experiences (e.g., getting positive feedback from teacher after ChatGPT use or good academic results with the assistance of ChatGPT) with ChatGPT is also helpful in boosting such a confidence. We therefore propose a positive relationship between ChatGPT use and students' academic confidence.

### **2.2 The moderating role of valence of academic outcomes.**

In psychology, valence of an outcome comes from Vroom's expectancy theory of motivation (1964). Expectancy theory proposes that an individual will behave or act in a certain way because they are motivated to select a specific behavior over others due to what they expect the result of that selected behavior will be (Oliver, 1974). Valence is about the value the individual places on the rewards, and how much the outcome is valued. The more an individual values a certain reward, the more satisfied they will be with their efforts. There are three categories of valence: avoiding, apathetic, and desiring the outcome (Channell, 2021). When it comes to the context of students' learning, expectancy theory also finds its place. It was believed that expectancy theory helps to understand learners' motivations and behaviors, as it is able to explain the cognitive processes used by the learners, as well as their achievement (Wang and Xue, 2022). Academic achievement is an important indicator for the student's academic development and the quality of education (Ye et al., 2013). Students' academic achievement, such as grades and GPA are important reflection of learning outcomes. When students receive positive academic outcomes or desired value in academic outcomes after using ChatGPT, they may believe that they not only achieve the planned academic goal but also mastered an additional educational tool at the same time. This may lead to enhanced academic confidence. On the other hand, when students receive negative academic outcomes or undesired value after using ChatGPT, they may see themselves as a bigger failure because even AI tools such as ChatGPT cannot help them get better grades. Thus, we predict that the usage of ChatGPT for coursework will positively influence university students' academic confidence, when students had a high valence in academic outcomes. However, the relationship between the usage of ChatGPT and academic confidence would become negative, when students had a low valence in academic outcomes.

### **2.3 The moderating role of students' desirability for control.**

Desire for control (DC) or need for control has frequently been proposed as an important personality characteristic and as a possible crucial moderator in the field of achievement in work and life (Burger and Cooper, 1979). Some individuals may be highly committed to being in charge of every situation which they encounter and to determine the outcomes, while others may have a much weaker urge to control their environment. In educational field, before the introduction of Generative AI, students usually have their own control toward their studies. A desire for control has been said to have a positive relationship with students' academic achievement (Burger, 1992). Nowadays, with the development of GenAI tools, quite a number of students began to rely on these AI tool to finish coursework. ChatGPT, for example, provides help and support to students on their coursework; but at the same time, it dictates what the answer should be and deprive students' sense of control in completing the assessment. Thus, in a university learning context, students who have a higher desire of control may see the usage of ChatGPT in coursework as a threat to their self-agency and control, and have a negative attitude toward it. Therefore, we predict that the usage of ChatGPT for coursework will positively influence university students' academic confidence, when students have a low desire for control. However, the relationship between the usage of ChatGPT and academic confidence would become negative, when students have a high desire for control.

### **2.4 The moderating role of students' protestant work ethics.**

Protestant work ethic comes from the religious importance attached to laboring at one's job. Protestant work ethic places a high value on productivity and devalue those who do not work hard and try to succeed at their job. Individuals who support the protestant ethics of work believe that hard work is

necessary in order to become successful and that there are negative consequences if we do not work hard (Rusu, 2018). Given that ChatGPT provides help and support to students on their coursework, leading to a reduced effort and hard work on the students' end, it is possible that student who have a strong protestant work ethic will see the help of ChatGPT negatively, and consequently have less academic confidence after receiving a lot of help from ChatGPT. Thus, we predict that the usage of ChatGPT for coursework will positively influence university students' academic confidence, when students have a weak protestant work ethic. However, the relationship between the usage of ChatGPT and academic confidence would become negative, when students have a strong protestant work ethic.

Based on the above discussions, we developed the below research model as shown in Figure 1.

