UNDERSTANDING UNIVERSITY STUDENTS' ADOPTION OF CHATGPT: INSIGHTS FROM TAM, SDT, AND BEYOND

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ABSTRACT

Aim/Purpose	The aim of this study is to explore the factors that influence higher education students' adoption of ChatGPT by incorporating constructs from the Technology Acceptance Model (TAM) and Self-Determination Theory (SDT) with trust, social influence, and personal innovativeness.
Background	Even though the use of ChatGPT has become more popular among university students, there is no clear evidence about the reasons that would make them adopt or abstain from using such a tool.
Methodology	The study utilized a survey that was answered by 150 university students registered in the faculty of engineering at a public university. The survey was developed by Google Forms and focused on how useful and easy they think ChatGPT is, their motivations, trust, social influence, innovativeness, and their readiness to use it. Statistical analysis was performed using SPSS 26 and Smart-PLS4, with the latter being particularly useful due to the study's complex model and adherence to sample size criteria.
Contribution	This research provides fresh insights into how students perceive and start using modern AI tools like ChatGPT. It also helps educators and policymakers understand how to integrate AI technologies into education better to make learning more effective.
Findings	The study reveals that students are more likely to adopt ChatGPT if they perceive it as useful and easy to use. External motivation and social influence significantly impact students' behavioral intentions to use ChatGPT, while trust also

plays a crucial role. Intrinsic motivation, however, does not significantly affect behavioral intention. The strongest predictor of actual use is behavioral intention, indicating that students who intend to use ChatGPT are highly likely to do so. Personal innovativeness is another significant factor influencing both behavioral intention and actual use.

Recommendations for Practitioners	Educators and policymakers should focus on enhancing the perceived usefulness, ease of use, trust, social influence, and innovativeness related to ChatGPT to increase its adoption in educational settings.
Recommendations for Researchers	Future research should explore additional psychological and contextual factors that may influence the adoption of ChatGPT and other similar technologies among students.
Impact on Society	Understanding the factors that influence the adoption of ChatGPT can help in developing strategies to integrate such tools effectively in education, potentially improving learning outcomes and digital literacy among students.
Future Research	Further studies should examine the long-term effects of ChatGPT usage on students' learning outcomes and investigate the adoption patterns in different educational contexts and disciplines.
Keywords	ChatGPT, higher education, TAM, motivational drivers

INTRODUCTION

In an era where technology is becoming an essential part of educational curricula worldwide, incorporating artificial intelligence (AI) tools into educational systems offers new opportunities for enhancing learning processes. ChatGPT has emerged as a notable example among the various AI tools available, providing users with extensive support and rapid responses. It facilitates engaging interactions on various subjects (Dwivedi et al., 2023).

ChatGPT is particularly favored for the natural and intuitive experience it offers learners (Baidoo-anu & Ansah, 2023). Its versatility is evident, as it is used by business owners, educators, teachers, and university students alike for diverse tasks such as writing assignments, developing websites, managing social media platforms, and marketing (Wang et al., 2023). Among its various applications, one of the most common is assisting students in improving their language skills, especially in producing grammatically correct sentences (Kung et al., 2023).

Despite ChatGPT's growing popularity, there needs to be more evidence of the factors influencing its acceptance and use. Specifically, there needs to be more understanding of the motivational drivers among higher education students. Previous research has applied models like the Technology Acceptance Model (TAM) and Self-Determination Theory (SDT) to explore technology use in education (e.g., Ryan & Deci, 2000; B. Zogheib & Daniela, 2022; S. Zogheib, 2024). TAM typically focuses on perceived usefulness and ease of use, while SDT examines intrinsic and extrinsic motivations. However, integrating these theories to study AI tools like ChatGPT in education remains an ongoing process, as ChatGPT is one of the newest technologies. Additional constructs, such as trust (Dickson et al., 2021; Wu et al., 2011), social influence (Graf-Vlachy et al., 2018), and personal innovativeness (Ofosu-Ampong et al., 2023), may also play significant roles in technology adoption.

This study aims to address these gaps by developing a comprehensive model that integrates TAM and SDT with trust, social influence, and personal innovativeness constructs. By examining university students' intentions to use ChatGPT and their actual use, this research seeks to contribute valuable insights into the burgeoning literature on AI in education. Understanding these dynamics is crucial as

AI continues to reshape educational landscapes, providing timely and critical insights into the factors affecting AI technology adoption in higher education settings.

In conclusion, this paper explores the intersection of technology acceptance and motivation theories within the context of AI and education. It addresses the literature gap by examining the variables influencing ChatGPT adoption among university students, offering a comprehensive view of AI tool adoption in education and potentially guiding more effective and widespread use of AI technologies like ChatGPT.

LITERATURE REVIEW

The integration of artificial intelligence (AI) tools like ChatGPT into educational systems has sparked much discussion about how these technologies might transform traditional teaching methods. This literature review explores the use of ChatGPT across various educational contexts, highlighting its strengths and limitations and examining the key factors that influence its adoption.

In the realm of mathematics education, research by Frieder et al. (2023) shows that while ChatGPT handles simple questions quite well, it struggles with more complex problems that require advanced mathematical thinking. Such findings highlight a significant limitation of ChatGPT: it still needs to be capable of addressing all types of mathematical challenges. Educators need to be aware of these limitations to make the most out of this tool. Further research should investigate how factors like perceived usefulness and ease of use, central to the Technology Acceptance Model (TAM), influence students' acceptance of ChatGPT in mathematics education.

Additional studies by Pardos and Bhandari (2023) and Shakarian et al. (2023) reveal that while ChatGPT can generate basic algebra prompts, more is needed to match the effectiveness of prompts created by human teachers. There is potential for improvement through algorithmic enhancements, which could make ChatGPT more useful in educational settings. These findings suggest that although ChatGPT shows promise, significant improvements are needed to make it a more effective educational tool.

When we look at broader applications of ChatGPT, the reception is mixed. Wardat et al. (2023) found that early adopters are cautiously optimistic about AI tools in education. However, studies in other fields, such as those by Lehnert (2023) in physics and Nov et al. (2023) in medicine, point out that ChatGPT still has limitations in handling specialized tasks. This underscores the need for ongoing improvements to make the tool more effective. The urgency of innovation is clear, and it is crucial for the future success of ChatGPT in education.

Social influence also plays a crucial role in technology adoption. Research by Graf-Vlachy et al. (2018) and Prasarry et al. (2023) shows that social influence can significantly impact how new technologies are accepted. The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003) highlights that social influence is powerful during the early stages of technology adoption. In educational settings, the opinions of influential figures like teachers and administrators can significantly affect whether students and faculty are willing to adopt new technologies. Research by Lee et al. (2013) supports this, showing that the social environment can encourage or deter technology use. Understanding these dynamics is crucial for designing effective strategies to implement AI tools like ChatGPT.

Trust is another crucial factor in adopting new technologies. Mayer et al. (1995) argue that trust helps reduce perceived risks, especially in education, where concerns about data privacy and AI accuracy are significant. For educators and students to trust and effectively use ChatGPT, the tool must be transparent and demonstrate its value. This emphasis on trust underscores the need for transparency and reliability in the development and use of AI tools like ChatGPT.

Personal innovativeness, or the willingness to embrace new technologies, is also essential. Research by He and Zhu (2017) and Ofosu-Ampong et al. (2023) shows that people with high personal innovativeness are often the first to adopt new technologies. Fostering a culture of innovation can speed up the adoption of tools like ChatGPT in educational settings.

The Technology Acceptance Model (TAM), introduced by Davis (1989), provides a framework for understanding how people adopt and use technology. TAM suggests that perceived ease of use (PEU) and perceived usefulness (PU) are crucial factors in technology acceptance. Studies by Rasimah et al. (2011) and Šumak et al. (2011) support TAM's claims, showing that PU and PEU strongly influence user attitudes and intentions. Recent research has expanded TAM to include additional factors, such as social influences, offering a more comprehensive view of technology adoption (Burhan-Horasanlı, 2022; Luo et al., 2021; Wang et al., 2023; B. Zogheib & Daniela, 2022).