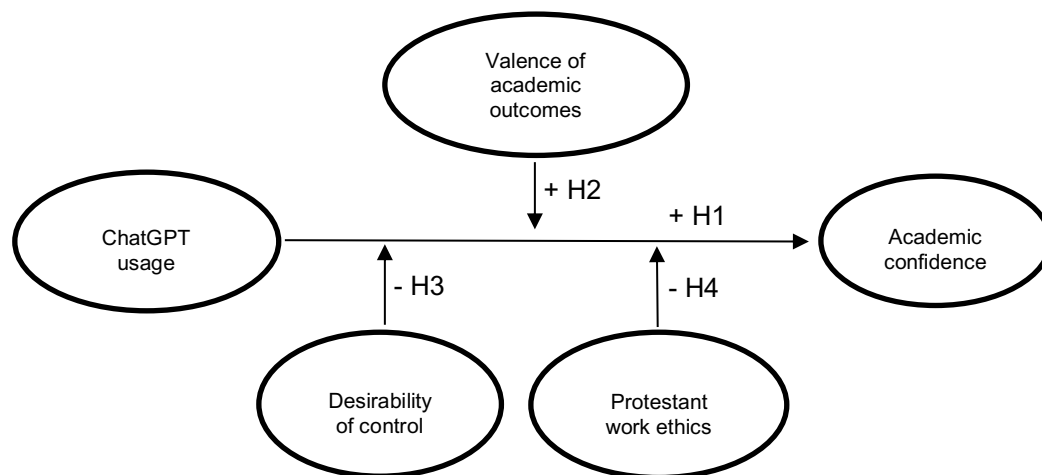


Figure 1. Research Model

- H1. There is a positive relationship between ChatGPT use and academic confidence
- H2. The usage of ChatGPT for coursework will positively influence university students' academic confidence, when students had a high valence in academic outcomes.
- H3. The usage of ChatGPT for coursework will positively influence university students' academic confidence, when students have a low desire for control.
- H4. the usage of ChatGPT for coursework will positively influence university students' academic confidence, when students have a weak protestant work ethic.

### 3 METHODOLOGY

Students from a freshman subject on management or marketing will be our target sample. We are going to use the results of one written assignment as the assessment method of students' ChatGPT usage. The assignment is a formative assessment, which requires students to write an essay with 600-800 words on a certain topic covered in the subject. Contents, citation and reference, and writing language are major assessment criteria for this assignment. Clear rubrics were established beforehand, and human graders will mark them based on the rubrics. Five hundred students are invited to participate in the study voluntarily, and their joining of the study will not affect their course grade. Participants will be told that they have one week to submit this essay, and using ChatGPT is a must in this writing task. After participants submitted their essays, they will be asked to immediately report the level of ChatGPT usage in completing the essay. When students received their assignment grade in the later stage, they will be invited to complete a set of measurement via online survey. This includes academic confidence (Sander 2009), valence of academic outcomes (James, et al., 1994), desirability of control (Burger and Cooper 1979), and protestant work ethics (Mirels and Garrett 1971). We will then run regressions to test the predicted interactive effects between ChatGPT usage and outcome valence, desirability of control, and protestant work ethics on participants' academic confidence.

### 4 EXPECTED RESULTS

We expected there would be a positive relationship between ChatGPT usage and students' academic confidence. We also expected there will be a positive moderating effect of valence of academic

outcomes and two negative moderating effects of desirability of control and protestant work ethics in the path. Findings of this research will contribute to the teaching and learning literature. First, it contributes to the growing literature on the usage of GenAI in education by demonstrating the impact of using ChatGPT in coursework on university students' academic confidence. Second, it adds to the literature on academic confidence by identifying its antecedent and moderators. Third, it also contributes to the literature on valence of academic outcomes, desire for control, and protestant work ethics by revealing their relationships with students' usage of GenAI in learning. Last but not least, the current research will have strong implications for students and educators regarding what will be the optimal method of ChatGPT usage in teaching and learning.

## 5 CONCLUSIONS

ChatGPT, as one of the most famous GenAI tools has greatly entrenched in educational field, especially in higher education. It radically changes how students interact with their teachers and the way they learn. Nowadays, university students are used to use ChatGPT to finish nearly all kinds of assessments. It has already become a necessity in their daily lives. This paper explores the impact of ChatGPT on student's academic confidence and discusses how the moderating factors such as valence of academic outcome, desirability of control and protestant work ethics will take effect in the path. It is among the first to use psychology theory such as Vroom's expectancy theory of motivation to explore the possible moderating relationships between ChatGPT use and academic confidence. Results of this study will have significant impact in psychology field and pedagogical field.

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