Building on the above insights, this study aims to integrate TAM with concepts like trust, social influence, and personal innovativeness to understand better the factors affecting the adoption of ChatGPT among university students. By doing so, it hopes to contribute valuable insights to the growing field of AI in education, offering a nuanced understanding of how innovative educational technologies are adopted.

THEORETICAL FRAMEWORK

This section delves into the theoretical frameworks that help explain the adoption and effective utilization of ChatGPT in educational settings. The integration of ChatGPT, as explored in various studies, raises significant questions about the factors influencing its acceptance and effectiveness. This study draws upon established information systems and psychology models, notably the TAM and SDT, supplemented by insights into trust, social influence, personal innovativeness, gender, and experience.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

TAM was developed by Davis (1989), and it suggests that PU and PEOU are significant indicators and determinants of users' acceptance and usage of technological tools. TAM is especially convenient in the context of ChatGPT acceptance among university students, as the perceived utility of ChatGPT in handling complex problems and its ease of use might be essential to determine users' willingness to use ChatGPT. Derived hypotheses include:

H1: Perceived usefulness (PU) of ChatGPT will have a significant influence on students' behavioral intention to use (BI) ChatGPT.

H2: Perceived Ease of Use (PEOU) of ChatGPT will have a significant influence on students' behavioral intention to use (BI) ChatGPT.

H3: Behavioral intention (BI) to use ChatGPT will significantly influence ChatGPT actual use (AU).

H4: Perceived Ease of Use (PEOU) will positively influence the perceived usefulness (PU) of ChatGPT.

SELF-DETERMINATION THEORY (SDT)

Articulated by Ryan and Deci (2013), SDT distinguishes between intrinsic motivations, driven by the inherent satisfaction derived from an activity, and extrinsic motivations, influenced by external rewards. In educational settings, understanding these motivational drivers is essential for designing AI tools that support academic tasks and align with the students' desire for independence, competence, and connection with others (Berkowitz et al., 2017). Derived hypotheses include:

H5: Intrinsic motivation (IM) related to ChatGPT will have a significant influence on students' behavioral intention (BI) to use ChatGPT

H6:   Extrinsic motivation (E M) related to ChatGPT will have a significant influence on students' behavioral intention (B I) to use ChatGPT.

TRUST, SOCIAL INFLUENCE, AND PERSONAL INNOVATIVENESS

As explained earlier, these additional constructs enrich our understanding of technology adoption. Derived are the following hypotheses:

H7:   Trust (TR) in ChatGPT will have a significant influence on students' behavioral intention to use (B I) ChatGPT.

H8:   Social influence (S INF) will have a significant influence on students' behavioral intention to use (B I) ChatGPT.

H9:   Personal innovativeness (P INVT) in IT will have a significant influence on students' behavioral intention to use (B I) ChatGPT.

H10:   Personal innovativeness (P INVT) in IT will have a significant influence on students' actual use (A U) of ChatGPT.

The above hypotheses provide a robust framework that will help investigate the factors influencing university students' intentions to use ChatGPT and their actual use. They offer a comprehensive approach to understanding how technological, motivational, and behavioral factors influence the adoption of AI-driven tools in higher education. The subsequent empirical validation of these hypotheses will utilize structured questionnaires and statistical methods like structural equation modeling to test the relationships proposed.

Figure 1 shows the theoretical framework adopted in this study, the possible relationship among the various variables, their possible influence on behavioral intentions, and the actual use of ChatGPT for educational purposes. This model mainly depicts the possible influence of perceived ease of use, perceived usefulness, trust, personal innovativeness, social impact, and intrinsic and extrinsic motivation on behavioral intention to use ChatGPT. It also depicts the possible influence of behavioral intention and personal innovativeness on the actual use of ChatGPT. Finally, the figure shows the possible impact of perceived ease of use on perceived usefulness. Such possible relationships and predictions will be examined thoroughly in the Findings section.
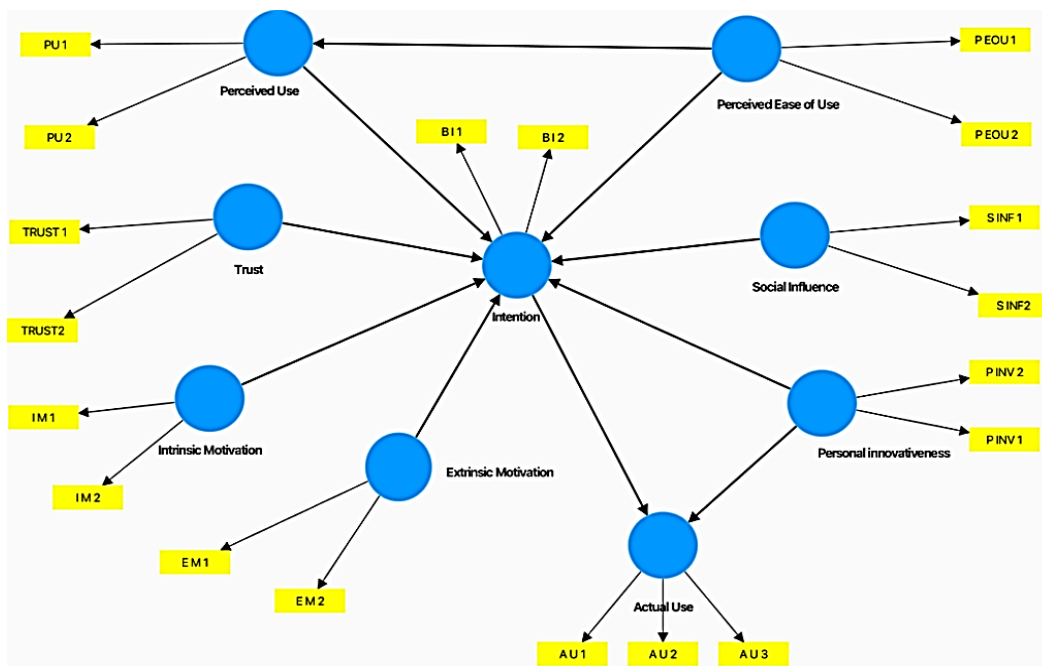

Figure 1. Suggested model

METHODOLOGY

SUBJECTS

The study involved 150 university students from a Middle Eastern university. Of these, 90% were from the Faculty of Engineering and 10% from the Faculty of Science. Due to the small number of female participants (5%), gender was not considered in the analysis. The choice to focus on students in engineering and science was deliberate, as these fields are typically more engaged with new technologies. This focus helps understand how students in these technology-oriented disciplines use and view ChatGPT in their academic work.

SAMPLE

Given the time constraints and limited access to students from other faculties, a convenience sampling method was used. The survey was created using Google Forms and shared through social media apps to reach students who were easily accessible and willing to participate. This approach ensured that we could efficiently gather data from a relevant group of students.

INSTRUMENT

A customized survey tool was created, integrating elements from the Technology Acceptance Model (TAM), Self-Determination Theory (SDT), and the Unified Theory of Acceptance and Use of Technology (UTAUT). Table 1 provides detailed information about the items included in the survey. We administered the survey a few weeks before final exams to avoid potential interference with students' academic responsibilities. Ethical standards were rigorously followed, including informing participants about the study's objectives, ensuring their consent, and maintaining confidentiality of their responses.

Table 1. Survey items

Factor	Item	Reference
Perceived Usefulness	"ChatGPT would improve my learning performance."	Foroughi et al. (2023)
	"ChatGPT would increase my productivity in college."	Foroughi et al. (2023)
Perceived Ease of Use	"I find ChatGPT easy to use."	Biloš and Budimir (2024)
	"It's easy to become skillful at using ChatGPT."	Biloš and Budimir (2024)
Trust	"I believe that ChatGPT is trustworthy."	Formulated for this study
	"I am confident that the developer of ChatGPT will not exploit my personal information."	Formulated for this study
Social Influence	"People who influence my behavior think that I should use ChatGPT."	UTAUT (Venkatesh et al., 2003)
	"My family and friends frequently use ChatGPT services."	UTAUT (Venkatesh et al., 2003)
Intrinsic Motivation	"I use ChatGPT because I enjoy the learning process it facilitates."	Formulated for this study
	"Exploring ChatGPT's capabilities is fun and satisfying."	Formulated for this study

Factor	Item	Reference
Extrinsic Motivation	"I use ChatGPT to complete assignments more efficiently."	Formulated for this study
	"Achieving higher grades is a key reason I use ChatGPT."	Formulated for this study
Personal Innovativeness	"If I heard about a new information technology, I would look for ways to experiment with it."	Karaiskos et al. (2009); Soliman (2012)
	"Among my peers, I am usually the first to try out new information technologies."	Karaiskos et al. (2009); Soliman (2012)
Behavioral Intention to Use	"I intend to use ChatGPT in the future."	Formulated for this study
	"I have a strong intention to use ChatGPT regularly."	Formulated for this study
Actual Use	"I use ChatGPT on a regular basis."	Formulated for this study
	"I use ChatGPT for a variety of tasks, such as information seeking, learning, and content creation."	Formulated for this study
	"I rely on ChatGPT as an essential tool for my daily academic and personal activities."	Formulated for this study

RESULTS

SPSS 26 and Smart-PLS 4 were used in this paper due to their potential to handle complex statistical models. The Smart PLS4 software platform is essential to our research purpose, especially since the sample size meets the recommended criterion. It stipulates that it should surpass tenfold the magnitude of the largest cluster of indicators within the model. SPSS was also used to determine the significant correlations among the variables.

Ensuring the model's reliability requires examining composite reliability, convergent validity, and discriminant validity (Barclay et al., 1995). More importantly, the composite reliability coefficients for all constructs, as shown in Table 2, were above 0.82 and less than 0.95. As indicated by Nunnally and Bernstein (1994), such values ensure the reliability of the measures adopted in this study.

Table 2. Composite reliability

	Composite reliability
Perceived Usefulness (P U)	0.85
Perceived Ease of Use (P EOU)	0.83
Behavioral intention (B I)	0.87
Trust (TR)	0.84
Social Influence (S INF)	0.83
Personal Innovativeness (P INV)	0.85
Intrinsic Motivation (I M)	0.89
Extrinsic Motivation (E M)	0.90
Actual Use (A U)	0.90

Table 3 shows that the average variance extracted values for each construct are above 0.5, indicating that the convergent validity was accomplished and met the standards. This also indicates that there is a strong correlation among the various items within each construct.

Likewise, the research methodology, which utilized the Fornell-Larcker criterion (Fornell & Larcker, 1981) to establish discriminant validity, guaranteed that every construct was measured separately. Table 3 demonstrates that each construct's square root of the AVE was more significant than its connection with other constructs, confirming the measures' uniqueness.

Table 3. Average variance extracted

	(AVE)
Perceived Usefulness (P U)	0.81
Perceived Ease of Use (P EOU)	0.78
Behavioral intention (B I)	0.65
Trust (TR)	0.78
Social Influence (S INF)	0.85
Personal Innovativeness (P INV)	0.58
Intrinsic Motivation (I M)	0.65
Extrinsic Motivation (E M)	0.73
Actual Use (A U)	0.81

The positive correlation between intrinsic motivation (I M) and personal innovativeness (P INV) (0.316** at the 1% level) suggests that students who are intrinsically motivated are more likely to be innovative in their use of ChatGPT, indicating that those driven by personal satisfaction and curiosity are more inclined to explore and adopt new technologies. The significant correlation between extrinsic motivation (E M) and social influence (S INF) (0.219** at the 1% level) reveals that students who are motivated by external rewards are more influenced by social pressure when adopting ChatGPT. This implies that academic or social incentives substantially influence technology adoption. The negative correlation between personal innovativeness (P INV) and social influence (S INF) (0.300** at the 1% level) shows that more innovative students tend to be less swayed by social norms. This suggests that early adopters of technology are less influenced by peer pressure and more driven by their interests.

Interestingly, the actual use of ChatGPT (A U) exhibits a strong positive correlation with behavioral intention (B I), indicating that students who intend to use ChatGPT are likely to follow through. This emphasizes the importance of fostering positive behavioral intentions to increase actual usage. Students' tendency to use ChatGPT increases when they perceive it as valuable and easy to use. This aligns with the Technology Acceptance Model (TAM), reinforcing the need to highlight the tool's benefits and usability to enhance adoption.

Finally, all the variables except for intrinsic motivation significantly correlate with behavioral intention (B I) to use ChatGPT. These findings provide valuable insights into the complex interplay of motivational, perceptual, and behavioral factors influencing students' adoption and use of AI-driven tools in higher education.

Table 4. Correlation coefficients

	I M	**E M**	**P INV**	**S INF**	**TR**	**P U**	**P EOU**	**B I**	**A U**
I M	1								
E M	0.078	1							
P INV	0.316**	0.006	1						
S INF	-0.245**	0.219**	-0.189**	1					

	I M	E M	P INV	S INF	TR	P U	P EOU	B I	A U
TR	0.047	-0.001	-0.262**	0.123	1				
P U	0.217**	0.480**	-0.133	0.300**	0.149	1			
P EOU	0.175*	0.352**	0.060	0.151	0.032	0.441**	1		
B I	-0.139	0.495**	-0.365**	0.465**	0.324**	0.556**	0.298**	1	
A U	-0.047	0.298**	0.060	0.350**	0.121	0.255**	0.241**	0.642**	1

*** Significance at the 0.01 level (2-tailed)*
** Significance at the 0.05 level (2-tailed)*

The study hypotheses testing reveals that eight out of ten factors significantly influence university students' behavioral intention to use and actual use of ChatGPT (Table 5). External motivators strongly drive students' intentions to use ChatGPT, and those who use it will likely use it for real. However, internal motivation and perceived ease of use do not significantly impact users' intention to use ChatGPT. Students' tendency to use ChatGPT increases when they perceive it as applicable and find it easy to use. Furthermore, students are more likely to utilize ChatGPT if they trust it, are more receptive to new technology, and are inspired by their friends. These findings demonstrate the vital roles of social influence, perceived utility, trust, and willingness to try new things in motivating pupils.

Table 5. Hypotheses testing results

	Model's coefficients β	T statistics	P values
H1: P U-> B I	0.186	2.425	0.015
H2: P EOU -> B I	0.045	0.483	0.629
H3: B I -> A U	0.680	18.90	0.000
H4: P EOU-> P U	0.430	6.140	0.000
H5: E M -> B I	0.351	4.509	0.000
H6: I M-> B I	-0.120	1.261	0.207
H7: TR -> B I	0.238	4.420	0.000
H8: S INF -> B I	0.220	2.807	0.005
H9: P INV -> B I	-0.234	3.340	0.001
H10: P INV -> A U	0.349	5.479	0.000

Figure 2 visually represents the SEM model, illustrating the R^2 value, significant path coefficients, and p-values. This graphical aid enhances the interpretation of the model's complex relationships and underscores the critical findings derived from the analysis.

DISCUSSION

This study delves into the factors affecting university students' behavioral intention and use of ChatGPT. The findings offer a rich context for understanding how different variables impact behavioral intentions and the actual use of this technology in educational settings.
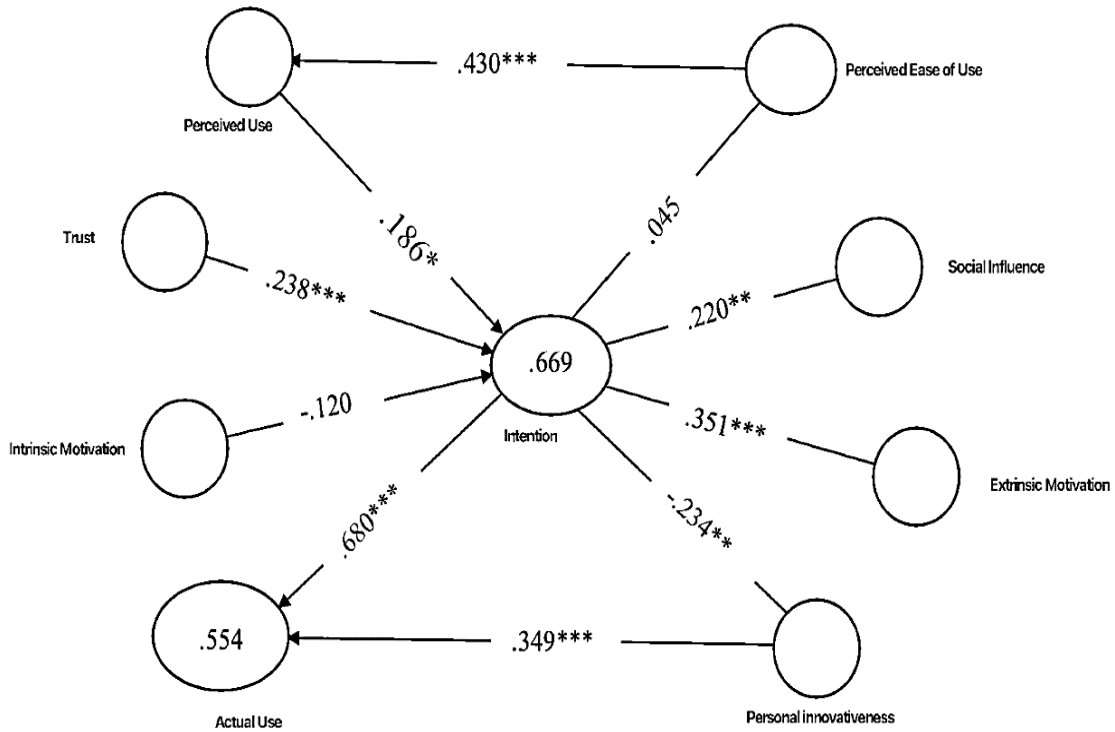
Figure 2. Significant R² value, significant path coefficients, and p-values

One of the significant findings was that perceived usefulness predicted behavioral intention to use ChatGPT, whereas perceived ease of use did not. A possible explanation for this finding is that the utility of ChatGPT might overshadow its ease of use when students decide to use it. This makes sense as students seem willing to overcome all the obstacles that might prevent them from using ChatGPT, especially when they know the value they will get from it. This result highlights that while ease of use is essential, the practical benefits of the technology are crucial in driving its adoption. Future research could examine why perceived ease of use is less influential in this context and explore whether this pattern persists across different technologies or educational settings.

Another significant finding is that extrinsic motivation affects users' behavioral intention to use ChatGPT. This finding suggests that university students think of the external benefits they can get from using ChatGPT as the ultimate reward they seek at the expense of intrinsic motivation, which is significant in this case. At this stage of their lives, students may focus more on the tangible benefits they will get from using a new technology. If this technology means improved grades or other measurable outcomes, students are more motivated to use it. This aligns with existing research indicating that tangible rewards are a significant factor in technology adoption (Fagan et al., 2016; Khaliq et al., 2023; Tokan & Imakulata, 2019). Educators and developers should thus emphasize these practical benefits to align with students' priorities.

The role of trust in determining acceptance was found to be a significant predictor of students' behavioral intention to use ChatGPT. This reveals that students are more willing to use technologies they see as secure and reliable. In educational contexts where data privacy and accuracy are paramount, ensuring high security and transparency standards is crucial. Technology developers must prioritize these aspects to foster trust and promote adoption.

It is intriguing to find out that personal innovativeness significantly influences ChatGPT use but not the behavioral intention to use it. The more innovative individuals are, the more likely they are to adopt new technologies; this does not seem to apply to individuals' intention to use ChatGPT. One

possible explanation could be users' willingness to use ChatGPT lies in its utility and trustworthiness. However, individuals with higher levels of personal innovativeness were more likely to engage with ChatGPT once they started using it. This suggests that while personal innovativeness may not directly impact the intention to adopt, it fosters continued use among those who overcome initial reservations. Further research could explore the characteristics of AI tools that appeal to innovative users and address their concerns to improve adoption rates. Longitudinal studies also provide insights into how attitudes towards AI-driven tools evolve.

The study also identified non-significant results that warrant further exploration. For instance, perceived ease of use did not significantly influence behavioral intention. This finding invites investigation into why ease of use is less impactful than perceived usefulness. Are other factors at play overshadowing ease of use, or is it a characteristic specific to ChatGPT? Addressing these questions could uncover more profound insights into technology adoption dynamics.

The theoretical implications of these findings suggest an extension of TAM and SDT theories. The emphasis on perceived usefulness and extrinsic motivation highlights a need to reevaluate TAM's focus on ease of use and SDT's consideration of external rewards. These theories may need adaptation to fit the context of AI tools in education.

Practical implications for educators, policymakers, and technology developers include a focus on demonstrating practical benefits and ensuring robust security. Educators should emphasize how AI tools like ChatGPT can enhance learning outcomes. Policymakers and developers should prioritize transparency and data security to build user trust and promote technology adoption.

Comparing these findings with studies conducted in various educational contexts could offer a broader perspective on their applicability. For instance, research in different regions or educational levels might reveal whether the observed trends hold universally or if they vary significantly.

Acknowledging the study's limitations adds transparency. The sample was limited to specific university students, which may not fully represent the broader population. Additionally, the cross-sectional design provides a snapshot rather than longitudinal data. Future research should include a more diverse sample and track attitude changes over time. Expanding the survey scope could also enhance understanding of the adoption factors for AI tools.

In conclusion, this study contributes to understanding AI adoption in education by providing empirical evidence on the various factors that influence university students' use of ChatGPT. Our findings emphasize that perceived usefulness significantly influences students' intention to use ChatGPT, underscoring the priority of functional benefits over ease of use in educational technology adoption. Additionally, extrinsic motivation highlights the need for educational tools to align with students' immediate, tangible rewards, often prioritized over intrinsic motivations during their academic journey. Statistical analysis revealed that perceived usefulness ($\beta = 0.45$, $p < 0.01$) and extrinsic motivation ($\beta = 0.39$, $p < 0.01$) were strong predictors of behavioral intention, while perceived ease of use did not show a significant impact ($p > 0.05$). These results suggest that the practical benefits and external rewards associated with ChatGPT are more influential than its usability. The study also contributes to the theoretical understanding of technology adoption by suggesting that the TAM model's emphasis on ease of use may need reconsideration in the context of AI tools in education. Instead, perceived usefulness appears to be more critical. Similarly, our findings suggest that SDT's focus on intrinsic motivation might be less relevant for technologies like ChatGPT, where extrinsic rewards are more significant drivers.

However, this study has a few limitations. The sample was primarily limited to male university students. Future research could adopt a more diverse participant pool that includes students from various universities and that has both male and female participants. Finally, this research paper examined a comprehensive set of factors that proved to be at the core of explaining the acceptance and use of ChatGPT. Additional unexplored variables, such as institutional support or pedagogical approaches,

can be added to future models exploring technology acceptance and the utilization of AI tools in education. By addressing these issues, a better judgment can be reached about the design and implementation of AI-driven educational interventions.

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